PRICING SUPPLEMENT

Korea National Oil Corporation

(a statutory juridical corporation established under the laws of the Republic of Korea)

Issue of U.S.$400,000,000 Floating Rate Notes due 2023
under the U.S.$9,000,000,000
Global Medium Term Note Programme

THE NOTES TO WHICH THIS PRICING SUPPLEMENT RELATES (THE "NOTES") HAVE NOT BEEN REGISTERED UNDER THE U.S. SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), OR WITH ANY SECURITIES REGULATORY AUTHORITY OF ANY STATE OR OTHER JURISDICTION OF THE UNITED STATES AND, UNLESS SO REGISTERED, MAY NOT BE OFFERED OR SOLD WITHIN THE UNITED STATES OR TO, OR FOR THE ACCOUNT OR BENEFIT OF, U.S. PERSONS (AS DEFINED IN REGULATION S UNDER THE SECURITIES ACT), EXCEPT PURSUANT TO AN EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT AND APPLICABLE STATE SECURITIES LAWS. ACCORDINGLY, THE NOTES WILL BE OFFERED AND SOLD ONLY OUTSIDE THE UNITED STATES TO NON-U.S. PERSONS IN RELIANCE ON REGULATION S.

Lead Manager and Joint Bookrunner

SG Securities (HK) Limited, Taipei Branch

Joint Bookrunners

Crédit Agricole Corporate and Investment Bank, Taipei Branch

HSBC Bank (Taiwan) Limited

Co-managers

Bank of Taiwan
E.SUN Commercial Bank, Ltd.
KGI Bank
Mega International Commercial Bank Co., Ltd.
SinoPac Securities Corporation

Capital Securities Corporation
Fubon Securities Co., Ltd.
KGI Securities Co. Ltd.
President Securities Corporation

The date of this Pricing Supplement is 29 June 2018.

Korea National Oil Corporation
Issue of U.S.$400,000,000 Floating Rate Notes due 2023
under the U.S.$9,000,000,000
Global Medium Term Note Programme

This document constitutes the Pricing Supplement relating to the issue of Notes described herein. Terms used herein shall be deemed to be defined as such for the purposes of the Conditions set forth in the Offering Circular dated 17 March 2017 (the "Offering Circular"). This Pricing Supplement contains the final terms of the Notes and must be read in conjunction with the Offering Circular.

1.	Issuer:		Korea National Oil Corporation
2.	(i)	Series Number:	46
	(ii)	Tranche Number:	1
3.	Specified Currency or Currencies:		United States dollars ("U.S.$")
4.	Aggregate Nominal Amount:		
	(i)	Series:	U.S.$400,000,000
	(ii)	Tranche:	U.S.$400,000,000
5.	(i)	Issue Price:	100.00 per cent. of the Aggregate Nominal Amount
	(ii)	Net proceeds (after deducting a combined management and underwriting commission but not estimated expenses):	U.S.$399,200,000
	(iii)	Use of proceeds:	The Issuer expects to use the net proceeds from the Notes offering principally for the repayment of maturing borrowings and bonds.
6.	Specified Denominations:		U.S.$200,000 and, in excess thereof, integral multiples of U.S.$1,000
7.	(i)	Issue Date:	16 July 2018
	(ii)	Interest Commencement Date:	16 July 2018
8.	Maturity Date:		16 July 2023
9.	Interest Basis:		3 month USD LIBOR + 0.875 per cent. Floating Rate (further particulars specified below)
10.	Redemption/Payment Basis:		Redemption at par
11.	Change of Interest Basis or Redemption/Payment Basis:		None
12.	Put (other than Condition 8(d)(i))/Call Options:		Not Applicable
13.	(i)	Status of the Notes:	Senior
	(ii)	Date Board approval for issuance of Notes obtained:	21 December 2017
14.	Listing:		Application will be made to list the Notes on the Taipei Exchange ("TPEx") of the Republic of China (the "ROC"). Effective date of listing of the Notes on the TPEx is on or about 16 July 2018. Application will also be made to list the Notes on the Singapore Exchange Securities Trading Limited ("SGX-

		ST"). Effective date of listing of the Notes on the SGX-ST is on or about 17 July 2018.
15.	Method of distribution:	Syndicated
	PROVISIONS RELATING TO INTEREST (IF ANY) PAYABLE	
16.	Fixed Rate Note Provisions:	Not Applicable
17.	Floating Rate Note Provisions:	Applicable
	(i) Specified Period(s)/Specified Interest Payment Dates:	Quarterly on each of 16 January, 16 April, 16 July and 16 October in each year, subject to adjustment in accordance with the Business Day Convention, commencing on 16 October 2018. "Interest Period" means the period beginning on (and including) the Interest Commencement Date and ending on (but excluding) the first Interest Payment Date and each successive period beginning on (and including) an Interest Payment Date and ending on (but excluding) the next succeeding Interest Payment Date.
	(ii) Business Day Convention:	Modified Following Business Day Convention
	(iii) Additional Business Centre(s):	London, New York City, Seoul, Taipei
	(iv) Manner in which the Rate of Interest and Interest Amount is to be determined:	Screen Rate Determination
	(v) Party responsible for calculating the Rate of Interest and Interest Amount (if not the Principal Paying Agent):	Not Applicable
	(vi) Screen Rate Determination:	
	— Reference Rate:	3 month USD LIBOR
	— Interest Determination Date(s):	Second London business day prior to the start of each Interest Period
	— Relevant Screen Page:	Reuters Page LIBOR01
	(vii) ISDA Determination:	Not Applicable
	(viii) Margin(s):	+0.875 per cent. per annum
	(ix) Minimum Rate of Interest:	Not Applicable
	(x) Maximum Rate of Interest:	Not Applicable
	(xi) Day Count Fraction:	Actual/360, adjusted
	(xii) Fall back provisions, rounding provisions and any other terms relating to the method of calculating interest on Floating Rate Notes, if different from those set out in	As set out in the Conditions

the Conditions:

18.	Zero Coupon Note Provisions:	Not Applicable
19.	Index Linked Interest Note Provisions:	Not Applicable
20.	Dual Currency Note Provisions:	Not Applicable

PROVISIONS RELATING TO REDEMPTION

21.	Issuer Call:	Not Applicable
22.	Investor Put (other than Condition 8(d)(i)):	Not Applicable
23.	Final Redemption Amount of each Note:	Par
24.	Early Redemption Amount of each Note payable on redemption for taxation reasons or on event of default and/or the method of calculating the same (if required or if different from that set out in Condition 8(e)):	Not Applicable

GENERAL PROVISIONS APPLICABLE TO THE NOTES

25.	Form of Notes:	Registered Notes
26.	Additional Financial Centre(s) or other special provisions relating to Payment Days:	
	(i) Additional Financial Centre(s):	Seoul
	(ii) Relevant cities for Payment Days:	London, New York City, Seoul, Taipei
27.	Talons for future Coupons or Receipts to be attached to Definitive Bearer Notes (and dates on which such Talons mature):	No
28.	Details relating to Partly Paid Notes: amount of each payment comprising the Issue Price and date on which each payment is to be made and consequences of failure to pay, including any right of the Issuer to forfeit the Notes and interest due on late payment:	Not Applicable
29.	Details relating to Installment Notes: amount of each installment, date on which each payment is to be made:	Not Applicable
30.	Redenomination applicable:	Redenomination not applicable.
31.	Other terms or special conditions:	Not Applicable

DISTRIBUTION

32.	(i) If syndicated, names of Managers:	<u>Lead Manager and Joint Bookrunner</u>: SG Securities (HK) Limited, Taipei Branch <u>Joint Bookrunners</u>: Crédit Agricole Corporate and Investment Bank, Taipei Branch HSBC Bank (Taiwan) Limited <u>Co-managers</u>: Bank of Taiwan Capital Securities Corporation E.SUN Commercial Bank, Ltd. Fubon Securities Co., Ltd. KGI Bank KGI Securities Co. Ltd. Mega International Commercial Bank Co., Ltd. President Securities Corporation SinoPac Securities Corporation
	(ii) Stabilising Manager (if any):	Not Applicable
33.	If non-syndicated, name of relevant Dealer:	Not Applicable
34.	U.S. Selling Restrictions:	Reg. S Category 2 TEFRA Rules Not Applicable
35.	Additional selling restrictions:	**The Republic of China** The Notes have not been, and shall not be, offered, sold or re-sold, directly or indirectly, to investors other than "professional investors" as defined under Paragraph 1 of Article 2–1 of the Taipei Exchange Rules Governing Management of Foreign Currency Denominated International Bonds (the "TPEx Rules"). Purchasers of the Notes are not permitted to sell or otherwise dispose of the Notes except by transfer to a professional investor.

OPERATIONAL INFORMATION

36.	Any clearing system(s) other than Euroclear and Clearstream, Luxembourg and the relevant identification number(s):	Not Applicable
37.	Delivery:	Delivery against payment
38.	In the case of Registered Notes, specify the Registrar:	Citibank, N.A., London Branch
39.	Specify the Principal Paying Agent:	Citibank, N.A., London Branch
40.	In the case of Registered Notes, specify the location of the office of the Registrar if other than New York:	Dublin, Ireland
41.	Additional Paying Agent(s) (if any):	Not Applicable
	ISIN:	XS1850316750
	Common Code:	185031675

LISTING APPLICATION

This Pricing Supplement comprises the final terms required to list the issue of Notes described herein pursuant to the U.S.$9,000,000,000 Global Medium Term Note Programme of Korea National Oil Corporation.

Application will be made to list and trade the Notes on the TPEx pursuant to the applicable rules of the TPEx. The TPEx is not responsible for the content of this Pricing Supplement and the Offering Circular and any supplement or amendment thereto and no representation is made by the TPEx to the accuracy or completeness of this Pricing Supplement and the Offering Circular and any supplement or amendment thereto. The TPEx expressly disclaims any and all liability for any losses arising from, or as a result of the reliance on, all or part of the contents of this Pricing Supplement and the Offering Circular and any supplement or amendment thereto. Admission to the listing and trading of the Notes on the TPEx shall not to be taken as an indication of the merits of the Issuer or the Notes.

Application will also be made to the SGX-ST for the listing and quotation of the Notes. The SGX-ST assumes no responsibility for any of the statements made, reports contained or opinions expressed in this Pricing Supplement and the Offering Circular. Admission of the Notes to the Official List of the SGX-ST is not to be taken as an indication of the merits of the Issuer or the Notes.

ROC TAXATION

The following is a general description of the principal ROC tax consequences for investors receiving interest in respect of, or disposing of, the Notes and is of a general nature based on the Company's understanding of current law and practice. It does not purport to be comprehensive and does not constitute legal or tax advice.

This general description is based upon the law as in effect on the date hereof and that the Notes will be issued, offered, sold and re-sold to professional investors as defined under Paragraph 1 of Article 2–1 of the TPEx Rules. This description is subject to change potentially with retroactive effect. Investors should appreciate that, as a result of changing law or practice, the tax consequences may be otherwise than as stated below. Investors should consult their professional advisers on the possible tax consequences of subscribing for, purchasing, holding or selling the Notes.

Interest on the Notes

As the Company is not a ROC statutory tax withholder, there is no ROC withholding tax on the interest or deemed interest to be paid by the Company on the Notes.

Payments of any interest or deemed interest under the Notes to a ROC individual holder are not subject to ROC income tax as such payments received by him/her are not considered to be ROC sourced income. However, such holder must include the interests or deemed interests in calculating his/her basic income for the purpose of calculating his/her alternative minimum tax ("**AMT**"), unless the sum of the interests or deemed interests and other non-ROC sourced income received by such holder and the person(s) who is (are) required to jointly file the tax return in a calendar year is below 1 million New Taiwan Dollars ("**NT$**"). If the amount of the AMT exceeds the annual income tax calculated pursuant to the ROC Income Basic Tax Act (also known as the AMT Act), the excess becomes such holder's AMT payable.

ROC corporate holders must include any interest or deemed interest receivable under the Notes as part of their taxable income and pay income tax at a flat rate of 20% (unless the total taxable income for a fiscal year is under NT$500,000), as they are subject to income tax on their worldwide income on an accrual basis. The AMT is not applicable.

Sale of the Notes

In general, the sale of corporate bonds or financial bonds is subject to 0.1% securities transaction tax ("**STT**") on the transaction price. However, Article 2-1 of the Securities Transaction Tax Act prescribes that STT will cease to be levied on the sale of corporate bonds and financial bonds from January 1, 2010 to December 31, 2026. Therefore, the sale of the Notes will be exempt from STT if the sale is conducted on or before December 31,

2026. Starting from January 1, 2027, any sale of the Notes will be subject to STT at 0.1% of the transaction price, unless otherwise provided by the tax laws that may be in force at that time.

Capital gains generated from the sale of bonds are exempt from income tax. Accordingly, ROC individual and corporate holders are not subject to income tax on any capital gains generated from the sale of the Notes. In addition, ROC individual holders are not subject to AMT on any capital gains generated from the sale of the Notes. However, ROC corporate holders should include the capital gains in calculating their basic income for the purpose of calculating their AMT. If the amount of the AMT exceeds the annual income tax calculated pursuant to the ROC Income Basic Tax Act (also known as the AMT Act), the excess becomes the ROC corporate holders' AMT payable. Capital losses, if any, incurred by such holders could be carried over 5 years to offset against capital gains of same category of income for the purposes of calculating their AMT.

Non-ROC corporate holders with a fixed place of business (e.g., a branch) or a business agent in the ROC are not subject to income tax on any capital gains generated from the sale of the Notes. However, their fixed place of business or business agent should include any such capital gains in calculating their basic income for the purpose of calculating AMT.

As to non-ROC corporate holders without a fixed place of business and a business agent in the ROC, they are not subject to income tax or AMT on any capital gains generated from the sale of the Notes.

ROC SETTLEMENT AND TRADING

Investors with a securities book-entry account with an ROC securities broker and a foreign currency deposit account with an ROC bank, may request the approval of the Taiwan Depositary & Clearing Corporation ("**TDCC**") for the settlement of the Notes through the account of TDCC with Euroclear or Clearstream, Luxembourg and if such approval is granted by TDCC, the Notes may be so cleared and settled. In such circumstances, TDCC will allocate the respective book-entry interest of such investor in the Notes to the securities book-entry account designated by such investor in the ROC. The Notes will be traded and settled pursuant to the applicable rules and operating procedures of TDCC and the TPEx as domestic bonds.

In addition, an investor may apply to TDCC (by filing in a prescribed form) to transfer the Notes in its own account with Euroclear or Clearstream, Luxembourg to the TDCC account with Euroclear or Clearstream, Luxembourg for trading in the domestic market or vice versa for trading in overseas markets.

For such investors who hold their interest in the Notes through an account opened and held by TDCC with Euroclear or Clearstream, Luxembourg, distributions of principal and/or interest for the Notes to such holders may be made by payment services banks whose systems are connected to TDCC to the foreign currency deposit accounts of the holders. Such payment is expected to be made on the second Taiwanese business day following TDCC's receipt of such payment (due to time difference, the payment is expected to be received by TDCC one Taiwanese business day after the distribution date). However, when the holders will actually receive such distributions may vary depending upon the daily operations of the ROC banks with which the holder has the foreign currency deposit account.

RESPONSIBILITY

The Issuer accepts responsibility for the information contained in this Pricing Supplement, including the Recent Developments section in Annex A, which, when read together with the Offering Circular, contains all information that is material in the context of the issue of the Notes.

RECENT DEVELOPMENTS

This section provides information that updates and supplements the information about the Company under the headings corresponding to the headings below in the Offering Circular. Defined terms used in this section have the meanings given them in the Offering Circular. If the information in this section differs from the information in the Offering Circular, you should rely on the information in this section.

RISK FACTORS

Risks Relating to the Company

The Company's operations are affected by the volatility of prices for crude oil, natural gas and petroleum products and price differentials between heavy and light oil, and a substantial or extended decline or fluctuations in such prices or differentials would have a material adverse effect on the Company's business, financial condition and results of operations.

International crude oil, natural gas and petroleum product prices are subject to global supply and demand, and fluctuate due to many factors beyond the Company's control. These factors include competition within the oil and natural gas industry and with other industries in supplying consumers with competing commodities, international economic trends, exchange rate and interest rate fluctuations, expectations of inflation, domestic and foreign governmental regulations, concerns regarding the security of energy supply, political and other events in major oil and gas producing and consuming nations and actions taken by members of the Organization of the Petroleum Exporting Countries ("OPEC") and other oil exporting countries.

The prices of oil and natural gas have fluctuated greatly during the recent period of volatility in the global credit and financial markets. For example, the Company's average sales prices for crude oil were US$45.05, US$35.78 and US$46.85 per barrel in 2015, 2016 and 2017, respectively.

Furthermore, the financial condition and results of operations of Harvest Operations Corp. ("Harvest Operations"), the Company's wholly owned subsidiary, are also affected by the price differentials between light oil and heavy oil. For 2017, Harvest Operations' production was approximately 15% light and medium gravity crude oil, 27% heavy oil, 12% natural gas liquids and 46% natural gas. Processing and refining heavy oil is more expensive than processing and refining light oil and accordingly, producers of heavy oil receive lower prices than light oil for their production. The price differential between light oil and heavy oil has fluctuated widely during recent years, and has resulted in substantial increase in the volatility of heavy oil prices. An increase in the heavy oil price differential, normally caused by seasonal supply and demand, pipeline constraints and heavy oil processing capacities of refineries, all of which are beyond the control of Harvest Operations, usually results in Harvest Operations receiving lower prices for its heavy oil.

It is impossible to accurately predict future crude oil, natural gas or petroleum product price movements or price differentials between heavy and light oil. Accordingly, crude oil and natural gas prices may not remain at, and may vary significantly from, their current levels. When international crude oil and natural gas prices are low, the Company earns less sales revenue, and therefore, earns less income because the Company's production costs remain roughly constant. Conversely, when crude oil and natural gas prices are high, the Company earns more sales revenue and its income increases. As a result, a substantial or extended decline in international crude oil and natural gas prices or price differentials between heavy and light oil would have a material adverse effect on the Company's business, financial condition and results of operations. The Company currently engages in only limited hedging transactions or other derivative trading to reduce the impact of the fluctuations of crude oil or gas prices on its financial condition.

Exploration drilling involves numerous risks, including risks that the Company will encounter no commercially productive crude oil or natural gas reserves.

The Company is currently involved in exploration activities in various geographic areas, including in some areas where natural conditions may be challenging and where the costs of such exploration activities may be high. As a result, the Company may incur cost overruns or may be required to curtail, delay or cancel drilling operations because of many factors, including, but not limited to, the following:

- unexpected drilling conditions;
- pressure or irregularities in geological formations;
- equipment failures or accidents;
- adverse weather conditions and natural disasters;
- compliance with environmental regulation;
- governmental requirements and standards; or
- delays in the availability of drillships and delivery and maintenance of equipment.

If the Company fails to conduct successful exploration activities or to acquire or retain assets holding proved reserves, its proved reserves will decline as it extracts crude oil and natural gas from the reservoirs. In addition, the volume of production from crude oil and natural gas properties generally decline as reserves are depleted. For example, the Company discontinued its exploration activities in the West Ferghana and Chinabad blocks in November 2017, deep-sea areas of Block VIII and the northern part of Block VI-1 (“8/6-1N”) in Korea in November 2017, Block JDZ-Subzone 1 in Korea in June 2017, southern part of Block VI-1 (“6-1S”) in Korea in December 2016, Zhambyl Block in Kazakhstan in December 2016, Block 2B in Malaysia in September 2016, Sangaw South Block in the Kurdistan autonomous region in Iraq in July 2016 and in the Namangan/Chust Block in Uzbekistan in April 2016 due to its determination that the areas did not contain economically viable hydrocarbon deposits. The Company is currently evaluating other potential exploratory projects. The Company’s future production depends significantly upon its success in finding or acquiring additional reserves and retaining and developing such reserves. If the Company is unsuccessful, it may not meet its production or growth targets, and its total proved reserves and production will decline, which would adversely affect the Company’s results of operations and financial condition.

The Company’s exploration, development and production activities require substantial expenditure and investments, and the Company’s plans for, and its ability to make, such expenditures and investments are subject to various risks.

Exploring, developing and producing crude oil and natural gas fields are capital-intensive activities with high risks. The Company incurred capital expenditures (consisting of cash used for acquisitions of (1) property, plant and equipment, (2) intangible assets other than goodwill and (3) investments in associates and joint ventures) of Won 1,583 billion for 2015, Won 727 billion for 2016 and Won 850 billion for 2017. The Company’s capital expenditure budget for 2018 for its exploration, development and production activities is approximately Won 1,019 billion on a consolidated basis, which represents an increase from its 2017 budget of Won 923 billion due to expectations of increased drilling activities during 2018.

The Company’s ability to carry out its exploration, development and production activities and make the necessary capital expenditures and investments is subject to many risks, contingencies and other uncertainties, which may prevent the Company from achieving its desired results, or which may significantly increase the expenditures and investments that the Company makes, including, but not limited to, the following:

- the Company’s ability to generate sufficient cash flows from operations to finance its expenditures, investments and other requirements, which are affected by changes in crude oil and natural gas prices and other factors;
- the availability and terms of external financing;
- the Company’s mix of exploration and development activities conducted on an independent basis and those conducted jointly with other partners;

- the extent to which the Company's ability to influence or adjust plans for exploration- and development-related expenditures is limited under joint operating agreements for those projects in which the Company has partners;

- government approvals required for exploration- and development-related expenditures and investments in jurisdictions in which the Company conducts its business; and

- economic, political and other conditions in jurisdictions in which the Company conducts its business.

If future oil and gas prices are forecasted to decline substantially, the Company may be required to write down the book value of its assets, which may have a material adverse effect on the Company's business, financial condition and results of operations.

The Company reviews its assets at the end of each reporting period to determine whether there is any indication of impairment. If any such indication exists, the Company estimates the recoverable amount of the relevant assets. The recoverable amount of an asset is the greater of its value in use, which is the estimated future net cash flow expected to be generated by the asset adjusted by a discount rate that reflects current market assessments of the time value of money and the risks specific to the asset, and its fair value less costs to sell. If the book value exceeds the recoverable amount of an asset, an impairment loss will be recognized and the book value of such asset will be adjusted to their recoverable amount.

The Company estimates the future net cash flows of its assets based on long-term forecasts from globally recognized research institutions. If such long-term forecasts estimate that oil and gas prices will decrease substantially, the Company may be required to recognize impairment losses on its assets. Likewise, certain of the entities in which the Company has made equity investments may be required to recognize impairment losses on their assets, which may contribute to the recognition of loss in investments in associates and joint ventures and impairment of available-for-sale financial assets by the Company.

The Company recognized impairment losses on its oil and gas properties of Won 2,362 billion in 2015, Won 434 billion in 2016 and Won 320 billion in 2017 and impairment losses on goodwill of Won 559 billion in 2015, Won 32 billion in 2016 and Won 87 billion in 2017 due to significant declines in forecasted future oil and gas prices, as well as decreases in probable reserves. Similarly, the Company recognized impairment of available-for-sale financial assets of Won 450 billion in 2015, Won 46 billion in 2016 and Won 72 billion in 2017 primarily due to the impairment of the Company's equity investment in EP Energy Corporation ("EP Energy"), Faroe Petroleum plc and Troika Resource Investment PEF in connection with the recent decline in oil and gas prices, and impairment loss of Won 243 billion in 2015, Won 117 billion in 2016 and Won 6 billion in 2017 from Offshore International Group, Inc. ("OIG"). Such recognition of impairment losses contributed to net losses for the year of Won 4,500 billion in 2015, Won 1,119 billion in 2016 and Won 675 billion in 2017.

The Company cannot accurately predict the amount or timing of any impairment of assets. If the Company is required to recognize an impairment loss on a significant portion of its assets, such impairment would have a material adverse effect on the Company's business, financial condition and results of operations.

The Company is subject to the control of the Government, and its activities are heavily regulated.

The Company was established under the KNOC Act to, among other policy objectives, secure Korea's supply of crude oil in times of large oil price fluctuations or shortages. From time to time, the Company is required to take action in furtherance of public policy considerations and the Government's broader objectives for the crude oil and natural gas industry, which may not necessarily be in the Company's best commercial interests or the interests of the Noteholders. As of the date of this Offering Circular, the Government holds 100.00% of the Company's issued share capital. Accordingly, the Government is able to elect the Company's board of directors including the president of the board of directors (the "President"), as well as control its management. Although the Company's management runs the day-to-day operations, the Government may determine material policies relating to the direction of the Company's business. For example, public policy considerations relating to the level of the Company's exploration and production activities or stockpiling activities may affect the Company's results of operations. The Government has historically influenced, and is likely to continue to influence, the Company's strategy and operations. For example, in June 2016, the Ministry of Strategy and Finance and the Ministry of Trade, Industry and Energy announced broad-based measures (the “June 2016 Government Plan”) to rationalize the overseas natural resource exploration, development and production activities of government-controlled enterprises, including the Company. Pursuant to such improvement measures, the Company has developed and is implementing a plan for the sale of its interests in overseas exploration, development and production operations, other than core assets (taking into consideration strategic value and profitability), to third parties with preference given to institutional investors in Korea if possible and with an aim to maximize the returns on such sales. The timing of any such sales will be subject to market conditions and the Company will be limited from entering into any new overseas investments other than any such investments that are in furtherance of important policy objectives. In addition, pursuant to the June 2016 Government Plan, the responsibility for administrative tasks related to the day-to-day operation of the SAER funds and the administration of SAER loans for oil-related projects, other than the administration of taxes and dues, were transferred from the Company to the Korea Energy Agency in July 2017. See “Business — Relationship with the Government.”

The Company is also heavily regulated by a variety of laws and government bodies, including the Ministry of Trade, Industry and Energy and the Ministry of Strategy and Finance. The Ministry of Trade, Industry and Energy, among other things, establishes policies relating to crude oil production and stockpiling. In addition, the Company must receive the Ministry of Trade, Industry and Energy’s consent in most instances, and in some cases must seek amendments to current laws, to expand its operations into new businesses outside of its core operations. This may cause delays in or cancellations of the Company’s plans to expand its core business, which may adversely affect the Company’s results of operations and financial condition. See “Regulation.”

In August 2017, the Board of Audit and Inspection of Korea announced that it had completed an inspection on the status of operations of state-owned enterprises and announced that the heads of certain state-owned enterprises, including Jung Rae Kim, the former President and Chief Executive Officer of the Company, had exerted undue influence in making hiring decisions. No assurance can be provided that the Board of Audit and Inspection of Korea or the Government will not take follow up actions relating to its findings.

Any failure to acquire rights to or discover additional crude oil and natural gas reserves that can be developed for commercially viable production or any failure to develop the proved undeveloped reserves in which the Company has invested could adversely affect the Company’s business, financial condition and results of operations.

Success of the Company’s business depends largely on acquiring rights to or discovering additional crude oil and natural gas reserves that can be developed for commercially viable production. If the acquisition and exploration activities in which the Company participated or which it conducts are not successful, the Company’s total proved reserves and future production will decline. In addition, approximately 37% of the Company’s proved reserves were undeveloped as of December 31, 2017. The Company’s future success will also depend on its ability to develop these reserves in a timely and cost-effective manner. If the Company is unable to generate profitable production from such reserves, its business, financial condition and results of operations could be adversely affected.

There are many reasons why the Company may not be able to acquire rights to, or discover crude oil and natural gas reserves, or develop them for commercially viable production, including, but not limited to, the following:

- the Company may be unable to negotiate commercially reasonable terms for such acquisition, exploration, development or production activities;
- the Company may be unable to limit development and production costs because of, for example, adverse weather, natural disasters, environmental considerations, equipment shortages, procurement delays or difficulties arranging transportation for production, all of which may make it uneconomical to proceed with developing such reserves;
- the Company may face difficulties arising from political, environmental and other conditions in the areas where the reserves are located or through which its products are transported or where its products are stored; or
- a partner company on which the Company relies as operator may commit errors or misjudgments, and the Company has limited ability to control day-to-day activities on a project on which it is not the operator.

Failure to implement key elements of the Company's strategy could have a material adverse effect on its business and results of operations.

A major element of the Company's business strategy is to achieve organic growth through exploration activities and pursue selective acquisitions to optimize its asset portfolio. The Company produced approximately 169,223 barrels of oil equivalent of crude oil and natural gas per day as of December 31, 2017, and is targeting to maintain its production at approximately 201,514 barrels per day in 2018. Both the process of drilling new productive wells and acquisition of other companies are affected by many factors beyond the Company's control, and it may not be able to achieve the desired objectives. Where the Company enters into joint ventures with partners in exploration and production projects, the Company may not act as an operator and will need to depend on its partners for their financial commitment and technical expertise. The Company cannot guarantee that its partners will successfully execute the business plans and strategies formulated for the joint ventures.

The ability to meet increasing exploratory and development drilling targets depends to a large extent on the ability to secure access to rigs. Third party rigs are in great demand at a time of limited rig availability, and there can be no guarantee that the Company or the operator of any exploration and development project in which the Company participates will be able to secure access to rigs in a sufficient quantity at a cost effective price to meet drilling targets at acceptable costs, or at all.

If the Company is unable to achieve the expected benefits of acquisitions, including realization of adequate rate of return on prices paid, successful integration of the acquired businesses and/or assets, the Company's business, financial condition and results of operations may be adversely affected.

Success of an acquisition or other similar transactions depends, in part, on the Company's ability to realize adequate return on the prices paid for properties, the anticipated synergies, cost savings and growth opportunities from integrating the business of the acquired company or the asset with its business. The prices paid by the Company for acquisitions are based, in part, on engineering and economic assessments made by the Company's engineers. These assessments include a number of material assumptions regarding such factors as recoverability and marketability of crude oil, natural gas and natural gas liquids, future prices of oil, natural gas and natural gas liquids and operating costs, future capital expenditures and royalties and other taxes which will be imposed over the producing life of the reserves. Many of these factors are subject to change and are beyond the Company's control. In particular, the prices of and markets for petroleum and natural gas may change from those anticipated at the time of making acquisitions. In addition, all engineering assessments involve a measure of geological and engineering uncertainty, which could result in lower production and reserves than those attributed to the properties when they were acquired. For example, for the reasons described above: (i) in 2015, the Company recognized impairment losses on oil and gas properties of Dana Petroleum of Won 1,249 billion and impairment losses on oil and gas properties of Harvest Operations of Won 984 billion as well as impairment losses on goodwill of Dana Petroleum of Won 386 billion and impairment losses on goodwill of Harvest Operations of Won 173 billion; (ii) in 2016, the Company recognized impairment losses on oil and gas properties of Dana Petroleum of Won 294 billion, impairment losses on oil and gas properties of Harvest Operations of Won 17 billion and impairment losses on goodwill of Harvest Operations of Won 32 billion; and (iii) in 2017, the Company recognized impairment losses on oil and gas properties of Harvest Operations of Won 29 billion and impairment losses on goodwill of Harvest Operations of Won 87 billion.

Furthermore, the integration of two independent companies is a complex, costly and time-consuming process. The difficulties of combining the operations of two companies include, among others:

- retaining key employees and senior management team;
- lack of experience in managing large operations;
- consolidating corporate and administrative infrastructures;
- preserving important relationships of the companies;
- integrating and managing information technology systems of the companies;

- using the acquired company's liquid capital and other assets efficiently to develop the business of the combined company;

- consolidating research and development operations;

- diverting management's attention from ongoing business concerns;

- coordinating geographically separate organizations; and

- the time required before the benefits of the acquisition are realized.

There can be no assurance that the Company will receive all of the anticipated benefits of any transaction, including recovery of costs paid for properties or companies, or that any of the risks described above will not occur. For example, in November 2014, the Company disposed of North Atlantic Refining Limited, which held the Company's downstream operations and related assets, for cash considerations of approximately Won 67 billion, and recorded Won 338 billion as loss from discontinued operation and Won 54 billion as loss on disposal of discontinued operation for the year ended December 31, 2014. The Company's failure or inability to identify suitable candidates and complete acquisitions, joint ventures or other similar transactions, to raise sufficient capital for the transactions at a commercially reasonable cost and eventually recover such costs, or to receive anticipated benefits of any such transaction could significantly harm its business, financial condition and results of operations.

If the Company is unable to dispose of its non-core assets or reinvest the proceeds of any such disposal, each on acceptable terms, the Company's financial condition and results of operations may be adversely affected.

Pursuant to the June 2016 Government Plan, the Company has developed and is implementing a plan for the sale of its interests in overseas exploration, development and production operations, other than core assets (taking into consideration strategic value and profitability), to third parties with preference given to institutional investors in Korea if possible and with an aim to maximize the returns on such sales. Although the Company is exploring potential avenues to dispose of certain of its assets, such disposals may require the consent of third parties outside of the Company's control, such as consents of lenders under its borrowings or general partners. Any potential transaction would be dependent upon a number of factors that may be beyond the Company's control, including, among other factors, market conditions, industry trends, the interest of third-parties and the availability of financing to potential buyers on reasonable terms. There can be no assurance that the Company will be able to consummate any such transaction on acceptable terms or at all.

Even if the Company is successful in disposing of certain of its assets through a sale or otherwise, the Company may be required to recognize a loss in connection with such disposal if the disposal price of such assets is less than their respective book value. In addition, the Company may not be able to reinvest the proceeds of any disposal on acceptable terms or at all.

The Company's failure to successfully dispose of its non-core assets or to reinvest the proceeds of any such disposal, each on acceptable terms, may have a material adverse effect on the Company's financial condition and results of operations.

Exploring, developing, producing, transporting and stockpiling activities involve numerous risks that may result in accidents and other substantial operating risks and costs, for which the Company may not be fully insured.

The Company is subject to exploration, development, production, equipment, transportation and stockpiling risks that are common among upstream oil and gas companies, including, but not limited to, the following:

- exploration and production risks: risks related to fluctuations in production that may be affected by reserve levels, accidents, mechanical difficulties, work stoppages, adverse natural conditions, such as bad weather, as well as the inability to manage unforeseen production costs;

- equipment risks: risks related to adequacy and condition of the production facilities, including situations where equipment, especially the equipment for stockpiling, becomes obsolete;

- transportation risks: risks related to the condition of pipelines and vulnerability and costs of other modes of transportation, such as oil tankers; and

- stockpiling risks: risks related to the condition of storage tanks and other stockpiling facilities and their compliance with safety and environmental standards.

In particular, the Company's business is subject to significant risk of pipeline explosions, oil spills and leaks, unexpected geological formations or pressures, sudden blowouts, violent explosions of oil, natural gas or water from drilling wells followed by uncontrolled flow, fires and mechanical failures and collapsed holes, particularly in horizontal wellbores. There can be no assurances that such accidents will not occur.

The occurrence of any of these events could result in the loss of human life, significant damage to property, environmental pollution, impairment of the Company's operations and substantial financial and reputational losses to the Company. For the Company's pipelines, stockpile facilities or production facilities located near populated areas, including residential areas, commercial business centers, industrial sites and other public gathering areas, the potential damage resulting from the occurrence of these events is greater. The Company maintains insurance against certain of these risks and losses in accordance with customary industry practice. However, these insurance policies do not cover all potential liabilities that may result from these risks. The occurrence of any of these events not fully covered by insurance would require the Company to cover the damages with its own funds, thereby reducing its profits, which could have a material adverse effect on the Company's financial condition and results of operations.

The Company previously engaged in certain activities relating to Russia and may become subject to sanctions under relevant laws and regulations of the United States and other jurisdictions as a result of such activities, which may adversely affect its business and reputation.

The U.S. Department of the Treasury's Office of Foreign Assets Control, or OFAC, administers and enforces certain laws and regulations (hereinafter referred to as "OFAC sanctions") that impose restrictions upon U.S. persons with respect to activities or transactions with certain countries, governments, entities and individuals that are the subject of OFAC sanctions, including certain Russian persons and entities sanctioned in connection with ongoing events in Ukraine. In particular, the Countering America's Adversaries Through Sanctions Act ("CAATS"), enacted in August 2017, codifies and expands the scope of Directive 4 under Executive Order 13662, enacted in March 2014, which, among other things, prohibits the provision, exportation, or reexportation, directly or indirectly, by persons acting within U.S. jurisdiction of goods, services (except for financial services), or technology in support of exploration or production for any deepwater, Arctic offshore, or shale project that has the potential to produce oil worldwide, if persons or entities designated under Directive 4 control such project or own a 33% or greater non-controlling interest in such project.

Even though non-U.S. persons generally are not directly bound by OFAC sanctions, in recent years U.S. authorities have brought a number of enforcement actions against non-U.S. persons holding them liable on various legal theories if they directly or indirectly involve U.S. persons or U.S. origin goods or services in their transactions or by engaging in transactions completed in part in the United States (such as, for example, wiring an international payment that clears through a bank branch in New York or transporting U.S.-origin goods into sanctioned regions).

The Ukraine Freedom Support Act ("UFSA"), enacted in December 2014, is a so-called "secondary" sanctions law that provides authority to the U.S. President to impose U.S. sanctions on foreign parties that engage in certain activities in the Russian energy and military sectors, among others. With respect to the energy sector, it is sanctionable to knowingly make a "significant investment" in a Russian deepwater (greater than 500 feet), Arctic offshore, or shale project ("Targeted Projects") intended to produce oil. A range of sanctions may be imposed on companies that engage in sanctionable activities, including among other things the blocking of any property subject to U.S. jurisdiction in which the sanctioned company has an interest. CAATS modifies such UFSA secondary sanctions to require the U.S. President to impose such sanctions for activities after the enactment of CAATS, subject to a national interest waiver.

Additionally, the U.S. Department of Commerce's Bureau of Industry and Security ("BIS"), which administers U.S. export controls, also maintains prohibitions against the provision of specified U.S. origin goods or technology in support of exploration for, or production of, oil or gas in Targeted Projects, or any U.S.-origin goods or technology to Targeted Projects operated by specified government entities.

In July 2014, prior to the promulgation of the BIS export restrictions and the UFSA, the Company entered into a drilling contract for its drillship with Gazprom Geologorazvedka LLC ("Gazprom Subsidiary"), a subsidiary of Gazprom OAO, for a term of three years and fee of approximately US$170 million. Gazprom OAO became designated under Directive 4 of Executive Order 13662 in September 2014, which prohibits the provision of U.S. origin goods, or services (other than financial services) in support of Targeted Projects with the potential to produce oil. Gazprom OAO is also on BIS's Entity List, which prohibits the unlicensed export of any U.S. origin item to Gazprom OAO in connection with any Targeted Project producing oil or gas. More general BIS controls prohibit the unlicensed export of specified U.S.-origin equipment or technology to any party within Russia in connection with Targeted Projects. As the Company remained contractually bound to perform the agreed services, in June 2015, the Company removed all U.S.-origin equipment and goods from its drillship in response to these restrictions. In June 2015, the drillship reached its contract destination for drilling operations and began drilling activities pursuant to the contract, which are located in a Russian deepwater zone. Primary drilling operations were completed in August 2015 and the drillship was successfully demobilized from the drilling location in September 2015. The Company terminated its obligations under the drilling contract for 2016 and 2017 due to the designation that the relevant drilling location was subject to sanctions. The Company has no further outstanding obligations under such contract with Gazprom Subsidiary. Furthermore, the Company has decided to dispose of the drillship within the first half of 2018 as a follow-up measure to the June 2016 Government Plan.

The Company believes that its activities relating to Russia were not prohibited under applicable U.S. sanctions law and BIS regulations, as it removed all U.S.-origin equipment from the drillship and no U.S. persons or entities are involved in performing the contract. It also does not believe that its Russian activities constituted a "significant investment" sanctionable under UFSA and CAATS.

However, there can be no assurance that the Company's past activities relating to Russia will not be deemed to comply with OFAC sanctions or BIS export controls or to involve sanctionable activity under the indirect U.S. sanctions, or that any other government will not determine that its activities did not comply with applicable sanctions or export restrictions of other countries. Moreover, global sanctions are evolving rapidly, and future changes in law could also adversely affect the Company. In addition, broadly similar sanctions are in place in the European Union and certain other jurisdictions, involving travel restrictions and the freezing of funds and economic resources of designated persons, as well as export and financing restrictions with respect to such persons.

The Company's business and reputation could be adversely affected if its past activities relating to Russia did not comply with OFAC sanctions or export controls, or involved sanctionable activity under the indirect U.S. sanctions, or if any other government were to determine that its activities relating to Russia did not comply with applicable sanctions of other countries. Any prohibition or conditions placed on the Company's assets located in the United States may adversely affect its business, and any other sanctions imposed could also adversely affect its business. It is also possible that certain investors could be prohibited from trading in or receiving payments on the Company's securities. If the U.S. government were to challenge the compatibility of the Company's past activities relating to Russia with its sanctions programs or export restrictions or assert that such activities are sanctionable, while no assurance can be given that any such measures would be successful, the Company intends to take all practicable measures to ensure that prohibitions or conditions are not placed on its U.S. assets or other activities.

The Company's business may be materially and adversely affected by legal claims and regulatory actions against it.

The Company is subject to the risk of legal claims and regulatory actions in the ordinary course of its business, which may expose the Company to substantial monetary damages and legal costs, injunctive relief, criminal and civil penalties, sanctions against the Company's management and employees and regulatory restrictions on the Company's operations, as well as significant reputational harm. See "Business — Legal Matters."

In December 2014, a committee of the Korean national assembly commenced investigations into various overseas resources projects conducted during the previous administration under former President Lee. As part of such investigations, in March 2015, the national assembly committee conducted an inspection of the Company and its investments in Harvest Operations and North Atlantic Refining Limited, as well as other acquisitions made by the

Company during President Lee's tenure. The investigations were completed in May 2015, and no significant sanctions were imposed on the Company as a result of the investigations.

In March 2015, the Board of Audit and Inspection of Korea (the "BAI") commenced an inspection of the Company, Korea Resources Corporation and Korea Gas Corporation, as well as the Ministry of Strategy and Finance and the Ministry of Trade, Industry and Energy, primarily to assess the performance of state-financed overseas resource development projects as well as the administration of SAER loans by the energy and resources related state-owned enterprises. The inspection was completed in June 2015 and no further actions were taken by the Board of Audit and Inspection of Korea with respect to the Company.

In March 2015, the Seoul Central District Prosecutor's Office commenced an investigation into the Company and Keangnam Enterprises, Ltd. ("Keangnam") regarding the SAER loans to Keangnam and Keangnam's involvement in the development projects in Kamchatka. Keangnam was a former member of the consortium that had invested in the Kamchatka project in 2006. The Company withdrew from the Kamchatka project in 2010. There have been press reports that Keangnam diverted certain portions of the loan to other accounts rather than using the funds for their intended purposes. In September 2015, the Seoul Central District Prosecutor's Office announced that it has concluded its investigation of various overseas resources projects conducted during the previous administration of former President Lee. No charges against the Company were filed in connection with the investigation.

In June 2015, the Seoul Central District Prosecutor's Office arrested Mr. Young Won Kang, former chief executive officer of the Company who left the Company in June 2012, and in July 2015 indicted him on charges of breach of fiduciary duty, for allegedly wasting corporate funds by making financially unsound acquisitions during his tenure, including North Atlantic Refining Limited. The Seoul District Court and, on appeal, the Seoul High Court ruled in favor of Mr. Kang. The case has been appealed to the Supreme Court of Korea in September 2016, where it is currently pending. The Company believes that these court proceedings will not have a material effect on its financial liability, based on the current status of the trial, but it can make no assurances with respect thereto.

In May 2018, the BAI recommended that the Company reprimand three employees of the Company for classifying the sale and leaseback of the Company's headquarters in January 2017 as an operating lease rather than a finance lease in the Company's audited consolidated financial statements for the year ended December 31, 2017. In June 2018, the Company reprimanded the three employees and reclassified the transaction, which resulted in a restatement of the audited consolidated financial statements for the year ended December 31, 2017 as described in Note 46 to the audited consolidated financial statements as of and for the years ended December 31, 2017 and 2016.

The Company is unable to predict the outcome of these and other investigations, lawsuits and regulatory actions, and the scope of the investigations in these matters may increase. Additional investigations may be launched by governmental authorities or civil claims may be filed against the Company in the future with respect to these or other alleged legal violations by the Company and its officers and employees. An adverse determination in any such proceedings may result in significant regulatory sanctions as well as reputational harm to the Company, which in turn may have a material adverse effect on the Company's business, results of operations and financial condition.

The Company may be exposed to potential claims made by current or previous employees for unpaid wages and may also incur increased labor costs as a result of the expansion of the scope of ordinary wages.

Under the Labor Standards Act and Labor Severance Payment Security Act of Korea, the amount of compensation to which an employee is legally entitled, such as overtime allowance for night shifts or work performed outside of working hours as well as severance pay, is determined by the definition of "ordinary wage."

Prior to the Supreme Court's decision as described below, the Ministry of Labor had released guidelines which recognized base salary and certain fixed monthly allowances as the components of ordinary wage. Pursuant to such guidelines, many companies excluded fixed bonuses paid bimonthly, quarterly or semi-annually from the definition of ordinary wage in calculating overtime allowances, although certain lower courts had held that fixed bonuses, whether paid monthly or not, should be included in the definition of ordinary wage if such bonuses are paid regularly to all employees.

On December 18, 2013, the Supreme Court of Korea delivered a decision which provided a standard rule for determining what kinds of payments should be included as part of ordinary wage. According to this decision, fixed bonuses paid regularly are included in ordinary wage, and any collective bargaining agreement or labor-management agreement which provides for exclusion of such regular bonuses from the scope of ordinary wage is void as such provision is in violation of the mandatory provisions of Korean law. However, with respect to wage agreements executed on or prior to December 18, 2013, the Supreme Court of Korea further ruled that an employee's claim for extra payments will not be granted on principles of good faith if such claim imposes an unexpected financial burden on the employer and results in material managerial difficulty or poses a threat to the existence of the employer, to the extent that such claim is made on the basis of rescission of any existing wage agreement that sets the total amount of wage but excludes regular bonus payments from the scope of ordinary wage.

In connection with the Supreme Court's decision described above, in May 2015, 208 employees belonging to the Company's labor union filed a lawsuit at the Seoul Central District Court for unpaid wages amounting to approximately Won 5 billion. On August 23, 2016, the Seoul Central District Court ruled partially in favor of the labor union and ruled that the Company pay Won 3.3 billion in unpaid wages. The case was appealed to the Seoul High Court in October 2016, and the Seoul High Court affirmed the decision of the Seoul District Court in October 2017. The Company appealed the decision of the Seoul High Court in November 2017 and the case is currently pending before the Supreme Court of Korea. While the number of total employees eligible to file a similar lawsuit cannot be ascertained at this time, the Company believes that it is unlikely that additional employees will file similar lawsuits, as the initial lawsuit was initiated by the Company's labor union upon discussion with employees belonging to the labor union. However, there can be no assurance that similar lawsuits will not occur in the future, or that the Company will successfully defend the current or any future lawsuits, all of which may have an adverse effect on the Company's business and results of operations.

Harvest Operations is subject to certain risks related to the BlackGold oil sands project, which in turn may have an adverse effect on the Company.

The Company acquired a 100.00% interest in an oil sands lease for the BlackGold area located in northeastern Alberta in August 2006. In August 2010, the interest in the BlackGold oil sands project was transferred to Harvest Operations for approximately CAD 374 million, which was funded by Harvest Operations through the issuance of additional capital stock to the Company. The initial phase of the project, targeting production of 10,000 barrels per day, has been approved by provincial regulators. The expansion phase of the BlackGold project, which is targeted to expand production to 30,000 barrels per day, was approved by provincial regulators in 2013.

In early 2015, construction of the BlackGold central processing facility, well pads, and connecting pipelines were substantially completed, but due to the depressed bitumen price environment, the completion of sanctioning and commissioning activities were subsequently postponed. However, in December 2017, Harvest Operations announced its decision to re-sanction and complete construction and commissioning of the 10,000 barrel per day BlackGold facility as a result of an improved bitumen price environment. Commissioning and first steam injection is expected to be completed in the second quarter of 2018 with first production of bitumen anticipated in the third quarter of 2018.

Final commissioning of the initial phase of the project and, in particular further development of the expansion phase of the BlackGold project will require substantial capital investment by Harvest Operations. The BlackGold project competes for cash flows against Harvest Operations' other capital projects and cash commitments. Harvest Operations may not have sufficient capital resources to finance all its projects and may delay or curtail certain development projects, including the BlackGold project. To help Harvest Operations fund the BlackGold project's initial capital, the Company has also injected approximately CAD 86 million of capital through the subsequent issuance of additional capital stock by Harvest Operations in 2010. Harvest Operations may require additional capital from the Company if it cannot finance the BlackGold project through operating cash flow, additional borrowings or proceeds from the sale of its assets.

As is the case with any large scale, technically complex project, the ongoing development of the BlackGold project subjects Harvest Operations to risks associated with cost overruns, scheduling delays and unforeseen technical challenges, including as a result of third-party performance failures, fluctuating market conditions, delays in regulatory approvals and other unexpected challenges. Any failure on Harvest Operations' part to recognize or respond to these and other risks may adversely affect the success of its operations, financial position and cash flows, which in turn could materially and adversely affect the Company's business and results of operations, or require the Company to make additional capital injections.

Risks Relating to the Notes

Uncertainty relating to the LIBOR calculation process may adversely affect the value of LIBOR-based Notes.

Regulators and law enforcement agencies in the United Kingdom and elsewhere are conducting civil and criminal investigations into the calculation of daily London Interbank Offered Rate ("LIBOR") by banks that contributed to the British Bankers' Association (the "BBA") when it was the body which exclusively set the relevant LIBOR benchmark rates. A number of BBA member banks have entered into settlements with their regulators and law enforcement agencies with respect to alleged manipulation of LIBOR. ICE Benchmark Rate Administration Ltd. (the "ICE Administration") has been appointed as the independent LIBOR administrator, effective February 1, 2014. Actions by ICE Administration, regulators or law enforcement agencies may result in changes to the manner in which LIBOR is determined. Some of these reforms are already effective, while others are still to be implemented or formulated. For example, on July 27, 2017, the Financial Conduct Authority of the United Kingdom announced that it intends to stop persuading or compelling banks to submit rates for the calculation of LIBOR to the administrator of LIBOR after 2021. The announcement indicates that the continuation of LIBOR on the current basis cannot and will not be guaranteed after 2021, and it appears highly likely that LIBOR will be discontinued or modified by 2021. Moreover, any of the proposals for reform or the general increased regulatory scrutiny of LIBOR could increase the costs and risks of administering or otherwise participating in the setting of a LIBOR rate and complying with any such regulations or requirements. As a result, it is not possible to predict whether and to what extent banks will continue to provide LIBOR submissions to the administrator of LIBOR to allow for the calculation of LIBOR in its current form, whether LIBOR rates will cease to be published or supported before or after 2021, or whether any additional reforms to LIBOR may be enacted in the UK or elsewhere. At this time, no consensus exists as to what rate or rates may become accepted alternatives to LIBOR and it is impossible to predict the effect of any such alternatives on the value of LIBOR-based notes, such as floating rate notes. Any of the above changes or other consequential changes to LIBOR or any other "benchmark" as a result of international, national or other proposals for reform or other initiatives or investigations, or any further uncertainty in relation to the timing and manner of implementation of such changes, could have a material adverse effect on the liquidity and value of, and return on, any LIBOR-based notes.

To the extent LIBOR is discontinued or is no longer quoted, the floating interest rate will be determined using the alternative methods described under Condition 6(b)(ii) of the Terms and Conditions of the Notes. Any of these alternative methods may result in interest payments that are lower than, or that do not otherwise correlate over time with, the payments that would have been made on the LIBOR-based notes if LIBOR was available in its current form. In particular, if LIBOR is not available and the banks are unable or unwilling to provide quotations for the calculation of LIBOR, the interest rate on the LIBOR-based notes may accrue at the same rate as the immediately preceding interest period, effectively converting the LIBOR-based notes into a fixed rate instrument.

CAPITALIZATION

The following table sets forth the Company's actual capitalization (defined as the sum of consolidated long-term debt and total equity) as of December 31, 2017, which is derived from the Company's audited consolidated financial statements as of December 31, 2017 and as adjusted to give effect to the issuance of the Notes offered hereby as well as the notes referred to in footnote (1) below, before deducting the Joint Lead Managers' discount and estimated offering expenses. This table should be read in conjunction with the Company's audited consolidated financial statements included in this Pricing Supplement.

	As of December 31, 2017			
	Actual		As adjusted	
	(In billions of Won)			
Long-term debt:				
Long-term borrowings, net of discounts	₩	1,035	₩	1,035
Bonds payable, net of discounts and including premiums		9,013		9,013
Notes issued since December 31, 2017 and offered hereby(1)		—		1,722
Total long-term debt	₩	10,048	₩	11,770
Owner's equity:				
Share capital(2)	₩	10,435	₩	10,811
Accumulated deficit		(8,463)		(8,463)
Other components of equity		(577)		(577)
Non-controlling interests		1,042		1,042
Total equity		2,437		2,813
Total capitalization(3)	₩	12,485	₩	14,583

(1) Consists of (i) notes issued by the Company in January 2018 in the amount of SGD 400 million (Won 320 billion), (ii) notes issued by Harvest Operations and guaranteed by the Company in April 2018 in the amount of US$397.5 million (Won 426 billion), (iii) notes issued by the Company in June 2018 in the amount of CHF 500 million (Won 547 billion) and (iv) Notes issued hereby in the amount of US$400 million (Won 429 billion). Translated into Won at Won 800.6 to SGD 1.00, Won 1,071.4 to US$1.00 and Won 1,094.7 to CHF 1.00, the Market Average Exchange Rates in effect on December 31, 2017.

(2) In March and June 2018, the Government made capital contributions of Won 237 billion and Won 139 billion, respectively, to the Company.

(3) Except as set forth herein, there has been no material change in the Company's capitalization since December 31, 2017.

BUSINESS

Overview

The Company is the national oil and gas company of Korea and is wholly owned by the Government. The Company was incorporated in 1979 under the KNOC Act to serve as the executing body for oil-related policies of the Government. The Company engages in a wide range of oil and gas activities, including:

- exploration, development and production of crude oil and natural gas in Korea and abroad;
- stockpiling of oil in furtherance of the Government's energy policies, as well as engaging in wholesale gasoline, gas oil and kerosene distribution and economical gas station businesses and construction of related stockpile facilities; and
- performance of other activities related to its business purpose, such as the collection and publication of oil-related information, and conducting research and development related to oil and natural gas.

Until September 2017, the Company also engaged in the operation of a semi-submersible drillship.

The Company carries out the Government's oil policy objectives by engaging in exploration and production activities and managing the nation's oil stockpile pursuant to master plans announced by the Government. The Company receives substantial financial support from the Government in the form of capital contributions and SAER loans to undertake these activities. The Ministry of Trade, Industry and Energy directs and supervises the Company's business activities, as well as appointing its standing directors and the President pursuant to the KNOC Act and other laws applicable to the Company. The Company is audited from time to time by the Board of Audit and Inspection and is required to regularly report its business activities and plans to the Government.

As of December 31, 2017, the Company had a daily crude oil and natural gas production of approximately 169,223 barrels of oil equivalent, and had interests in 18 production projects and nine exploratory projects, located across 18 countries. The Company is seeking to maintain its production level at approximately 201,514 barrels of oil equivalent per day until the end of 2018, and hopes to increase the Company's production level further in the near future through organic growth, production optimization and selective acquisitions, which would provide the basis for the Company to compete with larger global oil companies engaged in oil and gas exploration, development and production. The Company acquired a 50.00% interest in OIG in February 2009, a 100.00% interest in Harvest Operations (formerly known as Harvest Energy Trust) and an 85.00% interest in KNOC Caspian LLP (formerly known as Sumbe JSC) in December 2009, a 100.00% interest in Dana Petroleum in October 2010, a 95.00% interest in Altius and a 23.70% interest in the Eagle Ford shale oil formation in March 2011 and certain offshore oil producing assets from Northstar Offshore Energy Partners LLC ("Northstar") in the Gulf of Mexico region (the Company's share being 67.00%) and a 10.00% interest in Parallel Petroleum Corp. in December 2011. In May 2012, the Company, as part of a consortium led by Apollo Global Management, LLC, acquired a 14.99% interest in EPE Global (which holds all of the oil and gas exploration and production assets of El Paso Corporation) for approximately US$500 million. In September 2012, the Company, through Dana Petroleum, acquired a 28.30% additional stake in the Bittern oilfields located in the North Sea from Hess Corp. for approximately US$135 million, raising its total interest in the field to 33.00%.

In June 2016, the Ministry of Strategy and Finance and the Ministry of Trade, Industry and Energy announced the June 2016 Government Plan, which included broad-based measures to rationalize the overseas natural resource exploration, development and production activities of government-controlled enterprises, including the Company. Pursuant to the June 2016 Government Plan, the Company has developed and is implementing a plan for the sale of its interests in overseas exploration, development and production operations, other than core assets (taking into consideration strategic value and profitability), to third parties with preference given to institutional investors in Korea if possible and with an aim to maximize the returns on such sales. The timing of any such sales will be subject to market conditions and the Company will be limited from entering into any new overseas investments other than any such investments that are in furtherance of important policy objectives.

Since 1980, the Company has also been operating and managing Korea's national oil stockpile facilities and reserves in response to the global oil shocks during the 1970s. Aiming to further strengthen Korea's ability to cope with market disruptions caused by short-term oil shortages, the Government announced the Fourth Stockpiling Master Plan in December 2014. Pursuant to the Fourth Stockpiling Master Plan, the Company is required to maintain its stockpiling capacity at 146 million barrels until the end of 2025. The Company had reserve levels of approximately 96 million barrels as of December 31, 2017, and the Company is seeking to reach a stockpile reserve level of 107 million barrels by 2025 pursuant to the Fourth Stockpiling Master Plan. The Company also generates income from the stockpiling program by leasing a part of its storage facilities to foreign oil producing companies and domestic refineries, as well as by engaging in lending activities with respect to part of its stockpile reserves. In furtherance of the Government's policy to control increases in gasoline prices, the Company engages in a wholesale gasoline, gas oil and kerosene distribution business, and also operates 1,174 economical gas stations or "Al-tteul Gas Stations" located throughout Korea with Korea Expressway Corporation and National Agricultural Cooperative Federation, as of December 31, 2017. To support the Company's stockpiling projects, the Company also constructs stockpiling facilities.

To ensure a stable supply of energy and natural resources for the Korean economy and to promote the development of new energy resources, the Government established the SAER in 1995 which combines six energy-related funds that the Government had been operating previously. Pursuant to the SAER Act, the Minister of Trade, Industry and Energy oversees the management and operation of the SAER, and had delegated to the Company the administrative tasks related to the day-to-day operation of SAER and the administration of the SAER loans for oil-related projects. However, pursuant to the June 2016 Government Plan, the responsibilities relating to SAER, other than the administration of taxes and dues, were transferred from the Company to the Korea Energy Agency in July 2017. The Company also borrows a portion of the SAER funds to further expand its exploration and other oil-related activities.

The Company also performs various other functions related to its status as Korea's largest oil and gas developer and the Government's policy-executing arm for matters related to oil. For example, the Company collects, compiles and publishes both domestic and international oil-related statistics, as well as conducting research related to the exploration, development and production of oil and natural gas.

For the year ended December 31, 2017, the Company had revenue of Won 2,312 billion, operating profit of Won 174 billion and loss for the period of Won 675 billion. The Company had total assets of Won 19,293 billion and total equity of Won 2,493 billion as of December 31, 2017. For the year ended December 31, 2016, the Company had revenue of Won 2,430 billion, operating loss of Won 232 billion and loss for the period of Won 1,119 billion. The Company had total assets of Won 22,067 billion and total equity of Won 3,509 billion as of December 31, 2016.

Relationship with the Government

The Company was established as a statutory juridical entity in 1979 under the KNOC Act to ensure a stable supply of oil and to support the development of the Korean economy by developing oil fields in Korea and abroad, stockpiling petroleum reserves and engaging in other oil-related activities.

The Company is wholly owned by the Government and the Government is required under the KNOC Act to contribute all of the Company's authorized capital of up to Won 13 trillion. The Company may only be privatized through an amendment of Article 4 of the KNOC Act by the National Assembly, which states that the Government shall fund the Company's authorized capital. Pursuant to the KNOC Act, the Government may also guarantee the repayment of the Company's bonds and its other loans, and provide financial subsidies for the Company's business activities, although it is not obligated to do so.

The Government, through the Ministry of Trade, Industry and Energy, directs and supervises the Company's activities relating to the exploration, development and production of oil resources in Korea and abroad, the purchase and stockpiling of oil reserves, the construction and management of stockpile facilities, the collection, processing and publication of oil trading information and the enhancement of oil distribution channels. Pursuant to the KNOC Act and the Act on the Management of Public Institutions, the President of Korea appoints, and has the authority to remove, the Company's President and the standing member of the Audit Committee, while the Minister of Strategy and Finance appoints the Company's non-standing directors. Furthermore, the Company is required to publicly disclose certain information relating to its operation and management, including, among other matters, its management objectives, budget and business plan, financial statements, personnel data, articles of incorporation, bond register and the minutes of the board of directors (other than certain confidential information) and the audit reports of its Audit Committee.

The Board of Audit and Inspection, which is an independent Government agency that audits all Governmental agencies and Government-controlled entities, audits the Company from time to time. The audit includes a review of the Company's financial statements and an inspection of the Company's business operations and performance. The Board of Audit and Inspection reports its audit results to the President of Korea. The Company must report any issues identified by the Board of Audit and Inspection during the audit, as well as plans to remedy such issues, to the relevant standing committee of the National Assembly of Korea. The Company must also present mid- to long-term management objectives covering five fiscal years to the Minister of Trade, Industry and Energy and the Minister of Strategy and Finance on an annual basis. The Company is further subject to unscheduled inspections and investigations from time to time by the National Assembly under the Act on Inspection and Investigation of Government Administration of 1988, as amended.

Energy Base Plan

Under the Low Carbon Green Growth Act (the "Green Growth Act") and the Energy Act (the "Energy Act"), the Government must establish 20-year master plans, revised every five years, for the development, distribution, research and management of energy resources both domestic and abroad. The First Energy Base Plan, issued in 2008, sought to improve Korea's energy security, use efficiency and the environment.

The Second Energy Base Plan was issued in January 2014 and its objectives include the following:

- reducing energy and electricity demand in Korea through efficient management of resources and tariffs;
- improving distribution network of electricity;
- enhancing environmental protection and safety requirements;
- strengthening Korea's energy security through the development of alternative and overseas energy sources;
- establishing a network for more stable distribution of traditional energy sources, such as oil and gas; and
- implementing energy policies to further improve the quality of life for Korean citizens as well as improving transparency in energy policy determination processes.

To further strengthen offshore resources development, the Second Energy Base Plan seeks to increase KNOC's ratio of investment in exploratory sites to promote more organic growth of its production capacity compared to previous growth primarily through the acquisition of production assets, as well as promoting exchanges of technology, information and manpower, and joint exploratory projects with leading foreign global enterprises.

Furthermore, the Second Energy Base Plan requires KNOC to make its storage facilities available to foreign oil producing countries for storing oil and petroleum products in Korea, which may be subject to preemptive use by Korea in times of emergency, to ensure stability in the supply of oil resources and enhance Korea's energy security.

Overseas Resources Development Master Plan

Under the Overseas Resources Development Business Act of 1983, as last amended on July 24, 2015 and effective as of October 25, 2015 (the "Overseas Resources Development Act"), the Government must establish 10-year master plans, revised every five years, for the development of overseas natural resources. Under the Overseas Resources Development Act, if a Korean resident plans to develop overseas natural resources, such person must report his or her plans to the Minister of Trade, Industry and Energy.

Pursuant to the Overseas Resources Development Act, the Government is authorized to provide funds to a Korean resident to conduct necessary research and analysis for an overseas resources development business and to acquire the rights to develop such resources. The Government may also provide funds for the installation and operation of facilities required for the development, and funds for leasing or buying the necessary land for the development.

To ensure the proper use of Government funds, the Ministry of Trade, Industry and Energy delegated to the Company the authority to inspect the books, documents and materials of oil-related businesses to which the

Government has provided financial support and to evaluate the feasibility of the Government's financial support for the costs being incurred by such businesses.

In September 2014, the Ministry of Trade, Industry and Energy issued the Fifth Overseas Resources Development Master Plan, covering the period from 2013 to 2022 pursuant to the Overseas Resources Development Act. Objectives of the Fifth Overseas Resources Development Master Plan include the following:

- increase Korea's self-sufficiency rate for oil and gas, calculated by dividing the amount of oil and gas produced by domestic entities by the amount of oil and gas imported into Korea, to 25.0% by 2022 from a rate of 13.6% in 2013. The target self-sufficiency rate for oil and gas is calculated by taking into account (i) production plans of currently acquired exploration, development and production fields; (ii) projected production volume in light of the exploration success rate; and (iii) production volume of new fields planned to be acquired;

- assist the growth of the Company, Korea Gas Corporation and Korea Resources Corporation into global natural resource development corporations;

- expand the global presence of the Company and other Korean companies investing in the development of overseas resources by establishing development strategies tailored for each resource-producing region, including by entering into partnerships or forming consortiums with other Korean companies to provide construction or other services along with resource development activities;

- support the operation and growth of the Company and other Korean companies involved in development of overseas resources by increasing the size of Export-Import Bank of Korea's funds earmarked for such purpose;

- expand the infrastructure for development of overseas resources by supporting research and development activities of state-owned enterprises engaged in resource development; and

- focus on the development of rare metals including lithium, non-traditional energy sources and the polar regions.

Stockpiling Master Plan

The Company operates and manages Korea's national oil stockpile facilities and reserves, which began in 1980 in response to the global oil shocks of the 1970s. Pursuant to the Petroleum and Petroleum Substitute Fuel Business Act (the "Petroleum Business Act"), the Ministry of Trade, Industry and Energy sets goals for the national oil stockpile program and announces a master plan to implement these goals. The stockpiling master plan must include matters relating to the oil stockpile target level, the types and amount of oil to be stockpiled and the management of stockpile facilities.

Pursuant to the Petroleum Business Act, the Government announced the Fourth Stockpiling Master Plan in December 2014. Under the Fourth Stockpiling Master Plan, the Company is required to maintain its stockpiling capacity at 146 million barrels until the end of 2025. The Company had reserve levels of approximately 96 million barrels as of December 31, 2017, and the Company is seeking to reach a stockpile reserve level of 107 million barrels by 2025 pursuant to the Fourth Stockpiling Master Plan. Under the Fourth Stockpiling Master Plan, the estimated budget for achieving the Company's stockpiling capacity target is Won 40 billion and the budget for achieving the Company's reserve level target is Won 1.7 trillion.

Under the Petroleum and Petroleum Substitute Fuel Business Enforcement Regulation, the Ministry of Trade, Industry and Energy has the authority to require the Company to give priority to financing the purchase of a portion of the target stockpile reserves and the construction and expansion of the stockpiling facilities with the revenue generated from the Company's stockpiling activity. To support the Fourth Stockpiling Master Plan, the Company expects to generate income from the stockpiling program by leasing a part of its storage facilities to foreign oil producing companies and domestic refineries, and by engaging in trading activities with respect to part of its stockpile reserves.

Administration of the Special Accounts for Energy and Resources

In 1995, the Government established the SAER pursuant to the SAER Act, which combines six energy-related funds that were previously operated by the Government. Prior to 1995, to ensure a stable supply of energy and natural resources for the Korean economy and to promote the development of new energy resources, the Government operated six energy and resources related funds, namely the Oil Business Fund, the Coal Industry Support Fund, the Coal Industry Stabilization Fund, the Overseas Mineral Resources Development Fund, the Energy Use Rationalization Fund and the Natural Gas Safety Management Fund. These funds were designed to support a variety of public and private projects, including those relating to the exploration and development of energy resources both domestically and abroad, the stockpiling of energy resources, the restructuring of the coal and other energy-related industries, the safe distribution of natural gas, the development of alternative energy sources and research activities related to the foregoing.

The Government's annual budget for the SAER is prepared with input from Government-controlled and private entities engaged in the energy and natural resources business, the Ministry of Trade, Industry and Energy and the Ministry of Strategy and Finance, and approved by the National Assembly. The SAER budget in 2015, 2016 and 2017 amounted to Won 5,592 billion, Won 5,873 billion and Won 5,782 billion, respectively, and has been set at Won 5,437 billion for 2018.

Pursuant to the SAER Act, the Minister of Trade, Industry and Energy oversees the management and operation of the SAER. Until July 2017, the Minister of Trade, Industry and Energy had delegated to the Company the administrative tasks related to the day-to-day operation of the SAER and the administration of SAER loans for oil-related projects. The day-to-day administrative tasks included the collection of various taxes, assessments and other government revenues which constitute a part of the sources for the SAER funds as well as the disbursement of the SAER funds according to the budget. These administrative activities did not have any significant impact on the Company's financial condition and results of operation. The only tasks that were not delegated to the Company were (i) the maintenance of the coal stockpile and coal stockpile facilities, which was delegated to Korea Coal Corporation and (ii) the administration of the mining damage prevention funds under the Mining Damage Prevention and Restoration Act of Korea, which was delegated to Korea Mine Reclamation Corporation.

A significant portion of the SAER budget consists of loans to be made for various energy- and resource-related projects. Until July 2017, the funds for the loans were first provided by the Company, as the day-to-day administrator of the entire SAER, to the following six government agencies that manage and on-lend the funds: the Company, Korea Resources Corporation, Korea Coal Corporation, Korea Energy Agency, Mine Reclamation Corp. and Korea Gas Safety Corporation. The Company managed the SAER loans related to the oil industry, while the other loans were managed by the other five Government agencies for their respective energy fields.

There are generally two types of SAER loans for the oil industry: loans for domestic and international oil exploration and production projects and loans to support general oil-related projects, such as the construction of oil pipelines. The loans for the oil industry are available for use by the Company and by certain qualifying third-party borrowers engaging in oil-related businesses.

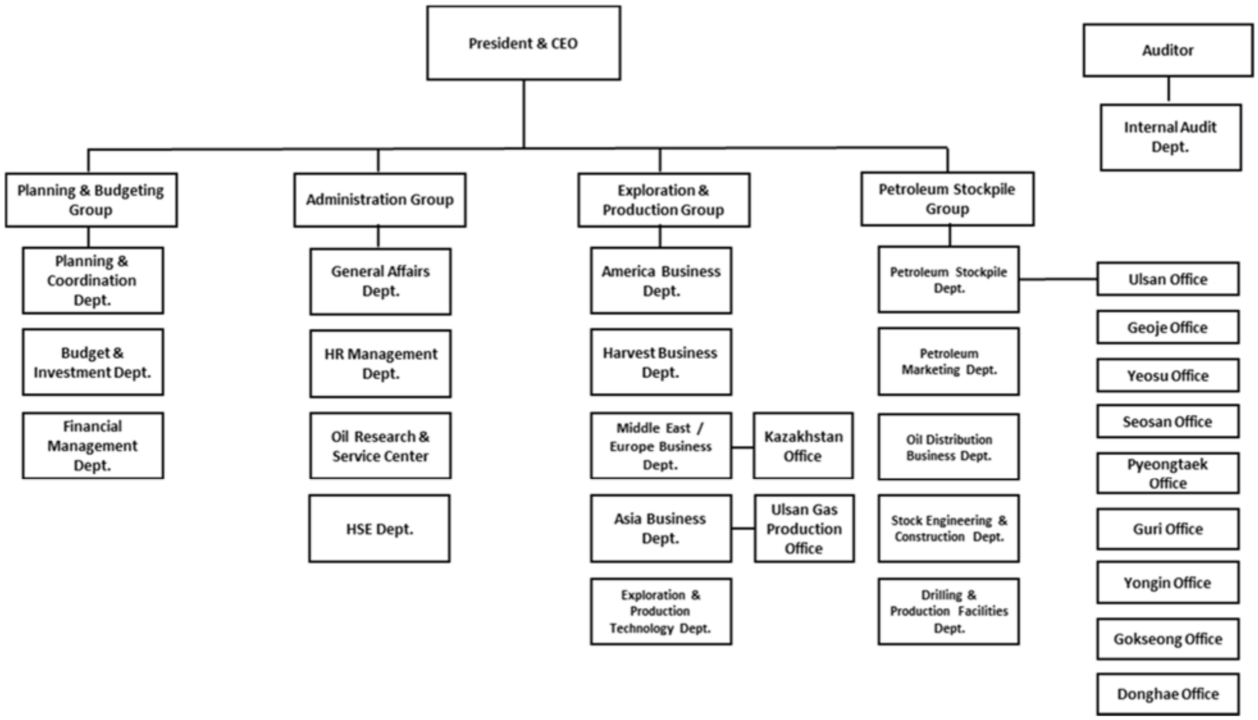
The funds from the SAER related to the oil industry were provided to the Company and then on-lent by the Company to third parties; therefore, such funds were not recorded as loans or borrowings on the Company's financial statements.

However, pursuant to the June 2016 Government Plan, the responsibility for administrative tasks related to the day-to-day operation of the SAER and the administration of SAER loans for oil-related projects, other than the administration of taxes and dues, were transferred from the Company to the Korea Energy Agency in July 2017.

The SAER loans used by the Company that were outstanding as of December 31, 2017 equaled Won 215 billion (after excluding loans relating to exploration fields which failed to discover commercially viable oil reserves, as payment obligations for such loans will be relieved). Under the SAER Act, loans used to fund exploration projects that do not result in discoveries are exempted from repayment of all or part of the principal amount of the loan and interest if they meet established criteria set by the Ministry of Trade, Industry and Energy.

Organizational Structure

The following diagram illustrates the Company's organizational structure as of the date hereof.



The Company has broadly organized its divisions by function and has an integrated exploration and development structure whereby separate divisions specialize in, and are responsible for, individual stages of exploration, development and production. The Exploration & Production Group oversees all exploration- and production-related activities and includes regional Business Departments and the Technology Department, which focuses on establishing the Company's mid-to-long-term research and development strategy and conducting research and development to enhance the Company's technological competitiveness. The Petroleum Stockpile Group oversees all activities relating to the operations of stockpiling facilities, as well as the Company's oil trading business.

Exploration, Development and Production

Overview

The Company engages in crude oil and natural gas exploration, development and production in Korea and abroad. The Company's operations include projects that the Company operates with a 100.00% ownership interest or a shared ownership with joint venture partners.

Contractual arrangements among participants in a joint venture are usually governed by an operating agreement, which usually provides that costs, entitlements to production, and liabilities are to be shared according to each party's percentage interest in the joint venture. Upon completion of the initial exploration phase, and if the Company and its joint venture partners determine that a project has commercially viable development potential, the project will enter the development phase and join the production and development portfolio.

As of December 31, 2017, the Company had interests in 27 projects, and it was the operator in 17 projects.

Reserves Data

The Company's estimated proved reserves of crude oil and natural gas as of December 31, 2017 totaled approximately 531.8 million barrels of crude oil and approximately 1,225.0 billion cubic feet of natural gas, respectively. As of December 31, 2017, proved developed reserves accounted for approximately 62% and 66% of the Company's total proved crude oil and natural gas reserves, respectively.

The following table sets forth the Company's estimated proved reserves (including proved developed reserves and proved undeveloped reserves) and proved developed reserves of crude oil and natural gas as of December 31, 2015, 2016 and 2017. The reserve data presented below and elsewhere in this Pricing Supplement are based on the Company's valuation of the reserves as of the date hereof, and are therefore subject to changes if further valuations of the reserves are conducted which revises the prior estimates.

	Crude Oil (Millions of barrels)	Natural Gas (Billions of cubic feet)	Combined (Barrel of oil equivalent, in millions)
Proved developed and undeveloped reserves			
Reserves as of December 31, 2015[1]	517.3	1,164.9	715.6
Revisions of previous estimates	27.9	139.8	51.7
Extensions and discoveries	0.2	23.5	4.8
Improved recovery	0.0	2.0	0.4
Acquisitions	0.0	0.0	0.0
Disposals	(13.9)	(15.7)	(16.7)
Production for the year	(42.4)	(174.9)	(72.2)
Reserves as of December 31, 2016[1]	489.1	1,139.6	683.6
Revisions of previous estimates	84.1	217.1	119.3
Extensions and discoveries	0.0	0.0	0.0
Improved recovery	0.0	0.0	0.0
Acquisitions	0.2	0.3	0.2
Disposals	(0.9)	(8.4)	(2.0)
Production for the year	(40.7)	(123.6)	(61.8)
Reserves as of December 31, 2017[1]	531.8	1,225.0	739.3
Proved developed reserves[1]			
As of December 31, 2015	279.7	811.5	418.7
As of December 31, 2016	249.0	764.4	379.6
As of December 31, 2017	329.1	807.6	466.1

(1) The reserve data include reserve data of Harvest Operations, as estimated under Canadian oil and gas reporting standards, COGEH and NI 51-101, as evaluated by the Independent Reserves Evaluator. If the reserve data of Harvest Operations as estimated under the Securities Act oil and gas reporting standards were included, the proved developed and undeveloped crude oil reserves, natural gas reserves and combined reserves as of December 31, 2015, 2016 and 2017 may differ from the corresponding amounts shown in the tables above.

In general, the Company's engineers estimate its proved crude oil and natural gas reserve quantities based on its internal surveys, external reserve reports and data collected from third-party operators of production facilities in which the Company has a working interest.

The following tables set forth the Company's crude oil and natural gas proved reserves (including proved developed and proved undeveloped reserves) and proved developed reserves by country as of December 31, 2015, 2016 and 2017.

	As of December 31,					
	2015		2016		2017	
	Proved Developed and Undevelope d	Proved Develope d	Proved Developed and Undevelope d	Proved Develope d	Proved Developed and Undeveloped	Proved Developed
	(millions of barrels)					
Crude oil reserves						
Canada[(1)]	161.2	50.2	144.1	36.0	141.0	31.1
China	—	—	—	—	—	—
Indonesia	—	—	—	—	—	—
Iraq	20.9	1.3	20.7	1.2	12.9	1.5
Kazakhstan	31.8	31.8	27.5	27.5	38.9	28.0
Korea	0.2	0.2	0.2	0.2	0.2	0.2
Libya	5.3	5.3	5.3	5.3	6.0	6.0
Peru	19.5	12.1	14.4	13.9	12.2	11.6
United Arab Emirates	34.7	34.7	34.7	34.7	45.6	45.6
United Kingdom[(2)]	67.7	43.9	54.1	30.3	62.9	52.3
United States of America	160.5	84.7	176.0	87.8	202.6	143.3
Venezuela	2.7	2.7	2.7	2.7	2.6	2.6
Vietnam	12.8	12.8	9.5	9.5	6.9	6.9
Total	517.3	279.7	489.1	249.0	531.8	329.1
Natural gas reserves						
Canada[(1)]	322.9	210.1	317.2	189.2	317.6	178.5
Indonesia	—	—	—	—	—	—
Kazakhstan	—	—	—	—	7.9	4.5
Korea	13.6	13.6	12.8	12.8	9.8	9.8
Peru	8.8	5.5	9.0	9.0	6.2	6.2
United Kingdom[(2)]	161.7	104.9	138.0	81.7	153.1	27.5
United States of America	446.0	265.6	469.9	279.0	566.9	417.6
Venezuela	15.0	15.0	15.0	15.0	14.8	14.8
Vietnam	120.2	120.2	101.0	101.0	72.1	72.1
Yemen	76.7	76.7	76.7	76.7	76.6	76.6
Total	1,164.9	811.5	1,139.6	764.4	1,225.0	807.6

(1) The reserve data of Harvest Operations are as estimated under Canadian oil and gas reporting standards, COGEH and NI 51-101, as evaluated by the Independent Reserves Evaluators. The reserves of Harvest Operations as estimated under the Securities Act oil and gas reporting standards as of December 31, 2015, 2016 and 2017 may differ from the amounts shown in the tables above.

(2) Indicates the reserve data of Dana Petroleum, whose headquarters are located in the United Kingdom. However, Dana Petroleum's production sites are located throughout Europe and Africa, including the Netherlands, Norway and Egypt.

Estimation and evaluation of reserves naturally involve multiple uncertainties. The accuracy of any reserve evaluation depends on the quality of available information and engineering and geological interpretation. Based on the results of drilling, testing and production after the date of this Pricing Supplement, reserves may be significantly restated upwards or downwards. Changes in the price of crude oil and natural gas may also affect the Company's reserve estimates as well as estimates of the Company's discounted future net cash flows because those reserves are evaluated, and the discounted future net cash flows are estimated, based on prices and costs as of the date of the evaluation. A relative decrease in the amount of the Company's estimated proved reserves and future discounted net cash flows could, if material, affect the amount of the Company's depreciation and depletion expenses, impairment charges or certain other financial information derived from or relating to such information reported in the Company's financial statements in future periods. Significant changes in these amounts could have a material adverse effect on the Company's financial condition and results of operations and cause future results to differ materially from those reported in this Pricing Supplement. See "Risk Factors — Risks Relating to the Company — The crude oil and natural gas reserve estimates in this Offering Circular are only estimates, and may require substantial revisions as a result of future drilling, testing and production, and as such, the Company's actual production, revenues and expenditures may also differ materially from estimates."

Production and Development

The Company is the largest producer of oil and gas in Korea, contributing to approximately 34% of Korea's total oil and natural gas production for the year ended December 31, 2017. The Company currently has 18 projects in production. There are currently no projects that are under development.

As of December 31, 2017, the Company's daily average net production was approximately 169,223 barrels of oil equivalent. Oil producing projects owned by Dana Petroleum, oil producing projects owned by Harvest Operations in Canada and oil producing projects located in the Maverick Basin Eagle Ford shale oil formation in the United States owned by KNOC Eagle Ford Corporation are the Company's most economically significant operating oil producing projects, accounting for approximately 31%, 15% and 13%, respectively, of the Company's net oil production for the year ended December 31, 2017. Gas producing projects located in the Maverick Basin Eagle Ford shale oil formation in the United States owned by KNOC Eagle Ford Corporation, gas producing projects owned by Harvest Operations in Canada and gas producing projects owned by Dana Petroleum are the Company's most economically significant operating gas producing projects, accounting for approximately 14%, 21% and 37%, respectively, of the Company's net natural gas production for the year ended December 31, 2017. The following is a summary of the Company's current production activities by country and region.

Country	Project Name	Type of Project	KNOC Share	Investment as of 12/31/17	Operated by	Arrangement Type	Participation Year
				(In thousands)			
Production Projects							
Canada	Harvest	Oil & Gas	100.00%	US$4,079,678[1]	KNOC	Lease	2009
Iraq.........................	Hawler Area	Oil	15.00%	US$173,611	KNOC	Concession agreement	2008
Kazakhstan.............	ADA	Oil	40.00%	US$81,501	KNOC	Concession Agreement	2005
	Altius	Oil	95.00%	US$516,826	KNOC	Concession agreement	2011
	KNOC Caspian	Oil & Gas	85.00%	US$424,201	KNOC	Concession agreement	2009
Korea	Donghae-1	Gas	100.00%	US$833,412	KNOC	Concession agreement	1998
	Donghae-2	Gas	70.00%	US$115,014	KNOC	Concession agreement	2016
Libya......................	Elephant	Oil	2.00%	US$213,091	Third Party	PSA	1990
Peru........................	Block 8	Oil	20.00%	US$1,058,142	Third Party	Concession agreement	1995
	Savia Peru (Block Z-2B)	Oil	50.00%	US$707,080	Joint	Service agreement	2009
United Kingdom (three projects) ..	Dana Petroleum	Oil & gas	100.00%	US$4,957,086[2]	KNOC	Concession agreement	2010
USA	ANKOR Offshore	Oil	51.00%	US$897,944	KNOC	Lease	2008
	Eagle Ford	Shale Oil	23.70%	US$1,927,989	Third Party	Lease	2011
	EP Energy	Oil & gas	12.82%	US$500,300	Third Party	Lease	2012
Venezuela	Onado	Oil	5.64%	US$34,197	Third Party	Available for Sale	1997
Vietnam	11-2	Gas	39.75%	US$707,961	KNOC	PSA	1992
Vietnam	15-1	Oil	14.25%	US$2,109,476	Joint	PSA*	1998

Country	Project Name	Type of Project	KNOC Share	Investment as of 12/31/17	Operated by	Arrangement Type	Participation Year
				(In thousands)			
Yemen....................	LNG	Gas	1.06%	US$29,718	Third Party	Gas Development Agreement	1997

* Production Sharing Agreement.

(1) Interests in these projects are held through Harvest Operations. US$4,079,678,000 represents the total amount of investment made by the Company in Harvest Operations, which was acquired by a subsidiary of the Company in December 2009.

(2) Interests in these projects are held through Dana Petroleum. US$4,957,086,000 represents US$3,496,454,000 of investment made by the Company in Dana Petroleum, which was acquired through a hostile tender offer in October 2010, and US$1,460,632,000 of investments made by the Company in Korea Captain Company Limited, which the Company transferred entirely to Dana Petroleum in October 2011, in consideration for additional shares issued by Dana Petroleum to the Company.

Major Production Projects

Canada

Harvest Conventional Projects. The Company's interests in production fields located in Canada are owned through Harvest Operations, a wholly owned subsidiary of the Company acquired in December 2009. Harvest Operations' operations are principally located in the western Canadian sedimentary basin. Harvest Operations has a high degree of operational control as it is the operator on properties that generate the majority of its production. Harvest Operations' core and strategic conventional production areas include Cecil/Royce, Deep Basin (including its equity investment in Deep Basin Partnership), Loon, Hay River and Rocky Mountain House, which are located throughout Alberta and British Columbia. Harvest Operations had net interests in approximately 1,693 gross producing oil wells and approximately 1,335 net producing oil wells, and in approximately 1,114 gross producing gas wells and approximately 397 net producing gas wells, located throughout Alberta and British Columbia as of December 31, 2017, and had a daily crude oil and natural gas production of approximately 31,357 barrels of oil equivalent for the year ended December 31, 2017 (including its equity share of Deep Basin Partnership production).

Oil and gas produced from these fields are sometimes processed at nearby processing facilities and transported to sales points through pipelines or other infrastructures, both of which may be owned by Harvest Operations or other third parties.

BlackGold Oil Sands Project. The Company acquired a 100.00% interest in an oil sands lease for the BlackGold area in August 2006. The BlackGold area is located 140 kilometers southeast of Fort McMurray within the Athabasca Oil Sands region of northern Alberta. Oil sands contain crude bitumen, which is a heavy and thick form of crude oil that does not flow unless it is heated or diluted with lighter hydrocarbons. In August 2010, the Company transferred its interest in the BlackGold project to Harvest Operations for approximately CAD 374 million, which was funded by Harvest Operations through the issuance of additional capital stock to the Company. To help Harvest Operations fund BlackGold project's initial capital, the Company has also injected approximately CAD 86 million of capital through the subsequent issuance of additional capital stock by Harvest Operations in 2010.

Harvest Operations received the relevant regulatory approval for the initial phase of the BlackGold project, for production of 10,000 barrels per day and a second phase expansion that would increase production to 30,000 barrels per day was approved in 2013. In early 2015, construction of the BlackGold central processing facility, well pads, and connecting pipelines were substantially completed, but due to the depressed bitumen price environment, the completion of sanctioning and commissioning activities were subsequently postponed. However, in December 2017, Harvest Operations announced its decision to re-sanction and complete construction and commissioning of the 10,000 barrel per day BlackGold facility as a result of an improved bitumen price environment. Commissioning and first steam injection is expected to be completed in the second quarter of 2018 with first production of bitumen anticipated in the third quarter of 2018.

Iraq

Hawler Area Block. The Company acquired a 15.00% interest in the Hawler Area Block in the Kurdistan autonomous region in Iraq in November 2008. Other participants in the project are Oryx Petroleum, which also serves as the operator and owns a 65.00% interest, and the Kurdistan regional government, which owns a 20.00% interest. Located in the Zagros basin in the northeast onshore area of Iraq, the Hawler Area Block covers an area of 788 square kilometers. The operator of the block drilled three exploratory wells and discovered oil and gas reservoirs in all of the three wells through well testing in 2013. In February 2014, the operator of the block announced its first discovery of an exploratory well in the Hawler Area Block at the Demir Dagh-2 site. As of December 31, 2017, the block is estimated to hold proved and probable reserves of approximately 188 million barrels of oil and has daily production of approximately 3,300 barrels of oil equivalent.

Kazakhstan

ADA Block. The Company acquired a 22.50% interest pursuant to a share purchase agreement with LGI Corporation in the ADA Block in November 2005. The Company purchased an additional 17.50% interest in the ADA Block in June 2009 and currently owns a total 40.00% interest. The ADA Block, covering an area of 31.2 square kilometers, is located in the northeastern part of Kazakhstan. The Company's exploratory drilling in the Bashenkol prospect resulted in the discovery of a well with proved oil reserves of approximately 19 million barrels, test production of which was approved by Kazakhstan authorities in 2009. The contract for commercial production was entered into in April 2013 between ADA Oil LLP, the operator, and the Kazakhstan government. Since the test production, the Company has produced approximately 8.3 million barrels of crude oil from this block.

Akzhar, Besbolek, Karataikyz and Alimbai Blocks. The Company acquired a 95.00% interest in Altius, a Canadian company listed on the Kazakhstan Stock Exchange, for US$515 million in March 2011. A local partner of the Company acquired the remaining 5.00%. Altius owns the Akzhar, Besbolek, Karataikyz and Alimbai blocks in western Kazakhstan, which hold estimated reserves of 34.1 million barrels, 1.1 million barrels, 0.2 million barrels and 0.5 million barrels of oil, respectively. The four fields Altius owns are in the production stage and Alimbai block changed its contract condition to production stage from exploration stage in January 2014. The Akzhar, Besbolek, Karataikyz and Alimbai fields have daily oil production of approximately 4,800 barrels, 1,100 barrels, 100 barrels, and 300 barrels, respectively, from 315 production wells as of December 31, 2017.

Arystan and Kulzhan projects. In December 2009, KNOC Kaz B.V., a wholly owned subsidiary of the Company located in Kazakhstan, acquired an 85.00% ownership interest in KNOC Caspian LLP (formerly known as Sumbe JSC) in Kazakhstan, which owns the Arystan and Kulzhan projects located in western Kazakhstan. The Arystan project has daily production of approximately 4,600 barrels of oil equivalent as of December 31, 2017, and holds estimated reserves of 44 million barrels as of December 31, 2017. The Kulzhan project has daily production of approximately 1,000 barrels of oil equivalent as of December 31, 2017 and holds estimated reserves of 4 million barrels as of December 31, 2017.

Korea

Donghae-1 Gas Project. In 1998, the Company discovered a commercially viable gas field located under the sea near the southeastern coast of Korea, and named it "Donghae-1." Located about 60 kilometers southeast of Ulsan city, the Donghae-1 gas project is estimated to hold recoverable reserves of about 2.3 billion cubic feet of natural gas with approximately 34 thousand barrels of condensate as of December 31, 2017. The Donghae-1 gas project was the first commercially productive gas field within Korean boundaries, and it allowed the Company to advance its knowledge and skill in gas field development and production. The Company owns 100.00% of the Donghae-1 gas project, and expects to deliver natural gas from the project daily to domestic consumers until about 2018.

Donghae-2 Gas Project. In 2005, the Company discovered a commercially viable gas field located about 5.4 kilometers southwest of Donghae-1, and named it "Donghae-2." The Company owns a 70.00% interest in the Donghae-2 gas project and POSCO Daewoo Corporation ("POSCO Daewoo") owns a 30.00% interest. In March 2014, the Company started to explore the Donghae-2 gas project and drilled one production well named DH 2-1P in December 2015. The Donghae-2 gas project is estimated to hold recoverable reserves of about 6.9 billion cubic feet of natural gas with approximately 42,300 barrels of condensate as of December 31, 2017.

Libya

Elephant Project. The Company initially acquired a 5.80% interest in the Elephant project pursuant to an exploration PSA in October 1990. The Company entered into an extension in 2008, which extended the termination date until 2033 from 2015, but reduced the Company's interest to 2.00%. The Elephant project is located in the Murzuk Basin, 850 kilometers south of Tripoli, and covers an area of approximately 139 square kilometers. Mellitah Oil & Gas B.V. is the operator of the Elephant project. Oil was first discovered on this site in February 1999 and commercial production began in May 2004. The Elephant project had proved and probable reserves of approximately 6.8 million barrels of crude oil as of December 31, 2017. The crude oil produced in the Elephant project is transported through a pipeline from El-Sharara Field to the Mellitah plant near the Mediterranean Sea. The operator of the project had ceased production from April 2015 to April 2017 due to security concerns around the region, but production has been resumed since the end of April 2017. As of December 31, 2017, the Elephant project has produced approximately 291,052 barrels of oil since resuming production.

Peru

Block 8. The Company acquired a 20.00% interest in Block 8 in 1996 through a competitive bidding process. The three other equity holders in Block 8 are POSCO Daewoo, SK Innovation Co., Ltd. and Pluspetrol Norte S.A., who own an 11.67%, 8.33% and 60.00% interest, respectively. Block 8 is located in Maranon Basin in northern Peru, covering an area of approximately 1,800 square kilometers. Block 8 consists of four oil fields, Corrientes, Pavayacu, Yanayacu and Chambira, with approximately 60 active wells. Hydrocarbon in Block 8 was first discovered in 1971, and production began in 1974. For the year ended December 31, 2017, Block 8 produced approximately 7,300 barrels of crude oil per day, and as of December 31, 2017, has produced 135 million barrels of oil since the Company acquired an equity interest. Approximately 70% of the oil produced in Block 8 comes from the Corrientes field. The crude oil produced in Block 8 is mostly sold to refineries located in the western coast and inland Peru through the North Peru pipeline, and to refineries in the east of the field through river barges.

Block Z-2B. In February 2009, the Company acquired a 50.00% interest in OIG, whose subsidiary, Savia Peru S.A. ("Savia Peru", formerly Petro-Tech Peruana S.A.), has an operation service contract for a producing field in Block Z-2B in the Talara Basin off the northwestern coast of Peru. Ecopetrol S.A., the national oil company of Colombia, acquired the other 50.00% interest in OIG. For the year ended December 31, 2017, Savia Peru produced approximately 9,000 barrels of crude oil per day and 20 million cubic feet of gas per day in its field in Block Z-2B, which covers an area of approximately 1,303 square kilometers.

United Kingdom

Dana Petroleum Projects. In January 2011, the Company acquired a 100.00% interest in Dana Petroleum through a hostile tender offer. Dana Petroleum is an oil and gas exploration and production company incorporated in the United Kingdom and headquartered in Aberdeen, United Kingdom, with a significant portion of its production and exploration assets located in the North Sea and Egypt. In March 2011, Dana Petroleum added six new offshore production fields through acquisition of production assets from Petro-Canada UK Limited. In October 2011, the Company transferred its entire interest in the KCCL to Dana Petroleum in consideration for additional shares issued by Dana Petroleum to the Company. In September 2012, the Company, through Dana Petroleum, acquired a 28.30% additional stake in the Bittern oilfields located in the North Sea from Hess Corp. for approximately US$135 million, raising its total interest in the field to 33.00%, together with the 4.70% interest that Dana Petroleum had already owned. In October 2013, the Company, through Dana Petroleum, sold a 19.00% stake in the Otter oilfield located in the North Sea to Abu Dhabi National Energy Company PJSC for approximately US$4.28 million. Dana Petroleum had proved and probable oil and gas reserves of approximately 153 million barrels of oil equivalent as of December 31, 2017, and had average daily oil and gas production of approximately 42 thousand barrels of oil equivalent in 2017. As of December 31, 2017, Dana Petroleum had interests in 54 production fields, which included 24 fields in the United Kingdom, eight fields in Egypt and 22 fields in the Netherlands. The most significant contributions in terms of production are associated with participation in the fields of Greater Guillemot Area, Greater Kittiwake Area, Hudson and Bittern in the United Kingdom, East Zeit in Egypt, the Dutch assets purchased through the acquisition of Petro Canada Netherlands B.V. on August 13, 2010 and production from the Babbage field in the United Kingdom which started production in August 2010. As of December 31, 2017, the Company has provided guarantees to creditors for certain obligations of Dana Petroleum.

Western Isles Project. Dana Petroleum, which the Company acquired in October 2010, has a 77.00% interest in the development of the Western Isles region. Dana Petroleum is developing two discovered oil fields in the North Sea and these fields are estimated to hold proved and probable reserves of approximately 39.3 million barrels of oil equivalent of crude oil and gas. Production commenced in November 2017 with a maximum daily production 37,000 barrels of oil equivalent of crude oil and gas.

United States of America

ANKOR Offshore Project. In March 2008, the Company and Samsung C&T Corporation each acquired an 80.00% and a 20.00% interest, respectively, in the ANKOR Offshore Project located on the shelf of the Gulf of Mexico. ANKOR Offshore Project contains several significant producing fields. In February 2012, the Company sold a 29.00% interest in the ANKOR Offshore Project to a consortium of Korean companies for approximately US$308 million, as part of an effort to increase Korean private sector involvement in resource development and to enhance the Company's liquidity. As a result of the sale, the Company's interest in the ANKOR Project was reduced from 80.00% to 51.00%. ANKOR E&P Holdings Corporation, a wholly-owned subsidiary of the Company that holds the Company's interests in the ANKOR Offshore Project, formed ANKOR Energy to manage the ANKOR Offshore Project. ANKOR Energy began its operations in March 2008, and currently produces approximately 7,375 barrels of oil equivalent per day. It has estimated oil and gas reserves of approximately 47.0 million barrels of oil equivalent.

Eagle Ford. In March 2011, KNOC Eagle Ford Corporation, a wholly owned subsidiary of the Company, entered into a joint venture agreement with Anadarko. Under the joint venture agreement, the Company, through KNOC Eagle Ford Corporation, acquired a 23.70% interest in Anadarko's Maverick Basin assets, located in southwest Texas, which is mainly comprised of the liquids-rich Eagle Ford shale assets. In exchange, the Company funded approximately US$1.55 billion of Anadarko's 3-year capital costs from 2011 to 2013 in the Maverick Basin, and reimbursed Anadarko for net cash outflows relative to the Company's interests. In addition, as part of the arrangement with Anadarko, the Company acquired a 24.90% working interest in midstream (gathering, processing, treating and transporting) systems and facilities associated with the Maverick Basin assets for approximately US$27 million. In December 2012 and January 2013, KNOC Eagle Ford Corporation sold 4.74% interests in each of the upstream asset and midstream asset to Vogo Eagle Ford LLC, for US$321 million and US$32 million, respectively. In March 2017, Anadarko sold its interest in the Maverick Basin assets to Sanchez Energy Corporation. Sanchez Energy Corporation holds approximately 288,046 net acres with an average working interest of approximately 71.00% in the Maverick Basin, of which the Company is entitled to interests in 80,000 net acres in Eagle Ford shale and approximately 16,000 additional prospective net acres for the deeper dry-gas Pearsall shale, as well as Pearsall opportunities underlying the Eagle Ford shale. Sanchez Energy Corporation produces approximately 172,076 barrels of oil equivalent per day.

Old Home. In December 2010, the Company and GS E&R Co. Ltd. (formerly known as STX Energy Co., Ltd.) jointly acquired a 46.80% interest in an oil field located in Escambia County, Alabama, for US$49 million from Renaissance Petroleum Company, LLC, which owns the remaining interest in the field. The Company has approximately a 23.40% interest in the field. In June 2016, the Company sold all production assets in the field to De Soto Oil & Gas Corp. but has retained an interest in the exploration assets in the field.

Northstar Project. In December 2011, the Company, through ANKOR E&P Holdings Corporation and in consortium with GS E&R Co. Ltd. (formerly known as STX Energy E&P Offshore Management, LLC) and SCL Resources, LLC, jointly acquired a 100.00% interest in an offshore oil field located in the Gulf of Mexico region for approximately US$201 million from Northstar. The Company has approximately a 67.00% interest in the field. The field produces approximately 1,900 barrels of oil equivalent of crude oil and gas per day, and has estimated oil and gas reserves of approximately 10.1 million barrels of oil equivalent.

Parallel Projects. In December 2011, the Company, in consortium with Samsung C&T Corp., jointly acquired a 100.00% interest in Parallel Petroleum Corp. (with the Company's share being 10.00%) from PLLL Holdings, LLC, an affiliate of Apollo Global Management LLC, for approximately US$722 million. Parallel Petroleum Corp. holds eight onshore producing oil fields and two onshore producing gas fields located throughout Texas and New Mexico in the United States. The fields on a combined basis produce approximately 9,449 barrels of oil equivalent of oil and gas per day, and have a combined estimated oil and gas reserves of approximately 58.7 million barrels of oil equivalent.

EPE Global Projects. In February 2012, the Company, as part of a consortium led by Apollo Global Management, LLC, signed a definitive agreement with El Paso to acquire a 100.00% interest in EPE Global (with the Company's share being 14.99%) for approximately US$7.15 billion. EPE Global held several conventional and unconventional oil and gas exploration and production assets located throughout primarily in the United States as well as Brazil. In January 2014, EP Energy, which now holds the interest in assets previously held by EPE Global, completed its initial public offering of 35,200,000 shares of its common stock at a public offering price of US$20.00 per share. EP Energy's common stock commenced trading on the New York Stock Exchange on January 17, 2014 under the ticker symbol "EPE." As the IPO has increased the total number of EP Energy's common stock, the Company's share has decreased from 14.99% to 12.82%. EPE Global holds approximately one million net acres of oil and gas properties located throughout the United States. For the year ended December 31, 2017, EPE Global had approximately 472 million barrels of oil equivalent (proved reserves) and fields held by EPE Global produced approximately 99,105 barrels of oil equivalent of oil and gas per day.

River Bend. In November 2011, the Company, in consortium with GS E&R Co., Ltd., acquired a 15.00% interest (with the Company's share being 7.50%) in the River Bend field in Alabama, United States. The operators attempted 13 exploratory drillings from 2013 to 2015 and discovered commercially viable oil and gas from seven wells. The field began active production in December 2013 and produces approximately 608 barrels of oil equivalent of oil and gas per day.

Venezuela

Onado Project. The Company currently owns a 5.64% interest in the Onado Project, after initially acquiring a 12.00% interest in 1997 and undergoing ownership changes in 1998, 2002 and 2006. Other owners are Corporación Venezolana del Petróleo, S.A., Compañía General de Combustibles S.A. and EP Petroecuador, which own 60.00%, 26.00% and 8.36% interest, respectively. The Onado Project is located near Maturin in the center of Venezuela, and covers an area of approximately 160 square kilometers. Petronado Empresa Mixta S.A. is the current operator of the Onado Project. Hydrocarbon in the Onado Project was first discovered in 1971, and the Onado Project currently produces crude oil and natural gas in an amount of approximately 800 barrels of oil equivalent per day.

Vietnam

Block 11-2. The Company first obtained operatorship of Block 11-2 in May 1992, and discovered the Rong Doi and Rong Doi Tay gas fields in May 1998. The Company entered into a gas sales purchase agreement with PetroVietnam, and commenced development construction, with gas production in the fields beginning in December 2006. The Company is the sole operator and carries out exploration, development and production activities within Block 11-2, which is located 320 kilometers offshore of Vietnam and covers an area of 691 square kilometers. The Company owns a 39.75% interest in Block 11-2 and holds a 35.25% interest on behalf of a Korean consortium, which is comprised of LG International Corp., Daesung Industrial Company, POSCO Daewoo, Hyundai Corp. and Seoul City Gas Co., Ltd. PetroVietnam Exploration and Production Company holds the remaining 25.00% participating interest in Block 11-2. Eight production wells in Block 11-2 are producing natural gas and condensate at an average of 86 million cubic feet per day and approximately 1,990 barrels per day. The recoverable reserves are estimated at 27 million barrels of oil equivalent.

Block 15-1. The Company entered into a production sharing agreement (a "PSA") for a 14.25% interest in Block 15-1 with PetroVietnam Exploration and Production Company (which owns 50.00%), Perenco (which owns 23.25%), SK Innovation (which owns 9.00%) and Geopetrol (which owns 3.50%) in September 1998. Block 15-1 is located 50 kilometers offshore of Vietnam, and covers an area of 800 square meters. Cuu Long Joint Operating Company is the operating company for Block 15-1. The Company performed a leading role in the exploration stage and discovered a large, high-quality oil field in Su Tu Den field in September 2000, which was selected as "One of the World's Top Discoveries of 2000" by the American Association of Petroleum Geologists. Oil production in Su Tu Den field began in October 2003.

Following the discovery at Su Tu Den field, Cuu Long Joint Operating Company successfully discovered oil in Su Tu Vang field in October 2001, natural gas and condensate in Su Tu Trang field in November 2003, and oil in Su Tu Nau field in September 2005. In Su Tu Den Southwest and Northeast fields, 38 production wells are producing oil and gas at an average of 16,256 barrels of oil equivalent per day as of December 31, 2017. In the Su Tu Vang field, 13 production wells are producing oil and gas at an average of 3,805 barrels of oil equivalent per day as of December 31, 2017. The Su Tu Trang field also commenced production in 2012 and produces approximately 22,517 barrels of oil equivalent of oil and gas per day. In the Su Tu Nau field, ten production wells are producing approximately 18,351 barrels of oil equivalent of oil and gas per day as of December 31, 2017.

Yemen

LNG Project. The Company began participation in the Yemen LNG Project as part of the SK consortium in 1997 and currently owns a 1.06% interest in the project. The project launched an LNG liquefaction plant in 2005, which was completed in 2010. The reserves within the Marib area which are currently dedicated to the project include 7.2 trillion cubic feet of proven gas reserves and an additional 0.7 trillion cubic feet of probable gas reserves. The plant and terminal are located in Balhaf, Yemen. First shipment was in November 2009. The operator of the project ceased production in April 2015 due to security concerns around the region. The Company and other participants of the project are continually monitoring the situation to re-start production as soon as practicable.

Block 4-Production. The Company owns a 50.00% interest in Block 4 pursuant to a PSA entered into with the Yemeni government in 2007, and the subsequent dissolution of the consortium which initially purchased the interest in the block. Block 4 is located in the Sabatayn (Marib – Shabwa) basin, in the southeastern part of Yemen, covering an area of approximately 2,000 square kilometers. A total of 91 exploratory and development wells have been drilled since 1987 and three oil fields, West Ayad, Amal and East Ayad, have been discovered as a result. Block 4 is classified as both a production project (pursuant to the Company's classification, even though the field is in a development state) and an exploratory project, as the Company conducted both production/development activities and exploratory activities in the area. In July 2013, the board of directors of the Company approved a withdrawal plan from the field due to the failure to discover viable oil reserves and the political instability in the region and in September 2013, the Company notified the Yemeni government of the withdrawal and the return of the Company's interests. The Company is currently in the process of carrying out the withdrawal plan.

Production Volume and Pricing

The following table sets forth the Company's historical annual crude oil and natural gas production by country and the Company's average sales price for the years ended December 31, 2015, 2016 and 2017.

	For the Year Ended December 31,		
	2015	2016	2017
Crude oil production(1)(2)			
(thousands of barrels, except percentages or otherwise indicated)			
Canada	9,037	7,054	5,739
Iraq	138	136	180
Kazakhstan	5,548	4,717	4,574
Korea	115	86	175
Libya	175	1	291
Peru	2,653	2,133	2,114
United Kingdom	13,861	13,589	10,047
United States of America	14,493	11,358	14,667
Venezuela	15	12	12
Vietnam	4,039	3,334	2,890
Yemen	—	—	—
Total	50,074	42,420	40,689
Average sales price(3) (US$ per barrel)	45.05	35.78	46.85
Natural gas production(1)(2)(4)			
(millions of cubic feet, except percentages or otherwise indicated)			

	For the Year Ended December 31,		
	2015	2016	2017
Canada	44,428	38,388	33,730
Kazakhstan	936	1,038	748
Korea	7,024	5,028	10,105
Peru	3,388	3,659	3,506
United Kingdom	26,794	23,194	18,336
United States of America	94,895	84,334	41,208
Venezuela	52	38	33
Vietnam	21,760	19,201	15,963
Yemen	953	—	—
Total	200,230	174,880	123,630
Average sales price[3] (US$ per thousand cubic feet)	3.50	3.10	4.08

(1) Production volumes for regions where the Company does not own 100.00% interest consist of the Company's share of the production from all of the Company's cooperative projects with other companies in that region.

(2) Includes production volume from subsidiaries or assets acquired during the period after their respective acquisition dates.

(3) Calculated by dividing total consolidated revenue from sale of oil or gas, as applicable, by total amount of oil or gas sold, as applicable. As such, excludes from calculation any production from the Company's affiliates where the Company's interests are accounted for either as available-for-sale securities or by using the equity method.

(4) Represents production of natural gas for sale.

Major Exploration Projects

The Company undertakes a number of projects to expand its commercially viable production facilities and fields. As exploring for oil and gas is a time-consuming and capital-intensive process, the Company's New Ventures and Exploration Group carefully analyzes each prospective location along with its partners and third party technical experts to determine the proper scope of each project, as well as consult an internal committee composed of heads of other departments and technical experts before making investment decisions. The Company is currently conducting exploratory activities in eight projects. The following is a summary of the Company's major exploration projects as of December 31, 2017.

Exploration Projects	Company Ownership	Arrangement Type	Status	Operated By
Korea (Block VI-1 Central, East)	70.00 ~ 100.00%	Exploration Right	Application for joint development in progress/preparing for 3D seismic data acquisition	KNOC
United Arab Emirates Areas 1, 2 and 3	30.00%	Joint Venture & Field Entry Agreement	Appraisal drilling and 3D seismic data acquisition	Joint
Uzbekistan West Ferghana & Chinabad	65.00%	Exploration Agreement	Geological and geophysical evaluation	KNOC
Yemen Block 70	12.35%	PSA[1]	Exploration suspended due to force majeure	Third party

(1) Production Sharing Agreement

Korea

Korea is surrounded by extensive continental shelves with an area of approximately 300,000 square kilometers, which contain potential for oil and gas reserves. Between 1972 and 1982, oil and gas exploration in Korea was led by western oil companies. In 1983, the Company began its own exploration projects within Korea, and has conducted significant 2D seismic surveys and drilled many exploratory wells since then.

There are currently three offshore sedimentary basins (Jeju Basin, Ulleung Basin and Yellow Sea Basin (West Sea Basin)) around the Korean peninsula.

Jeju Basin. The Jeju Basin is in the northeastern part of the East China Sea Shelf Basin, which is the largest Mesozoic-Cenozoic basin in the continental margin of China. The Jeju Basin is sub-divided into the Socotra sub-basin located in Block IV and Block V, the Domi sub-basin located in Block VI-2 and the Jeju sub-basin spanning Block V and the western part of the Joint Development Zone (the "JDZ") between Korea and Japan. Exploration at these blocks began in the 1960s by foreign oil companies, and there are currently 57,133 L-kilometers of 2D seismic data and 563 square kilometers of 3D seismic data as well as 15 exploratory wells in the region. The Company and several Japanese oil companies also conducted joint studies on petroleum potential throughout the JDZ from 2004 to 2009, which involved integrating existing data with satellite-derived oil seepage slicks. The exploration and studies in the region have resulted in only a few oil and gas showings and have yet to reveal reserves substantial enough for commercial development. As a result, the Company discontinued its exploration activities in Block JDZ subzone-1 in June 2017. However, the Company believes there is significant potential for oil and gas reserves in the Jeju Basin judging by the discovery of oil and gas fields in the Chinese part of the East China Sea Shelf Basin.

Ulleung Basin. The Ulleung Basin is located in the southwestern part of the East Sea, and contains Block VI-1 and Block VIII, each covering an area of 12,917 square kilometers and 8,481 square kilometers, respectively. Initial exploration efforts in Block VI-1 began in 1970 by the Royal Dutch Shell Oil Company. It acquired 5,193 L-kilometers of 2D seismic survey data and drilled one exploratory well. Although not tested, the exploratory well encountered numerous gas shows. Since 1983, the Company and other oil companies have conducted 23,589 L-kilometers of 2D seismic survey and 4,587 square kilometers of 3D seismic survey and drilled 26 exploratory wells, most of which are focused on the shelf area and found twelve minor gas deposits. These efforts led to the eventual discovery of Donghae-1 gas project in 1998. Additional gas reservoirs around Donghae-1 gas project were confirmed in 2005 and 2006, and were further developed between 2008 and 2009.

Starting in 2003, the Company expanded its exploration efforts to the continental slope and the deep-sea area of the Ulleung Basin. In February 2007, Woodside Energy (Korea) Pte. Ltd. ("Woodside") and the Company agreed to explore 8/6-1N. Pursuant to a Joint Operating Agreement, the Company and Woodside hold each a 50.00% interest in 8/6-1N. The exploration rights in 8/6-1N have expired in December 2016 and the Company discontinued its exploration activities in 8/6-1N in November 2017. The Company is currently preparing to acquire new exploration rights in the deep-sea area. The Company and Woodside conducted a 2D seismic survey of approximately 5,107 L-kilometers in 2008 and drilled an exploratory well named Jujak-1 in 2012. The Company and Woodside conducted 504 square kilometers of 3D marine seismic survey and drilled an exploratory well named Hongge-1 in September 2015. In 2011, POSCO Daewoo, holding a 70.00% interest and serving as the operator, started the exploration of 6-1S. POSCO Daewoo and the Company conducted a 3D seismic survey of 1,086 square kilometers and drilled one appraisal well in 6-1S. The Company discontinued its exploration activities in 6-1S in December 2016. In the first half of 2014, the Company started to develop the middle section of Block VI-1 ("6-1C"), covering approximately 2,710 square kilometers. In September 2011, the Company obtained the right to explore underwater resources at 6-1C pursuant to an agreement entered into with the Korean government. Currently, the Company holds a 70.00% interest in 6-1C and POSCO Daewoo holds a 30.00% interest in 6-1C. In March 2014, the Company started to explore the Donghae-2 gas project (within 6-C) located approximately 5.4 kilometers away from the Donghae-1 gas project, and drilled one production well named DH 2-1P in December 2015. In April 2016, the Company and POSCO Daewoo conducted a 3D marine seismic survey of 612 square kilometers for further exploration in 6-1C. The Company acquired the right to explore the eastern part of Block VI-1 ("6-1E") from the Korean government in 2013, and conducted a review of 6-1E during 2014 as part of the overall evaluation of the Company's projects in Korea. The Company conducted a 3D seismic survey of 224 square kilometers in 2015 and is currently reviewing the evaluation data and considering additional exploration in 6-1E.

Yellow Sea Basin. The Yellow Sea Basin is composed of three exploration blocks containing numerous sub-basins that are relatively less explored than the other sedimentary basins in offshore Korea. The Company and several foreign companies conducted seismic data acquisition and offshore drilling, totaling 35,827 L-kilometers of 2D seismic data, 298 square kilometers of 3D seismic data and six exploratory wells. Although exploration results have not been successful, the Company has been trying to make hydrocarbon discoveries in the region. Based on studies conducted by the Industry-University-Institute Cooperation in 2013, the Company identified several potential areas in the West Sea Basin. The Company and China National Offshore Oil Corporation ("CNOOC") have been conducting joint studies to better understand the geologic information on the South Yellow Sea Basin ("SYSB") since 2002. The Company and CNOOC will also conduct further studies to identify hydrocarbon potential areas in the SYSB.

United Arab Emirates ("UAE")

Areas 1, 2 and 3, Abu Dhabi. The Company acquired a 30.00% interest in Areas 1, 2 and 3 in Abu Dhabi through a Joint Venture Field Entry Agreement ("JVFEA") entered into with Abu Dhabi National Oil Corporation in March 2012, in consideration of cash payments and a commitment to engage in exploration and appraisal activities. Area 1 and Area 2 are on-shore fields whereas Area 3 is an off-shore area in the region. Al Dhafra Petroleum Operations Company Ltd. ("Al Dhafra"), serving as the co-operator, was established in December 2013. Haliba field in Area 1 is evaluated to have 184 million barrels of oil reserves and Al Dhafra established the Haliba Field Development Plan to develop three reservoirs and is updating the Haliba Field Development Plan to optimize and accommodate the increased reserves. The Company is currently in the process of preparing a final engineering, procurement and construction plan to produce 30,000 barrels of oil per day in the Haliba field from 2019.

Uzbekistan

West Ferghana & Chinabad. The Company signed an Exploration Agreement in February 2010 with Uzbekistan's state-owned energy firm Uzbekneftegaz for a 65.00% interest in West Ferghana and Chinabad. POSCO holds a 20.00% interest and Samchully holds the remaining 15.00% interest in the project. West Ferghana and Chinabad are onshore blocks with the combined size of approximately 6,170 square kilometers, located in the eastern part of Uzbekistan bordering Kyrgyzstan and Tajikistan. Exploration started in August 2011 and the Company acquired 1,324 L-kilometers of 2D seismic data through 2014. However, the Company decided to withdraw from the West Ferghana and Chinabad blocks in November 2017 due to economic infeasibility. The Company is currently in the process of reviewing alternative fields for exploration.

Yemen

Block 70. The Company entered into a PSA with the Yemeni government for a 61.75% interest in Block 70 as part of a Korean consortium through direct negotiation in April 2005. In July 2008, the Company sold a 30.88% interest in Block 70 to Total E&P Yemen, and again sold a portion of its interest to Total E&P Yemen and OMV Exploration & Production GMBH in February 2010, which reduced the Company's interest in Block 70 to 12.35%. Total E&P Yemen is the operator for the block. Block 70 is located in the Sab'atayn basin in the middle onshore area of Yemen, and covers an area of 1,367 square kilometers. The Company and its partners collected new 2D seismic survey data from February 2007 to April 2007 and finished processing and interpreting the data in August 2007. Total E&P Yemen, the operator of the project, declared force majeure and suspended exploration activity in April 2015 due to internal military conflict within Yemen.

Types of Exploration, Development and Production Agreements Entered into by the Company

The Company participates in the exploration, development and production of crude oil and natural gas ("E&P project") in a number of countries and geographic regions and is therefore subject to a broad range of rules and regulations which cover many aspects of exploration, development and production activities, including lease tenure, production sharing rates, royalties, pricing, environmental protection, export taxes and foreign exchange. The Company enters into a wide range of contractual arrangements governing the Company's E&P projects and its interest in oil and natural gas from those projects. Depending on the type of E&P project, the Company holds its interest in a project or an area through a PSA, concession agreement or service contract, or permits and licenses from a government-controlled entity or a national oil company of the country in which such E&P project is located. After acquiring its interest in an E&P project, the Company also enters into joint operating agreements to designate an operator of the E&P project and to determine the operational details of the exploration, development and production process.

The terms of different contractual arrangements vary substantially among different countries and geographic regions, project types and the time the agreements were entered into. To evaluate geological, geophysical, engineering and transportation issues involved in exploration and production, the Company also may enter into a technical evaluation agreement prior to entering into a PSA, which contains terms similar to a PSA.

Production Sharing Agreements

Most of the Company's exploration, development and production arrangements are governed by PSAs. Under a typical PSA, the government or the national oil company owning rights over the particular block at issue is the licensee and the Company and its partners, if any, assume the role of a contractor engaged in the exploration and development of the specific block, usually on the condition that the host government does not directly participate in the E&P project. The contractor is typically required to provide all the financing and bear all exploration and development costs and the associated risks. To compensate for these investments and the risks, upon the successful development and production of oil or natural gas in the relevant block, the contractor recovers its costs and receives the economic benefit of a portion of the produced oil and natural gas in accordance with a production sharing formula set out in the PSA.

A typical PSA has a term of two to six years for the exploration period, renewable upon the parties' agreement. During the exploration period, the contractor may be required to relinquish a portion of the original contract block to the government or the national oil company, excluding the areas in which oil or natural gas has been discovered. Moreover, the contractor is usually required to complete a minimum amount of survey and drilling during the exploration period.

Concession Agreements, Permits and Licenses

In addition to PSAs, the Company also enters into concession agreements. In a concession agreement, the government grants to the contractor an exclusive right to explore for, develop, produce, transport and dispose of crude oil and natural gas within a specified block. Thus the contractor bears the risk of exploration, development and production activities as well as the related costs, including financing for the operations. In principle, the contractor has the right to all of the production, less any production related fees, royalties or taxes that are payable in cash or in kind. The contractor recovers its investments and associated operating, exploration and development costs from the sale proceeds of the oil or natural gas produced, after such deductions.

A concession agreement usually requires the contractor to undertake a minimum amount of exploratory work as scheduled in the agreement. From the commencement date, the contractor is usually required to pay the host governmental entity an annual fixed sum for its exploration and development rights. Once crude oil and natural gas are produced in commercial quantities, the contractor is required to pay a royalty in lieu of the annual fixed payment. The amount of royalty payment is usually higher than that of the annual fixed payment. In addition, the contractor is required to pay the governmental entity bonuses when the production volume reaches the thresholds specified in the agreement, and production taxes to the host country's government. The contractor may also be obligated to grant to the host country's government a right to purchase certain amounts of crude oil at discounted prices.

The Company and its partners, if any, also enter into arrangements similar to concession agreements called "permits", "licenses", or "exploration and production contracts" granted by the relevant governmental authority to explore and develop specified areas. Under permits, licenses or exploration and production contracts, the contractor bears the risk of exploration, development and production activities and is responsible for the related financing. The contractor has the right to all of the production less any royalties that are payable in kind or cash whereby it can recover all of its investments and associated operating, exploration and development costs from the sale proceeds of the oil or natural gas produced. The Company is generally required to pay production taxes, bonuses or royalties, the amount of which may be in proportion to the actual volume of the produced oil or natural gas. Moreover, similar to the concession arrangements in the Middle East or typical PSAs, the contractor is also obligated to complete a minimum amount of exploration work as specified in the applicable agreement.

Service Contract

A service contract is a particular exploration, development and production arrangement entered into in countries where local laws restrict the ownership by foreign investors over domestic oil and natural gas. A foreign company, as a contractor, enters into a service contract with the host government or the national oil company, which delineates certain exploration, development and production targets that the contractor is obligated to meet within a specified period. Upon completion of the exploration and development stages and the commencement of oil and natural gas production, the ownership of certain facilities, such as exploration and developmental wells along with operational facilities, are transferred to the relevant host government or the national oil company, which then assumes the production activities.

Pursuant to a compensation agreement entered into with the host government or the national oil company together with a service contract, the contractor under the service contract recovers all investments and financing costs associated with the project from the produced crude oil and natural gas. In addition, the contractor receives compensation for its services, typically a predetermined percentage of the proceeds from the sale of the produced oil and natural gas received by the host government or the national oil company for a certain period, either in cash or in kind. Certain countries allow the contractors to purchase the produced oil or natural gas themselves.

Joint Operating Agreements

When the Company participates in exploration, development and production projects together with other companies, it enters into joint operating agreements ("JOAs"). Under a typical JOA, a joint venture is formed and each joint venture partner holds its respective undivided proportionate interest in the underlying contractual arrangement and the rights and obligations under such arrangement. The JOA typically designates an operator who is exclusively in charge of all petroleum-related operations, which usually includes preparing work programs and budgets, procuring equipment and materials relating to operations, establishing insurance programs, and issuing cash call notices to the joint venture partners. The operator is also responsible for determining and executing operation and budget plans and managing all day-to-day operational matters.

The operational activities conducted by the operator are generally funded by monthly cash calls based on the annual work program and budget approved by the operating committee, which is usually composed of representatives from each of the joint venture partners. If the operational costs exceed the approved operational budget, the operator is usually required to obtain an additional approval of the operating committee. The operating committee has the authority to make all material decisions concerning the joint operating project.

Representatives of each joint venture partner review joint venture accounts and records and provide reports before they are sent to the relevant government entities. Liabilities with respect to uninsured operations are generally borne by all joint venture partners in proportion to their respective interests in the project. The JOAs generally specify that the operator will acquire insurance on behalf of the joint venture partners, unless such joint venture partner or partners choose to acquire insurance individually, or self-insure their risks.

The JOAs generally terminate on the earlier of an agreement by the parties to terminate the joint venture or the termination of the underlying contractual arrangements. In addition, the ability of the joint venture partners (including the operator) to transfer or assign their rights under the JOA or otherwise withdraw from the joint venture is generally subject to pre-emptive or first refusal rights in favor of the remaining joint venture partners as set forth in the relevant JOA.

Exploratory and Development Wells

The following table sets forth the number of net exploratory and development wells the Company drilled, or in which the Company participated, and the results thereof, for the periods indicated.

Exploratory and Development Wells

Year		Total
2015	**Net exploratory wells drilled**[(1)]	3.35
	Crude oil	1.00
	Natural gas	1.00
	Dry[(2)]	1.35
	Net development wells drilled[(1)]	113.96
	Crude oil	106.28
	Natural gas	7.68

Year		Total
	Dry[(2)]	—
2016	**Net exploratory wells drilled**[(1)]	1.20
	Crude oil	—
	Natural gas	—
	Dry[(2)]	1.20
	Net development wells drilled[(1)]	15.3
	Crude oil	11.3
	Natural gas	3.9
	Dry[(2)]	—
2017	**Net exploratory wells drilled**[(1)]	1.30
	Crude oil	1.00
	Natural gas	—
	Dry[(2)]	0.30
	Net development wells drilled[(1)]	28.56
	Crude oil	24.66
	Natural gas	3.90
	Dry[(2)]	—

(1) "Net" wells refer to the wells after deducting interests of others.

(2) "Dry" wells are wells with insufficient reserves to sustain commercial production.

Sales and Marketing

The Company sells all of its domestically produced natural gas to Korea Gas Corporation. Natural gas produced in other countries, such as Vietnam and Indonesia, is sold directly to customers worldwide, including energy companies and trading companies. Most of the Company's crude oil and natural gas produced outside of Korea is sold to major domestic and international refineries, and energy and resource trading companies.

Sales of Crude Oil

The Company sells various types of crude oil with different gradations of quality and chemical content. The Company generally sells its crude oil and condensate oil to oil refineries, trading companies and petrochemical companies worldwide. The Company estimates the demand for crude oil from potential buyers and uses such estimates to determine the volume of crude oil to supply.

The price of crude oil is directly correlated to the global market price because it is a publicly traded commodity. The contract price of crude oil is determined through negotiations or tenders with buyers based upon the pricing standards adopted by each oil-producing country. For example, the price of oil produced in Indonesia is determined based on the Indonesian Crude Oil Price, which is based on price assessments announced by three private oil-rating companies in Indonesia. Prices of oil produced in other regions are typically determined based on the prevailing international oil price in the region. Spot oil prices are determined by either adding a premium or providing a discount to the public crude oil prices discussed above.

The crude oil and condensates are generally sold under free on board terms directly or through trading companies to oil refineries, power companies and petrochemical companies. Generally, there are two types of oil sales contracts — term contracts and spot contracts. A term contract is typically an annual contract usually lasting from January to December of the same year or from April to March of next year (each such period, a "term year"). The Company determines the sales volume for the term year based on the estimated production for such term year estimated by the project operator at the end of the year before the beginning of the corresponding term year.

The Company decides when and to whom it sells its products taking market conditions into consideration. The Company also maintains favorable business relationships with major domestic refineries to ensure stable energy supply into Korea. The Company partially conducts its crude oil marketing and sales activities through its Petroleum Marketing Department, usually pursuant to term contracts. The Company hedges a portion of its crude oil sales through swap or option contracts and such hedging decisions are recommended by its Risk Management Department and decided on by the relevant subsidiaries.

Harvest Operations markets its crude oil and natural gas liquids ("NGLs") production to a diverse portfolio of intermediaries and end users with the majority of oil contracts continually renewing on a 30 day basis and the NGL contracts on one year terms with the prices of both commodities derived from the prevailing monthly market prices. Harvest Operations has a small number of condensate purchase contracts, required for blending heavy oil to meet pipeline specifications, that are a combination of one year and monthly spot contracts, both with prices derived from the prevailing monthly market prices.

Sales of Natural Gas

The Company sells and supplies natural gas to Korea Gas Corporation, as well as various customers around the world. The Company's revenues derived from natural gas sales accounted for approximately 23% of its total sales for the year ended December 31, 2017. Due to its gaseous state, natural gas must be transported to the market either through pipelines or by a tanker after liquefaction into liquefied natural gas ("LNG"). Petroleum gas or propane and butane are also liquefied for transportation. Such liquefying facilities and pipelines require significant capital investment. In order to recover the high cost of investment, suppliers of LNG or natural gas seek buyers to whom they can sell a steady volume of gas over a long period of time to ensure consistent flow of future revenue. Moreover, upstream natural gas suppliers, such as the Company, have commonly sold gas products jointly with other companies instead of individually. For example, in Vietnam, the Company and other oil and gas companies supply most of their natural gas to Vietnam Oil and Gas Corporation, Vietnam's state-owned oil and gas corporation pursuant to long-term gas supply agreements. Vietnam Oil and Gas Corporation, in turn, sells the natural gas to various purchasers, including power companies, gas companies, petrochemical companies, trading companies and oil refineries within Vietnam and worldwide pursuant to long-term sales contracts and purchase agreements. The Company supplies 100% of the natural gas produced at the domestic Donghae-1 gas project to Korea Gas Corporation pursuant to a long-term supply contract.

The majority of Harvest Operations' natural gas production is currently being sold at the monthly average price of Alberta Energy Company ("AECO"), the benchmark price for natural gas in Western Canada.

Petroleum Stockpiling

Overview and Strategy

Korea is the world's eighth largest consumer of petroleum according to the 2016 Statistical Review of World Energy by BP p.l.c. and meets substantially all of its oil needs from imports. To mitigate the risks to the Korean economy posed by disruptions in oil supply or fluctuations in oil prices, the Government has adopted a series of oil stockpiling plans that have been implemented by the Company. The Company currently owns and operates nine stockpiling facilities, with a total storage capacity of 136 million barrels. The Company stockpiles crude oil, refined oil products (including kerosene, gasoline and diesel) and liquefied petroleum gas ("LPG"). The Company's stockpile facilities are located in Donghae, Geoje, Gokseong, Guri, Pyeong-taek, Seosan, Ulsan, Yeosu and Yong-in.

Under the Government's Third Stockpiling Master Plan, which was announced in May 2009, the Company's total stockpiling capacity was increased to 146 million barrels in April 2010. Pursuant to the Fourth Stockpiling Master Plan, which was announced in December 2014, the Company is seeking to reach a stockpile reserve level of 107 million barrels by 2025. Korea's stockpile reserve level as of December 31, 2017, which includes the reserves held by the Company and companies in private industry, is approximately 191 days of net oil imports based on calculation standards of the International Energy Agency (the "IEA"). Korea joined the IEA as a member in 2002 and became a party to the Agreement on an International Energy Program, which requires that participating countries maintain oil reserve levels of at least 90 days of net oil imports. The Government contributed a total of approximately Won 5.2 trillion to the Company for execution of the Stockpiling Master Plans as of December 31, 2017, of which approximately Won 2.4 trillion was used to construct stockpile facilities and Won 2.8 trillion was used to purchase additional stockpile oil reserves.

The Company's stockpiling strategy prior to 1999 consisted mainly of purchasing and storing oil supplies and providing oil to domestic refineries when anticipated deliveries of crude oil do not arrive on time or when there is a shortage of crude oil due to other emergencies. The Company also leases excess storage facilities to domestic oil companies. Since 1999, the Company has sought to increase its stockpile level and generate more income from its stockpiling activities by participating in international stockpile arrangements and engaging in oil trading activity.

International Stockpiling. As a means of increasing the Company's stockpile level, the Company enters into contracts with national oil companies of oil-producing countries, major international oil companies and oil trading companies to store their petroleum in the Company's stockpile facilities as part of these companies' distribution network for markets in northeast Asia. The Company receives a fee for allowing these companies to use its stockpile facilities, and as part of the arrangement, these companies are obligated to supply petroleum to the Company at the market price up to the volume of the leased storage space during periods of oil shortage or other emergencies. Participation in international stockpiling arrangements has allowed the Company to increase its oil reserve levels, generate revenue from its stockpile facilities and create opportunities to purchase crude oil for domestic use in emergencies.

Oil Trading. Since 2000, the Company has been engaging in swap trading for a portion of its oil reserves to supplement its revenues and increase its oil reserves, but only at levels that would not compromise its oil reserve maintenance objectives. The Company uses its oil reserves as well as its storage facilities to enter into oil trading transactions with oil and commodities trading companies. The Company fixes its buy or sell price using hedging financial products before entering into the trading transactions to minimize its risks.

Gasoline and Gas Oil Wholesale and Economical Gas Stations. In order to reform the oil product distribution landscape in Korea and to minimize price increase, the Company began engaging in gasoline and gas oil wholesale and operation of economical gas stations with the opening of the first economical gas station in December 2011. The Company purchases gasoline and gas oil at wholesale prices from refineries and overseas sources utilizing its stockpile facilities, and delivers such oil to the economical gas stations. As of December 31, 2017, the Company, along with Korea Expressway Corporation and National Agricultural Cooperative Federation, operated 1,174 such economical gas stations located throughout Korea. The Company believes that the economical gas stations provide reasonably priced petroleum products to Korean consumers and expects the business to stabilize at its current level.

Operation of Stockpiling Facilities

The Company's stockpile facilities are located throughout Korea.

Donghae

The Donghae stockpile facility is located on a 0.1 square kilometer site in Kangwon province and has been operational since 2000. It is located on the eastern coast of Korea, and as of December 31, 2017, it housed five aboveground storage tanks with a total capacity of 1.1 million barrels of refined oil products, with each tank having a storage capacity ranging from 100,000 barrels to 300,000 barrels.

Geoje

The Geoje stockpile facility, which has been in operation since 1985, is located on a 2.7 square kilometer tract of land near Korea's southern coast in South Kyungsang province. As of December 31, 2017, the Geoje facility had storage tanks both aboveground and underground, with total storage capacity of 47.5 million barrels of crude oil. The Company completed the construction of a loading dock near the facility to assist in the transportation of crude oil into the facility in 2012. See "— Engineering and Construction — Construction of Petroleum and LPG Stockpile Facilities."

Gokseong

The Gokseong stockpile facility has been in operation since 1999 and is located on a 0.4 square kilometer tract of land in South Jeolla province. As of December 31, 2017, the Gokseong facility, which is located aboveground, had a total capacity of 2.1 million barrels of refined oil products.

Guri

The Guri stockpile facility, which has been in operation since 1981, is located on a 0.6 square kilometer tract of land near Seoul in Gyeonggi province. The Guri facility is underground, with a capacity to store 3.0 million barrels of refined oil products as of December 31, 2017.

Pyeong-taek

The Pyeong-taek stockpile facility, which has been in operation since 1989, is located on a 0.7 square kilometer tract of land near Seoul in Gyeonggi province. As of December 31, 2017, the Pyeong-taek facility had storage tanks both aboveground and underground, with a total capacity of 4.4 million barrels of LPG and 1.8 million barrels of refined oil products.

Seosan

The Seosan stockpile facility has been in operation since 2005 and is located on a 0.9 square kilometer tract of land near Korea's southwestern coast in South Choongchong province. As of December 31, 2017, the Seosan facility, which is aboveground, had a total capacity of 11.0 million barrels of crude oil and 3.6 million barrels of refined oil products.

Ulsan

The Ulsan stockpile facility is located on a 1.8 square kilometer tract of land in Ulsan on Korea's southeastern coast, and first began operation in 1981. As of December 31, 2017, the Ulsan facility had underground storage facilities with a capacity of 6.5 million barrels of crude oil. Aboveground storage facilities are being replaced by underground storage facilities of 10.3 million barrels of crude oil, which are currently under construction and expected to be completed by December 2020.

Yeosu

The Yeosu stockpile facility has been in operation since 1998 and is located on a 3.8 square kilometer tract of land in South Jeolla province near the southern coast of Korea. As of December 31, 2017, the Yeosu site, which has both aboveground and underground storage facilities, had a total capacity of 52.3 million barrels of crude oil. In October 2017, the Company completed construction of additional aboveground storage facilities with a total capacity of 2.5 million barrels of crude oil.

Yong-in

The Yong-in stockpile facility, which commenced operation in 1998, is located on a 1.2 square kilometer site near Seoul in Gyeonggi province. The Yong-in facility is aboveground, and as of December 31, 2017, it housed 11 storage tanks with a total stockpile capacity of 2.5 million barrels of refined oil products, with each tank having a storage capacity ranging from 150,000 barrels to 275,000 barrels. Due to the facility's proximity to populated areas, it is constructed with a concrete membrane and is designed to withstand earthquakes to the same extent as nuclear power plants in Korea.

Engineering and Construction

Overview

In support of the Company's stockpiling and exploration and production business, the Company is also engaged in the construction of crude oil and gas storage facilities throughout Korea, as well as the construction of production facilities. The Company constructed nine stockpile facilities that it currently operates pursuant to the Stockpiling Master Plans, as well as the production facilities used in the Donghae-1 gas project and the Vietnam Block 11-2 gas project. Pursuant to the Third Stockpiling Master Plan, the Company completed the construction of a loading dock at Geoje in July 2012 and also completed additional stockpile facilities at its Pyeong-taek site in May 2009 and at its Ulsan site in April 2010. The Company completed the construction of a new storage facility at its Pyeong-taek location with a capacity of 225,000 barrels of refined oil products in June 2014, which is being used to supply products to Al-tteul gas stations operated by the Company. Furthermore, the Company completed construction of additional pipelines between the Company's Seosan stockpile facility and the petrochemical complex operated by Hanhwa Total Petrochemical Co., Ltd. in August 2015, to ensure stable supply of oil to domestic refineries even during energy distribution emergencies. The Company is also working to expand its construction business overseas and assisting domestic construction companies to increase their competitiveness in overseas construction markets by providing technological support.

Construction of Petroleum and LPG Stockpile Facilities

Stockpile facilities consist of aboveground tank facilities or underground cavern facilities. Aboveground facilities are easier to construct, and thus require a shorter construction period, usually from three to five years, are easier to maintain initially, and are not restricted in where they can be built or in the types of product that can be stored there. However, aboveground facilities are also more vulnerable to external threats such as theft, terrorist attacks or fires, more expensive to construct, and have a shorter life cycle, usually lasting from 15 to 20 years. Underground facilities provide higher security and safety, have a semi-permanent life cycle, are more environmentally friendly and require lower construction and maintenance costs. However, they also take longer to build, usually from five to eight years, may be built only on sites that meet specific geological requirements, and are limited in the types of petroleum products that can be stored in them. The Company currently has eight aboveground tank facilities and five underground facilities.

The Company recently began updating the repair system at its Geoje underground storage facilities to further upgrade and enhance its existing storage capacity, which is estimated to be completed by 2018. Furthermore, as part of the Government's plan to develop a new seaport in Ulsan, the Company is currently transferring the Ulsan storage facility's offshore loading platform to another location, which is expected to be completed sometime in 2018.

The Company is currently constructing new underground storage facilities at its Ulsan site to replace certain aboveground storage facilities, which is expected to be completed by 2020, and has also completed building additional aboveground storage facilities at its Yeosu site in October 2017.

Construction of Production Facilities

The Company also supports its exploration and development projects by constructing production facilities used at some of its oil and gas fields. The Company constructed the offshore platform, onshore terminal, subsea production system, and the subsea and onshore pipeline at the Donghae-1 gas project. The Company also constructed the natural gas production facilities at the Vietnam Block 11-2 gas project in Rong Doi, consisting of two offshore platforms, a subsea pipeline and a floating storage and offloading unit. The Company also provides construction support for construction of production platforms or pipelines at several of its production or exploration sites, including Vietnam Block 15-1, Western Isle block, BlackGold Project and Arystan block.

Other Businesses

Petroleum Information and Publication

Due to Korea's heavy dependence on foreign oil, efficient and accurate collection of information related to the global oil market is essential to Korea's ability to promptly respond to international market developments. In furtherance of its position as the execution arm of Korea's oil-related policies and operations, the Company, through its Oil Research & Information Center, also engages in the collection, compilation, analysis and publication of domestic and international oil-related information. The information provided by the Company is used widely not only in the oil industry, but also in the decision-making process for oil policies by the Government. The Company is currently certified by the Government to provide the official domestic oil usage and pricing data.

The Company currently publishes oil-related information through the following media:

Publication Title	Content	Medium	Language
Petronet	Multimedia internet website with comprehensive oil information service network, consisting of an extensive database on all Korean oil-related information. Both paid and free subscriptions are available.	Internet	Korean/ English
Korea Monthly Oil Statistics	Provides historical and up-to-date statistics on Korean oil supply and demand, including export, import, throughput, consumption and inventories, as well as analysis of Korean oil statistics.	Internet	Korean/ English
Daily Petroleum Status	Provides key international oil prices and indices, major news related to the domestic and international oil market, and prices of domestic oil (crude and refined) products.	Internet	Korean
Weekly International Oil Price Status	Provides weekly price status of international crude oil, oil products, as well as an update on the status of the Singapore oil market.	Internet	Korean
Weekly Domestic Oil Price Status	Provides weekly price status of domestic oil products, classified by gas stations, refineries and distributors.	Internet	Korean
Annual Oil Supply Statistics	Compilation of annual statistics relating to domestic oil imports, refineries and distributors.	Printed	Korean
Opinet	Publishes real-time product prices for domestic gas stations, as well as oil sale prices for all domestic oil distributors and refineries, both through www.opinet.co.kr[1] and other devices such as Global Positioning System navigators and mobile phones.	Internet	Korean

(1) Website addresses in this Pricing Supplement are included for reference only, and the contents of such websites are not incorporated by reference into this Pricing Supplement and should not be considered a part of this Pricing Supplement.

Affiliates

Certain information with regard to affiliates of the Company that are accounted for using the equity method as of such date are set forth in the table below.

	As of or for the year ended December 31, 2017					
Entity	Country of Incorporation	Equity Interest	Total Assets	Total Liabilities	Revenue	Net Income (Loss)
	(In billions of Won, except for percentages)					
Kernhem B. V.	Netherlands	37%	181	230	32	(5)
Oilhub Korea Yeosu Co., Ltd.	Korea	29%	511	337	75	21
ADA OIL LLP[1]	Kazakhstan	13%	79	132	32	(7)
Parallel Petroleum LLC	United States	10%	367	259	7	(20)
KNOC Nigerian West Oil Company Limited	Nigeria	75%	147	228	—	(9)
KNOC Nigerian East Oil Company Limited	Nigeria	75%	242	330	—	(11)
Offshore International Group Inc.	United States	50%	771	335	144	(67)
KADOC Ltd.	Malaysia	75%	355	405	—	(12)
Korea Oil Terminal Co., Ltd	Korea	82%	4	5	—	(1)
Deep Basin Partnership	Canada	83%	100	135	44	(83)
HKMS Partnership	Canada	68%	94	93	24	1

(1) As ADA OIL LLP is an affiliate of Kernhem B.V., equity method for ADA OIL LLP was applied considering the indirect ownership interest held by Kernhem B.V.

Employees and Labor Relations

As of December 31, 2017, the Company had 1,291 employees on a non-consolidated basis. The following table describes the total number of employees by department as of the period indicated.

Department	As of December 31, 2017
Strategy & Planning	135
Administration (inclusive of HSE Dept.)	169
E&P Business	303
Overseas E&P Offices	23
Petroleum Stockpile & Business	110
Stockpile Offices	295
Legal & Secretariat	19
E&P Support (inclusive of Technology Dept.)	142
Auditing	22
Others (Task force, Training, Labor union, etc.)	73
Total	1,291

Most of the Company's eligible employees are members of the labor union. The Company has not experienced any strikes, work stoppages, labor disputes or actions which affected the operation of any of the Company's businesses, and the Company considers its relations with its workforce to be generally good. The Company re-negotiated its collective bargaining agreement with the labor union in August 2016, which is scheduled to expire in August 2018. The negotiation for a new collective bargaining agreement will begin upon expiration of the current agreement. The collective bargaining agreement provides for, among other things, various employment benefits, the scope of union activities and negotiation procedures.

The Company, like most Korean companies, grants its employees annual increases in basic wages and pays periodic bonuses. Employees and directors with more than one year of service are entitled to receive a lump-sum payment upon termination of their service with the Company, based on their length of service and rate of pay at the time of termination.

Safety and Environmental Matters

Safety

Safety standards and regulations in the domestic oil industry are issued, and compliance is monitored, by the Ministry of Trade, Industry and Energy and the Korea Occupational Safety and Health Agency, a Government body under the control of the Ministry of Employment and Labor.

Because a number of the Company's stockpile facilities are located in industrial areas, the Company has established a series of preventative measures to improve the safety of its employees and surrounding communities and minimize disruptions or other adverse effects on its business, such as providing each individual member of the communities in areas surrounding its stockpile facilities with printed materials to explain and illustrate safety and protection knowledge and skills.

The Company has also undertaken various measures including improving its computer systems, increasing safety and maintenance training for employees and improving the Company's patrolling equipment (used to detect leaks, fire and other defects in pipes and stockpile facilities). The Company believes that its safety standards are at least comparable to domestic and international safety standards relating to the oil industry. In addition, the Company has been operating its safety system in compliance with international safety standards such as Process Safety Management since 1996 and International Organization for Standardization ("ISO") 9001 since 1998.

The Government from time to time conducts spot-checks of the Company's facilities to ensure that they are in compliance with occupational health and safety regulations. These spot-checks have never identified any major violations or resulted in monetary fines or other penalties.

To further enhance its management of such safety and other operational risks, which may increase as the Company follows its expansion plans, the Company implemented a comprehensive enterprise risk management

(“ERM”) system in November 2010. The ERM system allows the Company to centralize the detection, analysis and management of various safety, financial and other operational risks related to its business.

Environmental Matters

The Company is subject to numerous international, national, regional and local environmental laws and regulations concerning its oil and gas exploration and production operations, stockpiling operation and other activities. In particular, these laws and regulations:

- require an environmental impact assessment report to be submitted and approved prior to the commencement of exploration, development and production activities;
- restrict the type, quantities and concentration of various substances that can be released into the environment in connection with oil and gas exploration and production activities;
- limit or prohibit drilling activities on certain lands lying within protected areas and certain other areas; and
- impose penalties for pollution resulting from oil, natural gas and petrochemical operations, including criminal and civil liabilities for serious pollution.

These laws and regulations may also restrict air emissions and discharge to surface and subsurface water resulting from the operation of oil and natural gas processing plants, pipeline systems and other facilities that the Company and its joint venture partners own or operate. In addition, the Company’s operations may be subject to laws and regulations relating to the generation, handling, storage, transportation, disposal and treatment of waste materials. Moreover, since exploration and production activities may take place on sites that are ecologically sensitive (tropical forest, marine environment, etc.), each site may require a specific approach to minimize the impact on the related ecosystem, biodiversity and human health.

The Company anticipates that the environmental laws and regulations to which it is subject will become increasingly more strict and therefore likely to have an increasing impact on its operations. It is impossible, however, to predict accurately the effect of future developments in such laws and regulations on the Company’s future earnings and operations. Some risk of environmental costs and liabilities is inherent in certain of the Company’s operations and products, as it is with other companies engaged in similar businesses, and there can be no assurance that material costs and liabilities will not be incurred. The Company does not currently expect any material adverse effect on its financial conditions or results of operations as a result of compliance with such laws and regulations. In addition to complying with laws, regulations and standards to which the Company is subject, it is the Company’s policy to exercise maximum due care with respect to environmental matters in the course of its operations, and to maintain adequate insurance coverage.

The Company also has been conducting regular environmental audits on its operations and facilities by a third-party auditors, pursuant to the ISO 14001 since 1998, to identify any potential areas of problem and to assess ways of improving its compliance with environmental laws.

Insurance

The Company’s operations are subject to hazards and risks inherent in the drilling, production and storage of petroleum products. As protection against these operations risks, the Company maintains insurance coverage against some, but not all, potential losses, including the loss of wells, as well as liabilities related to costs of pollution control and environmental compliance. In some cases, the agreement under which the Company operates its fields and sells the petroleum products require it to carry insurance, while in other cases, the Company’s management exercises its discretion and determines the fields for which to purchase insurance coverage, taking into account the costs of such insurance and related risks. The Company’s insurance coverage includes property damage insurance for certain of its oil and gas fields, its stockpile facilities and the semi-submersible drillship and business interruption insurance for its production activities. The Company also has insurance against damage from terrorism for all of its stockpile and offshore facilities. The Company is not delinquent on any of its insurance payments. The Company believes that its insurance coverage is comparable to that of other companies engaged in similar businesses.

Legal Matters

From time to time the Company is involved in litigations or proceedings that have arisen in the ordinary course of its business, including disputes with respect to its exploration, development and production rights.

In January 2008, the Company and other participating companies were notified by the Iraqi federal government that the Company's agreement with the Kurdistan regional government for participating in the development of the oil blocks in the Kurdistan autonomous region in northern Iraq would be invalid without obtaining proper approval from the Iraqi federal government. The Iraqi federal government's actions stemmed from a proposed amendment in Iraqi energy resources law. The Company was initially advised by legal consultants in England and Iraq that there is no legal basis for the above alleged invalidity of the agreement. Discussions between the Iraqi federal government and the Kurdistan regional government regarding the validity of production agreements entered into by the Kurdistan regional government independent of the Iraqi federal government, as well as the legality of the Kurdistan regional government's authority to export oil, are currently on-going.

In January 2009, the Company was notified by the Nigerian government that the PSA entered into in 2006 in respect of the OPL 321 and OPL 323 offshore blocks will be revoked. The Nigerian Ministry of Petroleum Resources alleged that the revocation was due to the Company's failure to make payment in full of a certain signing bonus promised by the Company as the winning bidder during the initial bidding process for the blocks in 2005. The Company and its subsidiaries, KNOC Nigerian East Oil Company Limited and KNOC Nigerian West Oil Limited, filed for judicial review of the Nigerian government's decision with the Federal High Court of Nigeria in March 2008 to declare the revocation null and void, claiming that the Nigerian government has already acknowledged the receipt of full payment of the signing bonus. Owel Petroleum Services Nig. Limited ("Owel Petroleum"), which had allegedly been the local vehicle for the losing bidder during the bidding process for the OPL blocks, later joined the proceedings to be awarded the OPL blocks. In August 2009, the Federal High Court of Nigeria ruled in favor of the Company, and Owel Petroleum and the Nigerian government subsequently appealed the decision. In April 2012, the Nigerian Court of Appeal vacated the ruling of the Federal High Court, and both the Company and Owel Petroleum appealed that decision in June 2012. In February 2017, the Supreme Court of Nigeria affirmed the decision of the Court of Appeal. The Company is currently taking subsequent actions with the Nigerian government relating to the withdrawal of the Company's business in the OPL 321 and OPL 323 offshore blocks.

In May 2015, 208 employees belonging to the Company's labor union filed a lawsuit at the Seoul Central District Court for unpaid wages amounting to approximately Won 5 billion. On August 23, 2016, the Seoul Central District Court ruled partially in favor of the labor union and ruled that the Company pay Won 3.3 billion in unpaid wages. The case was appealed to the Seoul High Court in October 2016, and the Seoul High Court affirmed the decision of the Seoul District Court in October 2017. The Company appealed the decision of the Seoul High Court in November 2017 and the case is currently pending before the Supreme Court of Korea. While the number of total employees eligible to file a similar lawsuit cannot be ascertained at this time, the Company believes that is it unlikely that additional employees will file similar lawsuits, as the initial lawsuit was initiated by the Company's labor union upon discussion with employees belonging to the labor union.

As of the date of this Pricing Supplement, it is the Company's view that other than as disclosed in "Risk Factors — Risks Relating to the Company — The Company's business may be materially and adversely affected by legal claims and regulatory actions against it" and "Risk Factors — Risks Relating to the Company — The Company may be exposed to potential claims made by current or previous employees for unpaid wages and may also incur increased labor costs as a result of the expansion of the scope of ordinary wages," there are no other current or expected litigation or governmental proceedings involving the Company or any of its affiliates the outcome of which may have a material adverse effect on the results of operations or financial condition of the Company.

Intellectual Property and Research & Development

The Company's general policy is to seek intellectual property protection for those inventions and improvements likely to be utilized by its activities or to give it a competitive advantage compared to other fuel sources. The Company relies on a variety of patents, copyrights, trade secrets, trademarks and proprietary information to maintain and enhance its competitive position. The Company's principal brand names are registered trademarks in Korea.

The Company held 21 patents and 23 trademarks as of December 31, 2017. The Company does not believe that any individual property right or related group of intellectual property rights is of such importance that its expiration or termination would materially affect the business of the Company.

As of December 31, 2017, the Company employed 96 researchers (including 12 with doctorate degrees and 46 with master's degrees). The Company incurred research and development costs of approximately Won 2.6 billion in 2017.

Properties

The Company's headquarters and principal offices are located in Ulsan, at 305, Jongga-ro, Jung-gu, Ulsan, 44538, Korea. On January 31, 2017, the Company disposed of its headquarters building and entered into a lease contract for the same premises. The Company has title over nine stockpile branch offices and the stockpile facilities at Ulsan, Yeosu, Pyeong-taek, Geoje, Seosan, Guri, Yong-in, Gokseong and Donghae, as well as the production office for the Donghae-1 gas project.

MANAGEMENT

The Company's Articles of Incorporation provide that the board of directors shall be made up of no more than seven standing directors (including the President, who also serves as the Chief Executive Officer of the Company) and eight non-standing directors. The Articles of Incorporation also requires the Company to establish an Audit Committee as a committee of the board of directors. All non-standing directors are independent. The directors have terms of two years (with the exception of the President, whose term is for three years). The activities within the discretion of the board of directors are subject to the Act on the Management of Public Institutions, the KNOC Act, the Company's Articles of Incorporation and its internal regulations, and include establishing the budget, issuing debentures and amending the Company's Articles of Incorporation when necessary.

Under the KNOC Act, the Act on the Management of Public Institutions and the Articles of Incorporation of the Company, the President, who serves as the Company's chief executive, is nominated by the Company's Officer and Executive Recommending Committee. The Officer and Executive Recommendation Committee recommends a pool of candidates, which is then deliberated by the Committee for Management of Public Institutions (the "CMPI") established pursuant to the Act on the Management of Public Institutions. After such deliberations, the President is appointed by the President of Korea upon the recommendation of the Minister of Trade, Industry and Energy.

The President is deemed to have the capacity of a representative director where the Korean Commercial Code applies and thus administers most of the day-to-day business that is not specifically designated as a responsibility of the board of directors. The President must enter into a management contract with the Ministry of Trade, Industry and Energy pursuant to which the President must meet a certain minimum level of performance each year. Under the current management contract with the President and the Articles of Incorporation of the Company, if the board of directors of the Company determines that the President's ability to perform its duties has been seriously impaired (due to reasons such as the President's violation of applicable laws or the Company's Articles of Incorporation, or the President's failure to diligently perform its duties), the board of directors may pass a resolution to propose dismissal of the President to the Minister of Trade, Industry and Energy.

Standing directors other than the President and the standing member of the Audit Committee are appointed by the President. The standing directors assist the President and act on his or her behalf when the President is unable to act.

The non-standing directors are appointed by the Minister of Strategy and Finance, after being selected by the CMPI from a pool of candidates recommended by the Officer and Executive Recommendation Committee.

Pursuant to the Articles of Incorporation of the Company or, if applicable, as mandated by applicable laws, the board of directors may establish by resolution committees to facilitate its efficient operation in carrying out various management functions. The Audit Committee and the Officer and Executive Recommendation Committee have been established pursuant to applicable laws.

The Audit Committee is comprised of three members, of whom two members are non-standing directors. The Audit Committee has at least one member who is an accounting or financial expert, and its chairperson is a non-standing director. The principal function of the Audit Committee is to conduct internal review of the Company's operations and accounting, and to present its opinion to the board of directors, thereby ensuring the independence and professionalism of the Company.

The Officer and Executive Recommendation Committee is comprised of non-standing directors and private citizens appointed by the board of directors, and is chaired by one of the non-standing directors elected by the members of the Committee to serve as chairperson. The Officer and Executive Recommendation Committee is responsible for the selection and recommendation of candidates to serve as President, standing member of the Audit Committee or non-standing directors.

In addition to the Audit Committee and the Officer and Executive Recommendation Committee, the board of directors has established the Investment Risk Management Committee as well as various other committees to further facilitate the management activities of the board of directors.

The Investment Risk Management Committee is comprised of no more than seven members, including three internal and three external experts as well as the standing director in charge of risk management. The Investment Risk Management Committee reviews and makes recommendations to the board of directors with respect to the Company's new oil and gas projects, acquisitions or disposals of equity interests and other investment activities of the Company, including issues relating to risks associated with international and domestic oil and gas prices and the liquidity of the Company.

The Company's address is 305, Jongga-ro, Jung-gu, Ulsan, 44538, Korea. Summary biographical information regarding the Company's directors is set out below.

Standing Directors

The Company's standing directors are as follows:

Name	Age	Position	Director Since	Date Term Ends
Su Yeong Yang	60	President and Chief Executive Officer	March 2018	March 2021
Byung Chan Moon	58	Executive Vice President of the Petroleum Stockpile Group	April 2017	March 2019
Gyu Jung Ko	56	Executive Vice President of the Planning & Budgeting Group	June 2018	June 2020

Su Yeong Yang has served as a standing director, president and chief executive officer since March 22, 2018. Mr. Yang previously served as senior vice president of POSCO Daewoo. He holds a bachelor's degree in earth science education from Seoul National University, a master's degree in geoscience from Seoul National University and a doctorate in geophysics from Texas A&M University.

Byung Chan Moon has served as a standing director and executive vice president for the Petroleum Stockpile Group since April 1, 2017. Mr. Moon previously served as vice president of the Company's Oil Distribution Department and E&P Planning Department. He holds a bachelor's degree in public administration from Chonnam National University and a master's degree in corporate finance from Yonsei University.

Gyu Jung Ko has served as a standing director and executive vice president for the Planning & Budgeting Group since June 25, 2018. Mr. Ko previously served as the general manager of the Performance Management Team under the Budget and Investment Department. He holds a bachelor's degree in business administration from Chonnam National University.

Non-Standing Directors

The Company's non-standing directors are as follows:

Name	Age	Position	Director Since	Date Term Ends
Byeong ok Ahn	63	Professor, Gongju University	January 2014	January 2018*
Hag Yong Sung................................	61	Professor, Ulsan University	August 2014	August 2017*
Woon Wha Park...............................	52	CEO, KT&C Co., Ltd.	October 2014	October 2017*
Yong Seok Kim................................	69	Head of Operations, National Crisis Management Institute of Dankook University	April 2016	April 2018*
Tae-Young Kim	55	Attorney at Law, Gangnam LLP	April 2016	April 2018*
Dong Hwan Kim	70	—	March 2018	March 2020
Jang Hee Lee....................................	62	Professor, Chungbuk University	May 2018	May 2020

*	The term of this director has expired, but pursuant to the Act on the Management of Public Institutions, the director is continuing his duties until his term is officially extended or a successor is appointed.

Byeong ok Ahn has served as a non-standing director since January 28, 2014. Mr. Ahn currently serves as a professor at Gongju University. He holds a bachelor's degree in law from Korea University, a master's degree in public administration from Yonsei University and a doctorate in political science from Kyeonghui University.

Hag Yong Sung has served as a non-standing director since August 12, 2014. Mr. Sung is currently a professor of business administration at Ulsan University. He holds a bachelor's degree in chemical engineering from Pusan National University and a master's degree in business administration from Ulsan University.

Woon Wha Park has served as a non-standing director since October 28, 2014. Mr. Park is currently the chief executive officer of KT&C Co., Ltd. He holds a bachelor's degree in French literature from Dangook University.

Yong Seok Kim has served as a non-standing director since April 12, 2016. Mr. Kim is currently the head of operations at the National Crisis Management Institute of Dankook University. He holds a bachelor's degree in politics from the Korea Military Academy and Seoul National University and a master's degree and a doctorate in business administration from Dongkuk University.

Tae-Young Kim has served as a non-standing director since April 12, 2016. Mr. Kim is currently an attorney at law at Gangnam LLP. He holds a bachelor's degree in law from Seoul National University.

Dong Hwan Kim has served as a non-standing director since March 5, 2018. Mr. Kim previously served as a non-standing director of KT Capital Co., Ltd. from April 2010 to March 2014. He holds a bachelor's degree in international trade from Seoul National University and a master's degree in public policy and administration from University of Wisconsin-Madison.

Jang Hee Lee has served as a non-standing director since May 23, 2018. Mr. Lee is currently a professor of business administration at Chungbuk University. He holds a bachelor's degree in business administration from SungKyunkwan University, a master's degree and a doctorate in business administration from Yonsei University.

INDEPENDENT AUDITORS

The consolidated financial statements of the Company as of and for the years ended December 31, 2016 and 2017, included in this Pricing Supplement, have been audited by KPMG Samjong Accounting Corp., independent auditors, as stated in their report. KPMG Samjong Accounting Corp.'s report on the consolidated financial statements of the Company as of and for the years ended December 31, 2017 and 2016 contains an emphasis-of-matter paragraph that states a significant uncertainty exists with respect to the Company's future business results depending on the recovery of oil prices as described in Note 45 to the consolidated financial statements as of and for the years ended December 31, 2017 and 2016.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Financial Statements

December 31, 2017

(With Independent Auditors' Report Thereon)

Contents

Independent Auditors' Report

Based on a report originally issued in Korean

The Board of Directors and Shareholder
Korea National Oil Corporation:

We have audited the accompanying consolidated financial statements of Korea National Oil Corporation and its subsidiaries (the "Group") which comprise the consolidated statements of financial position as of December 31, 2017 and 2016, the consolidated statements of comprehensive loss, changes in equity and cash flows for the years then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Korean International Financial Reporting Standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with Korean Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2017 and 2016 and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with Korean International Financial Reporting Standards.

Emphasis of matter

Without qualifying our opinion, we draw attention to the following:

(1) Uncertainty of Deterioration in Operating Condition of Oil Market

As described in Note 45, imbalance between supply and demand continues to drive low oil prices in the international crude oil market and oil prices are unlikely to increase in a short period of time. There is a significant uncertainty with respect to the Group's future business results depending on the recovery of oil prices. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

(2) Financial Statements Restatement

As described in Note 46, the audited consolidated financial statements have been restated in relations to the accounting change for disposal of headquarters building in Ulsan. We have audited the consolidated financial statements for the year ended December 31, 2017 and issued auditors' report as of February 28, 2018.

Accounting for sale-and-leaseback transaction of headquarters building has been changed from an operating lease to a finance lease. As a result, the Group's net asset decreased ₩55,536 million and loss for the year increased ₩58,616 million.

Other matters

The procedures and practices utilized in the Republic of Korea to audit such consolidated financial statements may differ from those generally accepted and applied in other countries.

We have audited the consolidated financial statements for the year ended December 31, 2017 and issued auditors' report as of February 28, 2018. As describe in emphasis of matter paragraph above, we have reissued the auditors' report as the consolidated financial statements for the year ended December 31, 2017 have been restated. Accordingly, the restated consolidated financial statements for the year ended December 31, 2017 of the Group are different from the consolidated financial statements which have been authorized to issue by the Board of Directors on February 28, 2018. We have performed further audit procedures to express an opinion on the restated consolidated financial statements for the year ended December 31, 2017.

As described above, the auditors' report issued on February 28, 2018 is no longer effective, and therefore, shall not be used in relation to the consolidated financial statements for the year ended December 31, 2017, as the consolidated financial statements for the year ended December 31, 2017 have been restated.

KPMG Samjong Accounting Corp.

Seoul, Korea
February 28, 2018 (Except for the items in note 46)
June 12, 2018 (The date of the end of audit procedures performed only for the corrected misstatements in note 46)

This report is effective as of June 12, 2018, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that the above audit report has not been updated to reflect the impact of such subsequent events or circumstances, if any.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Financial Position
As of December 31, 2017 and 2016

In thousands of Korean won	***Notes***		**2017**	**2016**
Assets				
Cash and cash equivalents	8,39,41	₩	791,075,068	812,651,226
Current financial assets	9,10,13,14,15,39,40,41		24,710,087	19,007,401
Trade and other receivables, net	11,39,41		556,269,282	567,212,371
Inventories, net	16		88,273,335	125,113,992
Current income tax assets			37,055,000	15,439,429
Current non-financial assets	18		117,277,633	69,817,482
Assets held for sale	6,17		3,471,555	-
Current assets			1,618,131,960	1,609,241,901
Non-current financial assets, net	9,10,12,13,14,39,40,41		622,446,995	884,446,230
Long-term trade and other receivables	11,39,41,46		97,767,935	118,664,070
Property, plant and equipment, net	20,46		9,023,670,970	10,174,928,224
Goodwill	21		147,854,169	244,328,694
Intangible assets other than goodwill, net	22		2,934,334,387	3,587,399,646
Investments in associates and joint ventures	19		281,259,417	390,475,565
Deferred tax assets	37,46		1,218,914,526	1,154,541,941
Non-current non-financial assets	18		3,547,621,284	3,903,169,409
Non-current assets			17,873,869,683	20,457,953,779
Total assets		₩	19,492,001,643	22,067,195,680

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Financial Position, Continued
As of December 31, 2017 and 2016

In thousands of Korean won	***Notes***		**2017**	**2016**
Liabilities				
Trade and other payables	23,39,41,43,46	₩	786,399,194	973,354,166
Current financial liabilities	10,24,39,40,41,43		3,252,096,536	3,208,454,829
Current income tax liabilities	46		9,459,405	9,868,339
Current non-financial liabilities	27,46		108,686,434	85,103,193
Current provisions	26		94,440,202	155,940,533
Current liabilities			4,251,081,771	4,432,721,060
Long-term trade and other payables	23,39,41,43,46		503,799,162	293,433,599
Non-current financial liabilities	10,24,39,40,41,43		10,096,071,773	11,495,471,823
Non-current non-financial liabilities	27,46		42,607,876	-
Employee benefits, net	25		8,293,543	14,730,311
Deferred tax liabilities	37		132,817,193	291,310,490
Non-current provisions	26		2,020,256,660	2,030,796,036
Non-current liabilities			12,803,846,207	14,125,742,259
Total liabilities		₩	17,054,927,978	18,558,463,319
Equity				
Share capital	28		10,434,864,780	10,346,851,780
Accumulated deficit	29,46		(8,463,172,816)	(7,633,552,073)
Other components of equity	31		(576,845,327)	(314,455,121)
Equity attributable to the owner of the Company			1,394,846,637	2,398,844,586
Non-controlling interests			1,042,227,028	1,109,887,775
Total equity		₩	2,437,073,665	3,508,732,361
Total equity and liabilities		₩	19,492,001,643	22,067,195,680

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Comprehensive Loss

For the years ended December 31, 2017 and 2016

In thousands of Korean won	***Notes***		**2017**	**2016 (Restated) (Note 7)**
Continuing Operations				
Revenue	6,32	₩	2,312,485,962	2,424,966,928
Cost of sales	6,38		1,850,289,885	2,397,156,177
Gross profit	6		462,196,077	27,810,751
Selling and administrative expenses	6,38,46		286,324,859	260,114,038
Operating profit (loss)	6		175,871,218	(232,303,287)
Other non-operating income	6,33		152,268,721	235,672,964
Other non-operating expenses	6,33		207,235,979	26,243,896
Other loss, net	6,34,46		(463,149,784)	(422,718,978)
Finance income	6,35,39,46		304,558,480	182,857,191
Finance costs	6,36,39,46		710,411,647	820,782,736
Loss on investments in associates and joint ventures, net	6,19		(127,487,447)	(239,808,380)
Loss before income tax	6		(875,586,438)	(1,323,327,122)
Income tax benefit	37,46		(194,163,332)	(211,684,112)
Loss from continuing operations			(681,423,106)	(1,111,643,010)
Discontinued operations				
Loss from discontinued operations, net of tax			(52,337,450)	(7,203,465)
Loss for the year		₩	(733,760,556)	(1,118,846,475)
Other comprehensive income (loss)				
Items that will never be reclassified subsequently to profit or loss				
Actuarial gains (losses) on defined benefit plans, net of tax	25,29		3,141,590	(1,758,211)
Retained earnings adjustments in equity method, net of tax			(48,043)	11,669
Items that are or may be reclassified subsequently to profit or loss				
Net change in the unrealized fair value of available-for-sale financial assets, net of tax	12,39		(5,920,445)	(2,478,854)
Net change in fair value of available-for-sale financial assets reclassified to profit or loss, net of tax	12,39		(58,177,009)	-
Equity adjustments arising from investments in equity-method investees, net of tax	19		5,278,959	(4,064,426)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	10,39		(48,425,006)	(967,374)
Net change in fair value of derivatives using cash flow hedge accounting reclassified to profit or loss, net of tax	10,39		1,093,830	-
Foreign currency translation differences for foreign operations			(285,311,995)	(103,397,053)
Other comprehensive loss for the year, net of tax			(388,368,119)	(112,654,249)
Total comprehensive loss for the year		₩	(1,122,128,675)	(1,231,500,724)
Income (loss) attributable to:				
Owners of the Company			(832,714,290)	(1,091,916,698)
Non-controlling interests			98,953,734	(26,929,777)
Loss for the year			(733,760,556)	(1,118,846,475)
Total comprehensive income (loss) attributable to:				
Owners of the Company			(1,092,010,949)	(1,241,709,928)
Non-controlling interests			(30,117,726)	10,209,204
Total comprehensive loss for the year		₩	(1,122,128,675)	(1,231,500,724)

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Changes in Equity
For the years ended December 31, 2017 and 2016

In thousands of Korean won		Attributable to owners of the Company					
		Share capital	Accumulated deficit	Other components of equity	Subtotal	Non-controlling interests	Total equity
Balance as of January 1, 2016	₩	10,207,845,780	(6,539,888,833)	(166,408,433)	3,501,548,514	694,045,051	4,195,593,565
Total comprehensive loss for the year							
Loss for the year		-	(1,091,916,698)	-	(1,091,916,698)	(26,929,777)	(1,118,846,475)
Items that will not be reclassified subsequently to profit or loss							
Actuarial losses on defined benefit plan, net of tax		-	(1,758,211)	-	(1,758,211)	-	(1,758,211)
Retained earnings adjustments in equity method, net of tax		-	11,669	-	11,669	-	11,669
Items that may be reclassified subsequently to profit or loss							
Net change in the unrealized fair value of available-for-sale financial assets, net of tax		-	-	(2,478,854)	(2,478,854)	-	(2,478,854)
Equity adjustments arising from investments in equity-method investees, net of tax		-	-	(4,064,426)	(4,064,426)	-	(4,064,426)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax		-	-	(967,374)	(967,374)	-	(967,374)
Foreign currency translation differences for foreign operations		-	-	(140,536,034)	(140,536,034)	37,138,981	(103,397,053)
Total comprehensive income (loss) for the year		-	(1,093,663,240)	(148,046,688)	(1,241,709,928)	10,209,204	(1,231,500,724)
Transactions with owners of the Company, recognized directly in equity							
Issuance of share capital		139,006,000	-	-	139,006,000	-	139,006,000
Dividends paid		-	-	-	-	(46,420,000)	(46,420,000)
Contribution by non-controlling interests		-	-	-	-	452,053,520	452,053,520
Total transactions with owners of the Company		139,006,000	-	-	139,006,000	405,633,520	544,639,520
Balance as of December 31, 2016	₩	10,346,851,780	(7,633,552,073)	(314,455,121)	2,398,844,586	1,109,887,775	3,508,732,361

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Changes in Equity, Continued
For the years ended December 31, 2017 and 2016

In thousands of Korean won		Attributable to owners of the Company					
		Share capital	Accumulated deficit	Other components of equity	Subtotal	Non-controlling interests	Total equity
Balance as of January 1, 2017	₩	10,346,851,780	(7,633,552,073)	(314,455,121)	2,398,844,586	1,109,887,775	3,508,732,361
Total comprehensive loss for the year							
Loss for the year		-	(832,714,290)	-	(832,714,290)	98,953,734	(733,760,556)
Items that will not be reclassified subsequently to profit or loss							
Defined benefit plan actuarial gains, net of tax		-	3,141,590	-	3,141,590	-	3,141,590
Retained earnings adjustments in equity method, net of tax		-	(48,043)	-	(48,043)	-	(48,043)
Items that may be reclassified subsequently to profit or loss							
Net change in the unrealized fair value of available-for-sale financial assets, net of tax		-	-	(5,920,445)	(5,920,445)	-	(5,920,445)
Net change in fair value of available-for-sale financial assets reclassified to profit or loss, net of tax		-	-	(58,177,009)	(58,177,009)	-	(58,177,009)
Equity adjustments arising from investments in equity-method investees, net of tax		-	-	5,278,959	5,278,959	-	5,278,959
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax		-	-	(48,425,006)	(48,425,006)	-	(48,425,006)
Net change in fair value of derivatives using cash flow hedge accounting reclassified to profit or loss, net of tax		-	-	1,093,830	1,093,830	-	1,093,830
Foreign currency translation differences for foreign operations		-	-	(156,240,535)	(156,240,535)	(129,071,460)	(285,311,995)
Total comprehensive loss for the year		-	(829,620,743)	(262,390,206)	(1,092,010,949)	(30,117,726)	(1,122,128,675)
Transactions with owners of the Company, recognized directly in equity							
Issuance of share capital		88,013,000	-	-	88,013,000	-	88,013,000
Dividends paid		-	-	-	-	(35,007,112)	(35,007,112)
Distribution to non-controlling interests		-	-	-	-	(2,535,909)	(2,535,909)
Total transactions with owners of the Company		88,013,000	-	-	88,013,000	(37,543,021)	50,469,979
Balance as of December 31, 2017	₩	10,434,864,780	(8,463,172,816)	(576,845,327)	1,394,846,637	1,042,227,028	2,437,073,665

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Cash Flows
For the years ended December 31, 2017 and 2016

In thousands of Korean won		2017	2016
Cash flows from operating activities			
Loss for the year	₩	(733,760,556)	(1,118,846,475)
Adjustment for:			
Severance and retirement benefits		10,013,447	9,656,685
Depreciation		806,411,988	953,689,274
Amortization of intangible assets other than goodwill		98,482,908	151,930,271
Bad debt expense		-	428,504
Reversal of other bad debt allowance		(7,937,647)	(670,562)
Gains on exemption of debts		(76,743,985)	(220,473,024)
Loss on cancellation of debt exemption		2,701,210	-
Non-operating income from overseas oil fields (other income)		(3,914,767)	(7,265,315)
Interest costs on provision for decommissioning		73,316,028	93,005,038
Other bad debt expense		180,185,957	14,521,334
Gains on disposal of property, plant and equipment		(2,130,079)	(55,943,249)
Gains on disposal of intangible assets other than goodwill		-	(483,491)
Reversal of impairment losses on property, plant and equipment		(163,644,901)	(400,959,457)
Reversal of impairment losses on intangible assets other than goodwill		-	(6,416,059)
Gains on foreign currency translation (other profit or loss)		(39,594,669)	(21,467,246)
Losses on disposal of property, plant and equipment		182,050	9,045,000
Losses on disposal of intangible assets other than goodwill		3,524,172	66,325,786
Losses on valuation of inventories		6,820,816	-
Losses on valuation of derivatives (other profit or loss)		-	3,164,396
Impairment losses on property, plant and equipment		363,206,306	433,606,570
Impairment losses on intangible assets other than goodwill		227,051,386	345,031,887
Impairment losses on goodwill		87,470,422	32,440,037
Losses on foreign currency translation (other profit or loss)		45,109,552	26,709,709
Income tax benefit		(199,940,426)	(214,127,410)
Interest income		(50,601,455)	(37,816,259)
Dividends income		(9,991)	(24,114)
Gains on disposal of available-for-sale financial investments		-	(26,232,279)
Gains on repayment of financial liabilities		(1,583,427)	(17,233,744)
Gains on transaction of derivatives (finance income)		(1,168,345)	(737,705)
Gains on foreign currency translation (finance income)		(143,659,143)	(60,053,861)
Interest expense		401,018,825	424,597,942
Impairment losses on available-for-sale financial assets		71,585,757	45,576,708
Losses on transaction of derivatives (finance cost)		11,604,928	5,748,906
Loss on valuation of derivatives (finance cost)		25,305,094	-
Losses on foreign currency translation (finance cost)		93,114,772	205,689,862
Other finance costs (interest expense)		26,610,339	32,224,499
Share of loss in associates and joint ventures		128,645,527	131,858,177
Share of gain in associates and joint ventures		(6,684,312)	(10,176,936)
Impairment losses on investments in associates and joint ventures		5,526,231	118,139,758
Gains on disposal of investments in associates and joint ventures		-	(12,620)
		1,970,274,568	2,023,297,012
Changes in:			
Inventories		21,542,265	43,869,162
Trade and other receivables		(84,476,210)	155,555,916
Other receivables from operating activities		(67,541,088)	48,398,420
Trade and other payables		89,645,401	(126,602,890)
Other payables from operating activities		17,104,940	(54,297,941)
Defined benefit liability		(4,700,902)	(3,682,234)
Provisions		(61,140,231)	(60,170,625)
		(89,565,825)	3,069,808

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Cash Flows, Continued
For the years ended December 31, 2017 and 2016

In thousands of Korean won		2017	2016
Cash generated from operating activities	₩	1,146,948,187	907,520,345
Dividend received		24,242,702	14,700,343
Interest paid		(472,962,743)	(477,471,075)
Interest received		68,773,996	17,832,607
Income tax paid		(71,619,868)	(90,667,506)
Net cash provided by operating activities	₩	695,382,274	371,914,714
Cash flows from investing activities:			
Proceeds from disposal of investments in associates and joint ventures		-	3,626,880
Acquisition of investments in associates and joint ventures		(19,932,879)	(42,176,384)
Proceeds from disposal of property, plant and equipment		216,130,892	86,560,097
Acquisition of property, plant and equipment		(801,791,485)	(640,995,307)
Proceeds from disposal of intangible assets other than goodwill		11,920	5,725,944
Acquisition of intangible assets other than goodwill		(27,933,109)	(44,334,731)
Acquisition of non-current non-financial assets		(92,476,135)	(90,792,457)
Proceeds from disposal of available-for-sale financial investments		-	67,184,859
Acquisition of available-for-sale financial investments		(17,744)	-
Increase in long-term and short-term financial assets		(206,429,516)	-
Decrease in long-term and short-term financial assets		206,192,617	66,804
Increase in leasehold deposits provided		(21,506,145)	(18,364,281)
Decrease in leasehold deposits provided		1,066,154	16,059,739
Increase in short-term and long-term loans		(59,686,502)	(107,154,291)
Collection of short-term and long-term loans		23,259,743	10,576,677
Increase in leasehold deposits received		476,209	1,988,940
Decrease in leasehold deposits received		-	(29,786)
Net cash used in investing activities	₩	(782,635,980)	(752,057,297)
Cash flow from financing activities			
Proceeds from increase in share capital		88,013,000	139,006,000
Proceeds from short-term borrowings		152,272,880	698,772,900
Repayments of short-term borrowings		(801,762,951)	(1,149,502,996)
Proceeds from issue of bond payables		2,209,147,968	2,576,075,381
Repayments of bond payables		(1,946,543,420)	(2,165,791,933)
Proceeds from long-term borrowings		801,623,879	34,826,579
Repayments of long-term borrowings		(242,928,671)	(87,824,325)
Dividends paid		(35,007,112)	(46,420,000)
Repayments of finance lease liability		(7,855,845)	-
Net cash inflow from contribution by non-controlling interests		-	452,053,520
Net cash outflow due to other distribution to non-controlling interests		(2,535,909)	-
Net cash provided by financing activities	₩	214,423,819	451,195,126

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Cash Flows, Continued
For the years ended December 31, 2017 and 2016

In thousands of Korean won		2017	2016
Net increase in cash and cash equivalents before net effect of foreign exchange differences	₩	127,170,113	71,052,543
Effect of exchange rate fluctuations on cash held		(152,866,817)	(44,431,621)
Net Increase (decrease) in cash and cash equivalents		(25,696,704)	26,620,922
Cash and cash equivalents as of January 1		816,816,506	790,195,584
Cash and cash equivalents as of December 31 before deduction of government grants		791,119,802	816,816,506
Government grants		(44,734)	(4,165,280)
Cash and cash equivalents as of December 31 after deduction of government grants	₩	791,075,068	812,651,226

See accompanying notes to the consolidated financial statements.

1. Reporting Entity

(a) Description of the controlling company

Korea National Oil Corporation (the "Company" or the "Parent Company") was incorporated on March 3, 1979 to engage in the development of oil fields, distribution of crude oil, maintenance of petroleum reserve stock and improvement of the petroleum distribution infrastructure under the Korea National Oil Corporation Act. The Company's head office is located at 305, Jongga-Ro, Jung-Gu, Ulsan in Korea. The Company also has 9 petroleum stockpile sites, 1 domestic gas field management office, 1 overseas office in Kazakhstan and overseas subsidiaries and affiliates in the United States and other countries.

As of December 31, 2017, the Company's share capital is ₩10,434,865 million, which is wholly owned by the government of the Republic of Korea.

The consolidated financial statements comprise the Company and its subsidiaries (together referred to as the "Group" and individually as "Group entities") and the Group's interests in associates and joint ventures.

The list of subsidiaries as of December 31, 2017 and 2016 is disclosed in Note 5.

2. Basis of Preparation

(a) Statement of compliance

The consolidated financial statements have been prepared in accordance with Korean International Financial Reporting Standards ("K-IFRS"), as prescribed in the Act on External Audits of Corporations in the Republic of Korea.

The consolidated financial statements were authorized for issue by the Board of Directors on June 12, 2018.

(b) Basis of measurement

The consolidated financial statements have been prepared on the historical cost basis, except for the following material items in the statement of financial position:

- ✓ derivative financial instruments are measured at fair value
- ✓ financial instruments at fair value through profit or loss are measured at fair value
- ✓ available-for-sale financial assets are measured at fair value
- ✓ investments in associates and joint venture are measured at fair value
- ✓ liabilities for defined benefit plans are recognized at the net of the total present value of defined benefit obligations less the fair value of plan assets

2. Basis of Preparation, Continued

(c) Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the 'functional currency'). The accompanying consolidated financial statements are prepared in the Group's functional currency, the United States dollar, and presented in Korean won, the Group's presentation currency, for the financial reporting purposes in accordance with K-IFRS No. 1021, 'The Effects of Changes in Foreign Exchange Rates'. The Group is required to present its financial statements in Korean won in accordance with regulations in Korea.

Assets and liabilities for each statement of financial position presented (i.e. including comparatives) were translated at the closing rate at the date of that statement of financial position, income and expenses for each statement presenting profit or loss and other comprehensive income (i.e. including comparatives) were translated at the average exchange rates of the period and all resulting exchange differences were recognized in other comprehensive income.

(d) Use of estimates and judgments

The preparation of the consolidated financial statements in conformity with K-IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimates are revised and in any future periods affected.

(i) Management's judgment
Information about critical judgments in applying accounting policies that have the most significant effect on the amounts recognized in the consolidated financial statements is included in the following notes

Note 19: Investments in Associates and Joint Ventures – classification of a joint arrangement

(ii) Assumptions and estimation uncertainties
Information about assumptions and estimation uncertainties that have a significant risk of resulting in a material adjustment within the next financial year are included in the following notes

Note 19: Investments in Associates and Joint Ventures – main assumptions for recoverable amounts
Note 20: Property, Plant and Equipment – estimation of factors for depreciation and recoverable amount
Note 21: Goodwill – main assumptions for recoverable amounts
Note 22: Intangible assets other than goodwill – main assumptions for recoverable amounts
Note 25: Employee Benefits – main actuarial assumptions
Note 26 and 44: Provisions and Contingencies – assumptions for possibility of cash outflows and their amounts
Note 37: Income tax benefit – possibility of realization of deferred tax assets

2. Basis of Preparation, Continued

(d) Use of estimates and judgments, continued

(iii) Measurement of fair value

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities. The Group has an established control framework with respect to the measurement of fair values. This includes a valuation team that has overall responsibility for overseeing all significant fair value measurements, including Level 3 fair values, and reports directly to the CFO.

The valuation team regularly reviews significant unobservable inputs and valuation adjustments. If third party information, such as broker quotes or pricing services, is used to measure fair values, then the valuation team assesses the evidence obtained from the third parties to support the conclusion that such valuations meet the requirements of K-IFRS, including the level in the fair value hierarchy in which such valuations should be classified.

When measuring the fair value of an asset or a liability, the Group uses market observable data as far as possible. Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows.

· Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
· Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
· Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or a liability fall into different levels of the fair value hierarchy, then the fair value measurement is categorized in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

Information about the assumptions made in measuring fair values is included in the following notes:

Note 39 – Categories of financial instruments
Note 41 – Risk Management

3. Changes in Accounting Policies

Except for the changes below, the Group has consistently applied the accounting policies set out in note 4 to all periods presented in these consolidated financial statements. The Group has adopted the following amendments to standards with a date of initial application of January 1, 2017.

(a) K-IFRS No. 1007 'Statement of Cash Flows'

Amendments to K-IFRS No. 1007, 'Statement of Cash Flows' require an entity to disclose changes from financing cash flows, changes arising from obtaining or losing control of subsidiaries or other businesses, the effect of changes in foreign exchange rates, changes in fair values and other changes in liabilities arising from financing activities. K-IFRS No. 1007 does not require the disclosure of comparative information of prior year. The related disclosures are included in note 43.

(b) K-IFRS No. 1012 'Income taxes'

Amendments to K-IFRS No. 1012, in the case of debt instruments evaluated with fair values, deferred tax accounting treatment is clarified, as the temporary difference is calculated from the difference between the carrying amount and taxable base amount of the debt liabilities, regardless of the expected recovery method. When reviewing the feasibility of deferred tax assets, if there is sufficient evidence that it is likely to recover some part of an entity's assets in excess of the carrying amount, the estimated amount of future taxable income would be included in the estimated future taxable income. In addition, future taxable income estimates are calculated as the amount before deducting the deductible (deduction) effect from deductible temporary differences.

(c) Impact of changes in accounting policies.

Management believes the impact of the amendments on the Group's consolidated financial statements is not significant, and the Group did not retrospectively apply the amendments to K-IFRS No. 1212 stated above.

4. Significant Accounting Policies

The significant accounting policies applied by the Group in preparation of its consolidated financial statements are included below. The accounting policies set out below have been applied consistently to all periods presented in these consolidated financial statements, except for changes in accounting policies as explained in note 3.

(a) Basis of consolidation

(i) Non-controlling interests

Non-controlling interests are measured at their proportionate share of the acquiree's identifiable net assets at the date of acquisition. Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

(ii) Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

(iii) Loss of control

When the Group loses control over a subsidiary, it derecognizes the assets and liabilities of the subsidiary, and any related NCI and other components of equity. Any resulting gain or loss is recognized in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

4. Significant Accounting Policies, Continued

(a) Basis of consolidation, continued

(iv) Interests in equity-accounted investees

The Group's interests in equity-accounted investees comprise interests in associates and a joint venture. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies. A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities.

Interests in associates and the joint venture are accounted for using the equity method. They are initially recognized at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and OCI of equity-accounted investees, until the date on which significant influence or joint control ceases.

(v) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealized income and expenses arising from intra-group transactions, are eliminated. Unrealized gains arising from transactions with equity-accounted investees are eliminated against the investment to the extent of the Group's interest in the investee. Unrealized losses are eliminated in the same way as unrealized gains, but only to the extent that there is no evidence of impairment.

(b) Discontinued operations

The Group classifies its business segment or subsidiary as discontinued operation when it disposes a separate line of business or a segment, meets the criteria for assets held for sale, or acquires a subsidiary for sole purpose of sale. The consolidated statements of comprehensive income should be restated as if the operations have been discontinued from the beginning of the comparative fiscal period.

(c) Cash and cash equivalents

Cash and cash equivalents comprise cash on hand, demand deposits, and short-term investments in highly liquid securities that are readily convertible to known amounts of cash with maturities of three months or less from the acquisition date and which are subject to an insignificant risk of changes in value. Equity investments are excluded from cash and cash equivalents unless they are, in substance, cash equivalents, for example in the case of preferred shares when it has a short maturity with a specified redemption date.

4. Significant Accounting Policies, Continued

(d) Inventories

Inventories are measured at the lower of cost and net realizable value. The cost of inventories is based on the moving-weighted average method, and includes expenditures for acquiring the inventories, production or conversion costs and other costs incurred in bringing them to their existing location and condition. Net realizable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and selling expenses.

The amount of any write-down of inventories to net realizable value and all losses of inventories are recognized as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realizable value, are recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

(e) Non-derivative financial assets

The Group recognizes and measures non-derivative financial assets by the following four categories: financial assets at fair value through profit or loss, held-to-maturity investments, loans and receivables and available-for-sale financial assets. The Group recognizes financial assets in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the instrument.

Upon initial recognition, non-derivative financial assets are measured at their fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the asset's acquisition or issuance.

(i) Financial assets at fair value through profit or loss

A financial asset is classified as financial assets are classified at fair value through profit or loss if it is held for trading or is designated as such upon initial recognition. Upon initial recognition, transaction costs are recognized in profit or loss when incurred. Financial assets at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss.

(ii) Held-to-maturity investments

A non-derivative financial asset with a fixed or determinable payment and fixed maturity, for which the Group has the positive intention and ability to hold to maturity, are classified as held-to-maturity investments. Subsequent to initial recognition, held-to-maturity investments are measured at amortized cost using the effective interest method.

(iii) Loans and receivables

Loans and receivables are financial assets with fixed or determinable payments that are not quoted in an active market. Subsequent to initial recognition, loans and receivables are measured at amortized cost using the effective interest method except for loans and receivables of which the effect of discounting is immaterial.

4. Significant Accounting Policies, Continued

(e) Non-derivative financial assets, continued

(iv) Available-for-sale financial assets

Available-for-sale financial assets are those non-derivative financial assets that are designated as available-for-sale or are not classified as financial assets at fair value through profit or loss, held-to-maturity investments or loans and receivables. Subsequent to initial recognition, they are measured at fair value, which changes in fair value, net of any tax effect, recorded in other comprehensive income in equity. Investments in equity instruments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured and derivatives that are linked to and must be settled by delivery of such unquoted equity instruments are measured at cost.

(v) De-recognition of financial assets

The Group derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows on the financial asset in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in transferred financial assets that is created or retained by the Group is recognized as a separate asset or liability.

If the Group retains substantially all the risks and rewards of ownership of the transferred financial assets, the Group continues to recognize the transferred financial assets and recognizes financial liabilities for the consideration received.

(vi) Offsetting between financial assets and financial liabilities

Financial assets and financial liabilities are offset and the net amount is presented in the consolidated statement of financial position only when the Group currently has a legally enforceable right to offset the recognized amounts, and there is the intention to settle on a net basis or to realize the asset and settle the liability simultaneously.

4. Significant Accounting Policies, Continued

(f) Derivative financial instruments, including hedge accounting

Derivatives are initially recognized at fair value. Subsequent to initial recognition, derivatives are measured at fair value, and changes therein are accounted for as described below.

(i) Hedge accounting

The Group holds forward exchange contracts, interest rate swaps, currency swaps and other derivative contracts to manage interest rate risk and foreign exchange risk. The Group designated derivatives as hedging instruments to hedge the risk of changes in the fair value of assets, liabilities or firm commitments (a fair value hedge) and foreign currency risk of highly probable forecasted transactions or firm commitments (a cash flow hedge).

On initial designation of the hedge, the Group formally documents the relationship between the hedging instrument(s) and hedged item(s), including the risk management objectives and strategy in undertaking the hedge transaction, together with the methods that will be used to assess the effectiveness of the hedging relationship.

Fair value hedge
Changes in the fair value of a derivative hedging instrument designated as a fair value hedge are recognized in gain or loss. The gain or loss from remeasuring the hedging instrument at fair value for a derivative hedging instrument and the gain or loss on the hedged item attributable to the hedged risk are recognized in profit or loss in the same line item of the consolidated statement of comprehensive income.

The Group discontinues fair value hedge accounting if the hedging instrument expires or is sold, terminated or exercised, or if the hedge no longer meets the criteria for hedge accounting. Any adjustment arising from gain or loss on the hedged item attributable to the hedged risk is amortized to profit or loss from the date the hedge accounting is discontinued.

Cash flow hedge
When a derivative is designated to hedge the variability in cash flows attributable to a particular risk associated with a recognized asset or liability or a highly probable forecasted transaction that could affect profit or loss, the effective portion of changes in the fair value of the derivative is recognized in other comprehensive income, net of tax, and presented in the hedging reserve in equity. Any ineffective portion of changes in the fair value of the derivative is recognized immediately in profit or loss.

If the hedging instrument no longer meets the criteria for hedge accounting, expires or is sold, terminated, exercised, or the designation is revoked, then hedge accounting is discontinued prospectively. The cumulative gain or loss on the hedging instrument that has been recognized in other comprehensive income is reclassified to profit or loss in the periods during which the forecasted transaction occurs. If the forecasted transaction is no longer expected to occur, then the balance in other comprehensive income is recognized immediately in profit or loss.

4. Significant Accounting Policies, Continued

(f) Derivative financial instruments, including hedge accounting, continued

(ii) Separable embedded derivatives

Embedded derivatives are separated from the host contract and accounted for separately only if the following criteria have been met:

① The economic characteristics and risks of the embedded derivative are not closely related to those of the host contract;
② A separate instrument with the same terms as the embedded derivative would meet the definition of a derivative; and
③ The hybrid instrument is not measured at fair value with changes in fair value recognized in profit or loss.

Changes in the fair value of separable embedded derivatives are recognized immediately in profit or loss.

(iii) Other derivative financial instruments

Changes in the fair value of other derivative financial instrument not designated as a hedging instrument are recognized immediately in profit or loss.

(g) Impairment of financial assets

A financial asset not carried at fair value through profit or loss is assessed at each reporting date to determine whether there is objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that a loss event has occurred after the initial recognition of the asset, and that the loss event had a negative effect on the estimated future cash flows of that asset that can be estimated reliably. However, losses expected as a result of future events, regardless of likelihood, are not recognized.

If there is objective evidence that financial instruments are impaired, impairment losses are measured and recognized. In addition, for an investment in an equity security, a significant or prolonged decline in its fair value below its cost is objective evidence of impairment.

(i) Financial assets measured at amortized cost

An impairment loss in respect of a financial asset measured at amortized cost is calculated as the difference between its carrying amount and the present value of its estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognized in profit or loss and reflected in an allowance account. When the Group considers that there are no realistic prospects of recovery of the asset, the relevant amounts are written off. If the amount of impairment loss subsequently decreases and the decrease can be related objectively to an event occurring after the impairment was recognized, then the previously recognized impairment loss is reversed through profit or loss either directly or by adjusting an allowance account.

4. Significant Accounting Policies, Continued

(g) Impairment of financial assets, continued

(ii) Financial assets carried at cost

If there is objective evidence that an impairment loss has occurred on an unquoted equity instrument that is not carried at fair value because its fair value cannot be reliably measured, or on a derivative asset that is linked to and must be settled by delivery of such an unquoted equity instrument, the amount of the impairment loss is measured as the difference between the carrying amount of the financial asset and the present value of estimated future cash flows discounted at the current market rate of return for a similar financial asset. Such impairment losses shall not be reversed.

(iii) Available-for-sale financial assets

When a decline in the fair value of an available-for-sale financial asset has been recognized in other comprehensive income and there is objective evidence that the asset is impaired, the cumulative loss that had been recognized in other comprehensive income shall be reclassified from equity to profit or loss as a reclassification adjustment even though the financial asset has not been derecognized. Impairment losses recognized in profit or loss for an investment in an equity instrument classified as available-for-sale shall not be reversed through profit or loss. If, in a subsequent period, the fair value of a debt instrument classified as available-for-sale increases and the increase can be objectively related to an event occurring after the impairment loss was recognized in profit or loss, the impairment loss shall be reversed, with the amount of the reversal recognized in profit or loss.

(h) Property, plant and equipment

Property, plant and equipment are initially measured at cost and after initial recognition, are carried at cost less accumulated depreciation and accumulated impairment losses. The cost of property, plant and equipment includes expenditures arising directly from the construction or acquisition of the asset, any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management and the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

The following costs are capitalized as oil and gas properties.

- the costs incurred in development stage for constructing facilities and drilling wells for production
- the costs of acquiring production areas or fields with proved reserves
- the construction costs and other expenditures for initiating production
- the estimated costs for decommissioning

Additionally, the Group depreciates the acquisition costs of oil and gas properties which are aggregated on an area-by-area basis or field-by-field basis. For the costs of oil and gas properties which are aggregated on an area-by-area basis, the Group depreciates the acquisition costs using proved reserves as the total estimated production when applying the unit-of-production depreciation method. For the costs of oil and gas properties which are aggregated on a field-by-field basis, the Group depreciates the acquisition costs using proved developed reserves as the total estimated production when applying the unit-of-production depreciation method.

4. Significant Accounting Policies, Continued

(h) Property, plant and equipment, continued

Costs related to undeveloped oil and gas properties are not immediately included in the depletable pool of developed assets but are transferred to the depletable pool as the reserves become proved (for area-by-area basis) or developed (for field-by-filed basis) through drilling activities.

Subsequent costs are recognized in the carrying amount of property, plant and equipment at cost or, if appropriate, as separate items if it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of the replaced part is derecognized. The costs of the day-to-day servicing are recognized in profit or loss as incurred.

Property, plant and equipment, except for land and oil and gas properties, are depreciated on a straight-line basis over estimated useful lives that appropriately reflect the pattern in which the asset's future economic benefits are expected to be consumed.

	Useful lives (years)
Buildings	20 ~ 40 years
Structures	20 ~ 40 years
Machineries	5 ~ 20 years
Vessels	20 years
Tools and fixtures	5 years
Vehicles	5 years

Gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment and are recognized in profit or loss. Depreciation methods, useful lives and residual values are reviewed at the end of each reporting date and adjusted, if appropriate. The change is accounted for as a change in an accounting estimate.

(i) Intangible assets

Intangible assets with finite useful lives acquired separately are carried at cost. Intangible assets acquired in a business combination are initially recognized at their fair value at the acquisition date (which is regarded as their cost). Subsequent to initial recognition, intangible assets acquired in a business combination are reported at cost less accumulated amortization and accumulated impairment losses.

Prior to acquiring the legal rights to explore an area, all costs related to exploration and evaluation of an area are charged directly to the statement of comprehensive loss. Once the legal rights to explore are acquired, all costs associated with acquisition of exploration rights, geological, geophysical and geographical research, drilling costs and evaluation of technical and commercial viability of economic production are capitalized as exploration and evaluation assets. All such costs are subject to review for impairment when facts and circumstances suggest that the carrying amount of the assets exceeds their recoverable amount. When technical feasibility and commercial viability are established, the relevant expenditure is transferred to oil and gas properties after impairment is assessed and any resulting impairment loss is recognized. If no potentially commercial petroleum is discovered from exploration drilling, the relating exploration and evaluation assets are written off through the statement of comprehensive loss.

4. Significant Accounting Policies, Continued

(i) Intangible assets, continued

The useful lives of intangible assets are assessed as either finite or indefinite. Intangible assets with finite lives are amortized over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. The amortization period and the amortization method for intangible assets with a finite useful lives are reviewed at least each financial year end. Changes in the expected useful life or the expected pattern of consumption of future economic benefits embodied in the asset is accounted for by changing the amortization period or method, as appropriate, and are treated as changes in accounting estimates. The amortization expense on intangible assets with finite lives is recognized in the statement of comprehensive income in the expense category consistent with the function of the intangible asset.

Intangible assets with indefinite useful lives such as membership are not amortized, but are tested for impairment annually. Intangible assets with definite useful lives are amortized on a straight-line basis over estimated useful lives of 5 to 20 years.

Gains or losses arising from derecognition of an intangible asset, measured as the difference between the net disposal proceeds and the carrying amount of the asset, and are recognized in income or loss when the asset is derecognized.

(j) Oil stockpiles

The Group stockpiles crude oil and petroleum products to stabilize domestic demand and market prices and classifies those assets as oil stockpiles (non-current non-financial assets) of which the cost is determined using the moving-average method. The Group performs annual impairment test for oil stockpiles.

(k) Borrowing costs

The Group capitalizes borrowing costs directly attributable to the acquisition, construction or production of a qualifying asset as part of the cost of that asset. Other borrowing costs are recognized in expense as incurred. A qualifying asset is an asset that requires a substantial period of time to get ready for its intended use or sale. Financial assets and inventories that are manufactured or otherwise produced over a short period of time are not qualifying assets. Assets that are ready for their intended use or sale when acquired are not qualifying assets.

To the extent that the Group borrows funds specifically for the purpose of obtaining a qualifying asset, the Group determines the amount of borrowing costs eligible for capitalization as the actual borrowing costs incurred on that borrowing during the period less any investment income on the temporary investment of those borrowings. To the extent that the Group borrows funds generally and uses them for the purpose of obtaining a qualifying asset, the Group shall determine the amount of borrowing costs eligible for capitalization by applying a capitalization rate to the expenditures on that asset. The capitalization rate shall be the weighted average of the borrowing costs applicable to the borrowings of the Group that are outstanding during the period, other than borrowings made specifically for the purpose of obtaining a qualifying asset. The amount of borrowing costs that the Group capitalizes during a period shall not exceed the amount of borrowing costs incurred during that period.

4. Significant Accounting Policies, Continued

(l) Impairment of non-financial assets

The carrying amounts of the Group's non-financial assets, other than assets arising from employee benefits, inventories, deferred tax assets and non-current assets held for sale, are reviewed at the end of the reporting period to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Intangible assets that have indefinite useful lives or that are not yet available for use, irrespective of whether there is any indication of impairment, are tested for impairment annually by comparing their recoverable amount to their carrying amount.

For impairment testing, assets are grouped together into the smallest group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets ("CGUs"). The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. The value in use is estimated by applying a pre-tax discount rate that reflect current market assessments of the time value of money and the risks specific to the asset or CGU for which estimated future cash flows have not been adjusted, to the estimated future cash flows expected to be generated by the asset or CGU.

An impairment loss is recognized in profit or loss if the carrying amount of an asset or a CGU exceeds its recoverable amount.

(m) Lease

The Group classifies and accounts for leases as either a finance or operating lease, depending on the terms. Leases where the Group assumes substantially all of the risks and rewards of ownership are classified as finance leases. All other leases are classified as operating leases.

(i) Finance leases

At the commencement of the lease term, the Group recognizes as finance assets and finance liabilities in its consolidated statements of financial position, the lower amount of the fair value of the leased property and the present value of the minimum lease payments, each determined at the inception of the lease. Any initial direct costs are added to the amount recognized as an asset. Minimum lease payments are apportioned between the finance charge and the reduction of the outstanding liability. The finance charge is allocated to each period during the lease term so as to produce a constant periodic rate of interest on the remaining balance of the liability. Contingent rents are charged as expenses in the periods in which they are incurred.
The depreciable amount of a leased asset is allocated to each accounting period during the period of expected use on a systematic basis consistent with the depreciation policy the lessee adopts for depreciable assets that are owned. If there is no reasonable certainty that the lessee will obtain ownership by the end of the lease term, the asset is fully depreciated over the shorter of the lease term and its useful life. The Group reviews to determine whether the leased asset may be impaired.

(ii) Operating leases

Leases where the lessor retains a significant portion of the risks and rewards of ownership are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) are recognized in profit or loss on a straight-line basis over the period of the lease.

4. Significant Accounting Policies, Continued

(m) Lease, continued

(iii) Determining whether an arrangement contains a lease

Determining whether an arrangement is, or contains, a lease shall be based on the substance of the arrangement and requires an assessment of whether fulfillment of the arrangement is dependent on the use of a specific asset or assets (the asset) and the arrangement conveys a right to use the asset.

At inception or reassessment of the arrangement, the Group separates payments and other consideration required by such an arrangement into those for the lease and those for other elements on the basis of their relative fair values. If the Group concludes for a financial lease that it is impracticable to separate the payments reliably, the Group recognizes an asset and a liability at an amount equal to the fair value of the underlying asset that was identified as the subject of the lease. Subsequently, the liability shall be reduced as payments are made and an imputed finance charge on the liability recognized using the purchaser's incremental borrowing rate of interest

(n) Non-current assets held for sale

Non-current assets, or disposal groups comprising assets and liabilities, that are expected to be recovered primarily through sale rather than through continuing use, are classified as held for sale. In order to be classified as held for sale, the asset (or disposal group) must be available for immediate sale in its present condition and its sale must be highly probable. The assets or disposal group that are classified as non-current assets held for sale are measured at the lower of their carrying amount and fair value less cost to sell.

The Group recognizes an impairment loss for any initial or subsequent write-down of an asset (or disposal group) to fair value less costs to sell, and a gain for any subsequent increase in fair value less costs to sell, up to the cumulative impairment loss previously recognized in accordance with K-IFRS No. 1036, ‘Impairment of Assets’.

A non-current asset that is classified as held for sale or part of a disposal group classified as held for sale is not depreciated (or amortized).

4. Significant Accounting Policies, Continued

(o) Non-derivative financial liabilities

The Group classifies non-derivative financial liabilities into financial liabilities at fair value through profit or loss or other financial liabilities in accordance with the substance of the contractual arrangement and the definitions of financial liabilities. The Group recognizes financial liabilities in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the financial liability.

(i) Financial assets at fair value through profit or loss

Financial liabilities at fair value through profit or loss include financial liabilities held for trading or designated as such upon initial recognition. Subsequent to initial recognition, financial liabilities at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss. Upon initial recognition, transaction costs that are directly attributable to the acquisition are recognized in profit or loss as incurred.

(ii) Other financial liabilities

Non-derivative financial liabilities other than financial liabilities at fair value through profit or loss are classified as other financial liabilities. At the date of initial recognition, other financial liabilities are measured at fair value minus transaction costs that are directly attributable to the acquisition. Subsequent to initial recognition, other financial liabilities are measured at amortized cost using the effective interest method.

The Group derecognizes a financial liability from the consolidated statement of financial position when it is extinguished (i.e. when the obligation specified in the contract is discharged, cancelled or expires).

(p) Employee benefits

(i) Short-term employee benefits

Short-term employee benefits are employee benefits that are due to be settled within 12 months after the end of the period in which the employees render the related service. When an employee has rendered service to the Group during an accounting period, the Group recognizes the undiscounted amount of short-term employee benefits expected to be paid in exchange for that service.

(ii) Retirement benefits: defined contribution plans

When an employee has rendered service to the Group during a period, the Group recognizes the contribution payable to a defined contribution plan in exchange for that service as a liability (accrued expense), after deducting any contribution already paid. If the contribution already paid exceeds the contribution due for service before the end of the reporting period, the Group recognizes that excess as an asset (prepaid expense) to the extent that the prepayment will lead to a reduction in future payments or a cash refund.

4. Significant Accounting Policies, Continued

(p) Employee benefits, continued

(iii) Retirement benefits: defined benefit plans

A defined benefit plan is a post-employment benefit plan other than a defined contribution plan. The Group's net obligation in respect of defined benefit plans is calculated by estimating the amount of future benefit that employees have earned in return for their service in the current and prior periods; that benefit is discounted to determine its present value. The fair value of plan assets is deducted. The calculation is performed annually by an independent actuary using the projected unit credit method.

The discount rate is the yield at the reporting date on high-quality corporate bonds that have maturity dates approximating the terms of the Group's obligations and that are denominated in the same currency in which the benefits are expected to be paid. The Group recognizes all actuarial gains and losses arising from actuarial assumption changes and experiential adjustments in other comprehensive income when incurred.

Re-measurements of net defined benefit liabilities, which comprise actuarial gains and losses, the return on plan assets (excluding interest) and the effect of the asset ceiling (if any, excluding interest), are recognized immediately in other comprehensive income. The Group determines the net interest expense (income) on the net defined benefit liability (asset) for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period to the then-net defined benefit liability (asset), taking into account any changes in the net defined benefit liability (asset) during the period as a result of contributions and benefit payments, net interest expense and other expenses related to defined benefit plans are recognized in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss in curtailment is recognized immediately in profit or loss. The Group recognizes gains and losses on the settlement of a defined benefit plan when the settlement occurs.

4. Significant Accounting Policies, Continued

(q) Provisions

Provisions are recognized when the Group has a present legal or constructive obligation as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation.

The risks and uncertainties that inevitably surround many events and circumstances are taken into account in reaching the best estimate of a provision. Where the effect of the time value of money is material, provisions are determined at the present value of the expected future cash flows.

Where some or all of the expenditures required to settle a provision are expected to be reimbursed by another party, the reimbursement shall be recognized when, and only when, it is virtually certain that reimbursement will be received if the entity settles the obligation. The reimbursement shall be treated as a separate asset.

Provisions are reviewed at the end of each reporting period and adjusted to reflect the current best estimates. If it is no longer probable that an outflow of resources embodying economic benefits will be required to settle the obligation, the provision is reversed.

When there is a legal or contractual obligation for dismantling, removing facilities and restoring sites on which they are located to their original condition at the end of the useful lives of the facilities, the present value of the estimated future restoration costs are capitalized at the acquisition date as additions to the cost of oil and gas properties and are accounted for as a provision. The Group subsequently depreciates the restoration costs using the unit-of-production method and the difference between estimated restoration costs and their present value is charged to current operations by applying the effective-interest-rate method.

(r) Share capital

Common stock is classified as equity and the incremental costs arising directly attributable to the issuance of common stock less their tax effects are deducted from equity.

(s) Foreign currencies

Transactions in foreign currencies are translated to the respective functional currencies of Group entities at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are retranslated to the functional currency using the reporting date's exchange rate. Non-monetary assets and liabilities denominated in foreign currencies that are measured at fair value are retranslated to the functional currency at the exchange rate at the date that the fair value was determined. Non-monetary assets and liabilities denominated in foreign currencies that are measured in terms of historical cost in a foreign currency are translated using the exchange rate at the dates of the transactions.

Foreign currency differences arising on retranslation are recognized in profit or loss, except for differences arising on the retranslation of available-for-sale equity instruments, a financial liability designated as a hedge of the net investment in a foreign operation, or qualifying cash flow hedges, which are recognized in other comprehensive income. When gains or losses on non-monetary items are recognized in other comprehensive income, exchange components of those gains or losses are recognized in other comprehensive income. Conversely, when gains or losses on non-monetary items are recognized in profit or loss, exchange components of those gains or losses are recognized in profit or loss.

4. Significant Accounting Policies, Continued

(t) Revenue

Revenue from sale of goods, rendering of services or use of the Group assets is measured at the fair value of the consideration received or receivable, net of returns, trade discounts and volume rebates. When two or more revenue generating activities or deliverables are sold under a single arrangement, each deliverable that is considered to be a separate unit of account is accounted for separately. The allocation of consideration from a revenue arrangement to its separate units of account is based on the relative fair values of each unit.

(i) Sales of goods

Revenue from the sale of goods in the ordinary course of activities is measured at the fair value of the consideration received or receivable, trade discounts and volume rebates. Revenue is recognized when persuasive evidence exists, usually in the form of an executed sales agreement, that the significant risks and rewards of ownership have been transferred to the buyer, recovery of the consideration is probable, the associated costs can be estimated reliably, there is no continuing management involvement with the goods, and the amount of revenue can be measured reliably. The appropriate timing for transfer of risks and rewards varies depending on the individual terms and conditions of the sales contract. For international sales, this timing depends on the type of international commercial terms of the contract.

The Group recognizes revenue from the sales of product from a production area, only when the Group's investment in the production area is considered as a joint operation not as a joint venture. In addition, for the Group's joint operations, the Group capitalizes costs related to the production area as the oil and gas properties even if the Group is a non-operator.

(ii) Sales of other services

Revenue from services rendered is recognized in profit or loss in proportion to the stage of completion of the transaction at the reporting date. The stage of completion is assessed by reference to surveys of work performed or services performed to date as a percentage of total services to be performed or the proportion that costs incurred to date bear to the estimated total costs of the transaction or other methods that reliably measures the services performed.

(u) Finance income and finance costs

Finance income comprises interest income on funds invested (including available-for-sale financial assets), dividend income, gains on the disposal of available-for-sale financial assets and changes in the fair value of financial assets at fair value through profit or loss. Interest income is recognized as it accrues in profit or loss, using the effective interest rate method. Dividend income is recognized in profit or loss on the date that the Group's right to receive payment is established.

Finance costs comprise interest expense on borrowings and changes in the fair value of financial assets at fair value through profit or loss. Borrowing costs are recognized in profit or loss using the effective interest rate method.

4. Significant Accounting Policies, Continued

(u) Income taxes

Income tax expense comprises current and deferred tax. Current tax and deferred tax are recognized in profit or loss except to the extent that it relates to a business combination, or items recognized directly in equity or in other comprehensive income.

(i) Current tax

Current tax is the expected tax payable or receivable on the taxable profit or loss for the year, using tax rates enacted or substantively enacted at the end of the reporting period and any adjustment to tax payable in respect of previous years. The taxable profit is different from the accounting profit for the period since the taxable profit is calculated excluding the temporary differences, which will be taxable or deductible in determining taxable profit (tax loss) of future periods, and non-taxable or non-deductible items from the accounting profit.

(ii) Deferred tax

The measurement of deferred tax liabilities and deferred tax assets reflects the tax consequences that would follow from the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities. The Group recognizes a deferred tax liability for all taxable temporary differences associated with investments in subsidiaries, associates, and interests in joint ventures, except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. In addition, the Group recognizes a deferred tax asset for all deductible temporary differences to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

The carrying amount of a deferred tax asset is reviewed at the end of each reporting period and reduces the carrying amount to the extent that it is no longer probable that sufficient taxable profit will be available to allow the benefit of part or all of that deferred tax asset to be utilized.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply to the period when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period.

Deferred tax assets and liabilities are offset only if there is a legally enforceable right to offset the related current tax liabilities and assets, and they relate to income taxes levied by the same tax authority and they intend to settle current tax liabilities and assets on a net basis.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted

The following new standards have been published and are mandatory for the Group for annual period beginning after January 1, 2017 and the Group has not early adopted them.

(i) K-IFRS No. 1109 "Financial Instruments"

K-IFRS No. 1109 "Financial Instruments", issued on September 25, 2015, is effective for fiscal periods beginning after January 1, 2018, but may be adopted early. It replaces existing guidance in K-IFRS No. 1039 "Financial Instruments: Recognition and Measurement". The Group expects to apply K-IFRS No. 1109 for the fiscal period beginning January 1, 2018. The standard will generally be applied retrospectively with some exemptions allowing an entity not to restate the comparative information for prior periods in relation to classification and measurement (including impairment) changes.

When applying K-IFRS No. 1109, the classification of financial assets will be driven by the Group's business model for managing the financial assets and contractual terms of cash flow. To efficiently adopt K-IFRS No. 1109, it is generally necessary to prepare the analysis of the financial impact, accounting policies, accounting system, and system stabilization. The effect on the financial statements of the adoption of K-IFRS No. 1109 may differ not only based on the selection and judgment of accounting policies in accordance with the standard, but also on the financial instruments held by the Group and economic conditions during the fiscal period.

In order to assess the financial impact of the initial adoption of K-IFRS No. 1109, the Group has preliminarily analyzed the potential impact on the consolidated financial statements based on the available information as of December 31, 2017. The expected financial effects of the adoption of the standard are as follows. The Group expects to further analyze the impact on the consolidated financial statement with additional information in the future, and the result of the analysis of the impact on the financial statement may vary.

Classification and Measurement of Financial Assets
The following table shows the classification of financial assets measured subsequently at amortized cost, at fair value through other comprehensive income and at fair value through profit or loss. If a hybrid contract contains a host that is a financial asset, the classification of the hybrid contract shall be determined for the entire contract without separating the embedded derivative.

Business model	Contractual cash flows are solely payments of principal and interests	All other cases
To collect contractual cash flows	Amortized cost(*1)	
Both to collect contractual cash flows and sell financial assets	Fair value through other comprehensive income(*1)	Fair value through profit or loss(*2)
For trading, and others	Fair value through profit or loss	

(*1) The Group may irrevocably designate as at fair value through profit or loss to eliminate or significantly reduce an accounting mismatch.
(*2) The Group may irrevocably designate equity investments that is not held for trading as at fair value through other comprehensive income.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted, continued

(i) K-IFRS No. 1109 "Financial Instruments", continued

The requirements of K-IFRS No. 1109 to classify a financial instrument to be measured at amortized cost or fair value through other comprehensive income are more stringent than those of existing K-IFRS No. 1039. Therefore, the proportion of financial assets at fair value through profit or loss may increase upon the adoption of K-IFRS No. 1109 resulting in higher volatility in profit or loss. As of December 31, 2017, the Group owns available-for-sale financial assets of ₩90,807 million, and loans and receivables of ₩2,691,498 million.

According to K-IFRS No.1109, only debt instruments whose contractual cash flows solely represent payments of principal and interest on a given day and intended to receive contractual cash flow can be measured at amortized cost. The Group measures loans and receivables amounting to ₩2,691,498 million at amortized cost as of December 31, 2017.

As a result of analysis of the impact on the financial statements, most of the financial assets have contractual cash flows which solely consist of principal and interest, but loans and other receivables from associates and other related parties will be measured at fair value through profit or loss as they are not held for with the intent to receive contractual cash flows.

According to K-IFRS No. 1109, the Group may make an irrevocable election to present in other comprehensive income subsequent changes in the fair value of an investment in an equity instrument which is not held for trading at initial recognition. As of December 31 2017, the Group owns equity instruments classified as available-for-sale financial assets of ₩90,807 million, and corresponding unrealized gain on valuation of ₩58,177 million has been reclassified to profit or loss. As a result of analysis of the impact on the financial statements, financial assets will not have a material impact on the financial statements because the Group has a intent to designate long-term strategic purposed equity instruments, which accounts most of the available-for-sale equity instrument, to be measured at fair value through other comprehensive income.

Classification and Measurement of Financial Liabilities
Under K-IFRS No. 1039, all financial liabilities designated at fair value through profit or loss recognized their fair value movements in profit or loss. However, K-IFRS No. 1109 requires the amount of the change in the liability's fair value attributable to changes in the credit risk to be recognized in other comprehensive income. Amounts presented in other comprehensive income are not subsequently transferred to profit or loss. However, if the effects of changes in liability's credit risk recognized in other comprehensive income creates or enlarges an accounting mismatch, the entire fair value change is recognized in profit or loss.

The Group had financial liabilities of ₩14,638,367 million as of December 31, 2017, among which none is designated as liabilities measured at fair value through profit or loss. Therefore the Group expects the adoption of K-IFRS No. 1109 will not have a significant impact on the classification of financial liabilities.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted, continued

(i) K-IFRS No. 1109 "Financial Instruments", continued

Impairment: Financial Assets and Contract Assets
K-IFRS No. 1109 replaces the incurred loss model in the existing standard with a forward-looking expected credit loss model for debt instruments, lease receivables, contractual assets, loan commitments, and financial guarantee contracts.

Under K-IFRS No. 1109, impairment losses are likely to be recognized earlier than using the incurred loss model under the existing guidance in K-IFRS No. 1039 as loss allowances will be measured either 12-month or lifetime expected credit loss based on the extent of increase in credit risk.

If credit risk has increased significantly since the initial recognition, a loss allowance for lifetime expected credit loss is required to be measured at the end of every reporting period. If credit risk has not increased significantly since the initial recognition, a loss allowance is measured based on 12-month expected credit loss.

The Group owns debt instrument of ₩2,691,498 million (loans and receivables) measured at amortized cost, and recognizes ₩741,869 million of loss allowance for these assets as of December 31, 2017. The Group analyzed the impact on the financial statement by calculating loss allowance on an amount equivalent to the lifetime expected credit loss for trade receivables and contract assets with significant financing component. When analyzing the impact, the Group assumed that the credit risk has not significantly increased based on low credit risk as of December 31, 2017. As a result, the Group expects no significant effect on loss allowance upon adoption of K-IFRS No. 1109 as of January 1, 2018.

Hedge Accounting
K-IFRS No. 1109 maintains the mechanics of hedge accounting of existing K-IFRS No. 1039, but replaces the complex and rule-based requirements of K-IFRS No. 1039 to principle-based requirements emphasizing the hedging activities of an entity. The intensity of requirements for hedge accounting have been alleviated by broadening the qualifying criteria and hedged items, and removing quantitative standard (80~125%) for the effectiveness of hedge. Hedge accounting under K-IFRS No. 1109 can be applied to certain transactions which do not meet the requirements for hedge accounting under K-IFRS No. 1039, and thus the volatility of the profit or loss may be reduced.

As the Group applies hedge accounting, ₩1,094 million (after income tax effect) of the change in fair value of the financial instrument using cash flow hedge recognized in other comprehensive income was reclassified to profit or loss for the year ended December 31, 2017. As of December 31, 2017, the change in fair value of the financial instrument using cash flow hedge accumulated in other comprehensive income is (-)₩48,425 million.

The Group has not yet determined whether to apply the hedge accounting under the requirements of K-IFRS No. 1109 or existing requirements of K-IFRS No. 1039 at the time of initial application of K-IFRS No. 1109. As a result of analysis of the impact on the consolidated financial statement using hedge accounting under K-IFRS No. 1109, the Group expects it will not have a material impact on the consolidated financial statements.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted, continued

(ii) K-IFRS No. 1115 "Revenue from Contracts with Customers"

K-IFRS No. 1115 "Revenue from Contracts with Customers", issued on November 6, 2015, is effective for annual periods beginning on or after January 1, 2018, but may be adopted early. It replaces existing revenue recognition guidance, including K-IFRS No. 1018 "Revenue", K-IFRS No.1011 "Construction Contracts", K-IFRS No. 2031 "Revenue- Barter transactions involving advertising services", K-IFRS No. 2113 "Customer Loyalty Programs", K-IFRS No. 2115 "Agreements for the construction of real estate", and K-IFRS No. 2118 "Transfers of assets from customers". The Group intends to apply the modified retrospective approach which will recognize the cumulative impact of initially applying the revenue standard as of January 1, 2018, the date of initial application without restating prior year's financial statements and the Group also decided to apply the practical expedients as allowed by K-IFRS No. 1115 by applying the new standard only to those contracts that are not considered as completed contracts at the date of initial application.

Existing K-IFRS standards and interpretations including K-IFRS No. 1018 provide revenue recognition guidance by transaction types such as sales of goods, rendering of services, interest income, royalty income, dividend income and construction revenue; however, under the new standard, K-IFRS No. 1115, the five-step approach (Step 1: Identify the contract(s) with a customer, Step 2: Identify the performance obligations in the contract, Step 3: Determine the transaction price, Step 4: Allocate the transaction price to the performance obligations in the contract, Step 5: Recognize revenue when the entity satisfied a performance obligation) is applied for all types of contracts or agreements.

Based on the current circumstance and available information as of December 31, 2017, the Group has preliminary assessed the potential impact on the consolidated financial statements when applying K-IFRS No. 1115. The potential impact on the consolidated financial statements are as follows.

Considerations payable to a customer
In accordance with K-IFRS No. 1115, considerations payable to a customer should be deducted from the amount of revenue earned unless payment is made in relation to goods or service provided by the customer as a separable performance obligation. The Group has not been able to quantify the financial impact of considerations payable to customers, but consolidated revenues and selling and general administrative expenses are expected to decrease upon adoption of K-IFRS No. 1115.

Presentation and disclosures
The presentation and disclosure requirements of K-IFRS No. 1115 are more detailed than existing standards. Presentation requirements have significantly changed from current practice and disclosure requirements for consolidated financial statements have increased. Numerous disclosure requirements are newly added according to K-IFRS No. 1115 and the Group expects some portion of the disclosure requirements would have a significant effect. In addition, as required by K-IFRS No. 1115, the Group plans to disclose the performance obligations arising from contractual arrangements with the customers and the nature of the goods or services agreed to transfer.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted, continued

(iii) K-IFRS No. 1116 "Leases"

K-IFRS No. 1116 "Leases" will replace K-IFRS No. 1017 "Leases" and K-IFRS No. 2104 "Determining whether an Arrangement contains a Lease". It is effective for annual periods beginning on or after January 1, 2019, with early adoption permitted for a company which has adopted K-IFRS No. 1115. As a lessee, the Group shall apply this standard using one of the following two methods; (a) retrospectively to each prior reporting period presented in accordance with K-IFRS No. 1008 "Accounting Policies, Changes in Accounting Estimates and Errors" but using the practical expedients for completed contracts- i.e. completed contracts as of the beginning of the earliest prior period presented are not restated; or (b) retrospectively with the cumulative effect of initially applying this standard recognized at the date of initial application. The Group is in process of revaluating the financial impacts arising from applying this standard.

5. Subsidiaries

(a) The list of subsidiaries directly owned by the Company as of December 31, 2017 and 2016 are as follows:

			Ownership (%)	
Subsidiary name	**Principal activity**	**Country of incorporation**	**December 31, 2017**	**December 31, 2016**
ANKOR E&P Holdings Corp.	Exploration and production ("E&P")	United States	100.00	100.00
Dana Petroleum Limited	E&P	United Kingdom	100.00	100.00
KNOC Eagle Ford Corporation(*)	E&P	United States	100.00	100.00
Harvest Operations Corp.	E&P	Canada	100.00	100.00
KNOC Kaz B.V.	E&P	Netherlands	100.00	100.00
KNOC Exploracao e Producao de Petro do Brasil Ltda	E&P	Brazil	100.00	100.00
KNOC NEMONE Ltd.	E&P	Indonesia	100.00	100.00
KNOC NEMTWO Ltd.	E&P	Indonesia	100.00	100.00
KNOC Sumatra Ltd.	E&P	Indonesia	100.00	100.00
KNOC Yemen Ltd.	E&P	Yemen	60.00	60.00
KNOC Trading Singapore Pte. Ltd.	Trading and Marketing	Singapore	100.00	100.00

(*) All shares of KNOC Trading Corporation owned by the Company have been contributed to KNOC Eagle Ford Corporation, a subsidiary of the Company for the year ended December 31, 2017.

5. Subsidiaries, Continued

(b) Financial information of subsidiaries

(i) Financial information of subsidiaries as of and for the year ended December 31, 2017 is as follows:

In millions of Korean won

Company		Assets	Liabilities	Revenue	Net profit (loss)
ANKOR E&P Holdings Corp.	₩	474,839	163,947	88,378	(76,997)
Dana Petroleum Limited(*1)		3,398,242	2,290,141	712,145	10,755
KNOC Eagle Ford Corporation		2,401,577	217,888	375,150	48,696
Harvest Operations Corp.		2,657,014	2,804,010	248,619	(246,056)
KNOC Kaz B.V.(*1)		844,974	570,320	196,132	(127,015)
KNOC Exploracao e Producao de Petro do Brasil Ltda(*2)		10	305	-	224
KNOC NEMONE Ltd.(*2)		-	-	-	-
KNOC NEMTWO Ltd.(*2)		-	-	-	-
KNOC Sumatra Ltd.		634	-	-	(165)
KNOC Yemen Ltd.(*2)		13	-	-	155,817
KNOC Trading Singapore Pte. Ltd.		407	6	409	88

(*1) The amounts presented are after reflecting the difference between the fair value and the book value that arose during the business combination.
(*2) Entities are in the process of liquidation as of December 31, 2017.

(ii) Financial information of subsidiaries as of and for the year ended December 31, 2016 is as follows:

In millions of Korean won

Company		Assets	Liabilities	Revenue	Net profit (loss)
ANKOR E&P Holdings Corp.	₩	628,065	191,894	78,864	(13,685)
Dana Petroleum Limited(*1)		3,734,592	2,574,927	684,022	(104,267)
KNOC Eagle Ford Corporation		2,700,100	246,346	347,601	(148,276)
Harvest Operations Corp.		3,019,766	2,926,659	251,932	(306,387)
KNOC Kaz B.V.(*1)		1,144,608	653,062	155,975	8,546
KNOC Exploracao e Producao de Petro do Brasil Ltda(*2)		21	595	-	95
KNOC NEMONE Ltd.(*2)		-	-	-	-
KNOC NEMTWO Ltd.(*2)		-	-	-	-
KNOC Sumatra Ltd.		891	-	-	(33)
KNOC Yemen Ltd.(*2)		15	166,517	-	(57)
KNOC Trading Singapore Pte. Ltd.		342	14	478	33
KNOC Trading Corporation		2,367	-	1,109	454

(*1) The amounts presented are after reflecting the difference between the fair value and the book value that arose during the business combination.
(*2) Entities are in the process of liquidation as of December 31, 2016.

5. Subsidiaries, Continued

(b) Financial information of subsidiaries, continued

(iii) The financial information of the subsidiaries that are related to the Group's non-controlling interests as of December 31, 2017 is as follows:

In millions of Korean won

Company		ANKOR Energy LLC	KOA Energy LP(*1)	Eagle Ford MS LLC and Eagle Ford Energy LLC	KNOC EF Star LLC(*2)
Non-controlling interests		20%	98%	20%	-
Non-current assets	₩	-	155,031	2,170,701	412,489
Current assets		457	26,984	136,441	30,442
Non-current liabilities		-	(20,485)	(31,395)	-
Current liabilities		(457)	(1,535)	(3,959)	(50)
Net assets		-	159,995	2,271,788	442,881
Book value of the non-controlling interests		-	157,283	454,358	412,489
Revenue		-	25,919	441,982	15,045
Net income (loss)		-	(15,895)	55,759	14,921
Total comprehensive income (loss)		-	(15,895)	55,759	-
Net income (loss) distributed to non-controlling interests		-	(15,626)	11,152	-
Total comprehensive income (loss) distributed to non-controlling interests		-	(15,626)	11,152	-

(*1) According to shareholders' agreement, ANKOR E&P Holdings Corp. holds a de facto control.
(*2) A non-controlling interest has no voting right as non-cumulative and non-participating redeemable preferred shares (see Note 44).

(iv) The financial information of the subsidiaries that are related to the Group's non-controlling interests as of December 31, 2016 is as follows:

In millions of Korean won

Company		ANKOR Energy LLC	KOA Energy LP(*1)	Eagle Ford MS LLC and Eagle Ford Energy LLC	KNOC EF Star LLC(*2)
Non-controlling interests		20%	98%	20%	-
Non-current assets	₩	-	164,940	2,547,764	465,273
Current assets		4,271	22,389	98,731	31,646
Non-current liabilities		-	(24,247)	(43,748)	-
Current liabilities		(4,238)	(658)	(4,595)	-
Net assets		33	162,424	2,598,152	496,919
Book value of the non-controlling interests		7	159,671	521,521	465,273
Revenue		-	22,658	440,363	1,363
Net income (loss)		-	3,437	(116,551)	1,377
Total comprehensive income (loss)		-	3,437	(116,551)	-
Net income (loss) distributed to non-controlling interests		-	3,378	(23,310)	-
Total comprehensive income (loss) distributed to non-controlling interests		-	3,378	(23,310)	-

(*1) According to shareholders' agreement, ANKOR E&P Holdings Corp. holds a de facto control.
(*2) A non-controlling interest has no voting right as non-cumulative and non-participating redeemable preferred shares (see Note 44).

6. Segment and Other Information

(a) For management purposes, the Group is organized into business units based on their goods and services. The Group's operating segments are 1) oil and gas, 2) petroleum distribution, 3) oil stockpiling, 4) financing, 5) drillship chartering and 6) others.

Segments	Goods and services	Location of business
Oil and gas	Exploration, development and production of domestic and overseas resources and sales of crude oil	Domestic and overseas
Petroleum distribution	Distribution business of gasoline and gas oil and oil trading	Domestic and overseas
Oil stockpiling	Purchase and lending of oil stockpiles, management, operation and lending of oil stockpiling facilities	Domestic
Financing (*)	Financing for companies engaged in energy and natural resources development activities	Domestic
Drillship chartering (*)	Drillship chartering business	Domestic and overseas
Others	Oil information services, other research services, etc.	Domestic and overseas

(*) Financing and drillship chartering segments have been classified as discontinued operations during the year ended December 31, 2017. (see Note 7)

6. Segment and Other Information, Continued

(b) Segment results for the year

(i) For the year ended December 31, 2017

In millions of Korean won		Oil and gas	Petroleum distribution	Oil stockpiling	Others	Reportable segment total	Reconciling items(*)	Subtotal for continuing operations	Financing (Discontinued)	Drillship chartering (Discontinued)	Group total
Revenue	₩	2,004,759	187,984	112,146	7,597	2,312,486	-	2,312,486	314	-	2,312,800
Cost of sales		1,495,275	179,369	171,824	3,822	1,850,290	-	1,850,290	-	9,132	1,859,422
Gross profit (loss)		509,484	8,615	(59,678)	3,775	462,196	-	462,196	314	(9,132)	453,378
Selling and administrative expenses		208,658	369	-	-	209,027	77,298	286,325	244	-	286,569
Reportable segment operating profit (loss)		300,826	8,246	(59,678)	3,775	253,169	(77,298)	175,871	70	(9,132)	166,809
Other income						152,269	-	152,269	-	-	152,269
Other expenses						(207,236)	-	(207,236)	-	-	(207,236)
Other loss, net						(463,150)	-	(463,150)	-	(49,053)	(512,203)
Finance income						304,558	-	304,558	-	-	304,558
Finance costs						(710,411)	-	(710,411)	-	-	(710,411)
Loss on investments in associates and joint ventures, net						(127,487)	-	(127,487)	-	-	(127,487)
Loss before income tax	₩					(798,288)	(77,298)	(875,586)	70	(58,185)	(933,701)
Depreciation and amortization	₩	812,180	10	75,282	10	887,482	13,452	900,934	-	3,961	904,895
Impairment loss on property, plant and equipment		320,267	-	-	-	320,267	-	320,267	-	42,940	363,207
Reversal of impairment loss on property, plant and equipment		163,645	-	-	-	163,645	-	163,645	-	-	163,645
Impairment loss on intangible assets other than goodwill		227,051	-	-	-	227,051	-	227,051	-	-	227,051
Impairment loss on goodwill		87,470	-	-	-	87,470	-	87,470	-	-	87,470

(*) Primarily consists of operating profit (loss) including depreciation and amortization that are not allocated to the segments.

6. Segment and Other Information, Continued

(b) Segment results for the year, continued

(ii) For the year ended December 31, 2016

In millions of Korean won		Oil and gas	Petroleum distribution	Oil stockpiling	Others	Reportable segment total	Reconciling items(*)	Subtotal for continuing operations	Financing (Discontinued)	Drillship chartering (Discontinued)	Group total
Revenue	₩	1,778,518	487,970	118,902	39,577	2,424,967	-	2,424,967	1,274	4,157	2,430,398
Cost of sales		1,777,258	448,353	168,175	3,370	2,397,156	-	2,397,156	-	13,279	2,410,435
Gross profit (loss)		1,260	39,617	(49,273)	36,207	27,811	-	27,811	1,274	(9,122)	19,963
Selling and administrative expenses		186,342	822	-	-	187,164	72,950	260,114	678	-	260,792
Reportable segment operating profit (loss)		(185,082)	38,795	(49,273)	36,207	(159,353)	(72,950)	(391,656)	596	(9,122)	(240,829)
Other income						235,673	-	235,673	-	-	235,673
Other expenses						(26,244)	-	(26,244)	-	-	(26,244)
Other loss, net						(422,719)	-	(422,719)	-	(1,120)	(423,839)
Finance income						182,857	-	182,857	-	-	182,857
Finance costs						(820,783)	-	(820,783)	-	-	(820,783)
Loss on investments in associates and joint ventures, net						(239,808)	-	(239,808)	-	-	(239,808)
Loss before income tax	₩					(1,250,377)	(72,950)	(1,323,327)	596	(10,242)	(1,332,973)
Depreciation and amortization	₩	1,009,329	2	78,876	34	1,088,241	13,863	1,102,104	-	3,515	1,105,619
Impairment loss on property, plant and equipment		433,607	-	-	-	433,607	-	433,607	-	-	433,607
Reversal of impairment loss on property, plant and equipment		400,959	-	-	-	400,959	-	400,959	-	-	400,959
Impairment loss on intangible assets other than goodwill		345,032	-	-	-	345,032	-	345,032	-	-	345,032
Reversal of impairment loss on intangible assets other than goodwill		6,416	-	-	-	6,416	-	6,416	-	-	6,416
Impairment loss on goodwill		32,440	-	-	-	32,440	-	32,440	-	-	32,440

(*) Primarily consists of operating profit (loss) including depreciation and amortization that are not allocated to the segments.

6. Segment and Other Information, Continued

(c) Segment assets and liabilities

(i) As of December 31, 2017

In millions of Korean won		Oil and gas	Petroleum distribution	Oil stockpiling	Reportable segment total	Recon-ciling items(*2)	Financing (Discontinued)	Drillship chartering (Discontinued) (*3)	Group total
Assets	₩	12,566,159	90,160	5,597,713	18,254,032	-	-	3,472	18,257,504
Adjustments:									
Headquarters' land, buildings, tools & fixtures		-	-	-	-	278,750	-	-	278,750
Headquarters' software and memberships		-	-	-	-	13,059	-	-	13,059
Headquarters' loans to employees		-	-	-	-	102,842	-	-	102,842
Headquarters' deferred tax assets		-	-	-	-	580,526	-	-	580,526
Headquarters' derivatives assets		-	-	-	-	48,379	-	-	48,379
Headquarters' financial assets and etc.		-	-	-	-	210,942	-	-	210,942
	₩	12,566,159	90,160	5,597,713	18,254,032	1,234,498	-	3,472	19,492,002
Liabilities	₩	16,466,614	95,249	80,331	16,642,194	-	-	-	16,642,194
Adjustments:									
Headquarters' derivative liabilities		-	-	-	-	82,712	-	-	82,712
Headquarters' financial liabilities		-	-	-	-	330,022	-	-	330,022
	₩	16,466,614	95,249	80,331	16,642,194	412,734	-	-	17,054,928
Investments in associates and others(*1)	₩	543,616	50,430	-	594,046	-	-	-	594,046
Acquisitions of property, plant and equipment		486,072	-	113,642	599,714	232,648	-	-	832,362
Acquisitions of intangible assets other than goodwill		27,223	-	-	27,223	1,624	-	-	28,847

(*1) Investments in associates and others consist of investments in associates and joint ventures and loans to related parties.
(*2) Primarily consists of loans for employees, deferred tax assets and others which are not allocated to the reportable segments
(*3) Assets in drillship chartering segment amounting to ₩3,472 million have been classified as assets held for sale.

6. Segment and Other Information, Continued

(c) Segment assets and liabilities, continued

(ii) As of December 31, 2016

In millions of Korean won		Oil and gas	Petroleum distribution	Oil stockpiling	Reportable segment total	Recon-ciling items(*2)	Financing (Discontinued)	Drillship chartering (Discontinued)	Group total
Assets	₩	14,691,648	90,209	6,166,901	20,948,758	-	176,881	53,677	21,179,316
Adjustments:									
Headquarters' land, buildings, tools & fixtures		-	-	-	-	237,332	-	-	237,332
Headquarters' software and memberships		-	-	-	-	16,186	-	-	16,186
Headquarters' loans to employees		-	-	-	-	100,315	-	-	100,315
Headquarters' deferred tax assets		-	-	-	-	496,423	-	-	496,423
Headquarters' derivatives assets		-	-	-	-	9,011	-	-	9,011
Headquarters' financial assets and etc.		-	-	-	-	28,613	-	-	28,613
	₩	14,691,648	90,209	6,166,901	20,948,758	887,880	176,881	53,677	22,067,196
Liabilities	₩	18,144,278	68,450	48,524	18,261,252	-	543	3,474	18,265,269
Adjustments:									
Headquarters' derivative liabilities		-	-	-	-	190,403	-	-	190,403
Headquarters' financial liabilities		-	-	-	-	102,791	-	-	102,791
	₩	18,144,278	68,450	48,524	18,261,252	293,194	543	3,474	18,558,463
Investments in associates and others(*1)	₩	726,622	44,239	-	770,861	-	-	-	770,861
Acquisitions of property, plant and equipment		550,426	-	187,158	737,584	-	-	800	738,384
Acquisitions of intangible assets other than goodwill		42,790	-	-	42,790	1,565	-	-	44,355

(*1) Investments in associates and others consist of investment in associates and joint ventures and loans to related parties.

(*2) Primarily consists of loans for employees, deferred tax assets and others which are not allocated to the reportable segments.

6. Segment and Other Information, Continued

(d) Information about geographical areas

(i) Revenue by geographic area for the years ended December 31, 2017 and 2016 is as follows:

In millions of Korean won		2017	2016
Domestic	₩	694,935	905,004
Canada		248,619	251,932
United Kingdom		712,145	684,022
United States		463,528	427,574
Kazakhstan		192,850	155,975
Others		409	460
Reportable segment operating revenue	₩	2,312,486	2,424,967
Financing (discontinued)		314	1,274
Drillship chartering (discontinued)		-	4,157
	₩	2,312,800	2,430,398

In presenting information about geographical areas, segment revenue is based on the geographical location of the Group's entities which recorded the related revenue.

(ii) Non-current assets by geographic area as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Domestic	₩	6,326,504	7,121,214
Canada		1,966,834	2,294,904
United Kingdom		2,994,323	3,367,853
United States		2,564,524	3,092,412
Kazakhstan		325,109	442,808
Iraq		1,333,008	1,507,801
Yemen		3,948	4,453
Peru		45,297	45,145
Libya		43,668	41,550
Vietnam		331,524	382,161
Others		1	-
	₩	15,934,740	18,300,301

Non-current assets by geographic area include property, plant and equipment, goodwill, intangible assets other than goodwill, investments in associates and joint ventures, and non-financial assets.

6. Segment and Other Information, Continued

(e) Information about main customers

No customer's revenue is more than 10% of consolidated revenue for the year ended December 31, 2017. Customers whose revenue is 10% or more of consolidated revenue for the year ended December 31, 2016 are Unipec Asia Co., Ltd. and BP P.L.C. amounting to ₩388,888 million and ₩328,239 million, respectively. Furthermore, revenues from these customers for the years ended December 31, 2017 and 2016 are related to petroleum distribution and oil stockpiling segments.

7. Discontinued Operations

During 2017, financing and drillship chartering segments, which were part of the Parent Company, are classified as discontinued operations as 1) the Parent Company transferred its responsibilities related to financing for companies engaged in energy and natural resources development activities to another government agency in 2017 and 2) management committed to a plan to sell the primary assets of drillship chartering segment. As a result, the comparative consolidated statement of comprehensive loss for the year ended December 31, 2016 has been restated to present discontinued operations separately from continuing operations.

(a) Details of profit and loss from discontinued operations are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won		**Financing**	**Drillship chartering**	**Total**
Revenue	₩	314	-	314
Expenses (*)		244	58,184	58,428
Income (loss) before income tax		70	(58,184)	(58,114)
Income tax expense (benefit)		17	(5,794)	(5,777)
Profit (loss) from discontinued operations	₩	53	(52,390)	(52,337)

(*) Impairment loss on property, plant and equipment in drillship chartering segment amounting to ₩ 42,940 million and loss from valuation of supplies amounting to ₩ 6,821 million are included.

(ii) For the year ended December 31, 2016

In millions of Korean won		**Financing**	**Drillship chartering**	**Total**
Revenue	₩	1,274	4,157	5,431
Expenses		678	14,399	15,077
Income (loss) before income tax		596	(10,242)	(9,646)
Income tax expense (benefit)		144	(2,587)	(2,443)
Profit (Loss) from discontinued operations	₩	452	(7,655)	(7,203)

7. Discontinued Operations, Continued

(b) Details of cash flows from discontinued operations are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won		Financing	Drillship chartering	Total
Cash flow from operating activities	₩	70	(4,462)	(4,392)

(ii) For the year ended December 31, 2016

In millions of Korean won		Financing	Drillship chartering	Total
Cash flow from operating activities	₩	596	(6,727)	(6,131)
Cash flow from investing activities		-	(800)	(800)
	₩	596	(7,527)	(6,931)

(c) The book value of assets related to discontinued operations amounting to ₩3,472 million is classified as assets held for sale. (see Note 17)

8. Cash and Cash Equivalents

Cash and cash equivalents in the consolidated statements of cash flows include cash and bank deposit and exclude government grants. Cash and cash equivalents in the consolidated statements of cash flows for the years ended December 31, 2017 and 2016 are comprised of the following items in the consolidated statements of financial position.

In millions of Korean won		December 31, 2017	December 31, 2016
Cash in hands	₩	100	375
Other on demand deposits		211,415	182,380
Short-term deposits classified as cash equivalents		312,706	464,398
Short-term investments classified as cash equivalents		266,899	169,663
		791,120	816,816
Government grants		(45)	(4,165)
	₩	791,075	812,651

9. Restricted Deposits

Details of restricted deposits as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Current	Non-current	Current	Non-current
Compensations for fishermen	₩	2,056	-	2,032	-
Asset retirement obligation		-	2,317	-	2,426
Deposits for foreign workers		-	4	-	5
	₩	2,056	2,321	2,032	2,431

10. Derivatives

(a) Details of derivatives as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Current	Non-current	Current	Non-current
Derivative assets					
Currency swaps	₩	-	44,269	949	7,854
Interest rate swaps		1,161	2,949	-	1,157
Currency forwards		2,596	-	-	-
Other derivatives		775	84	-	-
	₩	4,532	47,302	949	9,011
Derivative liabilities					
Currency swaps	₩	18,830	45,832	42,572	147,831
Other derivatives		74,682	2,397	-	-
	₩	93,512	48,229	42,572	147,831

10. Derivatives, Continued

(b) Details of currency swap contracts as of December 31, 2017 are as follows:

In millions of Korean won and thousands of foreign currencies

			Contract amount				Contract interest rate per annum (%)	
Type	Counter party	Maturity	Currency	Sell	Currency	Buy	Sell	Buy
Cash flow hedge	HSBC	2021-02-08	HKD	500,000	USD	64,185	4.38	5.03
	BNP	2021-03-04	HKD	390,000	USD	50,081	4.50	5.20
	HSBC	2022-02-10	HKD	390,000	USD	50,282	3.95	4.45
	BNP	2022-03-28	EUR	50,000	USD	65,075	4.00	4.55
	HSBC	2023-01-26	HKD	400,000	USD	51,600	2.85	3.17
	HSBC	2018-01-22	HKD	400,000	USD	51,600	1.80	1.98
	DBS	2023-02-04	EUR	37,000	USD	49,765	2.40	3.19
	HSBC	2025-06-24	EUR	60,000	USD	80,070	3.00	4.06
	HSBC	2023-07-03	EUR	50,000	USD	65,670	3.09	4.31
	HSBC	2018-07-03	AUD	55,000	USD	51,260	3.21	3.05
	HSBC	2018-11-29	CHF	200,000	USD	210,970	1.63	3.16
	BNP	2018-11-29	CHF	40,000	USD	42,194	1.63	3.17
	HSBC	2019-10-08	AUD	125,000	USD	109,563	4.25	2.11
	HSBC	2019-10-08	AUD	75,000	USD	65,738	2.79	2.18
	ANZ	2019-10-08	AUD	150,000	USD	131,475	2.79	2.14
	SC	2020-01-29	HKD	310,000	USD	39,985	2.18	2.42
	HSBC	2020-08-26	KRW	150,000	USD	125,565	2.03	2.41
	CITI	2019-02-05	AUD	325,000	USD	230,555	2.98	2.15
	HSBC	2018-01-18	CAD	95,000	USD	73,643	(*)	(*)
	CIBC	2018-01-18	CAD	95,000	USD	73,643	(*)	(*)

(*) The contracts are currency swap contracts for the principal amounts excluding interests.

10. Derivatives, Continued

(c) Details of interest rate swap contracts as of December 31, 2017 are as follows:

In thousands of US dollar

Type	Counterparty	Terms	Contract amount	Contract interest rate per annum(%)	
				Sell	Buy
Cash flow hedge	HSBC	2018-06-07	300,000	U3L+100bp	2.18
	HSBC	2018-06-07	200,000	U3L+80bp	1.98
	BOA	2020-03-27	500,000	U3L+60bp	2.46

(d) Details of the currency forward contracts as of December 31, 2017 are as follows:

In thousands of foreign currencies

Type	Counter party	Contract date	Maturity	Contract amount				Contract currency rate
				Currency	Sell	Currency	Buy	
Cash flow hedge	CBA	2017-06-09	2018-01-10	GBP	6,000	USD	7,661	1.2769
	CBA	2017-06-07	2018-01-31	GBP	2,000	USD	2,600	1.2998
	CBA	2017-06-09	2018-02-13	GBP	8,000	USD	10,232	1.2790
	CBA	2017-06-09	2018-03-13	GBP	14,000	USD	17,941	1.2815
	CBA	2017-06-09	2018-04-10	GBP	17,000	USD	21,789	1.2817
	CBA	2017-06-09	2018-05-10	GBP	16,000	USD	20,536	1.2835
	CBA	2017-06-09	2018-06-12	GBP	10,000	USD	12,849	1.2849
	CBA	2017-06-12	2018-02-13	USD	10,269	GBP	8,000	1.2836
	CBA	2017-06-12	2018-03-13	USD	10,278	GBP	8,000	1.2847
	CBA	2017-06-12	2018-04-10	USD	12,861	GBP	10,000	1.2861
	CBA	2017-06-12	2018-05-10	USD	12,873	GBP	10,000	1.2873
	CBA	2017-06-12	2018-06-12	USD	7,732	GBP	6,000	1.2887

10. Derivatives, Continued

(e) Details of other derivatives (crude oil swaps) as of December 31, 2017 are as follows:

In BBL, US dollar

Type	Counterparty	Terms	Contract amount	Exercise price
Cash flow hedge	BNP	2018-03-31	282,000	55.56
	SG	2018-06-30	226,000	55.19
	SG	2018-09-30	169,000	55.10
	SG	2018-12-31	113,000	55.10
	GS	2018-03-31	57,000	53.06
	GS	2018-06-30	57,000	53.06
	SG	2018-09-30	57,000	53.09
	SG	2018-12-31	57,000	53.09
	GS	2019-03-31	15,000	51.05
	GS	2019-03-31	15,000	52.10
	BNP	2018-12-31	465,000	56.05
	ING	2018-12-31	600,000	55.00
	CBA	2018-06-30	191,159	55.08
	ING	2018-06-30	310,000	55.10
	ING	2018-12-31	490,000	55.00
	SG	2018-12-31	490,956	55.01
	SG	2018-12-31	290,000	55.12
	ING	2018-12-31	390,000	55.27
	ING	2018-12-31	499,161	55.84
	DNB	2019-03-31	135,581	58.72
	DNB	2019-09-31	352,140	58.01
	GS	2018-03-31	1,095,000	3.24(*)
	GS	2018-03-31	256,000	3.16(*)
	GS	2018-12-31	438,000	3.11(*)
	SG	2018-03-31	441,000	3.15(*)
	SG	2018-12-31	586,000	3.12(*)
	SG	2019-03-31	193,000	2.90(*)
	SG	2019-03-31	166,000	2.97(*)
	SC	2019-03-31	142,000	2.91(*)
	SG	2019-03-31	72,000	51.59
	SG	2019-06-30	66,000	51.34
	SG	2019-09-30	33,000	51.07

(*) The contracts above are derivatives settled based on Henry Hub gas price with exercise prices determined in USD/MBTU.

10. Derivatives, Continued

(f) Details of other derivatives(zero cost collar options) as of December 31, 2017 are as follows:

In BBL, US dollar

Type	Counterparty	Terms	Contract amount	Exercise Price	
				Call	Put
Held for trading	GS	2018-03-31	56,000	56.46	53.00
	GS	2018-06-30	56,000	56.46	53.00
	GS	2018-09-30	56,000	56.46	53.00
	GS	2018-12-31	56,000	56.46	53.00
	BNP	2018-03-31	46,000	65.62	56.00
	BNP	2018-06-30	47,000	65.62	56.00
	BNP	2018-09-30	48,000	65.62	56.00
	BNP	2018-12-31	49,000	65.62	56.00
Cash flow hedge	SC	2018-03-31	169,000	59.60	51.50
	SC	2018-06-30	127,000	59.60	51.50
	SG	2018-09-30	84,000	59.21	51.50
	SG	2018-12-31	42,000	59.21	51.50
	BNP	2018-03-31	42,000	56.90	52.25
	BNP	2018-06-30	42,000	56.90	52.25
	SC	2018-09-30	42,000	58.15	52.25
	SC	2018-12-31	42,000	58.15	52.25
	CITI	2019-03-31	38,000	57.05	52.25
	CITI	2018-03-31	42,000	54.80	51.80
	CITI	2018-06-30	42,000	54.80	51.80
	BNP	2018-09-30	42,000	55.00	51.80
	BNP	2018-12-31	42,000	55.00	51.80
	GS	2019-03-31	38,000	55.30	51.80
	GS	2019-06-30	38,000	55.30	51.80
	BNP	2018-03-31	42,000	59.21	53.00
	BNP	2018-06-30	42,000	59.21	53.00
	BNP	2018-09-30	42,000	59.21	53.00
	BNP	2018-12-31	42,000	59.21	53.00
	GS	2019-03-31	38,000	63.50	53.00
	GS	2019-06-30	38,000	63.50	53.00
	GS	2019-09-30	38,000	63.50	53.00
	GS	2018-03-31	85,000	52.00	54.05
	GS	2018-06-30	68,000	52.00	53.75
	GS	2018-09-30	50,000	51.50	53.75
	SC	2018-12-31	32,000	51.50	53.60
	SC	2019-03-31	15,000	51.50	53.60
	GS	2018-03-31	17,000	51.50	52.75
	GS	2018-06-30	17,000	51.50	52.60
	SC	2018-09-30	16,000	51.00	52.40
	SC	2018-12-31	15,000	51.00	51.90

In BBL, US dollar

Type	Counterparty	Terms	Contract amount	Exercise Price	
				Call	Put
Cash flow hedge	GS	2018-03-31	17,000	51.50	53.05
	GS	2018-06-30	17,000	51.50	52.80
	GS	2018-09-30	17,000	51.00	52.50
	GS	2018-12-31	16,000	51.00	51.90
	GS	2019-06-30	30,000	51.90	54.65
	GS	2019-09-30	16,000	51.90	53.55
	CBA	2018-12-31	480,000	52.00	59.00
	DNB	2019-06-30	217,052	54.00	62.96
	DNB	2019-09-30	440,000	54.00	62.41
	GS	2019-03-31	26,000	53.15	51.50
	GS	2018-12-31	80,000	53.50	51.50
	SC	2018-03-31	198,000	54.40	51.50
	SC	2018-03-31	152,000	54.98	51.50
	SC	2018-09-30	119,000	53.76	51.50
	SC	2018-06-30	141,000	54.98	51.50
	SC	2018-06-30	159,000	54.20	51.50
	SG	2018-09-30	131,000	52.76	51.00
	SG	2018-12-31	120,000	53.30	51.00

(g) Gains and losses on valuation and transaction of derivatives for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		Net income effects of valuations		Net income effects of transactions		Other comprehensive income (loss) (*)	
		2017	2016	2017	2016	2017	2016
Currency swaps	₩	(10,749)	-	(11,605)	(5,011)	5,935	(1,330)
Interest rate swaps			-	-	-	2,468	363
Currency forwards			-	-	-	(4,444)	-
Other derivatives		(14,556)	(3,164)	(2,477)	(1,423)	(51,290)	-
	₩	(25,305)	(3,164)	(14,082)	(6,434)	(47,331)	(967)

(*) Changes in accumulated other comprehensive income (loss) are net of tax effect amounting to ₩15,308 million and (-)₩1,582 million for the years ended December 31, 2017 and 2016, respectively.

11. Trade and Other Receivables

Details of trade and other receivables as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017				December 31, 2016			
		Gross amounts	Allowance for doubtful accounts	Present value discount	Book value	Gross amounts	Allowance for doubtful accounts	Present value discount	Book value
Current									
Trade accounts receivable	₩	267,828	(693)	-	267,135	298,536	(1,400)	-	297,136
Other receivables		289,145	(11)	-	289,134	270,254	(172)	(6)	270,076
		556,973	(704)	-	556,269	568,790	(1,572)	(6)	567,212
Non-current									
Other receivables		115,807	-	(18,039)	97,768	118,664	-	-	118,664
	₩	672,780	(704)	(18,039)	654,037	687,454	(1,572)	(6)	685,876

12. Available-for-sale Financial Instruments

(a) Details of available-for-sale financial instruments as of December 31, 2017 and 2016 are as follows:

In millions of Korean won	Ownership interest(%)		Carrying amount December 31, 2017	Carrying amount December 31, 2016	Fair value December 31, 2017	Fair value December 31, 2016
Non-marketable						
Yemen LNG Company Limited	1.06	₩	4,669	13,613	4,669	13,613
PETRO ONADO S.A.	5.64		-	-	-	-
Micronic Korea(*1)(*2)	16.70		820	925	820	925
Troika Resource Investment PEF	14.47		3,244	3,666	3,244	3,666
Global Dynasty Natural Resource PEF	15.67		2,991	3,498	2,991	3,498
Marketable						
EP Energy	12.82		79,083	247,576	79,083	247,576
		₩	90,807	269,278	90,807	269,278

(*1) The dividend incomes associated with Micronic Korea are ₩10 million and ₩24 million for the years ended December 31, 2017 and 2016, respectively.

(*2) The carrying amounts of non-marketable securities without a quoted price in an active market or a reliable fair value measurement held by the Group that was measured at cost are ₩820 million and ₩925 million as of December 31, 2017 and 2016, respectively.

12. Available-for-sale Financial Instruments, Continued

(b) Changes in available-for-sale financial instruments for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	269,278	355,733
Acquisitions (Disposals)		18	(40,953)
Valuation adjustments(*1)		(84,561)	(3,270)
Impairment losses(*2)		(71,586)	(45,577)
Effect of movements in exchange rates		(22,342)	3,345
	₩	90,807	269,278

(*1) Amounts are presented without the tax effect amounting to ₩20,464 million and ₩791 million for the years ended December 31, 2017 and 2016 respectively, which have been recognized directly in equity.

(*2) The Group recognized impairment losses on EP Energy, Troika Resource Investment PEF and Global Dynasty Resource PEF amounting to ₩71,445 million, ₩7 million and ₩134 million, respectively, for the year ended December 31, 2017. The Group recognized impairment losses on PETRO ONADO S.A., Troika Resource Investment PEF and Global Dynasty Resource PEF amounting to ₩19,042 million, ₩24,887 million and ₩1,648 million, respectively, for the year ended December 31, 2016.

13. Loans

Details of loans as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017			December 31, 2016		
		Face value	Provision for loans	Carrying amount	Face value	Provision for loans	Carrying amount
Short term Loans							
Loans to related parties(*1)	₩	3,185	-	3,185	-	-	-
Long term Loans							
Loans to employee(*2)	₩	103,222	-	103,222	100,490	-	100,490
General loans		108,554	(45,098)	63,456	121,256	(1,057)	120,199
Loans to related parties(*1)		1,008,855	(696,068)	312,787	1,109,773	(729,387)	380,386
	₩	1,223,816	(741,166)	482,650	1,331,519	(730,444)	601,075

(*1) The Group provided KADOC Ltd. and 15 other related parties with loans at interest rates of 3.00~7.99%. The maturities are due in 2~23 years, and the Group recognized related bad debt expenses of ₩47,280 million and ₩4,760 million for the years ended December 31, 2017 and 2016 respectively; reversal of bad debt allowance of ₩7,934 million for the year ended December 31, 2017; and share of loss under equity method of ₩18,706 million and ₩7,276 million for the years ended December 31, 2017 and 2016, respectively. (see Note 42)

(*2) Loans to employee consist of loans for tuitions, housing and vehicles.

14. Financial Instruments

Details of financial Instruments as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Current	Non-current	Current	Non-current
Term deposit	₩	2,074	4,873	2,032	5,083

15. Other Financial Assets

Details of other current financial assets as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Overseas field operations quick assets	₩	14,919	16,026

16. Inventories

Details of inventories as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017			December 31, 2016		
		Acquisition cost	Provision for losses on valuation	Carrying amount	Acquisition cost	Provision for losses on valuation	Carrying amount
Raw materials(*1)	₩	3,113	(441)	2,672	5,173	(518)	4,655
Merchandises		8,842	-	8,842	14,227	-	14,227
Work-in-progress		71	-	71	200	-	200
Finished goods		7,738	-	7,738	17,961	-	17,961
Supplies(*2)		66,013	-	66,013	84,905	-	84,905
Goods in-transit		2,937	-	2,937	3,166	-	3,166
	₩	88,714	(441)	88,273	125,632	(518)	125,114

(*1) The reversal of the losses on the valuation of inventories recognized in cost of sales for the year ended December 31, 2017 is ₩77 million, and the reversal of the valuation of inventories recognized in cost of sales for the year ended December 31, 2016 is ₩66 million.

(*2) As drillship chartering segment has been classified as discontinued operations, loss on valuation has been recognized amounting to ₩6,821 million and carrying amount of supplies related to the vessels has been classified as assets held for sale. (see note 17)

17. Assets Held for Sale

In September 2017, management committed to a plan to sell the primary asset, Doo Sung (a vessel), within drillship chartering segment which was approved by the Board of Directors. A sales contract was entered into in 2017, but was terminated in February 2018 before execution of the contract. Management expects the assets will be sold in 2018. The assets held for sale are measured at the lower of their carrying amount and fair value less cost to sell based on an appraisal value, and the Group recognized the related impairment and other losses amounting to ₩49,761 million in 2017.

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Details of assets held for sale as of December 31, 2017 are as follows:

In millions of Korean won

		Acquisition Cost	Accumulated Depreciation	Accumulated Impairment loss	Carrying Amount
Vessels	₩	114,625	(70,925)	(40,228)	3,472
Tools and fixtures		4,629	(4,174)	(455)	-
Supplies		6,462	-	(6,462)	-
	₩	125,716	(75,099)	(47,145)	3,472

18. Non-Financial Assets

Details of non-financial assets as of December 31, 2017 and 2016 are as follows:

In millions of Korean won

		December 31, 2017		December 31, 2016	
		Current	Non-current	Current	Non-current
Advance payments	₩	98,531	-	42,620	-
Prepaid expenses		18,747	7,629	27,197	9,014
Oil stockpiles		-	3,539,992	-	3,894,155
	₩	117,278	3,547,621	69,817	3,903,169

19. Investments in Associates and Joint Ventures

(a) Details of investments in associates and joint ventures as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won

Entity	Principal activity	Country	Equity interest (%)		Acquisition cost	Book value
<Investments in associates>						
Kernhem B.V.	Exploration and Production("E&P")	Netherlands	36.67	₩	10,947	-
Oilhub Korea Yeosu Co., Ltd.	Storing of oil	Korea	29.00		36,221	50,430
ADA Oil LLP(*1)	E&P	Kazakhstan	12.50		18,803	-
Parallel Petroleum LLC(*2)	E&P	United States	10.00		41,106	-
					107,077	50,430
<Investments in joint ventures>						
KNOC Inam Ltd.	Exploration	Malaysia	40.00		-	-
KNOC Kamchatka Petroleum Ltd.(*3)	Exploration	Cyprus	55.00		1	-
KC karpovsky B.V.	Exploration	Netherlands	35.00		10	-
KNOC Bazian Ltd.(*3)	Exploration	Malaysia	66.72		-	-
KNOC Nigerian West Oil Company Ltd.(*3)	Exploration	Nigeria	75.00		64	-
KNOC Nigerian East Oil Company Ltd.(*3)	Exploration	Nigeria	75.00		64	-
KNOC Aral Ltd.(*3)	Exploration	Malaysia	51.00		-	-
Korea kamchatka Co., Ltd.	Exploration	Cyprus	50.00		7,282	-
KC kazakh B.V.	Exploration	Netherlands	35.00		243	-
Offshore International Group, Inc.	E&P	United States	50.00		680,471	182,782
KNOC Ferghana Ltd.	Exploration	Malaysia	50.00		1	-
KNOC Ferghana2 Ltd.(*3)	Exploration	Malaysia	65.00		-	-
KADOC Ltd.(*3)	E&P	Malaysia	75.00		1	-
Korea Oil Terminal Co., Ltd.(*3)	Storing of oil	Korea	82.26		3,965	-
Deep Basin Partnership(*3)	E&P	Canada	82.59		199,759	-
HKMS Partnership(*3)	Gas processing plant operation	Canada	70.47		63,667	48,047
					955,528	230,829
				₩	1,062,605	281,259

(*1) Classified as an investment in associate as the Group's associate, Kernhem B.V. holds 75% of the equity interest and by effective equity interest, the Group has the ability to exercise significant influence over the entity.

(*2) Classified as an investment in associate as the Group can designate one director in its board of directors. Despite the percentage of ownership is below 20%, the Group has the ability to exercise significant influence over the entity.

(*3) Despite the percentage of ownership of over 50%, the investment is classified as an investment in joint ventures as the Group is unable to exercise control over investees solely.

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19. Investments in Associates and Joint Ventures, Continued

(a) Details of investments in associates and joint ventures as of December 31, 2017 and 2016 are as follows, continued:

(ii) As of December 31, 2016

In millions of Korean won

Entity	Principal activity	Country	Equity interest (%)		Acquisition cost	Book value
<Investments in associates>						
Kernhem B.V.	Exploration and Production("E&P")	Netherlands	36.67	₩	12,348	-
Oilhub Korea Yeosu Co., Ltd.	Storing of oil	Korea	29.00		40,856	44,239
ADA Oil LLP(*1)	E&P	Kazakhstan	12.50		21,209	1,169
Parallel Petroleum LLC(*2)	E&P	United States	10.00		46,366	1,050
					120,779	46,458
<Investments in joint ventures>						
KNOC Inam Ltd.	Exploration	Malaysia	40.00		-	-
KNOC Kamchatka Petroleum Ltd.(*3)	Exploration	Cyprus	55.00		1	-
KC karpovsky B.V.	Exploration	Netherlands	35.00		11	-
KNOC Bazian Ltd.(*3)	Exploration	Malaysia	66.72		-	-
KNOC Nigerian West Oil Company Ltd.(*3)	Exploration	Nigeria	75.00		73	-
KNOC Nigerian East Oil Company Ltd.(*3)	Exploration	Nigeria	75.00		73	-
KNOC Aral Ltd.(*3)	Exploration	Malaysia	51.00		-	-
Korea kamchatka Co., Ltd.	Exploration	Cyprus	50.00		8,213	-
KC kazakh B.V.	Exploration	Netherlands	35.00		274	-
Offshore International Group, Inc.	E&P	United States	50.00		767,547	247,660
KNOC Ferghana Ltd.	Exploration	Malaysia	50.00		1	-
KNOC Ferghana2 Ltd.(*3)	Exploration	Malaysia	65.00		-	-
KADOC Ltd.(*3)	E&P	Malaysia	75.00		1	-
Korea Oil Terminal Co., Ltd.(*3)	Storing of oil	Korea	82.26		3,967	-
Deep Basin Partnership(*3)	E&P	Canada	82.32		205,296	40,217
HKMS Partnership(*3)	Gas processing plant operation	Canada	70.23		71,042	56,141
					1,056,499	344,018
				₩	1,177,278	390,476

(*1) Classified as an investment in associate as the Group's associate, Kernhem B.V. holds 75% of the equity interest and by effective equity interest, the Group has the ability to exercise significant influence over the entity.

(*2) Classified as an investment in associate as the Group can designate one director in its board of directors. Despite the percentage of ownership is below 20%, the Group has the ability to exercise significant influence over the entity.

(*3) Despite the percentage of ownership of over 50%, the investment is classified as an investment in joint ventures as the Group is unable to exercise control over investees solely.

19. Investments in Associates and Joint Ventures, Continued

(b) Changes in carrying value of investments in associates and joint ventures for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won

Entity	Beginning balance	Acquisition	Dividends received	Share of profit and loss of equity method (*1)	Changes in equity adjustments in equity method	Impair-ment losses (*2)	Other changes (*3)	Ending balance
<Investment in associates>								
Kernhem B.V.	₩ -	-	-	477	(477)	-	-	-
Oilhub Korea Yeosu Co. Ltd.	44,239	-	-	6,054	5,836	-	(5,699)	50,430
ADA Oil LLP	1,169	-	-	(1,083)	(11)	-	(75)	-
Parallel Petroleum LLC	1,050	-	-	(982)	-	-	(68)	-
	46,458	-	-	4,466	5,348	-	(5,842)	50,430
<Investment in joint ventures>								
KNOC Inam Ltd.	-	-	-	-	-	-	-	-
KNOC Kamchatka Petroleum Ltd.	-	-	-	-	-	-	-	-
KC karpovsky B.V.	-	-	-	-	-	-	-	-
KNOC Bazian Ltd.	-	-	-	-	-	-	-	-
KNOC Nigerian West Oil Company Ltd.	-	-	-	-	-	-	-	-
KNOC Nigerian East Oil Company Ltd.	-	-	-	-	-	-	-	-
KNOC Aral Ltd.	-	-	-	-	-	-	-	-
Korea kamchatka Co., Ltd.	-	-	-	-	-	-	-	-
KC kazakh B.V.	-	-	-	-	-	-	-	-
Offshore International Group, Inc.	247,660	-	-	(33,297)	-	(5,526)	(26,055)	182,782
KNOC Ferghana Ltd.	-	-	-	-	-	-	-	-
KNOC Ferghana2 Ltd.	-	-	-	-	-	-	-	-
KADOC Ltd.	-	-	-	-	-	-	-	-
Korea Oil Terminal Co., Ltd.	-	473	-	(404)	(69)	-	-	-
Deep Basin Partnership	40,217	18,738	(9,611)	(47,205)	-	-	(2,139)	-
HKMS Partnership	56,141	722	(14,934)	8,634	-	-	(2,516)	48,047
	344,018	19,933	(24,545)	(72,272)	(69)	(5,526)	(30,710)	230,829
	₩ 390,476	19,933	(24,545)	(67,806)	5,279	(5,526)	(36,552)	281,259

(*1) Equity method is not applied to investments in associates and joint ventures for which the investment balance has been reduced to zero. As a result, losses of ₩18,706 million under equity method have been accounted to loans for the year ended December 31, 2017. Loss under equity method amounting to ₩35,449 million related to Group's additional obligation on Deep Basin Partnership has been accounted for as provision.

(*2) Details of the impairment loss as of December 31, 2017 are as follows:

In millions of Korean won

CGU	Recoverable amounts	Valuation of recoverable Method	Discount rate	Primary Assumption	Impairment loss	Reason for impairment
Offshore International Group, Inc.	182,782	Value in use	8.28%	Estimated production quantities based on reserve reports and long-term oil price forecasts by major forecasting Institutions	(5,526)	Decrease in international oil prices, changes in reserves and others

(*3) Include the effect of changes in exchange rates.

19. Investments in Associates and Joint Ventures, Continued

(b) Changes in carrying value of investments in associates and joint ventures for the years ended December 31, 2017 and 2016 are as follows, continued:

(ii) For the year ended December 31, 2016

In millions of Korean won

Entity		Beginning balance	Acquisition	Disposals	Dividends received	Share of profit and loss of equity method (*1)	Changes in equity adjustments in equity method	Impair-ment losses (*2)	Other changes (*3)	Ending balance
<Investment in associates>										
Kernhem B.V.	₩	-	-	-	-	1,978	(1,978)	-	-	-
Oilhub Korea Yeosu Co. Ltd.		39,016	-	-	-	5,305	(1,456)	-	1,374	44,239
ADA Oil LLP		2,012	-	-	-	1,467	(966)	(1,371)	27	1,169
Parallel Petroleum LLC		25,316	-	-	-	(24,059)	-	-	(207)	1,050
		66,344	-	-	-	(15,309)	(4,400)	(1,371)	1,194	46,458
<Investment in joint ventures>										
KNOC Inam Ltd.		-	-	-	-	-	-	-	-	-
KNOC Kamchatka Petroleum Ltd.		-	-	-	-	-	-	-	-	-
KC karpovsky B.V.		-	-	-	-	-	-	-	-	-
KNOC Bazian Ltd.		-	-	-	-	-	-	-	-	-
KNOC Nigerian West Oil Company Ltd.		-	-	-	-	-	-	-	-	-
KNOC Nigerian East Oil Company Ltd.		-	-	-	-	-	-	-	-	-
KNOC Aral Ltd.		-	-	-	-	-	-	-	-	-
Korea kamchatka Co., Ltd.		-	-	-	-	-	-	-	-	-
KC kazakh B.V.		-	-	-	-	-	-	-	-	-
Offshore International Group, Inc.		419,099	-	(3,614)	-	(56,780)	-	(116,769)	5,724	247,660
KNOC Ferghana Ltd.		-	-	-	-	-	-	-	-	-
KNOC Ferghana2 Ltd.		-	-	-	-	-	-	-	-	-
KADOC Ltd.		-	-	-	-	-	-	-	-	-
Korea Oil Terminal Co., Ltd.		3,190	650	-	-	(4,156)	347	-	(31)	-
Deep Basin Partnership		42,375	41,852	-	(1,436)	(45,001)	-	-	2,427	40,217
HKMS Partnership		58,310	876	-	(13,241)	6,841	-	-	3,355	56,141
		522,974	43,378	(3,614)	(14,677)	(99,096)	347	(116,769)	11,475	344,018
	₩	589,318	43,378	(3,614)	(14,677)	(114,405)	(4,053)	(118,140)	12,669	390,476

(*1) Equity method is not applied to investments in associates and joint ventures with fully impaired capital. As a result, losses of ₩7,276 million under equity method have been accounted to loans for the year ended December 31, 2016.

(*2) Details of the impairment losses as of December 31, 2016 are as follows:

In millions of Korean won

CGU	Recoverable amounts	Valuation of recoverable Method	Discount rate	Primary Assumption	Impairment loss	Reason for impairment
ADA Oil LLP	1,169	Value in use	10.16%	Estimated production quantities based on reserve reports and long-term oil price forecasts by major forecasting Institutions	(1,371)	Decrease in international oil prices, changes in reserves and others
Offshore International Group, Inc.	247,660		9.91%		(116,769)	

(*3) Include the effect of changes in exchange rates.

19. Investments in Associates and Joint Ventures, Continued

(c) The summaries of financial information of major associates and joint ventures for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won		Total assets	Total liabilities	Revenue	Net income (loss)
<Investment in associates>					
Kernhem B.V.	₩	180,599	230,387	31,885	(5,435)
Oilhub Korea Yeosu Co., Ltd.		511,353	337,455	74,838	20,877
ADA Oil LLP		78,933	132,246	31,885	(6,911)
Parallel Petroleum LLC		367,166	258,795	7,118	(19,528)
<Investment in joint ventures>					
KNOC Nigerian West Oil Company Ltd.		147,185	227,588	-	(9,481)
KNOC Nigerian East Oil Company Ltd.		241,808	329,639	-	(10,614)
Offshore International Group, Inc.		771,078	335,429	144,109	(66,594)
KADOC Ltd.		355,192	405,489	-	(12,359)
Korea Oil Terminal Co., Ltd.		3,693	4,507	-	(721)
Deep Basin Partnership		99,629	135,074	44,474	(82,654)
HKMS Partnership		94,140	93,246	24,147	811

19. Investments in Associates and Joint Ventures, Continued

(c) The summaries of financial information of major associates and joint ventures for the years ended December 31, 2017 and 2016 are as follows, continued:

(ii) For the year ended December 31, 2016

In millions of Korean won		Total assets	Total liabilities	Revenue	Net income (loss)
<Investment in associates>					
Kernhem B.V.	₩	205,086	254,046	26,677	10,519
Oilhub Korea Yeosu Co., Ltd.		554,894	402,345	76,668	18,294
ADA Oil LLP		91,663	144,322	26,677	16,421
Parallel Petroleum LLC		434,850	287,412	64,642	(1,489)
<Investment in joint ventures>					
KNOC Bazian Ltd.		150,999	214,036	-	(6,222)
KNOC Nigerian West Oil Company Ltd.		165,396	245,955	-	(8,803)
KNOC Nigerian East Oil Company Ltd.		272,964	360,691	-	(11,634)
KNOC Aral Ltd.		41,665	41,888	-	(5)
KC kazakh B.V.		345,673	923,725	-	(372,521)
Offshore International Group, Inc.		927,459	364,896	134,620	(95,825)
KNOC Ferghana Ltd.		63,963	72,798	-	(1,811)
KNOC Ferghana2 Ltd.		22,549	24,942	-	(643)
KADOC Ltd.		313,136	356,662	-	(11,604)
Korea Oil Terminal Co., Ltd.		3,827	4,521	-	(1,281)
Deep Basin Partnership		188,384	149,455	32,593	(45,263)
HKMS Partnership		100,334	100,892	20,881	(673)

20. Property, Plant and Equipment

(a) Details of property, plant and equipment as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Acquisition cost	Contributions for construction	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
Land	₩	445,333	-	-	-	-	445,333
Buildings		70,223	-	-	(24,419)	-	45,804
Structures		1,786,554	(113)	-	(634,577)	-	1,151,864
Machinery		563,786	(3,471)	-	(371,523)	-	188,792
Vehicles		9,289	-	-	(7,106)	-	2,183
Tools & fixtures		56,501	-	-	(46,530)	(306)	9,665
Finance lease asset		220,420	-	-	(5,839)	-	214,581
Construction-in-progress		254,104	-	-	-	-	254,104
Others		53,412	-	-	(39,568)	(2,086)	11,758
Oil & gas properties		19,718,592	-	(3,969)	(10,076,816)	(2,938,220)	6,699,587
	₩	23,178,214	(3,584)	(3,969)	(11,206,378)	(2,940,612)	9,023,671

(ii) As of December 31, 2016

In millions of Korean won		Acquisition cost	Contributions for construction	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
Land	₩	550,989	-	-	-	-	550,989
Buildings		205,139	-	-	(34,578)	-	170,561
Structures		1,967,228	(131)	-	(666,848)	-	1,300,249
Machinery		642,104	(4,254)	(2)	(393,442)	-	244,406
Vessels		129,293	-	-	(76,110)	-	53,183
Vehicles		10,286	-	-	(7,232)	-	3,054
Tools & fixtures		67,361	-	-	(49,843)	(321)	17,197
Construction-in-progress		274,357	-	-	-	-	274,357
Others		49,321	-	-	(38,465)	(2,198)	8,658
Oil & gas properties		20,530,244	-	(5,802)	(9,952,803)	(3,019,365)	7,552,274
	₩	24,426,322	(4,385)	(5,804)	(11,219,321)	(3,021,884)	10,174,928

20. Property, Plant and Equipment, Continued

(b) Changes in property, plant and equipment for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won		Beginning balance	Acquisitions	Disposals (*2)	Depreciation	Impairment losses	Reversal of impairment losses	Reclassifi-cations	Others (*3)	Ending balance
Land	₩	550,989	-	(45,542)	-	-	-	-	(60,114)	445,333
Buildings		170,561	974	(108,429)	(1,907)	-	-	(1,929)	(13,466)	45,804
Structures		1,300,380	67,644	(3,999)	(46,454)	-	-	(1,630)	(163,964)	1,151,977
(Contributions to construction)		(131)	-	-	4	-	-	-	14	(113)
Machinery		248,662	13,744	(19,839)	(27,467)	-	-	4,601	(27,438)	192,263
(Contributions to construction)		(4,254)	-	-	316	-	-	-	467	(3,471)
(Government grants)		(2)	-	2	-	-	-	-	-	-
Vessels(*1)		53,183	-	-	(3,641)	(42,460)	-	(3,664)	(3,418)	-
Vehicles		3,054	268	(36)	(866)	-	-	-	(237)	2,183
Tools & fixtures(*1)		17,197	708	(59)	(6,324)	(480)	-	90	(1,467)	9,665
Finance lease asset		-	232,648	-	(6,163)	-	-	-	(11,904)	214,581
Construction-in-progress		274,357	33,977	(45)	-	-	-	(29,008)	(25,177)	254,104
Others		8,658	857	(5)	(3,629)	-	-	38	5,839	11,758
Oil & gas properties		7,558,076	481,542	(432)	(711,533)	(320,267)	163,645	29,615	(497,090)	6,703,556
(Government grants)		(5,802)	-	-	1,240	-	-	-	593	(3,969)
	₩	10,174,928	832,362	(178,384)	(806,424)	(363,207)	163,645	(1,887)	(797,362)	9,023,671

(*1) Impairment loss on vessels and tools & fixtures due to discontinued drillship chartering segment has been recognized during the year ended December 31, 2017. Details are as follows:

In millions of Korean won

	Characteristics of asset	Valuation method of recoverable amount	Recoverable amount	Discount rate after tax	Primary assumptions	Impairment losses	Cause of impairment
Drillship chartering	Vessels and tools & fixtures	Fair value less cost to sell	3,472	-	Appraisal value when scrapped	42,940	Discontinued operation

(*2) For the years ended December 31, 2017, the Group sold the headquarters' land, building, and fixtures and leased back. The contracted sale price is ₩220,000 million, and the Group holds a right to purchase corresponding assets within 5 years from the commencement date. The Group has accounted the sale-and-leaseback transaction above as finance lease, and deferred gain on disposal of property, plant and equipment amounting to ₩34,364 million and recognized over the lease term.

(*3) Include the effect of changes in exchange rates and others. (see Note 23)

20. Property, Plant and Equipment, Continued

(ii) For the year ended December 31, 2016

In millions of Korean won		Beginning balance	Acquisitions	Disposals	Depreciation	Impairment losses	Reversal of impairment losses	Reclassifi-cations	Others (*)	Ending balance
Land	₩	536,779	28	(2,436)	-	-	-	-	16,618	550,989
Buildings		171,358	223	(310)	(5,836)	-	-	19	5,107	170,561
Structures		1,317,892	397	(8,141)	(48,418)	-	-	57	38,593	1,300,380
(Contributions to construction)		(131)	-	-	4	-	-	-	(4)	(131)
Machinery		281,861	2,427	(700)	(30,868)	-	-	183	(4,241)	248,662
(Contributions to construction)		(4,453)	-	-	325	-	-	-	(126)	(4,254)
(Government grants)		(2)	-	-	-	-	-	-	-	(2)
Vessels		54,406	800	-	(3,602)	-	-	-	1,579	53,183
Vehicles		2,138	1,650	(107)	(700)	-	-	27	46	3,054
Tools & fixtures		24,990	703	(6)	(7,981)	(315)	-	892	(1,086)	17,197
Construction-in-progress		90,877	184,006	-	-	-	-	(10,500)	9,974	274,357
Others		22,547	296	(18)	(5,259)	(2,147)	-	20	(6,781)	8,658
Oil & gas properties		8,222,136	547,853	(143,601)	(853,130)	(431,145)	400,959	38,678	(223,674)	7,558,076
(Government grants)		(6,978)	-	-	1,337	-	-	-	(161)	(5,802)
	₩	10,713,420	738,383	(155,319)	(954,128)	(433,607)	400,959	29,376	(164,156)	10,174,928

(*) Include the effect of changes in exchange rates and others.

(c) Details of impairments recognized by segments for the years ended December 31, 2017 and 2016 are as follows :

(i) For the year ended December 31, 2017

In millions of Korean won		**Oil and Gas(*1)**
General information		
Type of assets		Oil and gas properties
Recognition of impairment losses		26 CGUs and individual assets
Valuation Method		Value in use, fair value less cost to sell(*2)
Assumptions		
Discount rate after tax(*3)		8.00~22.30%
Oil prices(*4)		International indices
Production quantities		Estimated production quantities based on reserve reports
Recoverable amounts	₩	658,155
Impairment losses		320,266
Reason for impairment		Decrease in forecasted oil prices and probable reserves

(*1) The CGUs of the oil and gas segment are fields or areas.
(*2) Each individual asset in Canada has been measured at fair value less cost to sell based on disposal contracts.
(*3) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.
(*4) The oil prices are based on the long-term forecasts from globally recognized research institutions.

20. Property, Plant and Equipment, Continued

(c) Details of impairments recognized by segments for the years ended December 31, 2017 and 2016 are as follows, continued :

(ii) For the year ended December 31, 2016

In millions of Korean won		Oil and Gas(*1)
General information		
Type of assets		Oil and gas properties
Recognition of impairment losses		31 CGUs and individual assets
Valuation Method		Value in use
Assumptions		
Discount rate after tax(*2)		8.00~22.20%
Oil prices(*3)		International indices
Production quantities		Estimated production quantities based on reserve reports
Recoverable amounts	₩	2,018,690
Impairment losses		431,145
Reason for impairment		Decrease in forecasted oil prices and others

(*1) The CGUs of the oil and gas segment are fields or wells.
(*2) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.
(*3) The oil prices are based on the long-term forecasts from globally recognized research institutions.

(d) Details of reversal of impairment losses recognized by segments for the year ended December 31, 2017 are as follows :

In millions of Korean won		Oil and Gas(*1)
General information		
Type of assets		Oil and gas properties
Recognition of reversal of impairment losses		10 CGUs and individual assets
Valuation Method		Value in use, fair value less cost to sell (*2)
Assumptions		
Discount rate after tax(*3)		8.50~20.30%
Oil prices(*4)		International indices
Production quantities		Estimated production quantities based on reserve reports
Reversal of impairment losses	₩	163,645
Reason for reversal of impairment losses		Increase in probable reserves and others

(*1) The CGUs of the oil and gas segment are fields or areas.
(*2) Each individual asset in Canada has been measured at fair value less cost to sell based on disposal contracts.
(*3) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.
(*4) The oil prices are based on the long-term forecasts from globally recognized research institutions.

20. Property, Plant and Equipment, Continued

(e) Details of reversal of impairment losses recognized by segments for the year ended December 31, 2016 are as follows :

In millions of Korean won		**Oil and Gas(*1)**
General information		
Type of assets		Oil and gas properties
Recognition of reversal of impairment losses		24 CGUs and individual assets
Valuation Method		Value in use, fair value less cost to sell (*2)
Assumptions		
Discount rate after tax(*3)		8.00~12.00%
Oil prices(*4)		International indices
Production quantities		Estimated production quantities based on reserve reports
Reversal of impairment losses	₩	400,959
Reason for reversal of impairment losses		Production period extension, decrease in operation cost, disposal contracts and others

(*1) The CGUs of the oil and gas segment are fields or wells.
(*2) Each individual asset in Canada has been measured at fair value less cost to sell based on disposal contracts.
(*3) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.
(*4) The oil prices are based on the long-term forecasts from globally recognized research institutions.

21. Goodwill

(a) Details of goodwill as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Acquisition cost	₩	1,131,748	1,172,204
Accumulated impairment losses		(983,894)	(927,875)
	₩	147,854	244,329

(b) Changes in goodwill for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	244,329	301,308
Disposals		-	(10,253)
Impairment losses (*1)		(87,470)	(32,440)
Other changes (*2)		(9,005)	(14,286)
	₩	147,854	244,329

(*1) The Group recognized an impairment loss on goodwill arising from the acquisition of Harvest Operations Corp. due to significant decrease in oil and gas prices.
(*2) Include the effect of exchange rate changes.

(c) Changes in accumulated impairment losses for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	(927,875)	(1,009,450)
Impairment losses		(87,470)	(32,440)
Other changes (*)		31,451	114,015
	₩	(983,894)	(927,875)

(*) Include the effect of exchange rate changes.

21. Goodwill, Continued

(d) For the purpose of impairment testing, carrying amounts of goodwill allocated to Group's CGUs and groups of CGUs as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		**December 31, 2017**	**December 31, 2016**
Oil and gas properties segment			
Oil and gas properties of Dana Petroleum Limited by country (*1)	₩	122,454	125,912
Conventional oil and gas properties of Harvest Operations Corp. (*2)		-	89,767
Altius Holdings Inc. (a subsidiary of KNOC Kaz B.V.) (*3)		25,400	28,650
	₩	147,854	244,329

(*1) Dana Petroleum Limited's recoverable amount is estimated based on the value in use. The value in use is estimated from the cash inflows, which are discounted at 8% and 12% derived from the oil production in the long-term production plan indicated in the reserve reports and the long-term oil price forecasts by the research institutions. There is no impairment loss on goodwill recognized based on the value in use estimated for each CGU for the year ended December 31, 2017.

(*2) Harvest Operations Corp.'s recoverable amount is estimated based on the fair value less costs of disposal. The Group estimated the fair value less costs of disposal using the market approach valuation technique. The Group used the market multiples as the entity value of a set of comparable companies divided by their reserves and multiplied that multiples to the subsidiaries' reserves from the reserve reports. The Group recognized an impairment loss on goodwill of ₩87,470 million and ₩32,440 million in the consolidated statements of comprehensive loss as other loss based on the fair value less costs of disposal for the years ended December 31, 2017 and 2016 respectively.

(*3) Altius Holding Inc.'s recoverable amount is estimated based on the value in use. The value in use is estimated from the cash inflows, which are discounted at 9.28%, derived from the oil production in the long-term production plan indicated in the reserve reports and the long-term oil price forecasts by the research institutions. There is no impairment loss on goodwill recognized based on the value in use estimated for each CGU for the year ended December 31, 2017.

22. Intangible Assets Other Than Goodwill

(a) Details of intangible assets other than goodwill as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Acquisition cost	Accumulated amortization	Accumulated impairment losses	Book value
Exploration and evaluation assets	₩	3,085,261	-	(2,572,182)	513,079
Software		28,315	(23,782)	-	4,533
Mining rights		3,941,282	(1,438,868)	(95,095)	2,407,319
Development cost		38,070	(31,018)	-	7,052
Land use right		224	(70)	-	154
Others		85,870	(1,009)	(82,664)	2,197
	₩	7,179,022	(1,494,747)	(2,749,941)	2,934,334

(ii) As of December 31, 2016

In millions of Korean won		Acquisition cost	Accumulated amortization	Accumulated impairment losses	Book value
Exploration and evaluation assets	₩	3,231,627	-	(2,485,343)	746,284
Software		35,584	(28,510)	-	7,074
Mining rights		4,447,746	(1,523,666)	(101,142)	2,822,938
Development cost		40,802	(32,453)	-	8,349
Land use right		253	(71)	-	182
Others		97,093	(1,278)	(93,242)	2,573
	₩	7,853,105	(1,585,978)	(2,679,727)	3,587,400

22. Intangible Assets Other Than Goodwill, Continued

(b) Changes in intangible assets other than goodwill for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won

		Beginning balance	Acquisi-tions	Disposals	Amorti-zation	Impairment losses(*1)	Reclassifi-cations	Others (*2)	Ending balance
Exploration and evaluation assets	₩	746,284	27,171	(3,356)	-	(221,323)	(1,940)	(33,757)	513,079
Software		7,074	91	(4)	(2,657)	-	736	(707)	4,533
Mining rights		2,822,938	-	(8)	(93,346)	(5,728)	-	(316,537)	2,407,319
Development cost		8,349	1,573	-	(2,372)	-	429	(927)	7,052
Land use right		182	-	-	(6)	-	-	(22)	154
Others		2,573	13	-	(103)	-	-	(286)	2,197
	₩	3,587,400	28,848	(3,368)	(98,484)	(227,051)	(775)	(352,236)	2,934,334

(*1) Include the write-off of ₩227,051 million, which have been recognized due to relinquishment of explorations in continental shelf and decrease in estimated reserve amount of exploration in United Kingdom. Also, gains on debt exemption of ₩17,119 million from loans and accrued interest based on Accounting for Energy and Resources have been recognized.
(*2) Include the effect of changes in exchange rates and others.

(ii) For the year ended December 31, 2016

In millions of Korean won

		Beginning balance	Acquisi-tions	Disposals	Amorti-zation	Impairment losses(*1)	Reversal of impairment	Reclassifi-cations	Others (*2)	Ending balance
Exploration and evaluation assets	₩	1,246,714	41,844	(70,753)	-	(327,854)	-	(49,025)	(94,642)	746,284
Software		8,061	158	(781)	(3,482)	-	-	2,917	201	7,074
Mining rights		2,889,845	923	(9,569)	(144,746)	(17,178)	6,416	14,350	82,897	2,822,938
Development cost		7,880	1,425	-	(3,590)	-	-	2,380	254	8,349
Land use right		181	-	-	(6)	-	-	-	7	182
Others		2,600	5	-	(106)	-	-	-	74	2,573
	₩	4,155,281	44,355	(81,103)	(151,930)	(345,032)	6,416	(29,378)	(11,209)	3,587,400

(*1) Include the write-off of ₩345,032 million, which have been recognized due to expiration of mining rights in Korea, relinquishment of explorations in Iraq and decrease in recoverable amount of mining right in relation to oil and gas properties. Also, gains on debt exemption of ₩148,863 million from loans and accrued interest based on Accounting for Energy and Resources have been recognized.
(*2) Include the effect of changes in exchange rates and others.

23. Trade and Other Payables

(a) Details of trade and other payables as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Current	**Non-current**	**Current**	**Non-current**
Trade accounts payable	₩	140,950	-	100,246	-
Other accounts payable		502,444	46,474	693,151	57,144
Accrued expenses		98,358	196,583	117,873	203,009
Deposit received		-	4,480	-	4,546
Other deposits received		-	14	-	16
Finance lease liability		8,327	212,721	-	-
Other payables		36,320	43,527	62,084	28,719
	₩	786,399	503,799	973,354	293,434

(b) Details of finance lease liability are as follows:

(i) Lease Contract

As of January 31, 2018, the Group has entered in to a contract with KOCREF CR-REIT 36 to sell the headquarters building in Ulsan and lease back for use. The Group holds bargain purchase option which is exercisable after 5 years, and lease payments are renewed every 5 years. In compliance to the obligation to domicile in Ulsan under the legislation, the Group has accounted the contract for right to use the headquarters building as finance lease. Meanwhile, lessor holds the legal title of finance lease asset amounting to ₩214,581 million. (see Note 20)

(ii) Details of finance lease liability as of December 31, 2017 are as follows:

In millions of Korean won		**Minimum lease payments**	**Present value of minimum lease payment**
Within a year	₩	8,527	8,327
1~5 years		35,085	30,682
More than 5 years		482,577	182,039
	₩	526,189	221,048

(ii) Details of liquidity classification of finance lease liability as of December 31, 2017 are as follows:

In millions of Korean won		**As of December 31, 2017**
Current	₩	8,327
Non-current		212,721
	₩	221,048

24. Borrowings and Bonds Payable

(a) Details of borrowings and bonds payable as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Current Liabilities			
Short-term borrowings	₩	53,570	897,965
Current portion of long-term borrowings		782,304	245,325
Less: current portion of present discounted value		(4)	(160)
Current portion of bonds payable		2,324,147	2,023,507
Less: current portion of discount on bonds payable		(1,433)	(754)
		3,158,584	3,165,883
Non-current Liabilities			
Long-term borrowings		1,035,265	1,096,273
Less: present discounted value		(243)	(65)
Bonds payable		9,044,863	10,289,014
Less: discount on bonds payable		(32,899)	(39,459)
Add: premium on bonds payable		857	1,878
		10,047,843	11,347,641
	₩	13,206,427	14,513,524

(b) Details of payment schedule as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Borrowings	Bonds Payable	Borrowings	Bonds Payable
Within a year	₩	835,874	2,324,147	1,143,290	2,023,507
1~5 years		819,860	4,709,238	834,074	5,903,971
More than 5 years		215,405	4,335,625	262,199	4,385,043
	₩	1,871,139	11,369,010	2,239,563	12,312,521

24. Borrowings and Bonds Payable, Continued

(c) Details of short-term borrowings as of December 31, 2017 and 2016 are as follows:

In millions of Korean won

Type	Financial Institutions	Interest rate (%)	Maturity		December 31, 2017	December 31, 2016
				₩		
Short- term borrowings in foreign currencies	Shinhan Bank London	-	-		-	38,842
	CIBC and others	-	-		-	798,698
	The Export-Import Bank of Korea	-	-		-	60,425
	The Export-Import Bank of Korea	Libor+0.69	2018-06-26		53,570	-
				₩	53,570	897,965

(d) Details of long-term borrowings as of December 31, 2017 and 2016 are as follows:

In millions of Korean won and thousands of foreign currencies

Type	Financial Institution	Interest rate (%)	Maturity	December 31, 2017 Amount	December 31, 2017 Equivalent to Korean won	December 31, 2016 Amount	December 31, 2016 Equivalent to Korean won
Long- term borrowings in foreign currencies	Development Bank of Singapore	3M Libor+0.60	2018-01-30	USD 50,000	53,570	USD 50,000	60,425
	Mizuho Corporate Bank	3M Libor+0.75	2020-04-03	USD 200,000	214,280	USD 200,000	241,700
	SAER	Treasury 3Y -1.25	N/A(*1)	USD 95,939	102,788	USD 110,260	133,249
	SAER	Treasury 3Y -2.25	N/A(*1)	USD 105,111	112,616	USD 106,703	128,950
	BNP Paribas and others	Libor,Nibor, Euribor +1.75~2.25	2018-12-13	USD 660,170	707,306	USD 540,763	653,512
	CIBC and others	(*2)	2020-02-24	USD 150,983	161,764	-	-
	The Export Import Bank of Korea	2.27	2020-02-24	USD 397,522	425,905	-	-
	JP Morgan	Libor+0.80	2018-07-29	USD 10,000	10,714	USD 10,000	12,085
	Bank of America	Libor+0.75	2018-10-05	USD 10,000	10,714	USD 20,000	24,170
	Hyundai Heavy Industries, Hanhwa Corp	-	-	-	-	USD 52,692	63,678
	Kernhem International B.V.	8.13	2020-12-28	USD 16,718	17,912	USD 16,718	20,204
	Shinhan Bank	-	-	-	-	USD 3,000	3,625
					1,817,569		1,341,598
Less: present value discount					(247)		(225)
					1,817,322		1,341,373
Less: current portion					(782,304)		(245,325)
Less: current portion of present value discount					4		160
					1,035,022		1,096,208

(*1) SAER stands for Special Accounting for Energy and Resources. Loans from SAER included in borrowings have no specific maturity as they were borrowed under the condition that the Group is not obligated to make repayment of the principal and interest until the exploration is proven to be successful.
(*2) Interest rate on credit facility is subject to floating interest rate according to the contract terms, and effective interest rate for the year ended December 31, 2017 is approximately 2.215%.

24. Borrowings and Bonds Payable, Continued

(e) Details of bonds payable as of December 31, 2017 and 2016 are as follows:

In millions of Korean won and thousands of foreign currencies

Type	Interest rate (%)	Maturity	December 31, 2017 Amount	December 31, 2017 Equivalent to Korean won	December 31, 2016 Amount	December 31, 2016 Equivalent to Korean won
Floating interest rate bonds payable	3M Libor+0.80	2018-06-07	USD 200,000	214,280	USD 200,000	241,700
	3M Libor+1.00	2018-06-07	USD 300,000	321,420	USD 300,000	362,550
	A3B+1.50	2018-07-03	AUD 55,000	45,934	AUD 55,000	47,963
	3M Libor+1.20	2018-07-18	USD 330,000	353,562	USD 330,000	398,805
	A3B+1.08	2019-10-08	AUD 225,000	187,911	AUD 225,000	196,211
	-	-	-	-	USD 100,000	120,850
	3M Libor+0.60	2018-01-16	USD 50,000	53,570	USD 50,000	60,425
	3M Libor+0.70	2018-02-02	USD 250,000	267,850	USD 250,000	302,125
	A3B+1.28	2019-02-05	AUD 325,000	271,427	AUD 325,000	283,416
	3M Libor+0.60	2020-03-27	USD 500,000	535,700	-	-
Fixed interest rate bonds payable	4.38	2021-02-08	HKD 500,000	68,535	HKD 500,000	77,915
	4.50	2021-03-04	HKD 390,000	53,457	HKD 390,000	60,774
	3.95	2022-02-10	HKD 390,000	53,457	HKD 390,000	60,774
	-	-	-	-	CHF 300,000	354,399
	4.00	2022-03-28	EUR 50,000	63,963	EUR 50,000	63,380
	-	-	-	-	USD 1,000,000	1,208,500
	1.80	2018-01-22	HKD 400,000	54,828	HKD 400,000	62,332
	2.85	2023-01-24	HKD 400,000	54,828	HKD 400,000	62,332
	1.97	2018-01-29	USD 70,000	74,997	USD 70,000	84,595
	2.40	2023-02-04	EUR 37,000	47,332	EUR 37,000	46,901
	3.00	2025-06-24	EUR 60,000	76,755	EUR 60,000	76,056
	3.09	2023-07-03	EUR 50,000	63,963	EUR 50,000	63,380
	1.63	2018-11-29	CHF 240,000	262,733	CHF 240,000	283,519
	2.75	2019-01-23	USD 500,000	535,700	USD 500,000	604,250
	4.00	2024-01-23	USD 500,000	535,700	USD 500,000	604,250
	3.25	2024-07-10	USD 550,000	589,270	USD 550,000	664,675
	2.75	2019-01-23	USD 250,000	267,850	USD 250,000	302,125
	4.25	2019-10-08	AUD 125,000	104,395	AUD 125,000	109,006
	3.10	2027-01-21	USD 50,000	53,570	USD 50,000	60,425
	3.10	2027-01-21	USD 70,000	74,998	USD 70,000	84,595
	2.39	2020-01-28	USD 50,000	53,570	USD 50,000	60,425
	2.18	2020-01-29	HKD 310,000	42,492	HKD 310,000	48,307
	2.11	2020-03-16	KRW 100,000	100,000	KRW 100,000	100,000
	3.21	2030-03-19	USD 85,000	91,069	USD 85,000	102,723
	2.99	2025-03-19	USD 90,000	96,426	USD 90,000	108,765
	1.99	2020-04-23	KRW 50,000	50,000	KRW 50,000	50,000
	2.82	2025-04-29	USD 65,000	69,641	USD 65,000	78,553
	3.02	2030-04-29	USD 60,000	64,284	USD 60,000	72,510
	2.03	2020-08-26	KRW 150,000	150,000	KRW 150,000	150,000
	3.25	2025-10-01	USD 600,000	642,840	USD 600,000	725,100
	3.22	2030-11-10	USD 100,000	107,140	USD 100,000	120,850
	2.13	2021-04-14	USD 500,000	535,700	USD 500,000	604,250
	2.63	2024-04-14	USD 500,000	535,700	USD 500,000	604,250
	2.00	2021-10-24	USD 350,000	374,990	USD 350,000	422,975
	2.50	2026-10-24	USD 650,000	696,410	USD 650,000	785,525
	2.88	2022-03-27	USD 500,000	535,700	-	-
	3.38	2027-03-27	USD 500,000	535,700	-	-
	-	-	-	-	USD 281,140	339,758

24. Borrowings and Bonds Payable, Continued

(e) Details of bonds payable as of December 31, 2017 and 2016 are as follows, continued:

In millions of Korean won and thousands of foreign currencies

Type	Interest rate (%)	Maturity	December 31, 2017 Amount	December 31, 2017 Equivalent to Korean won	December 31, 2016 Amount	December 31, 2016 Equivalent to Korean won
Fixed interest rate bonds payable	2.13	2018-05-14	USD 629,964	674,972	USD 625,052	755,375
	2.33	2021-04-14	USD 195,678	209,659	USD 194,396	234,927
	3.00	2022-09-21	USD 480,409	514,732	-	-
				11,369,010		12,312,521
Less: discount on bonds payable				(34,332)		(40,213)
Add: premium on bonds payable				857		1,878
				11,335,535		12,274,186
Less: current portion				(2,324,147)		(2,023,507)
Less: current portion of present value discount				1,433		754
				9,012,821		10,251,433

25. Employee Benefits

The Group sponsors defined contribution plans and defined benefit plans which are subject to the employees' option.

(a) Defined contribution pension plan

The Group operates a defined contribution plan ("DC plan") which is subject to the employees' option. Contributions to the DC plan are separately managed by the plan's administrator. When employees terminate their employment before the benefits have vested, the Group's obligation to make contribution to the plan decreases on a pro rata basis.

Details of expenses relating to defined contribution plans for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Cost of sales	₩	1,057	934
Selling and administrative expenses		1,613	3,509
Profit (loss) from discontinued operations		64	-
	₩	2,734	4,443

Total expenses of ₩2,734 million and ₩4,443 million for the years ended December 31, 2017 and 2016, respectively are contributions paid by the Group based on the payment rate defined in employee benefits. No contributions remain unpaid as of December 31, 2017.

25. Employee Benefits, Continued

(b) Defined benefit pension plan

The latest actuarial calculation on both plan assets and defined benefit obligation was performed as of December 31, 2017. The Group uses the projected unit credit method to determine the present value of its defined benefit obligations and the related current service costs.

(i) The components of defined benefits liabilities as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Present value of defined benefit obligation from funded plans	₩	85,105	82,997
Fair value of plan assets		(76,811)	(68,267)
Net liabilities incurred from defined benefit plans	₩	8,294	14,730

(ii) Changes in the present value of defined benefit obligations for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	82,997	73,921
Current service cost		9,041	8,966
Interest cost		3,335	2,891
Remeasurement components		(5,509)	1,419
Actual payments		(4,759)	(3,682)
Effect of movement in exchange rates		-	(49)
Others		-	(469)
	₩	85,105	82,997

(iii) Changes in the fair value of plan assets for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	68,267	55,581
Expected return on plan assets(*)		2,765	2,201
Remeasurement components		(1,364)	(900)
Benefit paid by the plan		(4,759)	(3,667)
Contributions paid into the plan		11,902	15,052
	₩	76,811	68,267

(*) Actual returns on plan assets for the years ended December 31, 2017 and 2016 are ₩1,401 million and ₩1,301 million, respectively.

25. Employee Benefits, Continued

(b) Defined benefit pension plan, continued

(iv) Details of the fair value of plan assets as of December 31, 2017 and 2016 are as follows:

In millions of Korean won	Expected rate of return(*2) December 31, 2017	Expected rate of return(*2) December 31, 2016		Fair value of plan assets December 31, 2017	Fair value of plan assets December 31, 2016
Others(*1)	4.05%	3.96%	₩	76,812	68,267

(*1) Others are comprised of 79.34% of deposit and 20.66% of local and overseas securities as of December 31, 2017.
(*2) The expected rate of return is calculated based on the weighted average of expected rate of returns for each type of assets. The management evaluates the expected rate of returns based on the historical rate of return trends and the analysis of the predicted market during the period when the defined benefits liabilities exist.

(v) Principal actuarial assumptions as of December 31, 2017 and 2016 are as follows:

	December 31, 2017	December 31, 2016
Discount rate	4.31%	4.05%
Expected rate of return on plan assets	4.05%	3.96%
Future salary growth	4.99%	4.94%

(vi) Details of expenses relating to defined benefit plans for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Current service cost	₩	9,041	8,966
Interest cost		3,335	2,891
Expected return on plan assets		(2,765)	(2,201)
Transfer to other account		(294)	(326)
	₩	9,317	9,330

Expenses described above are recognized as the following items in the financial statements.

In millions of Korean won		2017	2016
Cost of sales	₩	2,884	3,227
Selling and administrative expenses		6,151	5,323
Others		294	326
Loss on discontinued operations		282	781
	₩	9,611	9,657

25. Employee Benefits, Continued

(b) Defined benefit pension plan, continued

(vii) Remeasurement components recognized in other comprehensive income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Defined benefit obligations	₩	5,509	(1,419)
Return on plan assets		(1,364)	(900)
Income tax effect		(1,003)	561
	₩	3,142	(1,758)

26. Provisions

(a) Details of provisions as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017			December 31, 2016		
		Current	Non-current	Total	Current	Non-current	Total
Decommissioning cost(*1)(*3)	₩	14,669	1,969,374	1,984,043	14,294	2,015,943	2,030,237
Social Overhead Capital(*2)		77,111	-	77,111	133,175	-	133,175
Allowance for salaries		667	-	667	2,043	-	2,043
Provision for litigations		-	-	-	4,474	-	4,474
Onerous contract		1,249	6,363	7,612	-	-	-
Others(*3)		744	44,520	45,264	1,955	14,853	16,808
	₩	94,440	2,020,257	2,114,697	155,941	2,030,796	2,186,737

(*1) The Group recognized provisions for future dismantling, removing and restoring obligations of wells and related facilities. Most of the costs incur at or after the completion of production and the management recognized its best estimations as provisions.

(*2) The Group is committed to providing construction services with regards to the Kurdish regional government's Social Overhead Capital to obtain rights on certain exploratory areas (see Note 44). This commitment has been classified as a provision due to its uncertain timing of related cash outflows.

(*3) The reclassifications from non-current to current amounted to ₩10,710 million and ₩11,733 million for the years ended December 31, 2017 and 2016, respectively.

26. Provisions, Continued

(b) Changes in provisions for the years ended December 31, 2017 and 2016 are as follows :

(i) For the year ended December 31, 2017

In millions of Korean won		Beginning balance	Provision	Accretion expenses	Transfer(*1)	Payment	Others(*2)	Ending Balance
Decommissioning cost	₩	2,030,237	9,124	73,316	(460)	(10,162)	(118,012)	1,984,043
Social Overhead Capital		133,175	-	1,131	-	(43,600)	(13,595)	77,111
Allowance for salaries		2,043	233	-	-	-	(1,609)	667
Provision for litigations		4,474	-	-	-	(6,643)	2,169	-
Onerous contract		-	-	923	-	(1,253)	7,942	7,612
Others(*3)		16,808	42,008	-	-	(924)	(12,628)	45,264
	₩	2,186,737	51,365	75,370	(460)	(62,582)	(135,733)	2,114,697

(*1) The Group transferred restoring obligations to contract party regarding disposal of an oil and gas property.
(*2) Include the effect of changes in exchange rates and others.
(*3) Additional obligation of Deep Basin Partnership to the Group amounting to ₩35,449 million has been accounted for as other provision.

(ii) For the year ended December 31, 2016

In millions of Korean won		Beginning balance	Provision	Accretion expenses	Transfer(*1)	Payment	Others(*2)	Ending Balance
Decommissioning cost	₩	2,246,021	28,094	93,005	(124,075)	(17,539)	(195,269)	2,030,237
Social Overhead Capital		183,306	-	1,598	-	(54,081)	2,352	133,175
Allowance for salaries		1,971	-	-	-	-	72	2,043
Provision for litigations		2,956	1,315	-	-	-	203	4,474
Others		2,770	9,339	1,225	-	(1,593)	5,067	16,808
	₩	2,437,024	38,748	95,828	(124,075)	(73,213)	(187,575)	2,186,737

(*1) The Group transferred restoring obligations to contract party regarding disposal of an oil and gas property.
(*2) Include the effect of changes in exchange rates and others.

27. Non-Financial Liabilities

Details of non-financial liabilities as of December 31, 2017 and 2016 are as follows:

In millions of Korean won

Type		December 31, 2017		December 31, 2016	
		Current	Non-current	Current	Non-current
Advance received	₩	13,866	-	8,289	-
Unearned revenue		25,207	9,123	30,867	-
Withholdings		68,303	-	45,947	-
Others (*)		1,310	33,485	-	-
	₩	108,686	42,608	85,103	-

(*) Deferred gain on disposal of property, plant and equipment in relation to the disposal of Ulsan headquarters building is included (current: ₩879 million, non-current: ₩33,485 million).

28. Share Capital

The Group's total share capital is invested solely by the Korean government in accordance with the Korea National Oil Corporation Act and the authorized share capital is ₩13 trillion as of December 31, 2017. The changes in share capital for the year ended December 31, 2017 are as follows:

In millions of Korean won	Description		Amount
Beginning balance		₩	10,346,852
2017-04-05	Contribution for oil stockpiling business		23,000
2017-04-27	Contribution for oil field development		22,300
2017-06-30	Contribution for oil stockpiling business		23,000
2017-12-26	Contribution for oil stockpiling business		19,713
Ending balance		₩	10,434,865

29. Accumulated Deficit

(a) Details of accumulated deficit as December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Undisposed accumulated deficit	₩	(8,463,173)	(7,633,552)

(b) Changes in accumulated deficit for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	(7,633,552)	(6,539,889)
Net loss for the year attributed to owner of the Company		(733,763)	(1,091,917)
Changes in equity method retained earnings		-	12
Remeasurement components of defined benefits plan		3,142	(1,758)
Ending balance	₩	(8,364,173)	(7,633,552)

(c) Changes in remeasurement components for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	(21,668)	(19,910)
Changes during the current year		4,145	(2,319)
Income tax effects		(1,003)	561
Ending balance	₩	(18,526)	(21,668)

30. Separate Statements of Disposition of Accumulated Deficit

Separate statements of disposition of accumulated deficit for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
I. Undisposed Deficit			
Undisposed accumulated deficit carried over from prior years	₩	(6,581,259)	(5,845,728)
Net loss		(1,594,028)	(733,773)
Remeasurement components		3,142	(1,758)
II. Undisposed deficit to be carried forward to the subsequent year	₩	(8,172,145)	(6,581,259)

These statements of disposition of accumulated deficit were based on the separate financial statements of the Parent Company.

31. Other Components of Equity

(a) Details of other components of equity as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Other capital surpluses(*)	₩	24,954	24,954
Accumulated other comprehensive loss		(601,799)	(339,409)
	₩	(576,845)	(314,455)

(*) All other capital surpluses are gains from assets contributed.

(b) Details of accumulated other comprehensive loss as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Gains on available-for-sale financial instruments	₩	12,088	76,185
Equity adjustments in equity method		23,839	18,560
Foreign currency translation differences for foreign operations		(654,015)	(497,774)
Gains on valuation of derivative instruments		16,289	63,620
	₩	(601,799)	(339,409)

32. Revenue

Details of revenues (based on customer locations) except for other income, other profit and financial income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017			2016		
		Domestic	**Overseas**	**Total**	**Domestic**	**Overseas**	**Total**
Sales of goods and finished goods	₩	160,926	1,997,153	2,158,079	85,605	2,180,883	2,266,488
Revenues from services provided		23,140	89,006	112,146	22,045	96,857	118,902
Income on government grants		5,131	-	5,131	4,954	-	4,954
Others		1,918	35,212	37,130	2,232	32,391	34,623
	₩	191,115	2,121,371	2,312,486	114,836	2,310,131	2,424,967

33. Other Income and Expenses

(a) Details of other income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Reversal of other provisions(*)	₩	31,518	2,996
Reversal of bad debt allowance		7,938	671
Gains on exemption of debts		76,744	220,473
Compensation and indemnity		12	11
Rental income		506	338
Other income from overseas fields		4,559	7,677
Others		30,992	3,507
	₩	152,269	235,673

(*) The Company recovered full amount of ₩29,967 million paid in the first trial against Hyundai Heavy Industries as a result of the ruling in the second trial in favor of the Company, and recognized it as a reversal of other provision. (see Note 44)

(b) Details of other expenses for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Other bad debt expense	₩	180,186	14,521
Donations		882	1,501
Losses on valuation of supplies		588	269
Other expenses from overseas fields		1,853	44
Others		23,727	9,909
	₩	207,236	26,244

34. Other Profit and Loss

Details of other profit and loss for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Gains on disposal of property, plant and equipment	₩	2,130	55,920
Gains on disposal of intangible assets other than goodwill		-	483
Gains on transactions of derivatives		1,695	-
Reversal of impairment losses on property, plant and equipment		163,645	400,959
Reversal of impairment losses on intangible assets other than goodwill		-	6,416
Gains on foreign currency translation		39,595	21,467
Gains on foreign currency transactions		41,699	55,275
Other gains		16,681	9,907
Losses on disposal of property, plant and equipment		(179)	(9,045)
Losses on disposal of intangible assets other than goodwill		(3,524)	(66,326)
Losses on transactions of derivatives		(1,695)	(1,423)
Losses on valuation of derivatives		-	(3,164)
Impairment losses on property, plant and equipment		(320,267)	(433,607)
Impairment losses on intangible assets(*)		(314,522)	(377,472)
Losses on foreign currency translation		(45,110)	(26,710)
Losses on foreign currency transactions		(40,259)	(54,432)
Other losses		(3,039)	(967)
	₩	(463,150)	(422,719)

(*) Impairment losses on intangible assets of ₩314,522 million due to failure to obtain renewal of certain mining right and relinquishment of exploration and others have been recognized for the year ended December 31, 2017. In connection with the relinquishment, gains on debt exemption of ₩17,119 million from loans and accrued interest based on Accounting for Energy and Resources have been recognized in other income and expense.

35. Finance Income

(a) Details of finance income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Interest income	₩	50,601	37,816
Dividend income		10	24
Gains on disposal of financial assets		-	26,232
Gains on transaction of derivatives financial instruments		1,168	738
Gains on repayment of financial liabilities		1,583	17,234
Gains on foreign currency translation		143,660	60,054
Gains on foreign currency transaction		107,536	40,759
	₩	304,558	182,857

35. Finance Income, Continued

(b) Details of interest income by sources included in finance income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Cash and cash equivalents	₩	12,066	6,154
Loans and receivables		38,535	31,662
	₩	50,601	37,816

36. Finance Costs

(a) Details of finance costs for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Interest expenses	₩	401,019	424,598
Impairment losses on available-for-sale financial instruments		71,586	45,577
Losses on valuation of derivatives financial instruments		25,305	-
Losses on transaction of derivatives financial instruments		15,251	5,749
Losses on foreign currency translation		93,115	205,690
Losses on foreign currency transactions		4,210	13,940
Other financial costs		99,926	125,229
	₩	710,412	820,783

(b) Details of interest expenses by sources included in finance costs for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Short-term borrowings	₩	7,363	29,868
Long-term borrowings		62,069	40,354
Bonds payable		342,992	362,087
Derivative liabilities		6,010	14,607
Other financial liabilities		11,028	5,362
		429,462	452,278
Less: capitalized costs of borrowings		(28,443)	(27,680)
	₩	401,019	424,598

The annual weighted average cost of capital of the borrowings is 4.56% for the year ended December 31, 2017 (3.87% and 8.30% for the year ended December 31, 2016).

37. Income Tax Benefit

(a) The components of income tax benefit for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Current income tax	₩	111,491	76,264
Deferred tax directly charged to equity		34,769	(230)
Changes in deferred taxes arising from temporary differences		(338,594)	(359,170)
Adjustment for prior periods		(7,606)	69,009
Income tax benefit	₩	(199,940)	(214,127)
Income tax benefit from continuing operations		(194,163)	(211,684)
Income tax benefit from discontinued operations	₩	(5,777)	(2,443)

(b) Reconciliations of expected income tax benefit computed by applying the statutory income tax rate to loss before income tax to the actual income tax benefit for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Loss before income tax	₩	(933,701)	(1,332,974)
Benefits computed at the statutory rate (*)		(225,956)	(322,580)
Adjustments			
Adjustments to prior year tax return		224	685
Non-taxable income		(1)	(13,274)
Non-deductible expenses		45,752	1,532
Effect from tax deduction and exemption		(96,328)	(16,898)
Temporary differences not recognized in deferred tax assets		44,096	155,827
Effect from temporary differences not recognized in prior years		(14,809)	(28,554)
Differences in tax rates in overseas entities		46,313	(1,206)
Effect of changes in tax rates		769	10,341
Income tax benefit	₩	(199,940)	(214,127)
Effective tax benefit rate		21.41%	16.06%

(*) The expected applicable statutory tax rate for the years ended December 31, 2017 and 2016 is 24.2%, which is the Korea statutory corporate income tax rate where the Company is domiciled.

(c) Income tax recognized as accumulated other comprehensive income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Available-for-sale financial assets	₩	20,464	791
Net change in the unrealized fair value of derivatives using cash flow hedge accounting		15,308	(1,582)
Remeasurement components		(1,003)	561
	₩	34,769	(230)

37. Income Tax Benefit, Continued

(d) Changes in deferred income tax assets (liabilities) recognized in the consolidated statements of financial position for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won		Beginning balance	Amounts recognized in profit or loss	Amounts recognized in other comprehensive income	Others	Ending balance
Deferred income tax on temporary differences						
Contributions for construction	₩	1,061	(77)	-	(117)	867
Investment in associates and others		52,324	(14,106)	-	(5,194)	33,024
Financial guarantee liabilities		2,615	9,836	-	(813)	11,638
Allowance for doubtful accounts		198,308	(27,257)	-	(21,065)	149,986
Available-for-sale financial instruments		89,237	65,501	20,464	(14,642)	160,560
Intangible assets		118,198	94,022	-	(18,351)	193,869
Accrued expense		50,888	(644)	-	(5,740)	44,504
Asset retirement obligation		41,881	6,650	-	(5,101)	43,430
Property, plant and equipment		105,446	(88,307)	-	(7,321)	9,818
Land		(70,006)	(1)	-	7,942	(62,065)
Loss on valuation of derivatives		(8,422)	3,522	(555)	800	(4,655)
Employee benefits		(2,846)	6,477	(1,003)	35	2,663
Others		(82,261)	73,687	-	5,461	(3,113)
Deferred assets of subsidiaries		658,119	42,118	15,863	(77,710)	638,390
Differences in fair value and book value from business combination and others		(156,812)	96,262	-	12,729	(47,821)
Deferred tax liabilities of subsidiaries		(134,498)	36,143	-	13,358	(84,997)
	₩	863,232	303,826	34,769	(115,729)	1,086,098
Deferred tax assets	₩	1,154,542				1,218,915
Deferred tax liabilities	₩	(291,310)				(132,817)

Temporary differences not recognized in deferred tax assets, tax loss carryforwards and tax deduction are ₩11,885,988 million as of December 31, 2017.

37. Income Tax Benefit, Continued

(d) Changes in deferred income tax assets (liabilities) recognized in the consolidated statements of financial position for the years ended December 31, 2017 and 2016 are as follows, continued:

(ii) For the year ended December 31, 2016

In millions of Korean won		Beginning balance	Amounts recognized in profit or loss	Amounts recognized in other comprehensive income	Others	Ending balance
Deferred income tax on temporary differences						
Contributions for construction	₩	1,109	(79)	-	31	1,061
Investment in associates and others		(34,737)	84,641	-	2,420	52,324
Financial guarantee liabilities		3,271	(727)	-	71	2,615
Allowance for doubtful accounts		170,159	21,942	-	6,207	198,308
Available-for-sale financial instruments		74,604	11,030	791	2,812	89,237
Intangible assets		112,938	1,673	-	3,587	118,198
Accrued expense		57,146	(7,719)	-	1,461	50,888
Asset retirement obligation		39,058	1,543	-	1,280	41,881
Property, plant and equipment		20,396	81,062	-	3,988	105,446
Land		(61,756)	(6,073)	-	(2,177)	(70,006)
Loss on valuation of derivatives		(9,376)	-	1,196	(242)	(8,422)
Employee benefits		1,223	(4,506)	561	(124)	(2,846)
Others		(37,263)	(42,097)	-	(2,901)	(82,261)
Deferred assets of subsidiaries		605,344	32,575	-	20,200	658,119
Differences in fair value and book value from business combination and others		(281,015)	127,674	-	(3,471)	(156,812)
Deferred tax liabilities of subsidiaries		(186,671)	58,461	(2,778)	(3,510)	(134,498)
	₩	474,430	359,400	(230)	29,632	863,232
Deferred tax assets	₩	942,116				1,154,542
Deferred tax liabilities	₩	(467,686)				(291,310)

38. Expenses Classified by Nature

(a) Expenses classified by nature for the year ended December 31, 2017 are as follows:

In millions of Korean won		Changes in inventories	Selling and administrative expenses	Cost of sales	Total
Changes in inventories - merchandise	₩	3,981	-	-	3,981
Changes in inventories - finished goods		8,639	-	-	8,639
Changes in inventories - others		11,284	-	-	11,284
Purchases of inventories		-	-	170,046	170,046
Raw materials used		-	-	4,857	4,857
Salaries		-	89,570	141,420	230,990
Severance and retirement benefits		-	7,764	3,941	11,705
Other employee benefits		-	13,712	7,088	20,800
Insurance		-	2,920	19,354	22,274
Depreciation		-	16,672	785,779	802,451
Amortization		-	5,015	93,468	98,483
Commissions and fees		-	21,736	42,957	64,693
Advertising		-	192	29	221
Education and training		-	3,522	631	4,153
Vehicle maintenance		-	1,394	545	1,939
Books and printing		-	592	14	606
Business development		-	119	37	156
Rent		-	6,718	46,449	53,167
Communications		-	930	528	1,458
Transport		-	-	140,373	140,373
Taxes and dues		-	2,197	33,218	35,415
Supplies		-	1,089	2,582	3,671
Utilities		-	1,460	43,830	45,290
Repairs		-	7,568	134,061	141,629
Research and development		-	260	2,382	2,642
Travel		-	1,753	350	2,103
Clothing expenses		-	13	80	93
Investigation and analysis		-	-	208	208
Association fee		-	159	13	172
Sales promotion		-	57	617	674
Sales commissions		-	90,768	-	90,768
Others		-	10,145	151,528	161,673
	₩	23,904	286,325	1,826,385	2,136,614

38. Expenses Classified by Nature, Continued

(b) Expenses classified by nature for the year ended December 31, 2016 are as follows:

In millions of Korean won		Changes in inventories	Selling and administrative expenses	Cost of sales	Total
Changes in inventories - merchandise	₩	54,103	-	-	54,103
Changes in inventories - finished goods		(520)	-	-	(520)
Changes in inventories - others		4,399	-	-	4,399
Purchases of inventories		-	-	375,571	375,571
Raw materials used		-	-	6,564	6,564
Salaries		-	97,456	129,797	227,253
Severance and retirement benefits		-	8,833	4,161	12,994
Other employee benefits		-	11,548	7,573	19,121
Insurance		-	3,389	25,984	29,373
Depreciation		-	18,904	931,270	950,174
Amortization		-	7,023	144,908	151,931
Bad debt expenses		-	429	-	429
Commissions and fees		-	19,202	47,347	66,549
Advertising		-	160	10	170
Education and training		-	3,723	791	4,514
Vehicle maintenance		-	1,583	662	2,245
Books and printing		-	800	17	817
Business development		-	111	39	150
Rent		-	8,271	57,307	65,578
Communications		-	1,071	6,207	7,278
Transport		-	-	165,472	165,472
Taxes and dues		-	3,029	38,161	41,190
Supplies		-	1,352	2,461	3,813
Utilities		-	1,294	42,839	44,133
Repairs		-	7,919	145,145	153,064
Research and development		-	253	856	1,109
Travel		-	1,879	365	2,244
Clothing expenses		-	12	81	93
Investigation and analysis		-	-	152	152
Association fee		-	163	9	172
Sales promotion		-	57	1,119	1,176
Sales commissions		-	55,470	-	55,470
Others		-	6,183	204,306	210,489
	₩	57,982	260,114	2,339,174	2,657,270

39. Categories of financial instruments

(a) Details of current financial assets by category as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Loans and receivables	Hedging financial assets	Total
Cash and cash equivalents	₩	791,075	-	791,075
Short-term loans		3,185	-	3,185
Short-term financial instruments		2,074	-	2,074
Derivative assets		-	4,532	4,532
Others		14,919	-	14,919
Trade and other receivables		556,270	-	556,270
	₩	1,367,523	4,532	1,372,055

(ii) As of December 31, 2016

In millions of Korean won		Loans and receivables	Hedging financial assets	Total
Cash and cash equivalents	₩	812,651	-	812,651
Short-term financial instruments		2,032	-	2,032
Derivative assets		-	949	949
Others		16,026	-	16,026
Trade and other receivables		567,212	-	567,212
	₩	1,397,921	949	1,398,870

39. Categories of Financial Instruments, Continued

(b) Details of non-current financial assets by category as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Loans and receivables	Available-for-sale financial instruments	Hedging financial assets	Total
Available-for-sale financial instruments	₩	-	90,807	-	90,807
Long-term loans		479,465	-	-	479,465
Long-term financial instruments		4,873	-	-	4,873
Derivative assets		-	-	47,302	47,302
Trade and other receivables		97,768	-	-	97,768
	₩	582,106	90,807	47,302	720,215

(ii) As of December 31, 2016

In millions of Korean won		Loans and receivables	Available-for-sale financial instruments	Hedging financial assets	Total
Available-for-sale financial instruments	₩	-	269,278	-	269,278
Long-term loans		601,075	-	-	601,075
Long-term financial instruments		5,083	-	-	5,083
Derivative assets		-	-	9,011	9,011
Trade and other receivables		118,664	-	-	118,664
	₩	724,822	269,278	9,011	1,003,111

39. Categories of financial instruments, Continued

(c) Details of current financial liabilities by category as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
Trade and other payables	₩	786,399	-	786,399
Short-term borrowings		53,570	-	53,570
Current portion of long-term borrowings		782,300	-	782,300
Bonds payable		2,322,715	-	2,322,715
Derivative liabilities		-	93,512	93,512
	₩	3,944,984	93,512	4,038,496

(ii) As of December 31, 2016

In millions of Korean won		Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
Trade and other payables	₩	973,354	-	973,354
Short-term borrowings		897,965	-	897,965
Current portion of long-term Borrowings		245,165	-	245,165
Current portion of Bonds payable		2,022,753	-	2,022,753
Derivative liabilities		-	42,572	42,572
	₩	4,139,237	42,572	4,181,809

39. Categories of financial instruments, Continued

(d) Details of non-current financial liabilities by category as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
Trade and other payables	₩	503,799	-	503,799
Long-term borrowings		1,035,022	-	1,035,022
Bonds payable		9,012,821	-	9,012,821
Derivative liabilities		-	48,229	48,229
	₩	10,551,642	48,229	10,599,871

(ii) As of December 31, 2016

In millions of Korean won		Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
Trade and other payables	₩	293,434	-	293,434
Long-term borrowings		1,096,208	-	1,096,208
Bonds payable		10,251,433	-	10,251,433
Derivative liabilities		-	147,831	147,831
	₩	11,641,075	147,831	11,788,906

39. Categories of financial instruments, Continued

(e) Net gains or losses by financial instruments for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Loans and receivables:			
Interest income	₩	50,601	37,816
Gain on foreign currency transactions, net		72,429	5,185
Gain (loss) on foreign currency translation, net		(39,367)	7,562
Available-for-sale financial investments:			
Dividend income		10	24
Gain on disposal		-	26,232
Impairment loss		(71,586)	(45,577)
Other comprehensive loss, net of tax		(64,097)	(2,479)
Hedge financial assets:			
Loss on transaction, net		-	(84)
Loss on foreign currency transactions, net		-	(661)
Gain (loss) on foreign currency translation, net		39,243	(3,882)
Other comprehensive income, net of tax		-	6,467
Other financial liabilities with amortized cost:			
Interest cost		(401,019)	(424,598)
Gain on foreign currency transactions, net		27,787	13,962
Loss on foreign currency translations, net		(17,456)	(114,909)
Gain on repayment of financial liabilities		1,583	17,234
Other financial cost (*)		(26,611)	(32,224)
Hedge financial liabilities:			
Loss on transactions, net		(14,083)	(4,927)
Loss on valuation, net		(25,305)	-
Gain on foreign currency transactions, net		3,110	8,333
Gain (loss) on foreign currency translation, net		68,124	(34,407)
Other comprehensive loss, net of tax		(47,331)	(7,434)
	₩	(443,968)	(548,367)

(*) Excludes increase in other provisions amounting to ₩73,315 million and ₩93,005 million for the years ended December 31, 2017 and 2016 respectively

40. Netting Agreements

(a) Offsetting of financial assets and financial liabilities

As of December 31, 2017 and 2016, financial assets and financial liabilities subject to offsetting, enforceable master netting arrangements and similar agreements are as follows:

(i) As of December 31, 2017

In millions of Korean won

		Gross amounts recognized as financial instruments	Gross amounts of recognized financial instruments set off in the statement of financial position	Net amounts of financial instruments presented in the statement of financial position	Related amounts not set off in the statement of financial position		Net Amounts
					Financial instruments	Collateral received or pledged	
Financial assets							
Derivatives(*)	₩	51,834	-	51,834	(51,834)	-	-
Financial liabilities							
Derivatives(*)		141,741	-	141,741	(51,834)	-	89,907

(*) Some of derivative contracts are made under International Swaps and Derivatives Association (ISDA) master netting agreements. In general, under such agreements the amounts owed by each counter party on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. In certain circumstances (i.e. when a default occurs), all standing transactions under the agreement are terminated, the termination value is assessed and only a single amount is payable in settlement of all transactions.

(ii) As of December 31, 2016

In millions of Korean won

		Gross amounts recognized as financial instruments	Gross amounts of recognized financial instruments set off in the statement of financial position	Net amounts of financial instruments presented in the statement of financial position	Related amounts not set off in the statement of financial position		Net Amounts
					Financial instruments	Collateral received or pledged	
Financial assets							
Derivatives(*)	₩	9,960	-	9,960	(9,960)	-	-
Financial liabilities							
Derivatives(*)		190,403	-	190,403	(9,960)	-	180,443

(*) Some of derivative contracts are made under International Swaps and Derivatives Association (ISDA) master netting agreements. In general, under such agreements the amounts owed by each counter party on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. In certain circumstances (i.e. when a default occurs), all standing transactions under the agreement are terminated, the termination value is assessed and only a single amount is payable in settlement of all transactions.

41. Risk Management

(a) Capital management

The primary objective of the Group's capital management is to ensure that it maintains a strong credit rating and capital ratios in order to support its business and maximize the owners' value. To maintain the sound capital structure, management periodically reviews the Group's capital structure which consist of equity and net debt, net of cash and cash equivalents and borrowing and debt securities. No changes were made in the objectives, policies or processes for managing capital for the year ended December 31, 2017.

The Group's debt-to-equity ratios as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Total borrowings and debt securities	₩	13,206,427	14,513,524
Cash and cash equivalents		(791,075)	(812,651)
Net borrowings and debt securities		12,415,352	13,700,873
Total equity	₩	2,437,074	3,508,732
Net borrowings and debt securities-to-equity ratio		509.44%	390.48%

(b) Financial risk management

The Group is exposed to various risks related to its financial instruments such as credit risk, market risk (currency risk, interest rate risk and price risk) and liquidity risk.

(i) Risk management structure

The board of directors is responsible for implementing and monitoring the Group's risk management structure and the management regularly updates the policies for each risk and confirms the validity of the policies. The purpose of the risk management policies is to identify the risks that could potentially affect the Group's financial results and reduce, to an acceptable level, avoid or eliminate those risks. The policies are reviewed regularly to reflect the current market conditions and the Group's activities. The Group makes constant efforts to improve the policies by monitoring on real time basis and with support from the outside experts. The audit committee oversees the Group's compliance to the risk management policies and procedures and reviews the effectiveness of the structure.

41. Risk Management, Continued

(b) Financial risk management, continued

(ii) Credit risk

Credit risk is the risk of financial loss to the Group if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the Group's receivables from customers, investment securities, derivatives and financial guarantee contracts.

Credit risk also arises from transactions with financial institutions, and such transactions include transactions of cash and cash equivalents, various deposits, and financial instruments such as derivative contracts. The Group manages its exposure to this credit risk by only entering into transactions with banks that have high international credit ratings. The Group implements a credit risk management policy under which the Group only transacts business with counterparties that have a certain level of credit rate evaluated based on financial condition, historical experience, and other factors.

Book values of the financial assets and guarantee amounts by the contract represent the maximum amounts exposed to the credit risk. Details of the Group's level of maximum exposure to credit risk as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Cash and cash equivalents	₩	791,075	812,651
Derivatives assets		51,834	9,960
Loans and receivables(*)		1,158,554	1,310,092
Financial guarantee contracts		34,541	38,961

(*) Comprised of loans, account receivables, non-trade receivables and others.

41. Risk Management, Continued

(b) Financial risk management, continued

(ii) Credit risk, continued

Details of maturities for loans and receivables and their impaired amounts as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Balance	**Impairment**	**Balance**	**Impairment**
Not past due	₩	1,820,957	(741,763)	1,951,467	(731,090)
0 ~ 30 days		22,112	-	8,167	-
31 ~ 60 days		9,981	-	13,892	-
More than 61 days		47,373	(106)	68,583	(927)
	₩	1,900,423	(741,869)	2,042,109	(732,017)

Details of changes in allowance for impairment of loans and receivables for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		**2017**	**2016**
Beginning balance	₩	732,017	697,957
Impairment		180,186	14,950
Reversal of impairment loss		(7,938)	(671)
Write-off		(769)	(588)
Others (*)		(161,627)	20,369
Ending balance	₩	741,869	732,017

(*) Include the effect of changes in exchange rates.

Aging of past due but not impaired financial assets as of December 31, 2017 and 2016 are as follows:

① As of December 31, 2017

In millions of Korean won		**Book value**	**Less than 6 months**	**6~12 Months**	**1~2 years**	**2~5 years**	**More than 5 years**
Loans and receivables	₩	79,360	36,287	387	42,424	262	-

② As of December 31, 2016

In millions of Korean won		**Book value**	**Less than 6 months**	**6~12 Months**	**1~2 years**	**2~5 years**	**More than 5 years**
Loans and receivables	₩	89,715	21,757	89	66,694	1,146	29

41. Risk Management, Continued

(b) Financial risk management, continued

(iii) Market risk

① Crude oil price risk

Crude oil price risk is the risk that the profit or cash flows will fluctuate due to changes in the international market prices of crude oil. With all other variables held constant, the changes in Group's profit before tax for the years ended December 31, 2017 and 2016 from crude oil price fluctuations are as follows:

		2017		2016	
In millions of Korean won		**Increase by 10%**	**Decrease by 10%**	**Increase by 10%**	**Decrease by 10%**
Increase (decrease) of profit before tax	₩	147,766	(147,766)	139,823	(139,823)

② Interest rate risk

The Group is exposed to interest rate risk due to its borrowings with floating interest rates. Assuming a 100 basis points increase or decrease in interest rates as of December 31, 2017 the Group's total equity and its profit or loss will also increase or decrease. The Group mitigates risks from fluctuation in interest rate through derivative contracts.

Except for the effect of derivative transactions, this analysis considers the Group's total exposed risks associated with the fluctuation in interest rate. This analysis assumes that all other variables are held constant and the same method is applied as the method used in the prior periods. The details of increase or decrease in the total equity and profit or loss are as follows:

		2017		2016	
In millions of Korean won		**Increase by 1%**	**Decrease by 1%**	**Increase by 1%**	**Decrease by 1%**
Increase (decrease) of profit before tax	₩	(34,033)	34,033	(37,262)	37,262

41. Risk Management, Continued

(b) Financial risk management, continued

(iii) Market risk, continued

③ Foreign currency risk

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the 'functional currency'). The Group is exposed to currency risk from the sales, purchases and borrowings not in United States dollar. The Group reduces currency risk from fluctuations in foreign exchange rates by carrying out derivative contracts.

Without considering the effect of the derivatives aforementioned, the Group's exposures to foreign currency risk as of December 31, 2017 and 2016 are as follows:

In thousands of foreign currencies and millions of Korean won

		December 31, 2017		December 31, 2016	
	Currency unit	Foreign currencies	Equivalent to Korean won	Foreign currencies	Equivalent to Korean won
Financial assets denominated in foreign currencies	KRW	357,539	357,539	254,691	254,691
Financial liabilities denominated in foreign currencies	KRW	593,153	593,153	331,915	331,915
	EUR	201,026	257,162	197,000	249,718
	SGD	303	243	235	196
	HKD	2,447,211	335,346	2,390,000	372,434
	CHF	240,351	263,126	540,000	637,918
	AUD	734,511	613,431	730,000	636,597
	GBP	-	-	3	4
	AED	13	4	195	64
			2,062,465		2,228,846

The exchange rates applied for the years ended and as of December 31, 2017 and 2016 are as follows:

In US dollar per one foreign currency

	Average rates		Reporting date spot rate	
	2017	2016	December 31, 2017	December 31, 2016
KRW	0.0009	0.0009	0.0009	0.0008
EUR	1.1294	1.1058	1.1940	1.0489
SGD	0.7244	0.7242	0.7473	0.6906
HKD	0.1283	0.1288	0.1279	0.1289
CHF	1.0159	1.0145	1.0218	0.9775
AUD	0.7666	0.7439	0.7795	0.7216
GBP	1.2876	1.3547	1.3436	1.2248
AED	0.2723	0.2723	0.2723	0.2723

41. Risk Management, Continued

(b) Financial risk management, continued

(iii) Market risk, continued

③ Foreign currency risk, continued

The Company and its subsidiaries use various functional currencies depending on their primary economic environment in which the entities operate. A sensitivity analysis below indicates the effect on the Group's profit before tax from the fluctuations in each function currency exchange rate. As of December 31, 2017 and 2016 the effect of a 5% increase or decrease in each functional currency exchange rate on profit before tax assuming all other variables held constant is as follows:

In millions of Korean won			2017 Increase by 5%	2017 Decrease by 5%	2016 Increase by 5%	2016 Decrease by 5%
Increase (decrease) of profit before tax	KRW	₩	(12,434)	12,434	(3,861)	3,861
	HKD		(17,698)	17,698	(18,622)	18,622
	CHF		(13,886)	13,886	(31,896)	31,896
	EUR		(23,808)	23,808	(12,388)	12,388
	AUD		(32,373)	32,373	(31,830)	31,830
	Others		(717)	717	(30)	30

(iv) Liquidity risk

The details of contractual maturities of financial liabilities and other contractual obligations as of December 31, 2017 are as follows:

In millions of Korean won		Book value	Contractual cash flows(*1)	Less than 1 year	1 ~ 2 years	2 ~ 5 years	More than 5 years(*2)
Short-term borrowings	₩	53,570	54,281	54,281	-	-	-
Bonds payable		11,335,535	12,845,151	2,602,331	1,601,844	3,879,198	4,761,778
Long-term borrowings		1,817,322	1,888,855	828,846	233,380	611,225	215,404
Trade and other payables		1,290,198	1,290,198	786,399	23,560	78,605	401,634
Derivatives liabilities		141,741	141,741	93,512	36,273	3,564	8,392
Financial guarantee contracts (*3)		-	34,541	34,541	-	-	-
	₩	14,638,366	16,254,767	4,399,910	1,895,057	4,572,592	5,387,208

(*1) Contractual cash flows include the estimated interest payments but exclude the effects of offsetting contracts.
(*2) Loans from Special Accounting for Energy and Resources ("SAER") included in borrowings have no specific maturity as entities were borrowed under the condition that the Group is not obligated to make repayment of the principal and interest until the exploration is proven to be successful.
(*3) Financial guarantee is allocated at the earliest period that the maximum amount could be requested.

41. Risk Management, Continued

(b) Financial risk management, continued

(iv) Liquidity risk, continued

The Group had a working capital (current assets minus current liabilities) deficit of ₩2,632,950 million as of December 31, 2017. The Group's management currently anticipates that expected future capital contributions from the Government and the cash flows that the Group generates from its operations, together with its existing cash and cash equivalents and credit sources, will be sufficient to meet its currently anticipated needs for working capital, capital expenditures and business expansion throughout the foreseeable future.

(v) Other price risk

Other price risk is the risk that the fair value or cash flows of financial instruments will fluctuate because of changes in market prices other than interest rate risk and foreign currency risk. The Group's marketable available-for-sale equity securities are exposed to market price risk arising from the fluctuation in the price of the securities. However, the Group's management believes that the effect of the fluctuation in the price of the securities on the financial statements is not significant.

(c) Fair value measurement

(i) Fair value and book value of financial assets and liabilities as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Book value	**Fair value**	**Book value**	**Fair value**
Assets recognized at fair value					
Available-for-sale financial assets	₩	89,987	89,987	268,353	268,353
Currency forwards		2,596	2,596	-	-
Currency swap		44,269	44,269	8,803	8,803
Interest rate swap		4,110	4,110	1,157	1,157
Other derivatives		859	859	-	-
Investments in associates and joint ventures(*)		48,047	48,047	96,358	96,358
		189,868	189,868	374,671	374,671
Liabilities recognized at fair value					
Currency swap		64,662	64,662	190,403	190,403
Other derivatives		77,079	77,079	-	-
		141,741	141,741	190,403	190,403

(*) The investments in joint ventures for Deep Basin Partnership and HKMS Partnership held by the Group are measured at the fair value at each financial statement date using the hypothetical liquidation book value method to estimate the Group's interests in the net assets of the joint ventures.

The fair values of the financial assets and liabilities measured at amortized costs do not significantly differ from their book values.

41. Risk Management, Continued

(c) Fair value measurement, continued

(ii) Fair value hierarchy

The following table provides an analysis of financial instruments that are measured subsequent to initial recognition at fair value, classified as Level 1, 2, or 3, based on the degree to which the fair value is observable.

Level 1: Unadjusted quoted prices in active markets for identical assets or liabilities;
Level 2: Inputs other than quoted prices that are observable for the asset or liability either directly or indirectly; and
Level 3: Inputs that are not based on observable market data.

Fair values of financial instruments by hierarchy level as of December 31, 2017 are as follows:

In millions of Korean won		December 31, 2017			
		Level 1	**Level 2**	**Level 3**	**Total**
Financial assets at fair value					
Available-for-sale financial assets	₩	79,083	-	10,904	89,987
Investments in associates and joint ventures		-	-	48,047	48,047
Derivative assets		-	51,834	-	51,834
		79,083	51,834	58,951	189,868
Financial liabilities at fair value					
Derivative liabilities		-	141,741	-	141,741

42. Related Parties

(a) The Group's major related parties as of December 31, 2017 are as follows:

Type	Related parties
Associates	Oilhub Korea Yeosu Co., Ltd.
	Kernhem B.V.
	ADA Oil LLP
	Parallel Petroleum LLC
Joint ventures	KNOC Inam Ltd.
	KNOC Kamchatka Petroleum Ltd.
	KC Karpovsky B.V.
	KNOC Bazian Ltd.
	KNOC Nigerian West Oil Company Ltd.
	KNOC Nigerian East Oil Company Ltd.
	KNOC Aral Ltd.
	Korea kamchatka Co., Ltd.
	KC kazakh B.V.
	Offshore International Group, Inc.
	KNOC Ferghana Ltd.
	KNOC Ferghana2 Ltd.
	KADOC Ltd.
	Korea Oil Terminal Co., Ltd.
	Deep Basin Partnership
	HKMS Partnership

42. Related Parties, Continued

(b) Significant transactions with related parties for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won	Transaction		Sales and others 2017	Sales and others 2016	Purchases and others 2017	Purchases and others 2016
Oilhub Korea Yeosu Co., Ltd.	Revenues from rental services	₩	1,470	1,495	-	-
	Expenses from rental services		-	-	13,646	16,472
Kernhem B.V.	Interest on loans		1,879	1,585	-	-
	Other bad debt expenses		-	-	41,685	-
ADA Oil LLP	Interest on loans		433	366	-	-
	Revenues from services		1,557	1,425	-	-
	Other bad debt expenses		-	-	12,692	-
KNOC Nigerian West Oil Company Ltd.	Interest on loans		2,544	1,886	-	-
	Other bad debt expenses		-	-	297	-
KNOC Nigerian East Oil Company Ltd.	Interest on loans		2,804	2,104	-	-
	Other bad debt expenses		-	-	297	-
Korea kamchatka Co., Ltd.	Other bad debt expenses		-	-	156	186
	Reversal of bad debt allowance		7,934	-	-	-
KC kazakh B.V.	Other bad debt expenses		-	-	-	456
	Reversal of bad debt allowance		-	609	-	-
Offshore International Group, Inc.	Interest on loans		3,215	2,467	-	-
KNOC Ferghana2 Ltd.	Other bad debt expenses		-	-	196	13,424
KADOC Ltd.	Interest on loans		6,381	5,749	-	-
Parallel Petroleum LLC	Interest on loans		323	172	-	-
Deep Basin Partnership	Other expenses		-	-	1,585	1,163
HKMS Partnership	Other expenses		-	-	280	186
		₩	28,540	17,858	70,834	31,887

42. Related Parties, Continued

(c) The outstanding receivables and payables, except for loans, arising from the transactions with related parties as of December 31, 2017 and 2016 are as follows:

In millions of Korean won	Transaction		Receivables 2017	Receivables 2016	Payables 2017	Payables 2016
Oilhub Korea Yeosu Co., Ltd.	Other account payables	₩	-	-	1,073	1,205
Kernhem B.V.	Accrued interest		-	9,154	-	-
ADA Oil LLP	Accrued interest		-	2,319	-	-
	Other receivables		-	1	-	-
KNOC Nigerian West Oil Company Ltd.	Accrued interest		20,946	20,908	-	-
KNOC Nigerian East Oil Company Ltd.	Accrued interest		23,239	23,216	-	-
KADOC Ltd.	Accrued interest		20,046	15,792	-	-
Offshore International Group, Inc.	Accrued interest		108	141	-	-
Deep Basin Partnership	Account payables		-	-	12,316	12,713
HKMS Partnership	Account payables		-	-	386	1,864
		₩	64,339	71,531	13,775	15,782

The Group recognized other bad debt expenses of ₩11,141million on receivables arising from the transaction with related parties for the year ended December 31, 2017.

(d) Loans to related parties as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Associates			
Kernhem B.V.	₩	-	41,989
ADA Oil LLP		-	11,998
Parallel Petroleum LLC		3,185	6,213
		3,185	60,200
Joint ventures			
KNOC Nigerian West Oil Company Ltd.		27,977	31,239
KNOC Nigerian East Oil Company Ltd.		31,280	34,928
Offshore International Group, Inc.		52,967	68,280
KADOC Ltd.		200,563	185,739
		312,787	320,186
	₩	315,972	380,386

The Group provided associates with additional loans of ₩48,425 million and received ₩15,921 million as the repayment of loans for the year ended December 31, 2017. The Group recognized other bad debt expenses of ₩47,280 million, and reversal of other bad debt allowance of ₩7,934 million. Also, the Group recognized increase of bad debt allowance due to equity method valuation amounting to ₩18,706 million and loss due to the effect of changes in exchange rates amounting to ₩38,866 million.

42. Related Parties, Continued

(e) There are no borrowings from the related parties as of December 31, 2017 and 2016.

(f) As of December 31, 2017, the Group does not provide any guarantees to the related parties.

(g) As of December 31, 2017, the Group is not provided with any guarantees from the related parties.

(h) The Company entered into a USD 70 million loan agreement available to December 31, 2017 with Offshore International Group Inc., an investment in joint venture. As of December 31, 2017, Offshore International Group Inc. had ₩52,967 million drawn under the loan agreement.

(i) The Company entered into Commercial Storage Agreement with Oilhub Korea Yeosu Co., Ltd., its associates, and leased storage with a volume of 240,000cbm per year. The agreement is terminated on March 31, 2021.

(j) The compensations to the key management personnel of the Group for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Salaries	₩	552	518
Severance and retirement benefits		43	45
	₩	595	563

43. Additional Cash Flow Statement Information

(a) Non-Cash Transactions

Significant non-cash investment and finance transactions excluded from statements of cash flows for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Bonds payable transferred to current portion	₩	2,435,235	1,954,941
Long-term borrowings transferred to current portion		825,658	261,647
Construction in progress transferred to other accounts		29,008	10,599
Non-current liabilities transferred to current portion		10,710	11,733

(b) Details of change in liabilities in financing activities are as follows:

				Non-cash transaction			
In millions of Korean won		Beginning balance	Cash flow	Change in exchange rate	Change in fair value	Others (*)	Ending balance
Current finance lease liability		-	-	(462)	-	8,789	8,327
Non-current finance lease liability		-	(7,856)	5,601	-	214,976	212,721
Short term borrowings	₩	897,965	(649,490)	(61,074)	-	(133,831)	53,570
Long term borrowings		1,341,373	558,695	(259,463)	-	176,717	1,817,322
Bond payables		10,251,433	2,209,148	(1,060,172)	-	(2,387,588)	9,012,821
Bond payables transferred into current portion		2,022,753	(1,946,543)	(268,239)	-	2,514,743	2,322,714
Liabilities held to hedge risk of bond payable		190,403	-	(15,823)	(109,918)	-	64,662

(*) Includes liquidity transfer and amortization to present value etc.

44. Contingencies and Commitments

(a) Details of the Group's significant pending litigations as of December 31, 2017 are as follows:

In millions of Korean won

Plaintiff	Defendant	Description(*1)	Amount	Process
Hanhwa Corp.	The Company	Claiming refunds of the premium paid to the Group acquire interests in Yemen 4 oil field(*2)	5,979	In third trial
Hyundai Heavy Industries	The Company	Claiming refunds of the acquisition costs and premium paid to the Group acquire interests in Yemen 4 oil field(*3)	20,906	In third trial

(*1) There are 6 cases againt the Company other than the litagations listed above amounting to total of ₩5,282 million.
(*2) The Company paid all claim amounts in February 2015 based on the loss of the first trial and received portion of statutory interest in January 2016 based on the partial loss of the second trial. The third trial is in the process as of December 31, 2017 by appealing to the decision of the second trial.
(*3) The Company received the return of the claim in March 2017 based on the win of the second trial and third trial is in the process as of December 31, 2017 by appealing to the decision.

Also, the Company is in the process of litigation with Dr. Owolabi claiming compensation for cooperation of acquiring Nigerian mining rights. The Group does not believe it has a present obligation and has not recognized any provisions for these lawsuits as of December 31, 2017.

44. Contingencies and Commitments, Continued

(b) The Group has provided loan guarantees to non-related parties as of December 31, 2017 and 2016 as follows:

In thousands of US dollar

Description of guarantee	Guaranteed Party	Effective Date	Guarantee period	December 31, 2017	December 31, 2016
Payment guarantee for Parallel business	Samsung C&T Corporation and others	2014-07-10 2016-06-20	Until loans fully repaid	8,459 23,780	8,459 23,780

(c) As of December 31, 2017, the Group has received guarantees provided by third parties for the Group's obligations and indebtedness as follows:

In thousands of US dollar

Provider	Description	Contractual currency amount	Description of guarantee
Sumitomo Mitsui Banking Corporation	Guarantee for payment in foreign currency	200,000	Guarantee for the principle and interests of bonds payable

(d) In 2007 and 2008, the Company and Korean Consortium entered into an agreement (Production Sharing Contract) for the exploration and production of oil fields located in Iraq, with the Kurdish regional government ("KRG"), in accordance with the local Kurdish oil exploration laws. In 2008, the Iraqi federal government announced that such agreement in the region without obtaining proper approval from the federal government would be invalid to the Company and other participating companies in the region. The Company was advised by legal consultants in the UK and in Iraq that there is no legal basis on the alleged nullity of the agreement by the Iraqi government.

(e) In 2009, the Company entered into an exclusive agreement with the Kurdish regional government ("KRG") to obtain rights on five exploratory areas. In consideration of obtaining these rights, the Company committed to pay USD 1.9 billion of construction services for the government's Social Overhead Capital (SOC).

However, the agreement was amended twice prior to 2012. The Company's rights on three exploratory areas, including Qush Tappa, were accordingly terminated and the Company's USD 1.9 billion commitment was reduced to USD 1.175 billion. In addition, the quantity of return-guaranteed crude oil was reduced.

The Company recorded mining rights in relation to this agreement and the carrying amount as of December 31, 2017 is ₩1,234,709 million. In addition, the Company recorded a current provision in relation to this agreement and the carrying amounts as of December 31, 2017 are ₩77,111 million which represent that the Company's estimated obligation of expected payments for KRG's SOC construction.

(f) The Company holds one-time right to purchase up to 30% of Korea GS E&P Pte. Ltd. which is owned by GS Energy Co. until February 2020. The exercise price is net of participation of GS Energy Co. in the business, cumulative expense and revenue until the date of the exercise.

44. Contingencies and Commitments, Continued

(g) As of December 31, 2017, other significant commitments and contingencies of the Company's subsidiaries are as follows:

(i) Harvest Operations Corp.("Harvest") and its subsidiaries

The Company provided a payment guarantee on senior notes issued by Harvest, its subsidiary in June 2016 for the principal amount of USD 196 million and their corresponding interest. The payment guarantee is effective until the maturity date (April 14, 2021) of the bonds.

The Company provided a payment guarantee on senior notes issued by Harvest, its subsidiary in May 2013 for the principal amount of USD 630 million and their corresponding interest. The payment guarantee is effective until the maturity date (May 14, 2018) of the bonds.

In February 2017, Harvest entered into a credit facility for CAD 500 million which payment guaranteed by Export-Import Bank of Korea and the Company. The payment guarantee is effective until February 24, 2020.

Harvest entered into a credit facility maturing on February 24, 2020 for CAD 500 million with the Canadian Imperial Bank of Commerce and other financial institutions

The Company provided a payment guarantee on senior notes issued by Harvest, its subsidiary in September and November 2017 for the principal amount of USD 285 million and USD 200 million respectively and their corresponding interest. The payment guarantee is effective until the maturity date (September 21, 2022) of the bonds.

(ii) Dana Petroleum Limited("Dana") and its subsidiaries

Dana entered into credit facilities agreements in a form of syndicated loan for up to USD 1.0 billion. Dana has drawn borrowings amounting to USD 660 million as of December 31, 2017. In relation to the credit facilities, certain financial ratios and cash flows are required to be in compliance with debt covenants and its oil and certain gas properties have been pledged as collateral.

The Company approved subordinated loan facility with a total amount of USD 600 million and the facility is available to December 31, 2018. It is undrawn as of December 31, 2017.

The Company, in relation to the acquisition of Dana Petroleum Limited's equity interest, has provided a guarantee for any potential environmental and bodily damages during the exploration and production activities by Dana Petroleum Norway AS to the Norwegian government

The Company provided a performance guarantee of GBP 80 million to Nexen and others for the expenses that will incur for restoration of the sites, decommissioning, dismantling and removal of the facilities and structures. Also, the Company provided a performance guarantee of NOK 167 million (limit: NOK 1,139 million) to ExxonMobile E&P Norway AS for transferring restoring obligation.

44. Contingencies and Commitments, Continued

(iii) ANKOR E&P Holdings Corp. ("ANKOR") and its subsidiaries

The Company provided a payment guarantee for ANKOR, its subsidiary, in relation to the borrowings from The Expert-Import Bank of Korea and others up to the limit of USD 108 million.

The Company provided a performance guarantee of USD 127 million to Chubb Limited and others for the future restoration of oil and gas sites held by ANKOR.

(iv) KNOC Yemen Ltd.
The Company is in the process of arranging the liquidation of KNOC Yemen Ltd. with YICOM, an acquirer. According to the arrangement, the Company may have a possibility of settlement, of which the amount cannot be estimated

(v) KNOC Eagle Ford and its subsidiaries

JB Patriot Investment Type Private Investment Limited Liability Company, non-controlling interest of KNOC Eagle Ford Corporation entered into an agreement of acquiring redeemable preferred shares with KNOC Eagle Ford Corporation and KNOC EF Star LLC, its subsidiary. The Company entered into the cash deficiency support agreement with KNOC Eagle Ford Corporation. In the case of a breach of covenants, JB Patriot Investment Type Private Investment Limited Liability Company is entitled to exercise a drag along right to require the KNOC Eagle Ford Corporation to sell the entire common shares held by KNOC Eagle Ford Corporation together with the preferred shares. Also, the Company holds the right to pay preferred shares and distributions on the preferred shares.

Details of agreements with financial facilities of KNOC Eagle Ford and its subsidiaries are as follows:

In thousands of US dollar

Agreement	Financial Institution	Credit line amount	Executed amount
Credit line	Bank of America	25,000	-
	Sumitomo Mitsui Banking Corporation	70,000	-
	Societe Generale Bank	30,000	-
		125,000	-

44. Contingencies and Commitments, Continued

(h) As of December 31, 2017, the Company 's significant commitments with the financial institutions are as follows:

In thousands of US dollar

Detail of contract	Financial institutions	Credit line amount	Executed amount
Trade finance	Deutsche Bank	350,000	-
	Development Bank of Singapore(*)	300,000	-
	Korea Development Bank	250,000	-
	Bank of America(*)	210,000	-
	ING Bank(*)	100,000	-
	Standard Chartered bank(*)	150,000	-
		1,360,000	-
Financial loans	BNP Paribas	400,000	-
	Development Bank of Singapore(*)	300,000	-
	Mizuho Corporate Bank	200,000	-
	Bank of America(*)	210,000	-
	ING Bank(*)	100,000	-
	Credit Agricole	100,000	-
	Bank of Tokyo-Mitsubishi UFJ	50,000	-
	Standard Chartered Bank(*)	150,000	-
	The Export-Import Bank of Korea	400,000	-
	Woori Bank	9,334	-
		1,919,334	-

(*) A portion of or all of lines of credit for trade finance and financial loans have been integrated and the integrated line of credit is USD 760 million.

45. Uncertainty of Deterioration in Operating Condition of Oil Market

Imbalance between supply and demand continues to drive low oil prices in the international crude oil market and oil prices are unlikely to increase in a short period of time. Low oil prices has continuously led to deterioration of Group's profitability and financial soundness.

The Group is carrying forward a scheme to improve the profitability and financial soundness against the unstable oil market. There is a significant uncertainty with respect to the Group's future business results depending on the recovery of oil prices.

46. Financial Statements Restatement

The consolidated financial statements of the Group were authorized for issue by the Board of Directors on February 28, 2018, but were restated as a result of accounting change in relation to disposal of headquarters building in Ulsan. The Group has changed accounting for sale-and-leaseback transaction of headquarters building from operating lease to finance lease. Details of the impact due to the accounting change are as follows:

(a) Details of the impact of the changes above on the Group's consolidated statement of financial position are as follows:

In millions of Korean won		**Before adjustment**	**After adjustment**
Non-current assets	₩		
Long-term trade receivables and other receivables		114,165	97,768
Property, plant and equipment		8,809,091	9,023,671
Deferred tax asset		1,218,549	1,218,915
		10,141,805	10,340,354
Current liabilities			
Trade receivables and other receivables		778,072	786,399
Current income tax liability		10,788	9,459
Current non-finance liability		107,806	108,686
		896,666	904,544
Non-current liabilities			
Long-term trade payables and other payables		291,077	503,799
Non-current non-finance liability		9,123	42,608
		300,200	546,407
Equity			
Accumulated other comprehensive income		(604,880)	(601,800)
Accumulated deficit		(8,404,557)	(8,463,173)
	₩	(9,009,437)	(9,064,973)

46. Financial Statements Restatement, Continued

(b) Details of the impact of the changes above on the Group's consolidated statement of comprehensive loss are as follows:

In millions of Korean won		**Before adjustment**	**After adjustment**
Selling and administrative expenses	₩		
Depreciation		(10,509)	(16,672)
Rent		(14,574)	(6,718)
		(25,083)	(23,390)
Other profit (loss)			
Gain on disposal of property, plant and equipment		43,642	2,130
Gain on foreign currency translation		39,287	39,595
Loss on disposal of property, plant and equipment		(5,419)	(179)
Loss on foreign currency translation		(27,707)	(45,110)
		49,803	(3,564)
Finance income			
Interest income		50,444	50,601
		50,444	50,601
Finance cost			
Interest expense		(392,131)	(401,019)
		(392,131)	(401,019)
Income tax benefit		192,374	194,163

As a result of the accounting changes, the Group's net asset decreased ₩55,536 million and loss for the year increased ₩58,616 million.

OFFERING CIRCULAR

Korea National Oil Corporation

(incorporated with limited liability under the laws of the Republic of Korea)

U.S.$9,000,000,000

Global Medium Term Note Program

This Offering Circular replaces and supersedes the offering circular dated October 10, 2016 describing the Program (as defined below). Any Notes (as defined below) issued under this Program on or after the date of this Offering Circular are issued subject to the provisions described herein. This does not affect any Notes issued prior to the date of this Offering Circular.

Under this U.S.$9,000,000,000 Global Medium Term Note Program (the "Program"), Korea National Oil Corporation (the "Issuer" or the "Company") may from time to time issue notes (the "Notes") denominated in any currency agreed between the Issuer and the relevant Dealer(s) (as defined below).

The Notes may be issued in bearer or registered form (respectively, "Bearer Notes" and "Registered Notes"). The maximum aggregate nominal amount of all Notes from time to time outstanding under the Program will not exceed U.S.$9,000,000,000 (or its equivalent in other currencies calculated as described herein), subject to increase as described herein.

The Notes may be issued on a continuing basis to one or more of the Dealers specified under "Summary of the Program" and any additional Dealer appointed under the Program from time to time by the Issuer (each a "Dealer" and together, the "Dealers"), which appointment may be for a specific issue or on an ongoing basis. References in this Offering Circular to the "relevant Dealer" shall, in the case of an issue of Notes being (or intended to be) subscribed by more than one Dealer, be to all Dealers agreeing to purchase such Notes.

Approval in-principle has been received from the Singapore Exchange Securities Trading Limited (the "Singapore Stock Exchange") in connection with the Program and application will be made for the listing and quotation of Notes that may be issued pursuant to the Program and which are agreed at or prior to the time of issue thereof to be so listed on the Singapore Stock Exchange. Such permission will be granted when such Notes have been admitted for listing and quotation on the Singapore Stock Exchange. Notice of the aggregate nominal amount of Notes, interest (if any) payable in respect of Notes, the issue price of Notes and any other terms and conditions not contained herein that are applicable to each Tranche (as defined under "Terms and Conditions of the Notes") of Notes will be set out in a pricing supplement (the "Pricing Supplement") which, with respect to Notes to be listed on the Singapore Stock Exchange, will be submitted to the Singapore Stock Exchange before the date of listing of the Notes of such Tranche.

The Singapore Stock Exchange assumes no responsibility for the correctness of any of the statements made, opinions expressed or reports contained herein. Approval in-principle from, admission to the Official List of, and the listing and quotation of any Notes on, the Singapore Stock Exchange are not to be taken as an indication of the merits of the Issuer, the Program or the Notes.

The Program provides that the Notes may be listed or admitted to trading on such other or further stock exchange(s) as may be agreed between the Issuer and the relevant Dealer. The Issuer may also issue unlisted Notes.

See "Risk Factors" for a discussion of certain factors to be considered in connection with an investment in the Notes.

The Notes have not been registered under the Securities Act of 1933, as amended (the "Securities Act"), or any state securities laws and, unless so registered, may not be offered or sold, except pursuant to an exemption from, or in a transaction not subject to, the registration requirements of the Securities Act and applicable state securities laws. Accordingly, the Notes will be offered and sold (a) in the United States, only to "qualified institutional buyers" (as defined in Rule 144A under the Securities Act) or to "accredited investors" (as defined in Rule 501(a)(1), (2), (3) or (7) under the Securities Act) that are institutions and (b) in "offshore transactions" to persons other than "U.S. persons" (each as defined in Regulation S under the Securities Act). See "Subscription and Sale and Transfer and Selling Restrictions."

The Issuer may agree with any Dealer that Notes may be issued in a form not contemplated by the Terms and Conditions of the Notes herein, in which event (in the case of Notes intended to be listed on the Singapore Stock Exchange) a supplementary Offering Circular, if appropriate, will be submitted to the Singapore Stock Exchange and made available which will describe the effect of the agreement reached in relation to such Notes.

Arranger

Citigroup

Dealers

BNP PARIBAS	**BofA Merrill Lynch**
Citigroup	**Crédit Agricole CIB**
Credit Suisse	**Deutsche Bank**
Goldman Sachs International	**HSBC**
J.P. Morgan	**The Korea Development Bank**
MUFG	**Société Générale Corporate & Investment Banking**
Standard Chartered Bank	**UBS**

The date of this Offering Circular is 17 March 2017.

The Issuer, having made all reasonable enquiries, confirms that this Offering Circular contains or incorporates all information which is material in the context of the issuance and offering of the Notes, that the information contained or incorporated in this Offering Circular is true and accurate in all material respects and is not misleading in any material respect, that the opinions and intentions expressed in this Offering Circular are honestly held and have been reached after considering all relevant circumstances and are based on reasonable assumptions, and that there are no other facts, the omission of which would, in the context of the issue and offering of the Notes, make this Offering Circular as a whole or any information or the expression of any opinions or intentions expressed in this Offering Circular misleading in any material respect. The Issuer accepts responsibility accordingly. Information provided in this Offering Circular with respect to Korea, its political status and economy has been derived from information published by the Korean government and other public sources, and the Issuer accepts responsibility only for the accurate extraction of information from such sources.

This Offering Circular is to be read in conjunction with all documents that are deemed to be incorporated herein by reference (see “Documents Incorporated by Reference” below). This Offering Circular shall be read and construed on the basis that such documents are incorporated and form part of this Offering Circular.

No representation, warranty or undertaking, express or implied, is made and no responsibility or liability is accepted by the Dealers as to the accuracy or completeness of the information contained or incorporated in this Offering Circular or any other information provided by the Issuer in connection with the Program. No Dealer accepts any responsibility or liability in relation to the information contained or incorporated by reference in this Offering Circular or any other information provided or statement made or purported to be made by the Issuer or a Dealer on its behalf in connection with the Program, the Issuer or the issue and offering of the Notes. The Dealers accordingly disclaim all and any liability whether arising in tort or contract or otherwise which it might otherwise have in respect of this Offering Circular or any such information or statement.

No person is or has been authorized by the Issuer to give any information or to make any representation not contained in or not consistent with this Offering Circular or any other information supplied in connection with the Program or the Notes and, if given or made, such information or representation must not be relied upon as having been authorized by the Issuer or any of the Dealers.

Neither this Offering Circular nor any other information supplied in connection with the Program or any Notes (a) is intended to provide the basis of any credit or other evaluation or (b) should be considered as a recommendation by the Issuer or any of the Dealers that any recipient of this Offering Circular or any other information supplied in connection with the Program or any Notes should purchase any Notes. Each investor contemplating purchasing any Notes should make its own independent investigation of the financial condition and affairs, and its own appraisal of the creditworthiness, of the Issuer. Neither this Offering Circular nor any other information supplied in connection with the Program or the issue of any Notes constitutes an offer or invitation by or on behalf of the Issuer or any of the Dealers to any person to subscribe for or to purchase any Notes.

Neither the delivery of this Offering Circular nor the offering, sale or delivery of any Notes shall in any circumstances imply that the information contained herein concerning the Issuer is correct at any time subsequent to the date hereof or that any other information supplied in connection with the Program is correct as of any time subsequent to the date indicated in the document containing the same. The Dealers expressly do not undertake to review the financial condition or affairs of the Issuer during the life of the Program or to advise any investor in the Notes of any information coming to their attention. Investors should review, inter alia, the most recently published documents incorporated by reference into this Offering Circular when deciding whether or not to purchase any Notes.

The Notes in bearer form are subject to U.S. tax law requirements and may not be offered, sold or delivered within the United States or its territories or to United States persons, except in certain transactions permitted by U.S. tax regulations. Terms used in this paragraph have the meanings given to them by the U.S. Internal Revenue Code and the regulations promulgated thereunder.

This Offering Circular does not constitute an offer to sell or the solicitation of an offer to buy any Notes in any jurisdiction to any person to whom it is unlawful to make the offer or solicitation in such jurisdiction. The distribution of this Offering Circular and the offer or sale of the Notes may be restricted by law in certain jurisdictions. The Issuer and the Dealers do not represent that this Offering Circular may be lawfully distributed, or that any Notes may be lawfully offered, in compliance with any applicable registration or other requirements in any such jurisdiction, or pursuant to an exemption available thereunder, or assume any responsibility for facilitating any such distribution or offering. In particular, no action has been taken by the Issuer or the Dealers that would permit a public offering of any Notes or distribution of this document in any jurisdiction where action for that purpose is required. Accordingly, no Notes may be offered or sold, directly or indirectly, and neither this Offering Circular nor any advertisement or other offering material may be distributed or published in any jurisdiction, except under circumstances that will result in compliance with any applicable laws and regulations.

Persons into whose possession this Offering Circular or any Notes may come must inform themselves about, and observe, any such restrictions on the distribution of this Offering Circular and the offering and sale of the Notes. In particular, there are restrictions on the distribution of this Offering Circular and the offer or sale of Notes in the United States of America, the European Economic Area (the "EEA"), the United Kingdom, Japan, Hong Kong, Singapore and Korea. See "Subscription and Sale and Transfer and Selling Restrictions."

In making an investment decision, investors must rely on their own examination of the Issuer and the terms of the Notes being offered, including the merits and risks involved. The Notes have not been approved or disapproved by the United States Securities and Exchange Commission (the "SEC") or any other securities commission or other regulatory authority in the United States, nor have the foregoing authorities approved this Offering Circular or confirmed the accuracy or determined the adequacy of the information contained in this Offering Circular. Any representation to the contrary is unlawful.

This Offering Circular has been prepared on the basis that, except to the extent sub-paragraph (ii) below may apply, any offer of Notes in any Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State") will be made pursuant to an exemption under the Prospectus Directive, as implemented in that Relevant Member State, from the requirement to publish a prospectus for offers of Notes. Accordingly any person making or intending to make an offer in that Relevant Member State of Notes which are the subject of an offering contemplated in this Offering Circular as completed by final terms in relation to the offer of those Notes may only do so (i) in circumstances in which no obligation arises for the Issuer or any Dealer to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive, in each case, in relation to such offer, or (ii) if a prospectus for such offer has been approved by the competent authority in that Relevant Member State or, where appropriate, approved in another Relevant Member State and notified to the competent authority in that Relevant Member State and (in either case) published, all in accordance with the Prospectus Directive, provided that any such prospectus has subsequently been completed by final terms which specify that offers may be made other than pursuant to Article 3(2) of the Prospectus Directive in that Relevant Member State and such offer is made in the period beginning and ending on the dates specified for such purpose in such prospectus or final terms, as applicable, and the Issuer has consented in writing to its use for the purpose of such offer. Except to the extent sub-paragraph (ii) above may apply, neither the Issuer nor any Dealer have authorized, nor do they authorize, the making of any offer of Notes in circumstances in which an obligation arises for the Issuer or any Dealer to publish or supplement a prospectus for such offer.

For the purposes of the foregoing paragraph, the expression "Prospectus Directive" means Directive 2003/71/EC (as amended, including by Directive 2010/73/EU), and includes any relevant implementing measure in each Relevant Member State.

This Offering Circular is only being distributed to and is only directed at (i) persons who are outside the United Kingdom or (ii) investment professionals falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (the "Order") or (iii) high net worth entities, and other persons to whom it may lawfully be communicated, falling within Article 49(2)(a) to (d) of the Order (all such persons together being referred to as "relevant persons"). The Notes will only be available to, and any invitation, offer or agreement to subscribe, purchase or otherwise acquire such Notes will be engaged in only with, relevant persons. Any person who is not a relevant person should not act or rely on this Offering Circular or any of its contents.

None of the Dealers or the Issuer makes any representation to any investor regarding the legality of its investment in the Notes under any applicable laws. The contents of this Offering Circular should not be construed as providing legal, business, accounting or tax advice. Any investor should be able to bear the economic risk of an investment in the Notes for an indefinite period of time.

U.S. INFORMATION

This Offering Circular is being submitted on a confidential basis in the United States to a limited number of QIBs or Institutional Accredited Investors (each as defined under "Form of the Notes") for informational use solely in connection with the consideration of the purchase of the Notes being offered hereby. Its use for any other purpose in the United States is not authorized. It may not be copied or reproduced in whole or in part nor may it be distributed or any of its contents disclosed to anyone other than the prospective investors to whom it is originally submitted.

The Registered Notes may be offered or sold within the United States only to QIBs or to Institutional Accredited Investors, in either case in transactions exempt from registration under the Securities Act. Each U.S. purchaser of the Registered Notes is hereby notified that the offer and sale of any Registered Notes to it may be being made in reliance upon the exemption from the registration requirements of the Securities Act provided by Rule 144A under the Securities Act ("Rule 144A").

Purchasers of the Definitive IAI Registered Notes will be required to execute and deliver an IAI Investment Letter (each as defined under "Terms and Conditions of the Notes"). Each purchaser or holder of the Definitive IAI Registered Notes, the Notes represented by a Rule 144A Global Note (as defined below) or any Notes issued in registered form in exchange or substitution therefor (together "Legended Notes") will be deemed, by its acceptance or purchase of any such Legended Notes, to have made certain representations and agreements intended to restrict the resale or other transfer of such Notes as set out in "Subscription and Sale and Transfer and Selling Restrictions." Unless otherwise stated, terms used in this paragraph have the meanings given to them in "Form of the Notes."

AVAILABLE INFORMATION

To permit compliance with Rule 144A in connection with any resales or other transfers of Notes that are "restricted securities" within the meaning of the Securities Act, the Issuer has undertaken in a deed poll dated April 1, 2016 (the "Deed Poll") to furnish, upon the request of a holder of such Notes or any beneficial interest therein, free of charge at the specified offices of the Paying Agents, to such holder or to a prospective purchaser designated by him, the information required to be delivered under Rule 144A(d)(4) under the Securities Act if, at the time of the request, the Issuer is neither a reporting company under Section 13 or 15(d) of the U.S. Securities Exchange Act of 1934, as amended (the "Exchange Act"), nor exempt from reporting pursuant to Rule 12g3-2(b) thereunder.

PRESENTATION OF FINANCIAL INFORMATION

The Issuer maintains its financial books and records and prepares its financial statements in accordance with the Korean International Financial Reporting Standards ("Korean IFRS") and uses the dollar as its functional currency and the Won as its presentation currency in accordance with Korean IFRS. Investors should be cautioned that Korean IFRS differs in certain respects from generally accepted accounting principles in other countries, including generally accepted accounting principles in the United States ("U.S. GAAP"). The Issuer has made no attempt to identify or quantify the impact of differences between Korean IFRS and U.S. GAAP. See "Risk Factors — Risks Relating to Korea — There are special risks involved with investing in securities of Korean companies, including the possibility of restrictions being imposed by the government in emergency circumstances as well as accounting and corporate disclosure standards that differ from those in other jurisdictions."

The audited consolidated financial statements of the Issuer as of and for the years ended December 31, 2014, 2015 and 2016 contained in this Offering Circular have been presented in accordance with Korean IFRS.

All financial and other information in the Offering Circular regarding the Issuer's activities, financial condition and results of operations are, unless otherwise indicated or required by context, presented on a consolidated basis.

In November 2014, the Company disposed of North Atlantic Refining Limited, which held the Company's downstream operations and related assets, for cash considerations of approximately Won 67 billion and classified all income and expenses relating to the downstream operations as discontinued operations for the year ended December 31, 2014. See Note 37 to the Company's audited consolidated financial statements as of and for the years ended December 31, 2015 and 2014 included in this Offering Circular.

PRESENTATION OF RESERVES DATA

The determination of oil and natural gas reserves involves the preparation of estimates that have an inherent degree of associated uncertainty. Categories of proved and probable reserves have been established to reflect the level of these uncertainties and to provide an indication of the probability of recovery. The estimation and classification of reserves requires the application of professional judgment combined with geological and engineering knowledge to assess whether or not specific reserves classification criteria have been satisfied. Knowledge of concepts including uncertainty and risk, probability and statistics, and deterministic and probabilistic estimation methods is required to properly use and apply reserves definitions.

The crude oil and natural gas reserve estimates presented herein with respect to the oil and gas fields of the Company have been measured in accordance with the guidelines of the respective jurisdictions in which the fields are located.

The crude oil and natural gas reserve estimates of Harvest Operations presented herein are based on the guidelines contained in the Canadian Oil and Gas Evaluation Handbook (the "COGE Handbook") and the reserve definitions contained in both National Instrument 51-101 — *Standards of Disclosure for Oil and Gas Activities* ("NI 51-101") and the COGE Handbook. The crude oil and natural gas reserves estimates presented herein in respect of Harvest Operations are based on reports prepared by GLJ Petroleum Consultants Ltd. (the "Independent Reserves Evaluators") for the years ended December 31, 2014, 2015 and 2016.

"Proved reserves" generally mean those estimated quantities which geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions as of the date the estimate is made. "Proved developed reserves" generally mean those reserves that are expected to be recovered through existing wells with existing equipment and operating methods. "Proved undeveloped reserves" generally mean those reserves that are expected to be recovered from new wells on undrilled acreage or from existing wells where a relatively major expenditure is required for recompletion. However, such definitions may vary according to the applicable guidelines of the respective jurisdictions in which the fields are located.

Disclosure provided herein in respect of barrel of oil equivalent ("BOE") should be understood as follows. A BOE conversion ratio of 6 million cubic feet: 1 barrel is based on an energy equivalency conversion method primarily applicable at the burner tip and does not represent a value equivalency at the wellhead. Given the value ratio based on the current price of crude oil as compared to natural gas is significantly different from the energy equivalency of 6:1, utilizing a conversion ratio at 6:1 may be misleading as an indication of value.

CERTAIN DEFINED TERMS AND CONVENTIONS

All references to "Korea" and the "Republic" contained in this Offering Circular shall mean The Republic of Korea. All references to the "Government" shall mean the government of Korea. All references to the "Issuer", "Company" or "KNOC" shall mean Korea National Oil Corporation, a statutory juridical entity established under the Korea National Oil Corporation Act of 1978, as amended (the "KNOC Act"), or Korea National Oil Corporation and its consolidated subsidiaries collectively, as required or as indicated by context. All references to "U.S." shall mean the United States of America. In this Offering Circular, all references to "Won" or "W" are to the lawful currency of Korea, all references to "dollars," "$", "U.S.$" or "US$" are to the lawful currency of the United States of America (the "U.S." or the "United States"), all references to "S$" are to the lawful currency of Singapore, all references to "Japanese Yen" are to the lawful currency of Japan, all references to "Chinese Renminbi" are to the lawful currency of the People's Republic of China, all references to "euro" or "€" are to the lawful currency of the European Union, all references to "British Pounds", "£" or "GBP" are to the lawful currency of the United Kingdom, all references to "Swiss Franc" or "CHF" are to the lawful currency of Swiss Confederation, all references to "Hong Kong dollars" or "HKD" are to the lawful currency of Hong Kong Special Administrative Region of the People's Republic of China, all references to "Canadian dollars", "C$" or "CAD" are to the lawful currency of Canada and all references to "Norwegian Krone" or "NOK" are to the lawful currency of Norway. For the reader's convenience, certain Won amounts in this Offering Circular have been translated into dollars at the market average exchange rate, announced by Seoul Money Brokerage Services, Ltd. in Seoul, between Won and dollars, rounded to the nearest tenth of one Won (the "Market Average Exchange Rate"). Unless otherwise stated, the translations of Won into dollars have been made at the Market Average Exchange Rate in effect on December 31, 2016, which was Won 1,208.5 to US$1.00. For a discussion of historical information regarding the rate of exchange between the Won and the dollar, see "Exchange Rates." No representation is made that the Won or dollar amounts referred to in this Offering Circular could have been or could be converted into dollars or Won, as the case may be, at any particular rate or at all.

Any discrepancies in any table between totals and the sums of the amounts listed are due to rounding.

SERVICE OF PROCESS AND ENFORCEMENT OF CIVIL LIABILITIES

The Issuer is a statutory juridical entity established in Korea pursuant to the KNOC Act. All of the Issuer's directors and officers and certain other persons named in this Offering Circular reside in Korea, and all or a significant portion of the assets of the directors and officers and certain other persons named in this Offering Circular and, substantial part of the Issuer's assets are located in Korea. As a result, it may not be possible for you to effect service of process within the United States upon such persons or to enforce against them or against the Issuer in U.S. courts judgments predicated upon the civil liability provisions of the federal securities laws of the United States. There is doubt as to the enforceability in Korea, either in original actions or in actions for enforcement of judgments of U.S. courts, of civil liabilities predicated on the U.S. federal securities laws.

FORWARD-LOOKING STATEMENTS

This Offering Circular contains certain "forward-looking statements" that are based on the Issuer's current expectations, assumptions, estimates and projections about the Issuer and the oil industry. The forward looking statements are subject to various risks and uncertainties. Generally, these forward-looking statements can be identified by the use of forward-looking terminology such as "anticipate", "believe", "estimate", "expect", "intend", "target", "seek", "aim", "contemplate", "project", "plan", "goal", "should" and similar expressions or the negatives thereof. Those statements include, among other things, the discussions of the Issuer's business strategy and expectations concerning its market position, future operations, cash flows, margins, profitability, liquidity and capital resources. Reliance on any forward-looking statement involves risks and uncertainties, and although the Issuer believes that the assumptions on which the forward-looking statements are based are reasonable, any of those assumptions could prove to be inaccurate, and, as a result, the forward-looking statements based on those assumptions could be incorrect. The uncertainties in this regard include, but are not limited to, those identified in the risk factors discussed elsewhere in this Offering Circular. See the section entitled "Risk Factors" in this Offering Circular. In light of these and other uncertainties, you should not conclude that the Issuer will necessarily achieve any plans and objectives or projected financial results referred to in any of the forward-looking statements. The Issuer does not undertake to release the results of any revisions of these forward-looking statements to reflect future events or circumstances, except as required by law.

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In connection with the issue and distribution of any Tranche of Notes, the Dealer(s) (if any) named as the Stabilizing Manager(s) (or persons acting on behalf of any Stabilizing Manager(s)) in the applicable Pricing Supplement may, subject to all applicable laws and regulations, over-allot the Notes or effect transactions with a view to supporting the market price of the Notes of a Series (as defined below) of which such Tranche forms a part at a level higher than that which might otherwise prevail for a limited period after the issue date. However, there may be no obligation on the Stabilizing Manager(s) (or persons acting on behalf of any Stabilizing Manager(s)) to undertake any stabilizing action. Such stabilizing, if commenced, may be discontinued at any time, and must be brought to an end after a limited period.

DOCUMENTS INCORPORATED BY REFERENCE

The following documents published or issued from time to time after the date hereof shall be deemed to be incorporated into, and to form part of, this Offering Circular:

(a) the most recently published audited consolidated annual financial statements and, if published later, the most recently published interim consolidated financial statements of the Issuer from time to time (see "General Information" for a description of the financial statements currently published by the Issuer); and

(b) all supplements or amendments to this Offering Circular circulated by the Issuer from time to time,

save that any statement contained herein or in a document which is deemed to be incorporated by reference herein shall be deemed to be modified or superseded for the purpose of this Offering Circular to the extent that a statement contained in any such subsequent document which is deemed to be incorporated by reference herein modifies or supersedes such earlier statement (whether expressly, by implication or otherwise). Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Offering Circular.

The Issuer will provide, without charge, to each person to whom a copy of this Offering Circular has been delivered, upon the request of such person, a copy of any or all of the documents deemed to be incorporated herein by reference unless such documents have been modified or superseded as specified above. Requests for such documents should be directed to the Issuer at its office set out at the end of this Offering Circular. In addition, such documents will be available from the principal office of Citibank N.A., London Branch (the "Principal Paying Agent") for any Notes listed on the Singapore Stock Exchange.

The Issuer will, in connection with the listing of the Notes on the Singapore Stock Exchange, so long as the rules of the Singapore Stock Exchange so require, in the event of any material change which is not reflected in this Offering Circular, prepare a supplement to this Offering Circular or publish a new Offering Circular for use in connection with any subsequent issue of the Notes to be listed on the Singapore Stock Exchange.

If the terms of the Program are modified or amended in a manner that would make this Offering Circular, as so modified or amended, inaccurate or misleading, a new offering circular will be prepared.

GENERAL DESCRIPTION OF THE PROGRAM

Under the Program, the Issuer may from time to time issue Notes denominated in any currency, subject as set out herein. A summary of the terms and conditions of the Program and the Notes appears below. The applicable terms of any Notes will be agreed between the Issuer and the relevant Dealer prior to the issue of the Notes and will be set out in the terms and conditions of the Notes endorsed on, attached to, or incorporated by reference into, the Notes, as modified and supplemented by the applicable Pricing Supplement attached to, or endorsed on, such Notes, as more fully described under "Form of the Notes" below.

This Offering Circular and any supplement will only be valid for the offering of Notes during the period of 12 months from the date of this Offering Circular in an aggregate nominal amount of the Notes which, when added to the aggregate nominal amount then outstanding of all Notes previously or simultaneously issued under the Program, does not exceed U.S.$9,000,000,000 or its equivalent in other currencies. For the purpose of calculating the U.S. dollar equivalent of the aggregate nominal amount of Notes issued under the Program from time to time:

(a) the U.S. dollar equivalent of Notes denominated in another Specified Currency (as specified in the applicable Pricing Supplement in relation to the relevant Notes, described under "Form of the Notes") shall be determined, at the discretion of the Issuer, either as of the date on which agreement is reached for the issue of Notes or on the preceding day on which commercial banks and foreign exchange markets are open for business in London, in each case on the basis of the spot rate for the sale of the U.S. dollar against the purchase of such Specified Currency in the London foreign exchange market quoted by any leading international bank selected by the Issuer on the relevant day of calculation;

(b) the U.S. dollar equivalent of Dual Currency Notes, Index Linked Notes and Partly Paid Notes (each as specified in the applicable Pricing Supplement in relation to the relevant Notes, described under "Form of the Notes") shall be calculated in the manner specified above by reference to the original nominal amount on issue of such Notes (in the case of Partly Paid Notes, regardless of the subscription price paid); and

(c) the U.S. dollar equivalent of Zero Coupon Notes (as specified in the applicable Pricing Supplement in relation to the relevant Notes, described under "Form of the Notes") and other Notes issued at a discount or a premium shall be calculated in the manner specified above by reference to the net proceeds received by the Issuer for the relevant issue.

SUMMARY OF THE PROGRAM

The following summary does not purport to be complete and is taken from, and is qualified in its entirety by, the remainder of this Offering Circular and, in relation to the terms and conditions of any particular Tranche of Notes, the applicable Pricing Supplement. Words and expressions defined in "Form of the Notes" and "Terms and Conditions of the Notes" below shall have the same meanings in this summary.

Issuer	Korea National Oil Corporation
Description	Global Medium Term Note Program.
Arranger	Citigroup Global Markets Inc.
Dealers	BNP Paribas, Citigroup Global Markets Inc., Crédit Agricóle Corporate and Investment Bank, Credit Suisse Securities (Europe) Limited, Deutsche Bank AG, Singapore Branch, Goldman Sachs International, The Hongkong and Shanghai Banking Corporation Limited, J.P. Morgan Securities plc, The Korea Development Bank, Merrill Lynch International, MUFG Securities EMEA plc, Société Générale, Standard Chartered Bank, UBS AG, Hong Kong Branch and any other Dealers appointed in accordance with the Program Agreement.
Certain Restrictions	Each issue of Notes denominated in a currency in respect of which particular laws, guidelines, regulations, restrictions or reporting requirements apply will only be issued in circumstances which comply with such laws, guidelines, regulations, restrictions or reporting requirements from time to time (see "Subscription and Sale and Transfer and Selling Restrictions") including the following restrictions applicable at the date of this Offering Circular. **Notes with a maturity of less than one year:** Notes having a maturity of less than one year from the date of issue will, if the proceeds of the issue are accepted in the United Kingdom, constitute deposits for the purposes of the prohibition on accepting deposits contained in section 19 of the Financial Services and Markets Act 2000 unless they are issued to a limited class of professional investors and have a denomination of at least £100,000 or its equivalent. See "Subscription and Sale and Transfer and Selling Restrictions."
Issuing and Principal Paying Agent	Citibank, N.A., London Branch
Registrar	Citibank, N.A., London Branch
Program Size	Up to U.S.$9,000,000,000 (or its equivalent in other currencies calculated as described under "General Description of the Program") outstanding at any time. The Issuer may increase the amount of the Program in accordance with the terms of the Program Agreement.
Distribution	Notes may be distributed by way of private or public placement and in each case on a syndicated or non-syndicated basis.
Currencies	Subject to any applicable legal or regulatory restrictions, any currency agreed between the Issuer and the relevant Dealer.

Redenomination	The applicable Pricing Supplement may provide that certain Notes may be redenominated in euro. The relevant provisions applicable to any such redenomination are contained in Condition 5.
Maturities	Such maturities as may be agreed between the Issuer and the relevant Dealer, subject to such minimum or maximum maturities as may be allowed or required from time to time by the relevant central bank (or equivalent body) or any laws or regulations applicable to the Issuer or the relevant Specified Currency.
Issue Price	Notes may be issued on a fully paid or a partly paid basis and at an issue price which is at par or at a discount to, or premium over, par.
Form of Notes	The Notes will be issued in registered form or in bearer form as described in "Form of the Notes." Registered Notes will not be exchangeable for Bearer Notes and vice versa.
Fixed Rate Notes	Fixed interest will be payable on such date or dates as may be agreed between the Issuer and the relevant Dealer and on redemption, and will be calculated on the basis of such Day Count Fraction (as defined in "Terms and Conditions of the Notes") as may be agreed between the Issuer and the relevant Dealer.
Floating Rate Notes	Floating Rate Notes will bear interest at a rate determined: (i) on the same basis as the floating rate under a notional interest rate swap transaction in the relevant Specified Currency governed by an agreement incorporating the 2006 ISDA Definitions (as published by the International Swaps and Derivatives Association, Inc., and as amended and updated as at the Issue Date of the first Tranche of Notes of the relevant Series); or (ii) on the basis of a reference rate appearing on the agreed screen page of a commercial quotation service; or (iii) on such other basis as may be agreed between the Issuer and the relevant Dealer, all as indicated in the applicable Pricing Supplement. The margin (if any) relating to such floating rate will be agreed between the Issuer and the relevant Dealer for each Series (as defined under "Terms and Conditions of the Notes") of Floating Rate Notes.
Index Linked Notes	Payments of principal in respect of Index Linked Redemption Notes or of interest in respect of Index Linked Interest Notes will be calculated by reference to such index and/or formula or to changes in the prices of securities or commodities or to such other factors as the Issuer and the relevant Dealer may agree.
Other provisions in relation to Floating Rate Notes and Index Linked Interest Notes	Floating Rate Notes and Index Linked Interest Notes may also have a maximum interest rate, a minimum interest rate or both. Interest on Floating Rate Notes and Index Linked Interest Notes in respect of each Interest Period, as agreed prior to issue by the Issuer and the relevant Dealer, will be payable on such Interest Payment Dates, and will be calculated on the basis of such Day Count Fraction, as may be agreed between the Issuer and the relevant Dealer.

Dual Currency Notes	Payments (whether in respect of principal or interest and whether at maturity or otherwise) in respect of Dual Currency Notes will be made in such currencies, and based on such rates of exchange, as the Issuer and the relevant Dealer may agree.
Zero Coupon Notes	Zero Coupon Notes will be offered and sold at a discount to their nominal amount and will not bear interest other than in the case of late payment.
Change of Control	Upon the occurrence of a Change of Control, each holder of Notes will have the right to require the Issuer to redeem all or any part of such holder's Notes at a redemption price equal to 100% of the principal amount thereof plus accrued but unpaid interest, if any, to the date of redemption, as further described in Condition 8(d)(i).
Redemption	The applicable Pricing Supplement will indicate either that the relevant Notes cannot be redeemed prior to their stated maturity (other than in specified installments, if applicable, or for taxation reasons or following an Event of Default (as defined in "Terms and Conditions of the Notes"), or that such Notes will be redeemable at the option of the Issuer and/or the Noteholders (as defined in "Terms and Conditions of the Notes") upon giving notice to the Issuer or the Noteholders, as the case may be, on a date or dates specified prior to such stated maturity and at a price or prices and on such other terms as may be agreed between the Issuer and the relevant Dealer. The applicable Pricing Supplement may provide that the Notes may be redeemable in two or more installments of such amounts and on such dates as are indicated in the applicable Pricing Supplement.
Denomination of Notes	The Notes will be issued in such denominations as may be agreed between the Issuer and the relevant Dealer save that the minimum denomination of each Note will be such as may be allowed or required from time to time by the relevant central bank (or equivalent body) or any laws or regulations applicable to the relevant Specified Currency. Unless otherwise stated in the applicable Pricing Supplement, the minimum denomination of each Definitive IAI Registered Note will be U.S.$500,000 or its approximate equivalent in other Specified Currencies.
Taxation	All payments in respect of the Notes will be made without deduction for or on account of withholding taxes imposed by any Tax Jurisdiction (as defined in "Terms and Conditions of the Notes"), subject as provided in Condition 9. In the event that any such deduction is made, the Issuer will, save in certain limited circumstances provided in Condition 9, be required to pay additional amounts to cover the amounts so deducted.
Certain Covenants	The terms of the Notes will contain a negative pledge provision and certain other covenants, as further described in Condition 4.
Cross Default	The terms of the Notes will contain a cross default provision as further described in Condition 11.
Status of the Notes	The Notes and any related Receipts (as defined in "Terms and Conditions of the Notes") and Coupons (as defined in "Terms and

	Conditions of the Notes") will constitute direct, unconditional, unsubordinated and, subject to the provisions of Condition 4, unsecured obligations of the Issuer and will rank pari passu among themselves (save for certain obligations preferred by law) and equally with all other unsecured and unsubordinated obligations of the Issuer, from time to time outstanding.
Listing	Approval in-principle has been received from the Singapore Stock Exchange in connection with the Program and application will be made for the listing and quotation of Notes that may be issued pursuant to the Program and which are agreed at or prior to the time of issue thereof to be so listed on the Singapore Stock Exchange. Such permission will be granted when such Notes have been admitted for listing and quotation on the Singapore Stock Exchange. For so long as any Notes are listed on the Singapore Stock Exchange and the rules of the Singapore Stock Exchange so require, such Notes will be traded on the Singapore Stock Exchange in a minimum board lot size of S$200,000 (or its equivalent in other specified currencies). The Notes may also be listed on such other or further stock exchange(s) as may be agreed between the Issuer and the relevant Dealer in relation to each Series. Unlisted Notes may also be issued. The applicable Pricing Supplement will state whether or not the relevant Notes are to be listed or admitted to trading and, if so, on which stock exchange(s).
Governing Law	The Notes will be governed by, and construed in accordance with, English law.
Selling Restrictions	There are restrictions on the offer, sale and transfer of the Notes in the United States of America, the European Economic Area (the "EEA"), the United Kingdom, Japan, Hong Kong, Singapore and Korea and such other restrictions as may be required in connection with the offering and sale of a particular Tranche of Notes. See "Subscription and Sale and Transfer and Selling Restrictions."

RISK FACTORS

Investing in the Notes involves risks and uncertainties. Prospective purchasers of the Notes are advised to review carefully all of the information contained elsewhere in, or incorporated by reference into, this Offering Circular and should consider, in particular, the following risk factors before purchasing the Notes. The risks described below are not the only ones that may be relevant to the Company or the Notes. Additional risks not currently known to the Company or those which the Company believes are immaterial may also impair its business operations.

Risks Relating to the Company

The Company's operations are affected by the volatility of prices for crude oil, natural gas and petroleum products and price differentials between heavy and light oil, and a substantial or extended decline or fluctuations in such prices or differentials would have a material adverse effect on the Company's business, financial condition and results of operations.

International crude oil, natural gas and petroleum product prices are subject to global supply and demand, and fluctuate due to many factors beyond the Company's control. These factors include competition within the oil and natural gas industry and with other industries in supplying consumers with competing commodities, international economic trends, exchange rate and interest rate fluctuations, expectations of inflation, domestic and foreign governmental regulations, concerns regarding the security of energy supply, political and other events in major oil and gas producing and consuming nations and actions taken by members of the Organization of the Petroleum Exporting Countries ("OPEC") and other oil exporting countries.

The prices of oil and natural gas have fluctuated greatly during the recent period of volatility in the global credit and financial markets. For example, the Company's average sales prices for crude oil were US$83.72, US$45.05 and US$35.78 per barrel in 2014, 2015 and 2016, respectively.

Furthermore, the financial condition and results of operations of Harvest Operations Corp. ("Harvest Operations"), the Company's wholly-owned subsidiary acquired in December 2009, is also affected by the price differentials between light oil and heavy oil. For 2016, Harvest Operations' production was approximately 17% light and medium gravity crude oil, 29% heavy oil, 11% natural gas liquids and 43% natural gas. Processing and refining heavy oil is more expensive than processing and refining light oil and accordingly, producers of heavy oil receive lower prices than light oil for their production. The price differential between light oil and heavy oil has fluctuated widely during recent years, and has resulted in substantial increase in the volatility of heavy oil prices. An increase in the heavy oil price differential, normally caused by seasonal supply and demand, pipeline constraints and heavy oil processing capacities of refineries, all of which are beyond the control of Harvest Operations, usually results in Harvest Operations receiving lower prices for its heavy oil.

It is impossible to accurately predict future crude oil, natural gas or petroleum product price movements or price differentials between heavy and light oil. Accordingly, crude oil and natural gas prices may not remain at, and may vary significantly from, their current levels. When international crude oil and natural gas prices are low, the Company earns less sales revenue, and therefore, earns less income because the Company's production costs remain roughly constant. Conversely, when crude oil and natural gas prices are high, the Company earns more sales revenue and its income increases. As a result, a substantial or extended decline in international crude oil and natural gas prices or price differentials between heavy and light oil would have a material adverse effect on the Company's business, financial condition and results of operations. The Company currently engages in only limited hedging transactions or other derivative trading to reduce the impact of the fluctuations of crude oil or gas prices on its financial condition.

Exploration drilling involves numerous risks, including risks that the Company will encounter no commercially productive crude oil or natural gas reserves.

The Company is currently involved in exploration activities in various geographic areas, including in some areas where natural conditions may be challenging and where the costs of such exploration activities may be high. As a result, the Company may incur cost overruns or may be required to curtail, delay or cancel drilling operations because of many factors, including, but not limited to, the following:

- unexpected drilling conditions;
- pressure or irregularities in geological formations;
- equipment failures or accidents;
- adverse weather conditions and natural disasters;
- compliance with environmental regulation;
- governmental requirements and standards; or
- delays in the availability of drillships and delivery and maintenance of equipment.

If the Company fails to conduct successful exploration activities or to acquire or retain assets holding proved reserves, its proved reserves will decline as it extracts crude oil and natural gas from the reservoirs. In addition, the volume of production from crude oil and natural gas properties generally decline as reserves are depleted. For example, the Company discontinued its exploration activities in the Zhambyl Block in Kazakhstan in December 2016, Block 2B in Malaysia in September 2016, Sangaw South Block in the Kurdistan autonomous region in Iraq in July 2016 and in the Namangan/Chust Block in Uzbekistan in April 2016 due to its determination that the areas did not contain economically viable drilling wells. The Company is currently evaluating other potential exploratory projects. The Company's future production depends significantly upon its success in finding or acquiring additional reserves and retaining and developing such reserves. If the Company is unsuccessful, it may not meet its production or growth targets, and its total proved reserves and production will decline, which would adversely affect the Company's results of operations and financial condition.

The Company's exploration, development and production activities require substantial expenditure and investments, and the Company's plans for, and its ability to make, such expenditures and investments are subject to various risks.

Exploring, developing and producing crude oil and natural gas fields are capital-intensive activities with high risks. The Company incurred capital expenditures (consisting of cash used for acquisitions of (1) property, plant and equipment, (2) intangible assets other than goodwill and (3) investments in associates and joint ventures) of Won 2,891 billion for 2014, Won 1,583 billion for 2015 and Won 727 billion for 2016. The Company's capital expenditure budget for 2017 for its exploration, development and production activities is approximately Won 811 billion on a consolidated basis, which represents a decrease from its 2016 budget of Won 1,145 billion due to expectations of decreased acquisition activities during 2017.

The Company's ability to carry out its exploration, development and production activities and make the necessary capital expenditures and investments is subject to many risks, contingencies and other uncertainties, which may prevent the Company from achieving its desired results, or which may significantly increase the expenditures and investments that the Company makes, including, but not limited to, the following:

- the Company's ability to generate sufficient cash flows from operations to finance its expenditures, investments and other requirements, which are affected by changes in crude oil and natural gas prices and other factors;
- the availability and terms of external financing;
- the Company's mix of exploration and development activities conducted on an independent basis and those conducted jointly with other partners;
- the extent to which the Company's ability to influence or adjust plans for exploration- and development-related expenditures is limited under joint operating agreements for those projects in which the Company has partners;

- government approvals required for exploration- and development-related expenditures and investments in jurisdictions in which the Company conducts its business; and
- economic, political and other conditions in jurisdictions in which the Company conducts its business.

If future oil and gas prices are forecasted to decline substantially, the Company may be required to write down the book value of its assets, which may have a material adverse effect on the Company's business, financial condition and results of operations.

The Company reviews its assets at the end of each reporting period to determine whether there is any indication of impairment. If any such indication exists, the Company estimates the recoverable amount of the relevant assets. The recoverable amount of an asset is the greater of its value in use, which is the estimated future net cash flow expected to be generated by the asset adjusted by a discount rate that reflects current market assessments of the time value of money and the risks specific to the asset, and its fair value less costs to sell. If the book value exceeds the recoverable amount of an asset, an impairment loss will be recognized and the book value of such asset will be adjusted to their recoverable amount.

The Company estimates the future net cash flows of its assets based on long-term forecasts from globally recognized research institutions. If such long-term forecasts estimate that oil and gas prices will decrease substantially, the Company may be required to recognize impairment losses on its assets. Likewise, certain of the entities in which the Company has made equity investments may be required to recognize impairment losses on their assets, which may contribute to the recognition of loss in investments in associates and joint ventures and impairment of available-for-sale financial assets by the Company.

The Company recognized impairment losses on its oil and gas properties of Won 776 billion in 2014, Won 2,362 billion in 2015 and Won 434 billion in 2016 and impairment losses on goodwill of Won 457 billion in 2014, Won 559 billion in 2015 and Won 32 billion in 2016 due to significant declines in forecasted future oil and gas prices. Similarly, the Company recognized impairment of available-for-sale financial assets of Won 450 billion in 2015 and Won 46 billion in 2016 primarily due to the impairment of the Company's equity investment in EP Energy, Faroe Petroleum plc and Troika Resource Investment PEF in connection with the recent decline in oil and gas prices, and impairment loss of Won 243 billion in 2015 and Won 117 billion in 2016 from Offshore International Group, Inc. ("OIG"). Such recognition of impairment losses contributed to net losses for the year of Won 1,611 billion in 2014, Won 4,500 billion in 2015 and Won 1,119 billion in 2016.

The Company cannot accurately predict the amount or timing of any impairment of assets. If the Company is required to recognize an impairment loss on a significant portion of its assets, such impairment would have a material adverse effect on the Company's business, financial condition and results of operations

The Company is subject to the control of the Government, and its activities are heavily regulated.

The Company was established under the KNOC Act to, among other policy objectives, secure Korea's supply of crude oil in times of large oil price fluctuations or shortages. From time to time, the Company is required to take action in furtherance of public policy considerations and the Government's broader objectives for the crude oil and natural gas industry, which may not necessarily be in the Company's best commercial interests or the interests of the Noteholders. As of the date of this Offering Circular, the Government holds 100% of the Company's issued share capital. Accordingly, the Government is able to elect the Company's board of directors including the president of the board of directors (the "President"), as well as control its management. Although the Company's management runs the day-to-day operations, the Government may determine material policies relating to the direction of the Company's business. For example, public policy considerations relating to the level of the Company's exploration and production activities or stockpiling activities may affect the Company's results of operations. The Government has historically influenced, and is likely to continue to influence, the Company's strategy and operations. For example, in June 2016, the Ministry of Strategy and Finance and the Ministry of Trade, Industry and Energy announced broad-based measures (the "June 2016 Government Plan") to rationalize the overseas natural resource exploration, development and production activities of government-controlled enterprises, including the Company. According to such improvement measures, the Company is expected to develop and implement a plan for the sale of its interests in overseas exploration, development and production operations, other than core assets (taking into consideration strategic value and profitability), to third parties with preference given to institutional investors in Korea if possible and with an aim to maximize the returns on such sales. The timing of any such sales will be subject to market conditions and the Company will be limited from entering into any new overseas investments other than any such investments that are in furtherance of important policy objectives. In addition, the Ministry of Trade, Industry and Energy announced that it will transfer the responsibility for administrative tasks related to the day-to-day operation of the Special Accounts for Energy and Resources ("SAER") funds and the administration of SAER loans for oil-related projects from the Company to the Korea Energy Agency by the first half of 2017. See "Business — Relationship with the Government."

The Company is also heavily regulated by a variety of laws and government bodies, including the Ministry of Trade, Industry and Energy and the Ministry of Strategy and Finance. The Ministry of Trade, Industry and Energy, among other things, establishes policies relating to crude oil production and stockpiling. In addition, the Company must receive the Ministry of Trade, Industry and Energy's consent in most instances, and in some cases must seek amendments to current laws, to expand its operations into new businesses outside of its core operations. This may cause delays in or cancellations of the Company's plans to expand its core business, which may adversely affect the Company's results of operations and financial condition. See "Regulation."

The crude oil and natural gas reserve estimates in this Offering Circular are only estimates, and may require substantial revisions as a result of future drilling, testing and production, and as such, the Company's actual production, revenues and expenditures may also differ materially from estimates.

This Offering Circular includes estimates made by the Company of the Company's proved crude oil and natural gas reserves. Petroleum engineering is a subjective process of estimating underground accumulations of crude oil and natural gas that cannot be measured in an exact manner. The reliability of the estimates of the value and quantity of economically recoverable crude oil and natural gas reserves, rates of production, and the timing of development expenditures depend upon several variables and assumptions, including but not limited to the following:

- quality and quantity of the technical and economic data used in the estimation process;
- extensive engineering judgments;
- interpretation of geological and geophysical data;
- continuity of current fiscal policy and regulatory regime in the countries where the reserves are located;
- assumptions concerning future crude oil and natural gas prices;
- capital expenditures; and
- assumptions concerning future operating costs, development and production costs and workover and remedial costs.

Many of the factors, assumptions and variables involved in estimating reserves are beyond the Company's control and may prove to be incorrect over time. As a result, the Company's reserve estimates may require substantial upward or downward revisions if subsequent drilling, testing and production reveal different results. Any downward adjustment could indicate lower future production and thus adversely affect the Company's business, financial condition and future prospects.

Any failure to acquire rights to or discover additional crude oil and natural gas reserves that can be developed for commercially viable production or any failure to develop the proved undeveloped reserves in which the Company has invested could adversely affect the Company's business, financial condition and results of operations.

Success of the Company's business depends largely on acquiring rights to or discovering additional crude oil and natural gas reserves that can be developed for commercially viable production. If the acquisition and exploration activities in which the Company participated or which it conducts are not successful, the Company's total proved reserves and future production will decline. In addition, approximately 44.5% of the Company's proved reserves were undeveloped as of December 31, 2016. The Company's future success will also depend on its ability to develop these reserves in a timely and cost-effective manner. If the Company is unable to generate profitable production from such reserves, its business, financial condition and results of operations could be adversely affected.

There are many reasons why the Company may not be able to acquire rights to, or discover crude oil and natural gas reserves, or develop them for commercially viable production, including, but not limited to, the following:

- the Company may be unable to negotiate commercially reasonable terms for such acquisition, exploration, development or production activities;
- the Company may be unable to limit development and production costs because of, for example, adverse weather, natural disasters, environmental considerations, equipment shortages, procurement delays or difficulties arranging transportation for production, all of which may make it uneconomical to proceed with developing such reserves;
- the Company may face difficulties arising from political, environmental and other conditions in the areas where the reserves are located or through which its products are transported or where its products are stored; or
- a partner company on which the Company relies as operator may commit errors or misjudgments, and the Company has limited ability to control day-to-day activities on a project on which it is not the operator.

The Company may encounter problems with its joint overseas exploration and production projects over which it may have limited control, and such problems may adversely affect its business.

Many of the Company's overseas exploration and production projects and other infrastructure projects are conducted with consortium partners or in joint ventures. The Company sometimes lacks a controlling interest in these projects even though the Company sometimes holds the largest interest in the projects among the consortium partners, and may have limited ability to influence or control operations or future developments. Therefore, the Company at times is unable to require that its joint ventures sell assets or return invested capital, make additional capital contributions or take any other action without the vote of at least a majority of its consortium partners. If there are disagreements between the Company and its consortium partners or among the other consortium partners regarding the business and operations of the joint projects, the Company cannot assure you that it will be able to resolve them in a manner that will be in the Company's best interests. Certain major decisions, such as selling or refinancing these projects, may require the consent of all other partners. These limitations may adversely affect the Company's ability to sell, refinance, or otherwise operate and profit from these projects.

In addition, the Company's consortium partners may:

- have economic or business interests or goals that are inconsistent with the Company;
- take actions contrary to the Company's instructions, requests, policies or objectives;
- be unable or unwilling to fulfill their obligations;
- have financial difficulties; or
- have disputes with the Company as to their rights, responsibilities and obligations.

Any of these and other factors may have a material adverse effect on the performance of the Company's joint projects and expose them to a number of risks, including the risk that these projects may not be able to fulfill their obligations under contracts with customers, resulting in disputes not only between the Company and its partners, but also between the joint ventures and their customers. Such a material adverse effect on the performance of the Company's joint projects may in turn materially and adversely affect the Company's results of operations and financial condition.

Failure to implement key elements of the Company's strategy could have a material adverse effect on its business and results of operations.

A major element of the Company's business strategy is to achieve organic growth through exploration activities and pursue selective acquisitions to optimize its asset portfolio. The Company produced approximately 200,633 barrels of oil equivalent of crude oil and natural gas per day as of December 31, 2016, and is targeting to maintain its production at approximately 188,000 barrels per day in 2017. Both the process of drilling new productive wells and acquisition of other companies are affected by many factors beyond the Company's control, and it may not be able to achieve the desired objectives. Where the Company enters into joint ventures with partners in exploration and production projects, the Company may not act as an operator and will need to depend on its partners for their financial commitment and technical expertise. The Company cannot guarantee that its partners will successfully execute the business plans and strategies formulated for the joint ventures.

The ability to meet increasing exploratory and development drilling targets depends to a large extent on the ability to secure access to rigs. Third party rigs are in great demand at a time of limited rig availability, and there can be no guarantee that the Company or the operator of any exploration and development project in which the Company participates will be able to secure access to rigs in a sufficient quantity at a cost effective price to meet drilling targets at acceptable costs, or at all.

If the Company is unable to achieve the expected benefits of acquisitions, including realization of adequate rate of return on prices paid, successful integration of the acquired businesses and/or assets, the Company's business, financial condition and results of operations may be adversely affected.

Success of an acquisition or other similar transactions depends, in part, on the Company's ability to realize adequate return on the prices paid for properties, the anticipated synergies, cost savings and growth opportunities from integrating the business of the acquired company or the asset with its business. See "Management's Discussion and Analysis of Financial Condition and Results of Operations — Major Factors Affecting the Company's Results of Operations — Strategy to Expand Production Levels" for a description of the Company's acquisitions. The prices paid by the Company for acquisitions are based, in part, on engineering and economic assessments made by the Company's engineers. These assessments include a number of material assumptions regarding such factors as recoverability and marketability of crude oil, natural gas and natural gas liquids, future prices of oil, natural gas and natural gas liquids and operating costs, future capital expenditures and royalties and other taxes which will be imposed over the producing life of the reserves. Many of these factors are subject to change and are beyond the Company's control. In particular, the prices of and markets for petroleum and natural gas may change from those anticipated at the time of making acquisitions. In addition, all engineering assessments involve a measure of geological and engineering uncertainty, which could result in lower production and reserves than those attributed to the properties when they were acquired. In 2015, the Company recognized impairment losses on oil and gas properties of Dana Petroleum of Won 1,249 billion and impairment losses on oil and gas properties of Harvest Operations of Won 984 billion as well as impairment losses on goodwill of Dana Petroleum of Won 386 billion and impairment losses on goodwill of Harvest Operations of Won 173 billion for the reasons described above. In 2016, the Company recognized impairment losses on oil and gas properties of Dana Petroleum of Won 51 billion and impairment losses on oil and gas properties of Harvest Operations of Won 17 billion.

Furthermore, the integration of two independent companies is a complex, costly and time-consuming process. The difficulties of combining the operations of two companies include, among others:

- retaining key employees and senior management team;
- lack of experience in managing large operations;
- consolidating corporate and administrative infrastructures;
- preserving important relationships of the companies;
- integrating and managing information technology systems of the companies;

- using the acquired company's liquid capital and other assets efficiently to develop the business of the combined company;
- consolidating research and development operations;
- diverting management's attention from ongoing business concerns;
- coordinating geographically separate organizations; and
- the time required before the benefits of the acquisition are realized.

There can be no assurance that the Company will receive all of the anticipated benefits of any transaction, including recovery of costs paid for properties or companies, or that any of the risks described above will not occur. For example, in November 2014, the Company disposed of North Atlantic Refining Limited, which held the Company's downstream operations and related assets, for cash considerations of approximately Won 67 billion, and recorded Won 338 billion as loss from discontinued operation and Won 54 billion as loss on disposal of discontinued operation for the year ended December 31, 2014. The Company's failure or inability to identify suitable candidates and complete acquisitions, joint ventures or other similar transactions, to raise sufficient capital for the transactions at a commercially reasonable cost and eventually recover such costs, or to receive anticipated benefits of any such transaction could significantly harm its business, financial condition and results of operations.

If the Company is unable to dispose of its non-core assets or reinvest the proceeds of any such disposal, each on acceptable terms, the Company's financial condition and results of operations may be adversely affected.

Pursuant to the June 2016 Government Plan, the Company is expected to develop and implement a plan for the sale of its interests in overseas exploration, development and production operations, other than core assets (taking into consideration strategic value and profitability), to third parties with preference given to institutional investors in Korea if possible and with an aim to maximize the returns on such sales. Although the Company is exploring potential avenues to dispose of certain of its assets, such disposals may require the consent of third parties outside of the Company's control, such as consents of lenders under its borrowings or general partners in connection with the sale of certain of its assets. Any potential transaction would be dependent upon a number of factors that may be beyond the Company's control, including, among other factors, market conditions, industry trends, the interest of third-parties and the availability of financing to potential buyers on reasonable terms. There can be no assurance that the Company will be able to consummate any such transaction on acceptable terms or at all.

Even if the Company is successful in disposing of certain of its assets through a sale or otherwise, the Company may be required to recognize a loss in connection with such disposal if the disposal price of such assets is less than their respective book value. In addition, the Company may not be able to reinvest the proceeds of any disposal on acceptable terms or at all.

The Company's failure to successfully dispose of its non-core assets or to reinvest the proceeds of any such disposal, each on acceptable terms, may have a material adverse effect on the Company's financial condition and results of operations.

Exploring, developing, producing, transporting and stockpiling activities involve numerous risks that may result in accidents and other substantial operating risks and costs, for which the Company may not be fully insured.

The Company is subject to exploration, development, production, equipment, transportation and stockpiling risks that are common among upstream oil and gas companies, including, but not limited to, the following:

- exploration and production risks: risks related to fluctuations in production that may be affected by reserve levels, accidents, mechanical difficulties, work stoppages, adverse natural conditions, such as bad weather, as well as the inability to manage unforeseen production costs;

- equipment risks: risks related to adequacy and condition of the production facilities, including situations where equipment, especially the equipment for stockpiling, becomes obsolete;
- transportation risks: risks related to the condition of pipelines and vulnerability and costs of other modes of transportation, such as oil tankers, for example the leakage of crude oil in April 2011 along a remote section of the Rainbow pipeline owned and operated by Plains Midstream Canada which affected transport of crude oil produced by Harvest Operations in the region; and
- stockpiling risks: risks related to the condition of storage tanks and other stockpiling facilities and their compliance with safety and environmental standards.

In particular, the Company's business is subject to significant risk of pipeline explosions, oil spills and leaks, unexpected geological formations or pressures, sudden blowouts, violent explosions of oil, natural gas or water from drilling wells followed by uncontrolled flow, fires and mechanical failures and collapsed holes, particularly in horizontal wellbores. There can be no assurances that such accidents will not occur.

The occurrence of any of these events could result in the loss of human life, significant damage to property, environmental pollution, impairment of the Company's operations and substantial financial and reputational losses to the Company. For the Company's pipelines, stockpile facilities or production facilities located near populated areas, including residential areas, commercial business centers, industrial sites and other public gathering areas, the potential damage resulting from the occurrence of these events is greater. The Company maintains insurance against certain of these risks and losses in accordance with customary industry practice. However, these insurance policies do not cover all potential liabilities that may result from these risks. The occurrence of any of these events not fully covered by insurance would require the Company to cover the damages with its own funds, thereby reducing its profits, which could have a material adverse effect on the Company's financial condition and results of operations.

The Company is exposed to political, economic, regulatory and legal risks related to countries where it participates in exploration, development and production projects.

The Company currently has operations and assets in various foreign countries and regions, including Iraq, Yemen, Vietnam, Kazakhstan, Libya, Egypt, Nigeria and Peru. The Company is subject to political, legal and regulatory environments in these countries, some of which are known to be unstable, and differ in certain significant respects from those prevailing in developed countries. The Company is currently involved in disputes in certain countries in which it operates. See "Business — Legal Matters."

In addition, the Company's results of operations may be adversely affected by a number of factors in the countries in which it operates or has interests, including, but not limited to, the following:

- changes in international and domestic political and economic conditions as well as social conditions;
- challenges caused by distance, language, local business customs and cultural differences;
- difficulty in obtaining licenses, permits or other regulatory approvals from local authorities and in enforcing the Company's rights under contracts;
- with respect to those countries that are members of OPEC, the lowering of petroleum production volume pursuant to OPEC policy;
- changes in laws, regulations or government policies, or in the interpretation or enforcement of laws, regulations and government policies, including changes driven by resource nationalism, or uncertainties thereof;
- measures which may be introduced to control inflation;
- changes in the rate or method of taxation;
- imposition of additional restrictions on currency conversion and remittances abroad;
- military hostilities, war, political unrest or acts of terrorism targeted at the Company's fields or facilities;

- reduction in tariff protection and other import restrictions;
- natural disasters and epidemics or outbreaks such as Ebola or Middle East Respiratory Syndrome;
- international economic sanctions; and
- changes in the usage and costs of state-controlled transportation services.

Any failure on the Company's part to recognize or respond to these challenges may adversely affect the success of its operations in those markets, which in turn could materially and adversely affect the Company's business and results of operations.

The Company engages in certain activities relating to Russia and may become subject to sanctions under relevant laws and regulations of the United States and other jurisdictions as a result of such activities, which may adversely affect its business and reputation.

The U.S. Department of the Treasury's Office of Foreign Assets Control, or OFAC, administers and enforces certain laws and regulations (which hereinafter is referred to as OFAC sanctions) that impose restrictions upon U.S. persons with respect to activities or transactions with certain countries, governments, entities and individuals that are the subject of OFAC sanctions, including certain Russian persons and entities sanctioned in connection with ongoing events in Ukraine. In particular, Directive 4 under Executive Order 13662, which was enacted in March 2014, prohibits the provision, exportation, or reexportation, directly or indirectly, of goods, services (except for financial services), or technology in support of exploration or production for deepwater, Arctic offshore, or shale projects that have the potential to produce oil in Russia, or in maritime areas claimed by Russia and extending from its territory, by persons acting within U.S. jurisdiction.

Even though non-U.S. persons generally are not directly bound by OFAC sanctions, in recent years U.S. authorities have brought a number of enforcement actions against non-U.S. persons holding them liable on various legal theories if they directly or indirectly involve U.S. persons or U.S. origin goods or services in their transactions or by engaging in transactions completed in part in the United States (such as, for example, wiring an international payment that clears through a bank branch in New York or transporting U.S.-origin goods into sanctioned regions).

The Ukraine Freedom Support Act ("UFSA"), enacted in December 2014, is a so-called "secondary" sanctions law that provides authority to the U.S. President to impose U.S. sanctions on foreign parties that engage in certain activities in the Russian energy and military sectors, among others. With respect to the energy sector, it is sanctionable to knowingly make a "significant investment" in a Russian deepwater (greater than 500 feet), Arctic offshore, or shale project ("Targeted Projects") intended to produce oil. A range of sanctions may be imposed on companies that engage in sanctionable activities, including among other things the blocking of any property subject to U.S. jurisdiction in which the sanctioned company has an interest.

Additionally, the U.S. Department of Commerce's Bureau of Industry and Security ("BIS"), which administers U.S. export controls, also maintains prohibitions against the provision of specified U.S. origin goods or technology in support of exploration for, or production of, oil or gas in Targeted Projects, or any U.S.-origin goods or technology to Targeted Projects operated by specified government entities.

In July 2014, prior to the promulgation of the BIS export restrictions and the UFSA, the Company entered into a drilling contract for its drillship with Gazprom Geologorazvedka LLC ("Gazprom Subsidiary"), a subsidiary of Gazprom OAO, for a term of three years and fee of approximately US$170 million. Gazprom OAO became designated under Directive 4 of Executive Order 13662 in September 2014, which prohibits the provision of U.S. origin goods, or services (other than financial services) in support of Targeted Projects with the potential to produce oil. Gazprom OAO is also on BIS's Entity List, which prohibits the unlicensed export of any U.S. origin item to Gazprom OAO in connection with any Targeted Project producing oil or gas. More general BIS controls prohibit the unlicensed export of specified U.S.-origin equipment or technology to any party within Russia in connection with Targeted Projects. As the Company remained contractually bound to perform the agreed services, in June 2015, the Company removed all U.S.-origin equipment and goods from its drillship in response to these restrictions. In June 2015, the drillship reached its contract destination for drilling operations and began drilling activities pursuant to the contract, which are located in a Russian deepwater zone. Primary drilling operations were completed in August 2015 and the drillship was successfully demobilized from the drilling location in September 2015. The Company terminated its obligations under the drilling contract for 2016 and 2017 due to the designation that the relevant drilling location was subject to sanctions. The Company has no further outstanding obligations under such contract with Gazprom Subsidiary.

The Company believes that its activities relating to Russia were not prohibited under applicable U.S. sanctions law and BIS regulations, as it removed all U.S.-origin equipment from the drillship and no U.S. persons or entities are involved in performing the contract. It also does not believe that its Russian activities constituted a "significant investment" sanctionable under UFSA. Furthermore, the President of the United States has stated that he currently intends not to use the sanctioning authority given under the UFSA.

However, there can be no assurance that the Company's past activities relating to Russia will not be deemed to comply with OFAC sanctions or BIS export controls or to involve sanctionable activity under the indirect U.S. sanctions, or that any other government will not determine that its activities did not comply with applicable sanctions or export restrictions of other countries. Moreover, sanctions against Russia are evolving rapidly, and future changes in law could also adversely affect the Company. In addition, broadly similar sanctions are in place in the European Union and certain other jurisdictions, involving travel restrictions and the freezing of funds and economic resources of designated persons, as well as export and financing restrictions with respect to such persons.

The Company's business and reputation could be adversely affected if its past activities relating to Russia did not comply with OFAC sanctions or export controls, or involved sanctionable activity under the indirect U.S. sanctions, or if any other government were to determine that its activities relating to Russia did not comply with applicable sanctions of other countries. Any prohibition or conditions placed on the Company's assets located in the United States may adversely affect its business, and any other sanctions imposed could also adversely affect its business. It is also possible that certain investors could be prohibited from trading in or receiving payments on the Company's securities. If the U.S. government were to challenge the compatibility of the Company's activities relating to Russia with its sanctions programs or export restrictions or assert that such activities are sanctionable, while no assurance can be given that any such measures would be successful, the Company intends to take all practicable measures to ensure that prohibitions or conditions are not placed on its U.S. assets or other activities.

The Company's business operations may be adversely affected by present or future environmental or safety regulations.

The Company's activities, including activities through Harvest Operations, are subject to a wide variety of federal, state and local laws and regulations and permit requirements relating to the safety and protection of human health and the environment, both in Korea, Canada and in other jurisdiction in which it has operations. For a discussion of the environmental laws and regulations in Korea that are relevant for the Company, see "Regulation — Environmental Legislation." The Company incurs, and expects to incur, capital and operating costs in order to comply with such laws and regulations, which are becoming increasingly complex. The introduction of new laws and regulations, the imposition of tougher requirements in licenses, or increasingly strict enforcement or new interpretations of existing laws, regulations and licenses may require further expenditure to modify operations, install pollution control equipment, or curtail or cease certain operations. In addition, the discovery of previously unknown contaminations may require site clean-ups and the payment of fees, fines or other payments for pollution, discharges or other breaches of environmental requirements. In addition, in joint projects where the Company does not act as the operator, it relies on its partners to comply with the applicable environmental regulations and may incur additional expenses or liabilities if its partners fail to comply.

Furthermore, international and national commitments to reduce greenhouse gas emissions and counteract climate change may lead to increased costs for the Company. Carbon tax proposals in various jurisdictions as well as consumer preference changes in response to growing concerns of climate change could stimulate the emergence of alternative technologies and renewable energy availability, which may impact demand for oil and gas while increasing corporate expenses. The Company’s oil sands activities in Canada could be particularly affected by international and national carbon emissions reduction targets, taxes, and other carbon emissions related regulations.

The Company believes that the facilities and operations in which it holds interests are in material compliance with the requirements of the relevant environmental protection laws and safety regulations. While the costs of the measures taken to comply with such laws or regulations have not had a material adverse effect on the Company’s financial condition or results of operations to date, the costs of such measures and liabilities related to damages caused by the Company’s operations may increase in the future. Also, if the Company is unable to comply with the applicable laws and regulations, the local government may, at its discretion, close the non-complying facility, or force the Company to cease operations until proper compliance is made. Such increases in environmental or safety compliance costs or disruptions in operations may have a material adverse effect on the Company’s results of operations and financial condition.

The Company faces competition from other oil and natural gas companies in a majority of its operations.

The oil and gas industry is highly competitive. As the Company seeks to expand its operation in accordance with its growth plans and act as operator in an increasing number of projects under development, the Company expects to come into increasing competition with much larger, well-established companies with substantially greater financial, human, technical and other resources. Some of these competitors have been engaged in the oil and gas business for much longer than the Company, and have strong market power through a combination of different factors, such as diversification and reduction of risk, financial strength, exploitation of benefits of integration and economic scale, strengthening of their positions in the global market and their relations with the governments of oil and gas producing countries. Many of these competitors also have greater financial capacity to fund acquisitions of oil and gas properties and conduct oil and gas exploration, development and production than the Company. As such, they may be able to identify, bid for and purchase a greater number of properties and prospects, including operatorships and licenses, than the Company’s financial or human resources permit. The Company’s competitors include major international oil and gas companies, independent oil and gas companies and state-owned oil and gas companies. Significant competitive pressure could make it difficult for the Company to acquire additional exploration licenses and development and production leases or acquire attractive companies and assets in the oil and gas sector, thereby causing a material adverse effect on its business, financial condition and results of operations.

The Company’s business may be materially and adversely affected by legal claims and regulatory actions against it.

The Company is subject to the risk of legal claims and regulatory actions in the ordinary course of its business, which may expose the Company to substantial monetary damages and legal costs, injunctive relief, criminal and civil penalties, sanctions against the Company’s management and employees and regulatory restrictions on the Company’s operations, as well as significant reputational harm. See “Business — Legal Matters.”

In December 2014, a committee of the Korean national assembly commenced investigations into various overseas resources projects conducted during the previous administration under former President Lee. As part of such investigations, in March 2015, the national assembly committee conducted an inspection of the Company and its investments in Harvest Operations and North Atlantic Refining Limited, as well as other acquisitions made by the Company during President Lee’s tenure. The investigations were completed in May 2015, and no significant sanctions were imposed on the Company as a result of the investigations.

In March 2015, the Board of Audit and Inspection of Korea commenced an inspection of the Company, Korea Resources Corporation and Korea Gas Corporation, as well as the Ministry of Strategy and Finance and the Ministry of Trade, Industry and Energy, primarily to assess the performance of state-financed overseas resource development projects as well as the administration of SAER loans by the energy and resources related state- owned enterprises. The inspection was completed in June 2015 and no further actions were taken by the Board of Audit and Inspection of Korea with respect to the Company following the completion of the inspection.

In March 2015, the Seoul Central District Prosecutor's Office commenced an investigation into the Company and Keangnam Enterprises, Ltd. ("Keangnam") regarding its SAER loans to Keangnam and Keangnam's involvement in the development projects in Kamchatka. Keangnam was a former member of the consortium that had invested in the Kamchatka project in 2006. The Company withdrew from the Kamchatka project in 2010. There have been press reports that Keangnam diverted certain portions of the loan to other accounts rather than using the funds for their intended purposes. In September 2015, the Seoul Central District Prosecutor's Office announced that it has concluded its investigation of various overseas resources projects conducted during the previous administration under former President Lee. No charges against the Company were filed in connection with the investigation.

In June 2015, the Seoul Central District Prosecutor's Office arrested Mr. Young Won Kang, former chief executive officer of the Company who left the Company in June 2012, and in July 2015 indicted him on charges of breach of fiduciary duty, for allegedly wasting corporate funds by making financially unsound acquisitions during his tenure, including North Atlantic Refining Limited. The Seoul District Court and, on appeal, the Seoul High Court ruled in favor of Mr. Kang. The case has been appealed to the Supreme Court of Korea in September 2016, where it is currently pending. The Company believes that these court proceedings will not have a material effect on its financial liability, based on the current status of the trial.

The Company is unable to predict the outcome of these and other investigations, lawsuits and regulatory actions, and the scope of the investigations in these matters may increase. Additional investigations may be launched by governmental authorities or civil claims may be filed against the Company in the future with respect to these or other alleged legal violations by the Company and its officers and employees. An adverse determination in any such proceedings may result in significant regulatory sanctions as well as reputational harm to the Company, which in turn may have a material adverse effect on the Company's business, results of operations and financial condition.

The Company may be exposed to potential claims made by current or previous employees for unpaid wages and may also incur increased labor costs as a result of the expansion of the scope of ordinary wages.

Under the Labor Standards Act and Labor Severance Payment Security Act of Korea, the amount of compensation to which an employee is legally entitled, such as overtime allowance for night shifts or work performed outside of working hours as well as severance pay, is determined by the definition of "ordinary wage."

Prior to the Supreme Court's decision as described below, the Ministry of Labor had released guidelines which recognized base salary and certain fixed monthly allowances as the components of ordinary wage. Pursuant to such guidelines, many companies excluded fixed bonuses paid bimonthly, quarterly or semi-annually from the definition of ordinary wage in calculating overtime allowances, although certain lower courts had held that fixed bonuses, whether paid monthly or not, should be included in the definition of ordinary wage if such bonuses are paid regularly to all employees.

On December 18, 2013, the Supreme Court of Korea delivered a decision which provided a standard rule for determining what kinds of payments should be included as part of ordinary wage. According to this decision, fixed bonuses paid regularly are included in ordinary wage, and any collective bargaining agreement or labor-management agreement which provides for exclusion of such regular bonuses from the scope of ordinary wage is void as such provision is in violation of the mandatory provisions of Korean law. However, with respect to wage agreements executed on or prior to December 18, 2013, the Supreme Court of Korea further ruled that an employee's claim for extra payments will not be granted on principles of good faith if such claim imposes an unexpected financial burden on the employer and results in material managerial difficulty or poses a threat to the existence of the employer, to the extent that such claim is made on the basis of rescission of any existing wage agreement that sets the total amount of wage but excludes regular bonus payments from the scope of ordinary wage.

In connection with the Supreme Court's decision described above, in May 2015, 208 employees belonging to the Company's labor union filed a lawsuit at the Seoul Central District Court for unpaid wages amounting to approximately Won 5 billion. On August 23, 2016, the Seoul Central District Court ruled partially in favor of the labor union and ruled that the Company pay Won 3.3 billion in unpaid wages. The case has been appealed to the Seoul High Court in October 2016, where it is currently pending. While the number of total employees eligible to file a similar lawsuit cannot be ascertained at this time, the Company believes that it is unlikely that additional employees will file similar lawsuits, as the initial lawsuit was initiated by the Company's labor union upon discussion with employees belonging to the labor union. However, there can be no assurance that similar lawsuits will not occur in the future, or that the Company will successfully defend the current or any future lawsuits, all of which may have an adverse effect on the Company's business and results of operations.

Harvest Operations is subject to certain risks related to the BlackGold oil sands project, which in turn may have an adverse effect on the Company.

The Company acquired a 100.0% interest in an oil sands lease for the BlackGold area located in northeastern Alberta in August 2006. In August 2010, the interest in the BlackGold oil sands project was transferred to Harvest Operations for approximately CAD 374 million, which was funded by Harvest Operations through the issuance of additional capital stock to the Company. The initial phase of the project, targeting production of 10,000 barrels per day, has been approved by provincial regulators. The expansion phase of the BlackGold project, which is targeted to expand production to 30,000 barrels per day, was approved by provincial regulators in 2013.

In early 2015, construction of the BlackGold central processing facility, well pads, and connecting pipelines was substantially completed. Subsequently, Harvest Operations has been performing commissioning activities at a measured pace. Several systems have since been commissioned and others will be progressed slowly within a limited budget. Harvest Operations postponed commencing the project production process in response to the unfavorable heavy oil price environment and will continually assess the commodity price environment to determine when to complete commissioning the central processing facility and commence the production process.

Final commissioning of the initial phase of the project and, in particular further development of the expansion phase of the BlackGold project will require substantial capital investment by Harvest Operations. The BlackGold project competes for cash flows against Harvest Operations' other capital projects and cash commitments. Harvest Operations may not have sufficient capital resources to finance all its projects and may delay or curtail certain development projects, including the BlackGold project. To help Harvest Operations fund the BlackGold project's initial capital, the Company has also injected approximately CAD 86 million of capital through the issuance of additional capital stock by Harvest Operations in 2010. Harvest Operations may require additional capital from the Company if it cannot finance the BlackGold project through operating cash flow, additional borrowings or proceeds from the sale of its assets.

As is the case with any large scale, technically complex project, the ongoing development of the BlackGold project subjects Harvest Operations to risks associated with cost overruns, scheduling delays and unforeseen technical challenges, including as a result of third-party performance failures, fluctuating market conditions, delays in regulatory approvals and other unexpected challenges. Any failure on Harvest Operations' part to recognize or respond to these and other risks may adversely affect the success of its operations, financial position and cash flows, which in turn could materially and adversely affect the Company's business and results of operations, or require the Company to make additional capital injections.

Risks Relating to Korea

The Company is significantly supported by the Government, and its current business and future growth could be materially and adversely affected if financial and economic conditions in Korea deteriorate.

The Company is wholly owned by the Government and serves as an execution arm for Government policies and businesses relating to oil, supported by significant capital contributions and other support from the Government. The Company's headquarters and significant parts of its operations, customers and assets are also located in Korea. Accordingly, the Company's performance and successful fulfillment of its operational strategies are necessarily dependent on the overall Korean economy and the resulting impact on the need for energy, including crude oil and natural gas.

Due to recent liquidity and credit concerns and volatility in the global financial markets, the value of the Won relative to the U.S. dollar and other foreign currencies and the stock prices of Korean companies have fluctuated significantly in recent years. In particular, the global financial markets continue to experience significant volatility in light of the slowdown of economic growth in China and other major emerging economies as well as concerns regarding the financial difficulties affecting many governments worldwide, including southern Europe and Latin America, and low oil prices. In addition, political and social instability in various countries in the Middle East and Northern Africa, including Iraq, Syria and Egypt, as well as in Ukraine and Russia, have resulted in an increase in volatility in the global financial markets. Accordingly, the overall prospects for the Korean and global economies in the remainder of 2016 and beyond remain uncertain. Any future deterioration of the Korean or global economy could adversely affect the business, financial condition and results of operations of the Company.

Developments that could have an adverse impact on Korea's economy include:

- difficulties in the financial sectors in Europe and elsewhere and increased sovereign default risks in selected countries and the resulting adverse effects on the global financial markets;
- adverse conditions or uncertainty in the economies of countries and regions that are important export markets for Korea, such as China, the United States, Europe and Japan, or in emerging market economies in Asia or elsewhere, as well as increased uncertainty in light of Brexit;
- declines in consumer confidence and a slowdown in consumer spending;
- adverse changes or volatility in foreign currency reserve levels, commodity prices (including oil prices), exchange rates (including fluctuation of the Dollar, the Euro or the Yen exchange rates or revaluation of the Renminbi and the overall impact of Brexit on the value of the Korean Won), interest rates, inflation rates or stock markets;
- the emergence of the Chinese economy, to the extent its benefits (such as increased exports to China) are outweighed by its costs (such as competition in export markets or for foreign investment and the relocation of the manufacturing base from Korea to China), as well as a slowdown of economic growth and financial instability in China;
- the recent political scandal in Korea involving a confidant of the President and the resulting social unrest, as well as related investigations of large Korean business groups and their senior management for bribery, embezzlement and other possible misconduct;
- increased sovereign default risk in select countries and the resulting adverse effects on the global financial markets;
- a continuing rise in the level of household debt and increasing delinquencies and credit defaults by retail and small- and medium-sized enterprise borrowers in Korea;
- the economic impact of any pending or future free trade agreements;
- social and labor unrest;
- decreases in the market prices of Korean real estate;
- a decrease in tax revenues and a substantial increase in the Government's expenditures for fiscal stimulus measures, unemployment compensation and other economic and social programs that, together, would lead to an increased government budget deficit;
- financial problems or lack of progress in the restructuring of Korean business groups, other large troubled companies, their suppliers or the financial sector;
- loss of investor confidence arising from corporate accounting irregularities and corporate governance issues concerning certain Korean business groups;
- increases in social expenditures to support an aging population in Korea or decreases in economic productivity due to the declining population size in Korea;

- geo political uncertainty and risk of further attacks by terrorist groups around the world, including ISIS;
- the occurrence of severe health epidemics in Korea and other parts of the world, such as the Middle East Respiratory Syndrome outbreak in Korea from May to July 2015;
- deterioration in economic or diplomatic relations between Korea and its trading partners or allies, including deterioration resulting from trade disputes or disagreements in foreign policy (such as the ongoing controversy between Korea and China regarding the deployment of a Terminal High Altitude Area Defense system in Korea by the United States);
- political uncertainty or increasing strife among or within political parties in Korea;
- hostilities or political or social tensions involving Russia and oil producing countries in the Middle East and North Africa, and any material disruption in the global supply of oil or sudden increase in the price of oil;
- natural or man-made disasters that have a significant adverse economic or other impact on Korea (such as the sinking of the Sewol ferry in 2014, which significantly dampened consumer sentiment in Korea) or its major trading partners;
- hostilities or political or social tensions involving oil producing countries in the Middle East and North Africa and any material disruption in the supply of oil or sudden increase in the price of oil;
- political or social tensions involving Russia and any resulting adverse effects on the global supply of oil or the global financial markets; and
- an increase in the level of tensions or an outbreak of hostilities between North Korea and Korea or the United States.

Political and societal unrest surrounding the impeachment of President Park Geun-hye could adversely affect the Korean economy.

In November 2016, the Korean prosecutor's office indicted a confidant of President Park Geun-hye who had allegedly used her ties with the President to extort donations from Korean business groups for two non-profit foundations over which she is purported to have substantial influence, as well as a number of current and former presidential aides, on charges of, among others, abuse of power, coercion and leaking classified documents. On November 30, 2016, a special independent prosecutor was appointed to conduct an investigation of the extent of the President's involvement, and mass weekend rallies have been held in Seoul and other cities to protest against President Park.

On December 9, 2016, the National Assembly voted in favor of impeaching President Park for a number of alleged constitutional and criminal violations, including violation of the Constitution and abuse of power by allowing her confidant to exert influence on state affairs and allowing senior presidential aides to aid in her extortion from companies. President Park was suspended from power immediately, with the prime minister simultaneously taking over the role of acting President. On March 10, 2017, the Constitutional Court upheld the impeachment, which triggered a requirement to hold a special presidential election within 60 days. The special independent prosecutor has also launched related investigations of several large Korean business groups and members of their senior management for bribery, embezzlement and other possible misconduct. There is no assurance that such events will not have a material adverse effect on the Korean economy.

Escalations in tensions with North Korea could have an adverse effect on the Company and the market value of the Notes.

Relations between Korea and North Korea have been tense throughout Korea's modern history. The level of tension between the two Koreas has fluctuated and may increase abruptly as a result of current and future events. In particular, since the death of Kim Jong-il in December 2011, there has been increased uncertainty with respect to the future of North Korea's political leadership and concern regarding its implications for political and economic stability in the region. Although Kim Jong-il's third son, Kim Jong-eun, has assumed power as his father's designated successor, the long-term outcome of such leadership transition remains uncertain.

In addition, there have been heightened security concerns in recent years stemming from North Korea's nuclear weapon and long-range missile programs as well as its hostile military actions against Korea. Some of the significant incidents in recent years include the following:

- From time to time, North Korea has conducted ballistic missile tests. In February 2016, North Korea launched a long-range rocket in violation of its agreement with the United States as well as United Nations sanctions barring it from conducting launches that use ballistic missile technology. Despite international condemnation, North Korea released a statement that it intends to continue its rocket launch program, and it conducted additional ballistic missile tests in June 2016 and a submarine-launched ballistic missile test in August 2016. In August 2016, the United Nations Security Council issued a unanimous statement condemning North Korea and agreeing to continue to closely monitor the situation and to take further significant measures.
- North Korea renounced its obligations under the Nuclear Non-Proliferation Treaty in January 2003 and conducted three rounds of nuclear tests between October 2006 to February 2013, which increased tensions in the region and elicited strong objections worldwide. In January 2016, North Korea conducted a fourth nuclear test, claiming that the test involved its first hydrogen bomb, which claim has not been independently verified. In response to such test (as well as North Korea's long-range rocket launch in February 2016), the United Nations Security Council unanimously passed a resolution in March 2016 condemning North Korea's actions and significantly expanding the scope of the sanctions applicable to North Korea, while the United States and the European Union also imposed additional sanctions on North Korea. In September 2016, North Korea conducted a fifth nuclear test, claiming to have successfully detonated a nuclear warhead that could be mounted on ballistic rockets, which claim has not been independently verified.
- In August 2015, two Korean soldiers were injured in a landmine explosion near the Korean demilitarized zone. Claiming the landmines were set by North Koreans, the Korean army re-initiated its propaganda program toward North Korea utilizing loudspeakers near the demilitarized zone. In retaliation, the North Korean army fired artillery rounds on the loudspeakers, resulting in the highest level of military readiness for both Koreas. High-ranking officials from North Korea and Korea subsequently met for discussions and entered into an agreement on August 25, 2015 intended to defuse military tensions.
- In March 2010, a Korean naval vessel was destroyed by an underwater explosion, killing many of the crewmen on board. The Government formally accused North Korea of causing the sinking, while North Korea denied responsibility. Moreover, in November 2010, North Korea fired more than one hundred artillery shells that hit Korea's Yeonpyeong Island near the Northern Limit Line, which acts as the de facto maritime boundary between Korea and North Korea on the west coast of the Korean peninsula, causing casualties and significant property damage. The Government condemned North Korea for the attack and vowed stern retaliation should there be further provocation.

North Korea's economy also faces severe challenges, which may further aggravate social and political pressures within North Korea.

There can be no assurance that the level of tensions affecting the Korean peninsula will not escalate in the future. Any further increase in tensions, which may occur, for example, if North Korea experiences a leadership crisis, high-level contacts between Korea and North Korea break down or further military hostilities occur, could have a material adverse effect on the Korean economy and on the Company's business, financial condition and results of operations.

There are special risks involved with investing in securities of Korean companies, including the possibility of restrictions being imposed by the government in emergency circumstances as well as accounting and corporate disclosure standards that differ from those in other jurisdictions.

As the Company is a Korean company and operates in a business and cultural environment that is different from that of other countries, there are risks associated with investing in its securities that are not typical for investments in securities of companies in other jurisdictions.

Under the Foreign Exchange Transaction Act of Korea and the Presidential Decree and regulations under that Act and Decree (collectively referred to as the "Foreign Exchange Transaction Laws"), if the Government deems that certain emergency circumstances, including sudden fluctuations in interest rates or exchange rates, extreme difficulty in stabilizing the balance of payments or substantial disturbance in the Korean financial and capital markets, are likely to occur, it may impose any necessary restriction such as requiring Korean or foreign investors to obtain prior approval from the Minister of Strategy and Finance for the acquisition of Korean securities or for the repatriation of interest, dividends or sales proceeds arising from Korean securities or other types of capital transactions. Moreover, if the Government deems it necessary on account of war, armed conflict, natural disaster or grave and sudden changes in domestic or foreign economic circumstances or similar events or circumstances, the Minister of Strategy and Finance may temporarily suspend performance under any or all foreign exchange transactions, in whole or in part, to which the Foreign Exchange Transaction Laws apply (including suspension of payment and receipt of foreign exchange) or impose an obligation to deposit or sell any means of payment to the Bank of Korea or certain other governmental agencies or financial institutions.

In addition, the Company prepared and included in this Offering Circular its annual financial statements as of and for the years ended December 31, 2014, 2015 and 2016 in accordance with Korean IFRS and expects to prepare its financial statements in accordance with Korean IFRS for future periods, which differ in certain respects from accounting principles applicable to companies in certain other countries, including the United States. In addition, the Company is not a listed company but makes public disclosures regarding aspects of its business pursuant to the Act on the Management of Public Agencies and other laws applicable to the Company. These disclosure rules differ in many material respects from those applicable to companies in certain other countries, including the United States. In making an investment decision, investors must rely upon their own examination of the Company, the terms of the offering and the financial information contained in this Offering Circular.

The Company is generally subject to Korean corporate governance and disclosure standards, which differ in significant respects from those in other countries.

Korean companies, including the Company, are subject to corporate governance standards applicable to Korean companies that differ in many respects from standards applicable in other countries, including the United States. The Company's operations and management are also subject to the Act on Management of Public Agencies pursuant to Article 18 of the KNOC Act. See "Management." There may also be less publicly available information about Korean companies, such as the Company, than is regularly made available by public or non-public companies in other countries. Such differences in corporate governance standards and less public information could result in less than satisfactory corporate governance practices or disclosure to investors in certain countries.

Risks Relating to the Notes

The Notes are not guaranteed by the Republic of Korea.

The Notes are not the obligations of, or guaranteed by, the Republic of Korea. Although under the KNOC Act, the Government is allowed, but not obligated, to guarantee bonds offered by the Company, it is not providing a guarantee in respect of the Notes. In addition, the Government is under no obligation to maintain the solvency of the Company. Therefore, investors should not rely on the Government to fulfill the Company's obligations under the Notes in the event the Company is unable to do so.

The Notes are unsecured obligations.

Because the Notes are unsecured obligations, their repayment may be compromised if:

- the Company enters into bankruptcy, liquidation, rehabilitation or other winding-up proceedings;
- there is a default in payment under the Company's future secured indebtedness or other unsecured indebtedness; or
- there is an acceleration of any of the Company's indebtedness.

If any of these events occurs, the Company's assets may not be sufficient to pay amounts due on any of the Notes. In addition, any secured indebtedness incurred by the Company would have priority over its unsecured indebtedness to the extent of the assets securing such indebtedness.

The Notes are subject to transfer restrictions.

The Notes will not be registered under the Securities Act or any state securities laws of the United States and may not be offered or sold to any person in the United States, or to, or for the account or benefit of, U.S. persons except pursuant to an exemption from, or, in a transaction not subject to, the registration requirements of the Securities Act. For a further discussion of the transfer restrictions applicable to the Notes, see "Subscription and Sale and Transfer and Selling Restrictions — Transfer Restrictions."

The Notes may have limited liquidity.

There can be no assurance as to the liquidity of, or the development and continuation of an active trading market for, the Notes. If an active trading market for the Notes does not develop or is not maintained, the market price and liquidity of the Notes may be adversely affected. If an active trading market for the Notes were to develop, the Notes could trade at prices that may be higher or lower than the offering price depending on many factors, including:

- prevailing interest rates;
- the Company's results of operations, financial condition and future prospects;
- political and economic developments in and affecting Korea;
- the market conditions for similar securities; and
- the financial condition and stability of the Korean oil industry and the Korean and Singaporean financial markets.

The Notes may be redeemed by the Company in certain circumstances.

If Issuer call is specified in the applicable pricing supplement, the Company may redeem all or some only of the Notes then outstanding on any Optional Redemption Date and at the Optional Redemption Amount(s) (each as defined in the "Terms and Conditions of the Notes") specified in the applicable Pricing Supplement together (if appropriate) with interest accrued to (but excluding) the relevant Optional Redemption Date. Furthermore, the Notes may be redeemable at the option of the Company, in whole but not in part, at their Early Redemption Amount (as defined in the "Terms and Conditions of the Notes") together (if appropriate) with interest accrued to (but excluding) the date of redemption, upon the occurrence of certain changes in applicable tax laws and regulations which requires the Company to pay additional amounts on payments of principal and interest in respect of the Notes due to withholding or deduction required by law. See "Terms and Conditions of the Notes — Condition 8 (Redemption and Purchase)."

Accordingly, holders of the Notes should not rely on being able to hold the Notes until their maturity date. The date on which the Company elects to redeem the Notes may not align with the preference of holders of the Notes, and such election by the Company may be disadvantageous to holders of the Notes in light of market conditions or the individual circumstances of such holders. In addition, if the Notes are redeemed prior to their maturity date, there can be no assurance that the holders of the Notes will be able to reinvest the amounts received upon redemption at a rate that will provide the same return as the investment in the redeemed Notes.

Risks Relating to Forward-Looking Statements

This Offering Circular contains forward-looking statements that are the management's present expectations of future events and are subject to uncertainties that could cause actual results to differ materially from those described in the forward-looking statements.

In addition to the risks related to the Company's business discussed above, other factors could cause actual results to differ materially from those described in the various forward-looking statements contained in this Offering Circular. These factors include, but are not limited to, the following:

- general economic, business, political and social conditions;
- adverse trends in regulatory, legislative and judicial developments, including litigation and environmental regulatory restrictions and liabilities;
- changes in interest rates and foreign exchange rates;
- development projects and exploration prospects and the speculative nature of oil and gas exploration and development, including the risk of obtaining necessary licenses and permits;
- uncertainties inherent in estimating proved or potential oil and gas reserves;
- development and drilling potential and development of undeveloped reserves, including the risks and hazards associated with oil and gas development and operating or technical difficulties in connection with oil and gas development activities;;
- expansion and other development trends of the oil and gas industry, and regulatory, administrative or economic conditions affecting the oil and gas industry, including changes to applicable oil and gas and other laws regulating the oil and gas industry;
- risks related to gathering and processing facilities and pipeline systems;
- business strategy, including expansion and growth of operations;
- oil and gas prices and demand;
- future earnings and cash flow;
- factors affecting future profitability;
- seasonality;
- long-term reliance on third parties;
- claims made in respect of the Company's operations, property or assets, and contests over such claims, particularly title to undeveloped properties;
- competition for, among other things, capital, the acquisition of reserves, equipment, export pipeline capacity and skilled personnel;
- environmental risks and hazards and the costs of compliance with environmental regulations;
- the Company's estimated financial information; and
- conditions in the Korean and the global financial markets.

By their nature, certain disclosures relating to these and other risks are only estimates and should one or more of these uncertainties or risks materialize, actual results may vary materially from those estimated, anticipated or projected, as well as from historical results. Specifically but without limitation, revenues could decrease, costs (including capital costs) could increase, investments could be delayed and anticipated improvements in performance might not be fully realized.

You should not place undue reliance on the forward-looking statements, which speak only as of the date of this Offering Circular. Except as required by law, the Company is not under any obligation, and expressly disclaims any obligation, to update or alter any forward-looking statements, whether as a result of new information, future events or otherwise. All subsequent forward-looking statements attributable to the Company or any person acting on the Company's behalf are expressly qualified in their entirety by the cautionary statements contained or referred to in this section.

FORM OF THE NOTES

The Notes of each Series will be in either bearer form, with or without interest coupons attached, or registered form, without interest coupons attached. Bearer Notes will be issued outside the United States to non-U.S. persons in reliance on Regulation S under the Securities Act ("Regulation S") and Registered Notes will be issued both outside the United States in reliance on the exemption from registration provided by Regulation S and within the United States in reliance on Rule 144A or Regulation D under the Securities Act.

Bearer Notes

Each Tranche of Bearer Notes will be in bearer form and will be initially issued in the form of either a temporary bearer global note (a "Temporary Bearer Global Note") or a permanent bearer global note (a "Permanent Bearer Global Note") as indicated in the applicable Pricing Supplement, which, in either case, will be delivered on or prior to the original issue date of the Tranche to a common depositary (the "Common Depositary") for Euroclear Bank S.A./N.V. ("Euroclear") and Clearstream Banking, société anonyme ("Clearstream, Luxembourg"). Whilst any Bearer Note is represented by a Temporary Bearer Global Note, payments of principal, interest (if any) and any other amount payable in respect of the Notes due prior to the Exchange Date (as defined below) will be made against presentation of the Temporary Bearer Global Note only to the extent that certification (in a form to be provided) to the effect that the beneficial owners of interests in such Bearer Note are not U.S. persons or persons who have purchased for resale to any U.S. person, as required by U.S. Treasury regulations, has been received by Euroclear and/or Clearstream, Luxembourg and Euroclear and/or Clearstream, Luxembourg, as applicable, has given a like certification (based on the certifications it has received) to the Principal Paying Agent ("non-U.S. beneficial ownership certification").

On and after the date (the "Exchange Date") which is 40 days after the Temporary Bearer Global Note is issued, interests in such Temporary Bearer Global Note will be exchangeable (free of charge) upon a request as described therein either for (i) interests in a Permanent Bearer Global Note of the same Series or (ii) for definitive Bearer Notes of the same Series with, where applicable, receipts, interest coupons and talons attached (as indicated in the applicable Pricing Supplement and subject, in the case of definitive Bearer Notes, to such notice period as is specified in the applicable Pricing Supplement), in each case against non-U.S. beneficial ownership certification as described above unless such certification has already been given. The holder of a Temporary Bearer Global Note will not be entitled to collect any payment of interest, principal or other amount due on or after the Exchange Date unless, upon due certification, exchange of the Temporary Bearer Global Note for an interest in a Permanent Bearer Global Note or for definitive Bearer Notes is improperly withheld or refused.

Payments of principal, interest (if any) or any other amounts on a Permanent Bearer Global Note will be made through Euroclear and/or Clearstream, Luxembourg against presentation or surrender (as the case may be) of the Permanent Bearer Global Note without any further requirement for certification beyond the initial non-U.S. beneficial ownership certification as described above.

The applicable Pricing Supplement will specify that a Permanent Bearer Global Note will be exchangeable (free of charge), in whole but not in part, for definitive Bearer Notes with, where applicable, receipts, interest coupons and talons attached upon either (i) not less than 60 days' written notice from Euroclear and/or Clearstream, Luxembourg (acting on the instructions of any holder of an interest in such Permanent Bearer Global Note) to the Principal Paying Agent as described therein or (ii) only upon the occurrence of an Exchange Event. In the case of definitive Bearer Notes that are issued in exchange for any Permanent Bearer Global Notes, such exchange shall only be permitted if the issuance of definitive Bearer Notes are issued in integral multiples of the Specified Denomination. For these purposes, an "Exchange Event" means that (i) an Event of Default (as defined in Condition 11) has occurred and is continuing, (ii) the Issuer has been notified that both Euroclear and Clearstream, Luxembourg have been closed for business for a continuous period of 14 days (other than by reason of holiday, statutory or otherwise) or have announced an intention permanently to cease business or have in fact done so and no alternative clearing system is available or (iii) the Issuer has or will become subject to adverse tax consequences which would not be suffered were the Notes represented by the Permanent Bearer Global Note in definitive form (provided that, in certain circumstances where the Notes are held through Euroclear and

Clearstream, Luxembourg, such adverse tax consequences are the result of a change in, or amendment to, the laws and regulations (taxation or otherwise) of a Tax Jurisdiction). For so long as the Notes are listed on the Singapore Stock Exchange and the rules of the Singapore Stock Exchange so require, in the event that a Permanent Bearer Global Note is exchanged for definitive Bearer Notes, the Issuer will appoint and maintain a Singapore Paying Agent (as defined below) (unless the Issuer obtains an exemption from the Singapore Stock Exchange), where the definitive Bearer Notes may be presented or surrendered for payment or redemption. In addition, in the event that a Permanent Bearer Global Note is exchanged for definitive Bearer Notes, announcement of such exchange shall be made by the Issuer or on the Issuer's behalf through the Singapore Stock Exchange and such announcement will include all material information with respect to the delivery of the definitive Bearer Notes, including details of the Singapore Paying Agent. In the event of the occurrence of an Exchange Event, Euroclear and/or Clearstream, Luxembourg (acting on the instructions of any holder of an interest in such Permanent Bearer Global Note) may give notice to the Principal Paying Agent requesting exchange and, in the event of the occurrence of an Exchange Event as described in (iii) above, the Issuer may also give notice to the Principal Paying Agent requesting exchange. Any such exchange shall occur not later than 45 days after the date of receipt of the first relevant notice by the Principal Paying Agent.

The following legend will appear on all Bearer Notes that have an original maturity of more than 365 days and on all receipts and interest coupons relating to such Notes:

"ANY UNITED STATES PERSON WHO HOLDS THIS OBLIGATION WILL BE SUBJECT TO LIMITATIONS UNDER THE UNITED STATES INCOME TAX LAWS, INCLUDING THE LIMITATIONS PROVIDED IN SECTIONS 165(j) AND 1287(a) OF THE INTERNAL REVENUE CODE."

The sections referred to provide that United States holders, with certain exceptions, will not be entitled to deduct any loss on Bearer Notes and will not be entitled to capital gains treatment of any gain on any sale, disposition, redemption or payment of principal in respect of such Notes.

Notes that are represented by a Bearer Global Note will only be transferable in accordance with the rules and procedures for the time being of Euroclear or Clearstream, Luxembourg, as the case may be.

Registered Notes

The Registered Notes of each Tranche offered and sold in reliance on Regulation S, which will be sold only to non-U.S. persons outside the United States, will initially be represented by a global note in registered form (a "Regulation S Global Note"). Prior to expiry of the distribution compliance period (as defined in Regulation S) applicable to each Tranche of Notes, beneficial interests in a Regulation S Global Note may not be offered or sold to, or for the account or benefit of, a U.S. person save as otherwise provided in Condition 2 and may not be held otherwise than through Euroclear or Clearstream, Luxembourg and such Regulation S Global Note will bear a legend regarding such restrictions on transfer.

The Registered Notes of each Tranche may only be offered and sold in the United States or to U.S. persons in private transactions (i) to "qualified institutional buyers" within the meaning of Rule 144A under the Securities Act ("QIBs") or (ii) to "accredited investors" (as defined in Rule 501(a)(1), (2), (3) or (7) under the Securities Act) that are institutions ("Institutional Accredited Investors") who agree to purchase the Notes for their own account and not with a view to the distribution thereof. The Registered Notes of each Tranche sold to QIBs will be represented by a global note in registered form (a "Rule 144A Global Note" and, together with a Regulation S Global Note, the "Registered Global Notes").

The Registered Global Notes will either (a) be deposited with a custodian for, and registered in the name of a nominee of, the Depository Trust Company ("DTC") for the accounts of Euroclear and Clearstream, Luxembourg or (b) be deposited with a common depositary for, and registered in the name of a common nominee of, Euroclear and Clearstream, Luxembourg, as specified in the applicable Pricing Supplement. Persons holding beneficial interests in the Registered Global Notes will be entitled or required, as the case may be, under the circumstances described below, to receive physical delivery of definitive Notes in fully registered form. The Registered Notes of each Tranche sold to Institutional Accredited Investors will be in definitive form, registered in the name of the holder thereof ("Definitive IAI Registered Notes"). Unless otherwise set forth in the applicable

Pricing Supplement, Definitive IAI Registered Notes will be issued only in minimum denominations of U.S.$250,000 and integral multiples of U.S.$1,000 in excess thereof (or the approximate equivalents in the applicable Specified Currency). Definitive IAI Registered Notes will be subject to the restrictions on transfer set forth therein and will bear the restrictive legend described under "Subscription and Sale and Transfer and Selling Restrictions." Institutional Accredited Investors that hold Definitive IAI Registered Notes may elect to hold such Notes through DTC, but transferees acquiring the Notes in transactions exempt from Securities Act registration pursuant to Regulation S or Rule 144 under the Securities Act (if available) may do so upon satisfaction of the requirements applicable to such transfer as described under "Subscription and Sale and Transfer and Selling Restrictions." The Rule 144A Global Note and the Definitive IAI Registered Notes will be subject to certain restrictions on transfer set forth therein and will bear a legend regarding such restrictions.

Payments of principal, interest and any other amount in respect of the Registered Global Notes will, in the absence of provision to the contrary, be made to the person shown on the Register (as defined in Condition 7(d)) as the registered holder of the Registered Global Notes. None of the Issuer, any Paying Agent or the Registrar will have any responsibility or liability for any aspect of the records relating to or payments or deliveries made on account of beneficial ownership interests in the Registered Global Notes or for maintaining, supervising or reviewing any records relating to such beneficial ownership interests.

Payments of principal, interest or any other amount in respect of the Registered Notes in definitive form will, in the absence of provision to the contrary, be made to the persons shown on the Register on the relevant Record Date (as defined in Condition 7(d)) immediately preceding the due date for payment in the manner provided in that Condition.

Interests in a Registered Global Note will be exchangeable (free of charge), in whole but not in part, for definitive Registered Notes without receipts, interest coupons or talons attached only upon the occurrence of an Exchange Event. For these purposes, an "Exchange Event" means that (a) an Event of Default has occurred and is continuing, (b) in the case of Notes registered in the name of a nominee for DTC, either DTC has notified the Issuer that it is unwilling or unable to continue to act as depository for the Notes and no alternative clearing system is available or DTC has ceased to constitute a clearing agency registered under the Exchange Act, (c) in the case of Notes registered in the name of a nominee for a common depositary for Euroclear and Clearstream, Luxembourg, the Issuer has been notified that both Euroclear and Clearstream, Luxembourg have been closed for business for a continuous period of 14 days (other than by reason of holiday, statutory or otherwise) or have announced an intention permanently to cease business or have in fact done so and, in any such case, no successor clearing system is available or (d) the Issuer has or will become subject to adverse tax consequences which would not be suffered were the Notes represented by the Registered Global Note in definitive form (provided that, in certain circumstances where the Notes are held through Euroclear and Clearstream, Luxembourg, such adverse tax consequences are the result of a change in, or amendment to, the laws and regulations (taxation or otherwise) of a Tax Jurisdiction).

For so long as any Notes are listed on the Singapore Stock Exchange and the rules of the Singapore Stock Exchange so require, in the event that a Permanent Registered Global Note is exchanged for definitive Registered Notes, the Issuer will appoint and maintain a paying agent in Singapore (the "Singapore Paying Agent") (unless the Issuer obtains an exemption from the Singapore Stock Exchange), where the definitive Registered Notes may be presented or surrendered for payment or redemption. In addition, in the event that a Permanent Registered Global Note is exchanged for definitive Registered Notes, announcement of such exchange shall be made by the Issuer or on the Issuer's behalf through the Singapore Stock Exchange and such announcement will include all material information with respect to the delivery of the definitive Registered Notes, including details of the Singapore Paying Agent. In the event of the occurrence of an Exchange Event, DTC, Euroclear and/or Clearstream, Luxembourg (acting on the instructions of any holder of an interest in such Registered Global Note) may give notice to the Registrar requesting exchange and, in the event of the occurrence of an Exchange Event as described in (d) above, the Issuer may also give notice to the Registrar requesting exchange. Any such exchange shall occur not later than ten days after the date of receipt of the first relevant notice by the Registrar.

Transfer of Interests

Interests in a Registered Global Note may, subject to compliance with all applicable restrictions, be transferred to a person who wishes to hold such interest in another Registered Global Note or in the form of a Definitive IAI Registered Note and Definitive IAI Registered Notes may, subject to compliance with all applicable restrictions, be transferred to a person who wishes to hold such Notes in the form of an interest in a Registered Global Note. No beneficial owner of an interest in a Registered Global Note will be able to transfer such interest, except in accordance with the applicable procedures of DTC, Euroclear and Clearstream, Luxembourg, in each case to the extent applicable. Registered Notes are also subject to the restrictions on transfer set forth therein and will bear a legend regarding such restrictions, see "Subscription and Sale and Transfer and Selling Restrictions."

Pursuant to the Agency Agreement (as defined under "Terms and Conditions of the Notes"), the Principal Paying Agent shall arrange that, where a further Tranche of Notes is issued which is intended to form a single Series with an existing Tranche of Notes, the Notes of such further Tranche shall be assigned a common code and ISIN which are different from the common code and ISIN assigned to Notes of any other Tranche of the same Series until at least the expiry of the Distribution Compliance Period applicable to the Notes of such Tranche.

For so long as any of the Notes is represented by a Global Note (as defined in "Terms and Conditions of the Notes") held on behalf of Euroclear and/or Clearstream, Luxembourg each person (other than Euroclear or Clearstream, Luxembourg) who is for the time being shown in the records of Euroclear or of Clearstream, Luxembourg as the holder of a particular nominal amount of such Notes (in which regard any certificate or other document issued by Euroclear or Clearstream, Luxembourg as to the nominal amount of such Notes standing to the account of any person shall be conclusive and binding for all purposes save in the case of manifest error) shall be treated by the Issuer and its agents as the holder of such nominal amount of such Notes for all purposes other than with respect to the payment of principal or interest on such nominal amount of such Notes, for which purpose the bearer of the relevant Bearer Global Note or the registered holder of the relevant Registered Global Note shall be treated by the Issuer and its agents as the holder of such nominal amount of such Notes in accordance with and subject to the terms of the relevant Global Note, and the expressions "Noteholder" and "holder of Notes" and related expressions shall be construed accordingly.

So long as DTC or its nominee is the registered owner or holder of a Registered Global Note, DTC or such nominee, as the case may be, will be considered the sole owner or holder of the Notes represented by such Registered Global Note for all purposes under the Agency Agreement and such Notes except to the extent that in accordance with DTC's published rules and procedures any ownership rights may be exercised by its participants or beneficial owners through participants.

Any reference herein to Euroclear, Clearstream, Luxembourg and/or DTC shall, whenever the context so permits, be deemed to include a reference to any additional or alternative clearing system specified in the applicable Pricing Supplement.

The Notes may be accelerated by the holder thereof in certain circumstances described in Condition 11. In such circumstances, where any Note is still represented by a Global Note and the Global Note (or any part thereof) has become due and repayable in accordance with the terms and conditions of such Notes and payment in full of the amount due has not been made in accordance with the provisions of the Global Note then, holders of interests in such Global Note credited to their accounts with Euroclear, Clearstream, Luxembourg and/or DTC, as the case may be, will become entitled to proceed directly against the Issuer on the basis of statements of account provided by Euroclear, Clearstream, Luxembourg and/or DTC on and subject to the terms of a deed of covenant dated April 1, 2016 (the "Deed of Covenant"), executed by the Issuer. In addition, holders of interests in such Global Note credited to their accounts with DTC may require DTC to deliver Definitive Notes in registered form in exchange for their interest in such Global Note in accordance with DTC's standard operating procedures.

Form of Pricing Supplement

Set out below is the form of Pricing Supplement that will be completed for each Tranche of Notes issued under the Program.

[Date]

Korea National Oil Corporation

Issue of [Aggregate Nominal Amount of Tranche] [Title of Notes]

under the U.S.$9,000,000,000

Global Medium Term Note Programme

This document constitutes the Pricing Supplement relating to the issue of Notes described herein. Terms used herein shall be deemed to be defined as such for the purposes of the Conditions set forth in the Offering Circular dated March 17, 2017 [and the supplemental Offering Circular dated [●]]. This Pricing Supplement contains the final terms of the Notes and must be read in conjunction with such Offering Circular as so supplemented.

[The following alternative language applies if the first tranche of an issue that is being increased was issued under an Offering Circular with an earlier date.

Terms used herein shall be deemed to be defined as such for the purposes of the Conditions (the "Conditions") set forth in the Offering Circular dated [*original date*]. *This Pricing Supplement contains the final terms of the Notes and must be read in conjunction with the Offering Circular dated [current date], save in respect of the Conditions which are extracted from the Offering Circular dated [original date] and are attached hereto.]*

[Include whichever of the following apply or specify as "Not Applicable" (N/A). Note that the numbering should remain as set out below, even if "Not Applicable" is indicated for individual paragraphs or subparagraphs. Italics denote directions for completing the Pricing Supplements]

1.	Issuer:	Korea National Oil Corporation
2.	(i) Series Number:	[●]
	(ii) Tranche Number:	[●] (*If fungible with an existing Series, details of that Series, including the date on which the Notes become fungible*)
3.	Specified Currency or Currencies:	[●]
4.	Aggregate Nominal Amount:	
	(i) Series:	[●]
	(ii) Tranche:	[●]
5.	(i) Issue Price:	[●] per cent. of the Aggregate Nominal Amount [plus accrued interest from [Issue Date] *(in the case of fungible issues only, if applicable)*]
	(ii) [Net proceeds (after deducting underwriting discounts but not estimated expenses): (required only for listed issues):	[●]
	(iii) [Use of proceeds]:	[●] (*if different from the use of proceeds specified in the Offering Circular*)

6.	Specified Denominations: (*in the case of Registered Notes, this means the minimum integral amount* in which transfers can be made)	[●] *(N.B. Notes must have a minimum denomination of €100,000 (or equivalent) in order to benefit from the wholesale exemption set out in Article 3.2(d) of the Prospectus Directive in that Member State.)* *(N.B. Where Bearer Notes with multiple denominations above U.S.$200,000 or equivalent are being used, the following sample wording should be followed:* *"U.S.$200,000 and integral multiples of U.S.$1,000 in excess thereof up to and including U.S.$399,000. No Notes in definitive form will be issued with a denomination above U.S.$399,000.")*
7.	(i) Issue Date:	[●]
	(ii) Interest Commencement Date:	[●]
8.	Maturity Date:	**[Fixed rate — *specify date*]** Floating rate — Interest Payment Date falling in [***specify months and year***]
9.	Interest Basis:	[[●] **per cent. Fixed Rate] [[LIBOR/EURIBOR] +/- [●] per cent. Floating Rate] [Zero Coupon] [Index Linked Interest] [Dual Currency Interest] [*specify other*]** (further particulars specified below)
10.	Redemption/Payment Basis:	**[Redemption at par] [Index Linked Redemption] [Dual Currency Redemption] [Partly Paid] [Installment] [*specify other*]**
11.	Change of Interest Basis or Redemption/Payment Basis:	**[Specify details of any provision for change of Notes into another Interest Basis or Redemption/ Payment Basis]**
12.	Put (other than Condition 8(d)(i))/Call Options:	**[Investor Put] [Issuer Call] [(further particulars specified below)]**
13.	(i) Status of the Notes:	[Senior]/[Subordinated]
	(ii) Date Board approval for issuance of Notes obtained:	[●] *(N.B. Only relevant where Board (or similar) authorization is required for the particular tranche of Notes)*
14.	Listing:	**[Singapore Exchange Securities Trading Limited/ specify other/None]** (*N.B. Notes under this Programme cannot be admitted to trading on an EU regulated market without the preparation of a prospectus compliant with the disclosure requirements under the EU Prospectus Directive*)
15.	Method of distribution:	**[Syndicated/Non-syndicated]**
	PROVISIONS RELATING TO INTEREST (IF ANY) PAYABLE	
16.	Fixed Rate Note Provisions:	**[Applicable/Not Applicable] *(If not applicable, delete the remaining sub-paragraphs of this paragraph)***

	(i) Rate[(s)] of Interest:	[●] per cent. per annum **[payable [annually/semi-annually/quarterly] in arrear]** ***(If payable other than annually, consider amending Condition 6)***
	(ii) Interest Payment Date(s):	**[[●] in each year up to and including the Maturity Date]/[specify other] [*N.B.: This will need to be amended in the case of long or short coupons*]**
	(iii) Fixed Coupon Amount(s):	[●] per [ ] in nominal amount
	(iv) Broken Amount(s):	**[*Insert particulars of any initial or final broken interest amounts which do not correspond with the Fixed Coupon Amount*]**
	(v) Day Count Fraction:	**[30/360 or Actual/Actual (ICMA) or [*specify other*]]**
	(vi) Determination Date(s):	[●] in each year **[*Insert regular interest payment dates, ignoring issue date or maturity date in the case of a long or short first or last coupon NB: This will need to be amended in the case of regular interest payment dates which are not of equal duration. NB: Only relevant where Day Count Fraction is Actual/Actual (ICMA)*]**
	(vii) Business Day Convention:	**[*Following Business Day Convention*]**
	(viii) Other terms relating to the method of calculating interest for Fixed Rate Notes:	**[None/*Give details*]**
17.	Floating Rate Note Provisions:	**[Applicable/Not Applicable]** ***(If not applicable, delete the remaining sub-paragraphs of this paragraph)***
	(i) Specified Period(s)/Specified Interest Payment Dates:	[●]
	(ii) Business Day Convention:	**[Floating Rate Convention/Following Business Day Convention/Modified Following Business Day Convention/Preceding Business Day Convention/[*specify other*]]**
	(iii) Additional Business Centre(s):	[●]
	(iv) Manner in which the Rate of Interest and Interest Amount is to be determined:	**[Screen Rate Determination/ISDA Determination/*specify other*]**
	(v) Party responsible for calculating the Rate of Interest and Interest Amount (if not the Principal Paying Agent):	[●]
	(vi) Screen Rate Determination:	
	— Reference Rate:	[●] *(Either LIBOR, EURIBOR or other, although additional information is required if other — including fallback provisions in the Agency Agreement)*

— Interest Determination Date(s):	[●] *(Second London business day prior to the start of each Interest Period if LIBOR (other than Sterling or euro LIBOR), first day of each Interest Period if Sterling LIBOR and the second day on which the TARGET 2 system is open prior to the start of each Interest Period if EURIBOR or euro LIBOR)*
— Relevant Screen Page:	[●] *(In the case of EURIBOR, if not Telerate Page 248 ensure it is a page which shows a composite rate or amend the fallback provisions appropriately)*
(vii) ISDA Determination:	
— Floating Rate Option:	[●]
— Designated Maturity:	[●]
— Reset Date:	[●]
(viii) Margin(s):	[+/-][●] per cent. per annum
(ix) Minimum Rate of Interest:	[●] per cent. per annum
(x) Maximum Rate of Interest:	[●] per cent. per annum
(xi) Day Count Fraction:	**[Actual/365 Actual/365 (Fixed) Actual/365 (Sterling) Actual/360 30/360 30E/360 Other]** ***(See Condition 6 for alternatives)***
(xii) Fall back provisions, rounding provisions and any other terms relating to the method of calculating interest on Floating Rate Notes, if different from those set out in the Conditions:	[●]
18. Zero Coupon Note Provisions:	**[Applicable/Not Applicable]** ***(If not applicable, delete the remaining sub-paragraphs of this paragraph)***
(i) Accrual Yield:	[●] per cent. per annum
(ii) Reference Price:	[●]
(iii) Any other formula/basis of determining amount payable:	[●] *(Consider applicable day count fraction if euro denominated)*
(iv) Day Count Fraction in relation to Early Redemption Amount and Late Payment on Zero Coupon Notes:	**[Condition 8(e)(iii) and Condition 8(j) apply/** ***specify other] (Consider applicable day count fraction if not U.S. dollar denominated)***
19. Index Linked Interest Note Provisions:	**[Applicable/Not Applicable]** ***(If not applicable, delete the remaining sub-paragraphs of this paragraph)***
(i) Index/Formula:	***[give or annex details]***
(ii) Calculation Agent responsible for calculating the interest due:	[●]
(iii) Provisions for determining Coupon where calculation by reference to Index and/or Formula is impossible or impracticable:	[●]

(iv) Specified Period(s)/Specified Interest Payment Dates:	[●]
(v) Business Day Convention:	**[Floating Rate Convention/Following Business Day Convention/Modified Following Business Day Convention/Preceding Business Day Convention/ *specify other*]**
(vi) Additional Business Centre(s):	[●]
(vii) Minimum Rate of Interest:	[●] per cent. per annum
(viii) Maximum Rate of Interest:	[●] per cent. per annum
(ix) Day Count Fraction:	[●]
20. Dual Currency Note Provisions:	**[Applicable/Not Applicable]** ***(If not applicable, delete the remaining sub-paragraphs of this paragraph)***
(i) Rate of Exchange/method of calculating Rate of Exchange:	[***give details***]
(ii) Calculation Agent, if any, responsible for calculating the principal and/or interest payable:	[●]
(iii) Provisions applicable where calculation by reference to Rate of Exchange impossible or impracticable:	[●]
(iv) Person at whose option Specified Currency(ies) is/are payable:	[●]
PROVISIONS RELATING TO REDEMPTION	
21. Issuer Call:	**[Applicable/Not Applicable]** ***(If not applicable, delete the remaining sub-paragraphs of this paragraph)***
(i) Optional Redemption Date(s):	[●]
(ii) Optional Redemption Amount of each Note and method, if any, of calculation of such amount(s):	[●] per Note of [●] Specified Denomination
(iii) If redeemable in part:	
(a) Minimum Redemption Amount:	[●]
(b) Higher Redemption Amount:	[●]
(iv) Notice period (if other than as set out in the Conditions):	[●] *(N.B. If setting notice periods which are different to those provided in the Conditions, the Issuer is advised to consider the practicalities of distribution of information through intermediaries, for example, clearing systems and custodians, as well as any other notice requirements which may apply, for example, as between the Issuer and the Principal Paying Agent)*
22. Investor Put (other than Condition 8(d)(i)):	**[Applicable/Not Applicable]** ***(If not applicable, delete the remaining sub-paragraphs of this paragraph)***

	(i) Optional Redemption Date(s):	[●]
	(ii) Optional Redemption Amount of each Note and method, if any, of calculation of such amount(s):	[●] per Note of [●] Specified Denomination
	(iii) Notice period (if other than as set out in the Conditions):	[●] *(N.B. If setting notice periods which are different to those provided in the Conditions, the Issuer is advised to consider the practicalities of distribution of information through intermediaries, for example, clearing systems and custodians, as well as any other notice requirements which may apply, for example, as between the Issuer and the Principal Paying Agent)*
23.	Final Redemption Amount of each Note:	[Par/*specify other*/see Appendix]
24.	Early Redemption Amount of each Note payable on redemption for taxation reasons or on event of default and/or the method of calculating the same (if required or if different from that set out in Condition 8(e)):	[●]
	GENERAL PROVISIONS APPLICABLE TO THE NOTES	
25.	Form of Notes:	**[Bearer Notes:** **[Temporary Bearer Global Note exchangeable for a Permanent Bearer Global Note which is exchangeable for Definitive Notes [on 60 days' notice given at any time/only upon an Exchange Event]]** **[Temporary Bearer Global Note exchangeable for Definitive Notes on and after the Exchange Date]** **[Permanent Bearer Global Note exchangeable for Definitive Notes [on 60 days' notice given at any time/only upon an Exchange Event]]** **[Registered Notes:** **Regulation S Global Note (U.S.$[●] nominal amount) registered in the name of a nominee for [DTC/a common depositary for Euroclear and Clearstream, Luxembourg]/Rule 144A Global Note (U.S.$[●] nominal amount) registered in the name of a nominee for [DTC/a common depositary for Euroclear and Clearstream, Luxembourg]/Definitive IAI Registered Notes (specify nominal amounts)]**
26.	Additional Financial Centre(s) or other special provisions relating to Payment Days:	***[Not Applicable/give details] (Note that this item relates to the place of payment and not Interest Period end dates to which items 17(iii) and 19(vi) relate)***
	(i) Additional Financial Centre(s):	**[●]**
	(ii) Relevant cities for Payment Days:	London, [●]

27.	Talons for future Coupons or Receipts to be attached to Definitive Bearer Notes (and dates on which such Talons mature):	**[Yes/No.** ***If yes, give details*****]**
28.	Details relating to Partly Paid Notes: amount of each payment comprising the Issue Price and date on which each payment is to be made and consequences of failure to pay, including any right of the Issuer to forfeit the Notes and interest due on late payment:	**[Not Applicable/*****give details. NB: new forms of Global Note(s) may be required for Partly Paid issues.*****]**
29.	Details relating to Installment Notes: amount of each installment, date on which each payment is to be made:	**[Not Applicable/*****give details*****]**
30.	Redenomination applicable:	Redenomination **[not]** applicable. **[*****(If Redenomination is applicable, specify the applicable Day Count Fraction and any provisions necessary to deal with floating rate interest calculation (including alternative reference rates))] [(if Redenomination is applicable, specify the terms of the redenomination in an Annex to the Pricing Supplement)*****]**
31.	Other terms or special conditions:	**[Not Applicable/give details]**
	DISTRIBUTION	
32.	(i) If syndicated, names of Managers:	**[Not Applicable/*****give names*****]**
	(ii) Stabilizing Manager (if any):	**[Not Applicable/*****give name*****]**
33.	If non-syndicated, name of relevant Dealer:	[●]
34.	U.S. Selling Restrictions:	**[Reg. S Category 1/Reg. S Category 2]** **[TEFRA D/TEFRA C/TEFRA not applicable]**
35.	Additional selling restrictions:	**[Not Applicable/*****give details*****]** (***If Item 34 confirms that either TEFRA C or TEFRA D applies, then specify each of the selling restrictions and representations that should be complied with to ensure that the issuance of Notes is U.S. Treas. Reg. § 1.163-5(c)(2)(i)(C) (i.e., TEFRA C) or U.S. Treas. Reg. § 1.163-5(c)(2)(i)(D) (i.e., TEFRA D) compliant, as applicable***)
	OPERATIONAL INFORMATION	
36.	Any clearing system(s) other than Euroclear and Clearstream, Luxembourg and the relevant identification number(s):	**[Not Applicable/*****give name(s) and number(s)*****]**
37.	Delivery:	Delivery **[against/free of]** payment
38.	In the case of Registered Notes, specify the Registrar:	**[Not Applicable/Citibank, N.A., London Branch]**
39.	Specify the Principal Paying Agent:	**[Citibank, N.A., London Branch]**

40.	In the case of Registered Notes, specify the location of the office of the Registrar if other than New York:	**[Not Applicable/give location]**
41.	Additional Paying Agent(s) (if any):	[●]
	ISIN:	[●]
	Common Code:	[●]
	(insert here any other relevant codes such as CUSIP and CINS codes)	

[LISTING APPLICATION

This Pricing Supplement comprises the final terms required to list the issue of Notes described herein pursuant to the U.S.$9,000,000,000 Global Medium Term Note Programme of Korea National Oil Corporation.]

RESPONSIBILITY

The Issuer accepts responsibility for the information contained in this Pricing Supplement, which, when read together with the Offering Circular and the supplemental Offering Circular referred to above, contains all information that is material in the context of the issue of the Notes.

Signed on behalf of the Issuer:

By:

Duly authorized

If the applicable Pricing Supplement specifies any modification to the Terms and Conditions of the Notes as described herein, it is envisaged that, to the extent that such modification relates only to Conditions 1, 5, 6, 7, 8 (except Condition 8(b)), 12, 13, 14, 15 (insofar as such Notes are not listed or admitted to trading on any stock exchange) or 17, they will not necessitate the preparation of a supplement to this Offering Circular. If the Terms and Conditions of the Notes of any Series are to be modified in any other respect, a supplement to this Offering Circular will be prepared, if appropriate.

TERMS AND CONDITIONS OF THE NOTES

The following are the Terms and Conditions of the Notes which will be incorporated by reference into each Global Note (as defined below) and each definitive Note, in the latter case only if permitted by the relevant stock exchange or other relevant authority (if any) and agreed by the Issuer and the relevant Dealer at the time of issue but, if not so permitted and agreed, such definitive Note will have endorsed thereon or attached thereto such Terms and Conditions. The applicable Pricing Supplement in relation to any Tranche of Notes may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the following Terms and Conditions, replace or modify the following Terms and Conditions for the purpose of such Notes. The applicable Pricing Supplement (or the relevant provisions thereof) will be endorsed upon, or attached to, each Global Note and definitive Note. Reference should be made to "Form of the Notes" for a description of the content of Pricing Supplements which will specify which of such terms are to apply in relation to the relevant Notes.

This Note is one of a Series (as defined below) of Notes issued by Korea National Oil Corporation (the "Issuer") pursuant to the Agency Agreement (as defined below).

References herein to the "Notes" shall be references to the Notes of this Series and shall mean:

(a) in relation to any Notes represented by a global Note (a "Global Note"), units of the lowest Specified Denomination in the Specified Currency;

(b) any Global Note;

(c) any definitive Notes in bearer form ("Bearer Notes") issued in exchange for a Global Note in bearer form; and

(d) any definitive Notes in registered form ("Registered Notes") (whether or not issued in exchange for a Global Note in registered form).

The Notes, the Receipts (as defined below) and the Coupons (as defined below) have the benefit of the agency agreement dated 1 April 2016, as further amended and/or supplemented from time to time (the "Agency Agreement"), and made between the Issuer, Citibank, N.A., London Branch as issuing and principal paying agent (the "Principal Paying Agent," which expression shall include any successor agent) and the other paying agents named therein (together with the Principal Paying Agent, the "Paying Agents," which expression shall include any additional or successor paying agents), as exchange agent (the "Exchange Agent," which expression shall include any additional or successor exchange agent) and as registrar (the "Registrar," which expression shall include any successor registrar) and a transfer agent and the other transfer agents named therein (together with the Registrar, the "Transfer Agent" which expression shall include any additional or successor transfer agents).

Interest bearing definitive Bearer Notes (unless otherwise indicated in the applicable Pricing Supplement) have interest coupons ("Coupons") and, if indicated in the applicable Pricing Supplement, talons for further Coupons ("Talons") attached on issue. Any reference herein to Coupons or coupons shall, unless the context otherwise requires, be deemed to include a reference to Talons or talons. Definitive Bearer Notes repayable in installments have receipts ("Receipts") for the payment of the installments of principal (other than the final installment) attached on issue. Registered Notes and Global Notes do not have Receipts, Coupons or Talons attached on issue.

The Pricing Supplement for this Note (or the relevant provisions thereof) is attached to or endorsed on this Note and supplements these Terms and Conditions and may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with these Terms and Conditions, replace or modify these Terms and Conditions for the purposes of this Note. References to the "applicable Pricing Supplement" are to the Pricing Supplement (or the relevant provisions thereof) attached to or endorsed on this Note.

Any reference to "Noteholders" or "holders" in relation to any Notes shall mean (in the Bearer Notes) the holders of the Notes and (in the case of Registered Notes) the persons in whose name the Notes are registered and shall, in relation to any Notes represented by a Global Note, be construed as provided below. Any reference herein to "Receiptholders" shall mean the holders of the Receipts and any reference herein to "Couponholders" shall mean the holders of the Coupons and shall, unless the context otherwise requires, include the holders of the Talons.

As used herein, "Tranche" means Notes which are identical in all respects (including as to listing) and "Series" means a Tranche of Notes together with any further Tranche or Tranches of Notes which are (a) expressed to be consolidated and form a single series and (b) identical in all respects (including as to listing) except for their respective Issue Dates, Interest Commencement Dates and/or Issue Prices.

The Noteholders, the Receiptholders and the Couponholders are entitled to the benefit of a deed of covenant dated 1 April 2016 (the "Deed of Covenant") made by the Issuer. The original of the Deed of Covenant is held by the common depositary for Euroclear (as defined below) and Clearstream, Luxembourg (as defined below).

Copies of the Agency Agreement, a deed poll dated 1 April 2016 (the "Deed Poll") and made by the Issuer, the applicable Pricing Supplement and the Deed of Covenant are available during normal business hours at the specified office of each of the Principal Paying Agent, the Registrar and the other Paying Agents and Transfer Agents (such agents and the Registrar being together referred to as the "Agents"). Copies of the applicable Pricing Supplement are obtainable during normal business hours at the specified office of each of the Agents save that, if this Note is an unlisted Note of any Series, the applicable Pricing Supplement will only be available for inspection by a Noteholder holding one or more unlisted Notes of that Series and such Noteholder must produce evidence satisfactory to the Issuer or the relevant Paying Agent as to its holding of such Notes and identity. The Noteholders, the Receiptholders and the Couponholders are deemed to have notice of, and are entitled to the benefit of, all the provisions of the Agency Agreement, the Deed Poll, the Deed of Covenant and the applicable Pricing Supplement which are applicable to them. The statements in these Terms and Conditions include summaries of, and are subject to, the detailed provisions of the Agency Agreement.

Words and expressions defined in the Agency Agreement or used in the applicable Pricing Supplement shall have the same meanings where used in these Terms and Conditions unless the context otherwise requires or unless otherwise stated and provided that, in the event of inconsistency between the Agency Agreement and the applicable Pricing Supplement, the applicable Pricing Supplement will prevail.

1. FORM, DENOMINATION AND TITLE

The Notes are in bearer form or in registered form as specified in the applicable Pricing Supplement and, in the case of definitive Notes, serially numbered, in the Specified Currency and the Specified Denomination(s). Notes of one Specified Denomination may not be exchanged for Notes of another Specified Denomination and Bearer Notes may not be exchanged for Registered Notes and vice versa.

This Note may be a Fixed Rate Note, a Floating Rate Note, a Zero Coupon Note, an Index Linked Interest Note, a Dual Currency Interest Note or a combination of any of the foregoing, depending upon the Interest Basis shown in the applicable Pricing Supplement.

This Note may be an Index Linked Redemption Note, an Installment Note, a Dual Currency Redemption Note, a Partly Paid Note or a combination of any of the foregoing, depending on the Redemption/ Payment Basis shown in the applicable Pricing Supplement.

Definitive Bearer Notes are issued with Coupons attached, unless they are Zero Coupon Notes in which case references to Coupons and Couponholders in these Terms and Conditions are not applicable.

Subject as set out below, title to the Bearer Notes, Receipts and Coupons will pass by delivery and title to the Registered Notes will pass upon registration of transfers in accordance with the provisions of the Agency Agreement. The Issuer and the Paying Agents will (except as otherwise required by law) deem and treat the bearer of any Bearer Note, Receipt or Coupon and the registered holder of any Registered Note as the absolute owner thereof (whether or not overdue and notwithstanding any notice of ownership or writing thereon or notice of any previous loss or theft thereof) for all purposes but, in the case of any Global Note, without prejudice to the provisions set out in the next succeeding paragraph.

For so long as any of the Notes is represented by a Global Note held on behalf of Euroclear Bank S.A./N.V., as operator of the Euroclear System ("Euroclear") and/or Clearstream Banking, société anonyme ("Clearstream, Luxembourg"), each person (other than Euroclear or Clearstream, Luxembourg) who is for the time being shown in the records of Euroclear or of Clearstream, Luxembourg as the holder of a particular nominal amount of such

Notes (in which regard any certificate or other document issued by Euroclear or Clearstream, Luxembourg as to the nominal amount of such Notes standing to the account of any person shall be conclusive and binding for all purposes save in the case of manifest error) shall be treated by the Issuer and the Paying Agents as the holder of such nominal amount of such Notes for all purposes other than with respect to the payment of principal or interest on such nominal amount of such Notes, for which purpose the bearer of the relevant Bearer Global Note and the registered holder of any Registered Note shall be treated by the Issuer and any Paying Agent as the holder of such nominal amount of such Notes in accordance with and subject to the terms of the relevant Global Note and the expressions "Noteholder" and "holder of Notes" and related expressions shall be construed accordingly.

For so long as the Depository Trust Company ("DTC") or its nominee is the registered owner or holder of a Registered Global Note, DTC or such nominee, as the case may be, will be considered the sole owner or holder of the Notes represented by such Registered Global Note for all purposes under the Agency Agreement and the Notes except to the extent that in accordance with DTC's published rules and procedures any ownership rights may be exercised by its participants or beneficial owners through participants.

Notes that are represented by a Global Note will be transferable only in accordance with the rules and procedures for the time being of DTC, Euroclear and Clearstream, Luxembourg, as the case may be. References to DTC, Euroclear and/or Clearstream, Luxembourg shall, whenever the context so permits, be deemed to include a reference to any additional or alternative clearing system specified in the applicable Pricing Supplement.

2. TRANSFERS OF REGISTERED NOTES

(a) Transfers of interests in Registered Global Notes

Transfers of beneficial interests in Registered Global Notes will be effected by DTC, Euroclear or Clearstream, Luxembourg, as the case may be, and, in turn, by other participants and, if appropriate, indirect participants in such clearing systems acting on behalf of beneficial transferors and transferees of such interests. A beneficial interest in a Registered Global Note will, subject to compliance with all applicable legal and regulatory restrictions, be transferable for Notes in definitive form or for a beneficial interest in another Registered Global Note only in the authorized denominations set out in the applicable Pricing Supplement and only in accordance with the rules and operating procedures for the time being of DTC, Euroclear or Clearstream, Luxembourg, as the case may be, and in accordance with the terms and conditions specified in the Agency Agreement. Transfers of a Registered Global Note registered in the name of a nominee for DTC shall be limited to transfers of such Registered Global Note, in whole but not in part, to another nominee of DTC or to a successor of DTC or such successor's nominee.

(b) Transfers of Registered Notes in definitive form

Subject as provided in paragraphs (e), (f) and (g) below, upon the terms and subject to the conditions set forth in the Agency Agreement, a Registered Note in definitive form may be transferred in whole or in part (in the authorized denominations set out in the applicable Pricing Supplement). In order to effect any such transfer (i) the holder or holders must (A) surrender the Registered Note for registration of the transfer of the Registered Note (or the relevant part of the Registered Note) at the specified office of the Registrar or any Transfer Agent, with the form of transfer thereon duly executed by the holder or holders thereof or his or their attorney or attorneys duly authorized in writing and (B) complete and deposit such other certifications as may be required by the Registrar or, as the case may be, the relevant Transfer Agent and (ii) the Registrar or, as the case may be, the relevant Transfer Agent must, after due and careful enquiry, be satisfied with the documents of title and the identity of the person making the request. Any such transfer will be subject to such reasonable regulations as the Issuer and the Registrar may from time to time prescribe (the initial such regulations being set out in Schedule 8 to the Agency Agreement). Subject as provided above, the Registrar or, as the case may be, the relevant Transfer Agent will, within three business days (being for this purpose a day on which banks are open for business in the city where the specified office of the Registrar or, as the case may be, the relevant Transfer Agent is located) of the request (or such longer period as may be required to comply with any applicable fiscal or other laws or regulations), authenticate and deliver, or procure the authentication and delivery of, at its specified office to the transferee or (at the risk of the transferee) send by uninsured mail, to such address as the transferee may request, a new Registered Note in definitive form of a like aggregate nominal amount to the Registered Note (or the relevant part of the Registered Note) transferred. In the case of the transfer of part only of a Registered Note in definitive form, a new Registered Note in definitive form in respect of the balance of the Registered Note not transferred will be so authenticated and delivered or (at the risk of the transferor) sent to the transferor.

(c) Registration of transfer upon partial redemption

In the event of a partial redemption of Notes under Condition 8, the Issuer shall not be required to register the transfer of any Registered Note, or part of a Registered Note, called for partial redemption.

(d) Costs of registration

Noteholders will not be required to bear the costs and expenses of effecting any registration of transfer as provided above, except for any costs or expenses of delivery other than by regular uninsured mail and except that the Issuer may require the payment of a sum sufficient to cover any stamp duty, tax or other Governmental charge that may be imposed in relation to the registration.

(e) Transfers of interests in Regulation S Global Notes

Prior to expiry of the applicable Distribution Compliance Period, transfers by the holder of, or of a beneficial interest in, a Regulation S Global Note to a transferee in the United States or who is a U.S. person will only be made:

(i) upon receipt by the Registrar of a written certification substantially in the form set out in Schedule 6 to the Agency Agreement, amended as appropriate (a "Transfer Certificate"), copies of which are available from the specified office of the Registrar or any Transfer Agent, from the transferor of the Note or beneficial interest therein to the effect that such transfer is being made:

(A) to a person whom the transferor reasonably believes is a QIB in a transaction meeting the requirements of Rule 144A; or

(B) to a person who is an Institutional Accredited Investor, subject to delivery of the Registrar of a Transfer Certificate from the transferor to the effect that such transfer is being made to an Institutional Accredited Investor, a duly executed investment letter from the relevant transferee substantially in the form set out in the Agency Agreement (an "IAI Investment Letter"); or

(ii) otherwise pursuant to the Securities Act or an exemption therefrom, subject to receipt by the Issuer of such satisfactory evidence as the Issuer may reasonably require, which may include an opinion of U.S. counsel, that such transfer is in compliance with any applicable securities laws of any State of the United States,

and, in each case, in accordance with any applicable securities laws of any State of the United States or any other jurisdiction.

In the case of (A) above, such transferee may take delivery through a Legended Note in global or definitive form and, in the case of (B) above, such transferee may take delivery only through a Legended Note in definitive form. After expiry of the applicable Distribution Compliance Period (i) beneficial interests in Regulation S Global Notes registered in the name of a nominee for DTC may be held through DTC directly, by a participant in DTC, or indirectly through a participant in DTC and (ii) such certification requirements will no longer apply to such transfers.

(f) Transfers of interests in Legended Notes

Transfers of Legended Notes or beneficial interests therein may be made:

(i) to a transferee who takes delivery of such interest through a Regulation S Global Note, upon receipt by the Registrar of a duly completed Transfer Certificate from the transferor to the effect that such transfer is being made in accordance with Regulation S and that in the case of a Regulation S Global Note registered in the name of a nominee for DTC, if such transfer is being made prior to expiry of the applicable Distribution Compliance Period, the interests in the Notes being transferred will be held immediately thereafter through Euroclear and/or Clearstream, Luxembourg; or

(ii) to a transferee who takes delivery of such interest through a Legended Note:

(A) where the transferee is a person whom the transferor reasonably believes is a QIB in a transaction meeting the requirements of Rule 144A, without certification; or

(B) where the transferee is an Institutional Accredited Investor, subject to delivery to the Registrar of a Transfer Certificate from the transferor to the effect that such transfer is being made to an Institutional Accredited Investor, together with a duly executed IAI Investment Letter from the relevant transferee; or

(iii) otherwise pursuant to the Securities Act or an exemption therefrom, subject to receipt by the Issuer of such satisfactory evidence as the Issuer may reasonably require, which may include an opinion of U.S. counsel, that such transfer is in compliance with any applicable securities laws of any State of the United States,

and, in each case, in accordance with any applicable securities laws of any State of the United States or any other jurisdiction.

Notes transferred by Institutional Accredited Investors to QIBs pursuant to Rule 144A or outside the United States pursuant to Regulation S will be eligible to be held by such QIBs or non-U.S. investors through DTC, Euroclear or Clearstream, Luxembourg, as appropriate, and the Registrar will arrange for any Notes which are the subject of such a transfer to be represented by the appropriate Registered Global Note, where applicable.

Upon the transfer, exchange or replacement of Legended Notes, or upon specific request for removal of the Legend, the Registrar shall deliver only Legended Notes or refuse to remove the Legend, as the case may be, unless there is delivered to the Issuer such satisfactory evidence as may reasonably be required by the Issuer, which may include an opinion of U.S. counsel, that neither the Legend nor the restrictions on transfer set forth therein are required to ensure compliance with the provisions of the Securities Act.

(g) Exchanges and transfers of Registered Notes generally

Holders of Registered Notes in definitive form, other than Institutional Accredited Investors, may exchange such Notes for interests in a Registered Global Note of the same type at any time.

(h) Definitions

In this Condition, the following expressions shall have the following meanings:

"*Distribution Compliance Period*" means the period that ends 40 days after the completion of the distribution of each Tranche of Notes, as certified by the relevant Dealer (in the case of a non-syndicated issue) or the relevant Lead Manager (in the case of a syndicated issue);

"*Institutional Accredited Investor*" means "accredited investors" (as defined in Rule 501(a)(1), (2), (3) or (7) under the Securities Act that are institutions;

"*Legended Note*" means Registered Notes in definitive form that are issued to Institutional Accredited Investors and Registered Notes (whether in definitive form or represented by a Registered Global Note) sold in private transactions to QIBs in accordance with the requirements of Rule 144A;

"*QIB*" means a "qualified institutional buyer" within the meaning of Rule 144A;

"*Regulation S*" means Regulation S under the Securities Act;

"*Regulation S Global Note*" means a Registered Global Note representing Notes sold outside the United States in reliance on Regulation S;

"*Rule 144A*" means Rule 144A under the Securities Act;

"*Rule 144A Global Note*" means a Registered Global Note representing Notes sold in the United States or to QIBs; and

"*Securities Act*" means the United States Securities Act of 1933, as amended.

3. STATUS OF THE NOTES

The Notes and any relative Receipts and Coupons are direct, unconditional, unsubordinated and (subject to the provisions of Condition 4) unsecured obligations of the Issuer and rank pari passu among themselves and will rank *pari passu* with all other present and future unsecured and unsubordinated obligations of the Issuer, save for such as may be preferred by mandatory provisions of applicable law.

4. CERTAIN COVENANTS

(a) Negative Pledge

So long as any of the Notes of this Series remains outstanding, the Issuer will not itself, and will not permit any Principal Subsidiary (as defined below) to, create or permit to be outstanding any mortgage, charge, lien, pledge or other security interest ("Security") upon the whole or part of its property, assets or revenues, present or future, to secure for the benefit of the holders of any International Investment Securities (as defined below) (i) payment of any sum due in respect of any such International Investment Securities or (ii) any payment under any guarantee of any such International Investment Securities or (iii) any payment under any indemnity or other like obligation relating to any such International Investment Securities, without in any such case at the same time, according to the Notes of this Series and the Receipts and Coupons applicable thereto, either the same security as is granted to or is outstanding in respect of such International Investment Securities, guarantee, indemnity or other like obligation or such other security as shall be approved by an Extraordinary Resolution (as defined in the Agency Agreement) passed at a meeting of the holders of Notes of this Series.

The foregoing shall not operate to restrict or prohibit (i) the existence of any Security for the benefit of the holders of any International Investment Securities created by a Principal Subsidiary prior to it becoming a Principal Subsidiary, *provided* that the same shall not have been created in contemplation thereof or in connection therewith, (ii) the creation or existence of any Security consisting of a security interest solely in Receivables (as defined below) securing payment of interest or principal of, payment under any guarantee of, or payment under any indemnity relating to, any International Investment Securities issued by a wholly-owned Subsidiary (or another Person in which the Issuer or any Principal Subsidiary makes an investment and to which the Issuer or any Principal Subsidiary transfers Receivables and related assets) and (iii) the creation of any Security over the assets of a capital project securing payment of interest or principal of, payment under any guarantee of, or payment under any indemnity relating to, any International Investment Securities issued by the Issuer or that Principal Subsidiary, where the International Investment Securities are issued to finance such capital project and the financier's rights of recovery are limited to the assets of such capital project.

In this Condition, a "capital project" means a long-term investment project to acquire, develop, improve, and/or maintain oil or gas fields or oil or gas exploration, development and production related equipment.

(b) Consolidation, Merger and Sale of Assets

The Issuer, without the consent of the holders of the Notes, may consolidate with, or merge into, or sell, transfer, lease or convey its assets as an entirety or substantially as an entirety to any corporation; provided that

(i) any successor corporation expressly assumes the Issuer's obligations under these Conditions and the Agency Agreement, (ii) after giving effect to the transaction, with respect to the Issuer or any such successor corporation, no Event of Default and no event which, after notice or lapse of time or both, would become an Event of Default, shall have occurred and be continuing and (iii) the Issuer has delivered to the Principal Paying Agent a certificate executed by a duly authorized officer of the Issuer and an opinion of counsel as to matters of law stating that such consolidation, merger, sale, transfer, lease or conveyance and, if a supplemental agency agreement is required in connection with such transaction, such supplemental agency agreement comply with the Agency Agreement and the Notes and that all conditions precedent herein provided for relating to such transaction have been complied with.

(c) Certain Definitions

In this Condition, the following expressions shall have the following meanings:

"*International Investment Securities*" means notes, debentures, bonds or investment securities of the Issuer which:

(A) either are by their terms payable, or confer a right to receive payment, in any currency other than Won or are denominated in Won and more than 50 per cent. of the aggregate principal amount thereof is initially distributed outside Korea by or with the authorization of the Issuer; and

(B) are for the time being, or are intended to be, quoted, listed, ordinarily dealt in or traded on any stock exchange or over-the-counter or other securities market outside Korea.

"*Person*" means any individual, corporation, company, firm, tribunal, undertaking, association, organization, partnership, joint venture, trust, limited liability company, unincorporated organization or government or any agency, instrumentality or political subdivision thereof; in each case whether or not being a separate legal entity.

"*Principal Subsidiary*" means:

(i) any Subsidiary (as defined below) of the Issuer:

(x) whose net sales, as shown by the then latest audited financial statements or accounts (consolidated where applicable, but without intercompany adjustments for consolidation with the Issuer) of such Subsidiary, constitute at least 10% of the consolidated net sales of the Issuer as shown by the then latest audited consolidated accounts of the Issuer; or

(y) whose total assets, as shown by the then latest audited financial statements or accounts (consolidated where applicable, but without intercompany adjustments for consolidation with the Issuer) of such Subsidiary, constitute at least 10% of the total consolidated assets of the Issuer as shown by the then latest audited consolidated accounts of the Issuer;

provided that:

(1) in the case of a Subsidiary acquired, or a company becoming a Subsidiary, after the end of the financial period to which the latest audited consolidated accounts of the Issuer relate, the reference to the then latest audited consolidated accounts of the Issuer for the purposes of the calculation above shall, until audited consolidated accounts of the Issuer for the financial period in which the acquisition is made or, as the case may be, in which the relevant company becomes a Subsidiary are published, be deemed to be a reference to the then latest audited consolidated accounts of the Issuer adjusted to consolidate the last audited accounts (consolidated where applicable) of such Subsidiary in such accounts;

(2) if at any relevant time in relation to the Issuer or any Subsidiary in respect of which financial consolidation is relevant no consolidated accounts are prepared and audited, net sales and total assets of the Issuer and/or any such Subsidiary shall be determined on the basis of pro-forma consolidated accounts prepared for this purpose by the auditors for the time being of the Issuer;

(3) if at any relevant time in relation to any Subsidiary no accounts are audited, its net sales and total assets (consolidated where applicable, but without intercompany adjustments for consolidation with the Issuer) shall be determined on the basis of pro-forma accounts (consolidated where applicable, but without intercompany adjustments for consolidation with the Issuer) of the relevant Subsidiary prepared for this purpose by the auditors for the time being of the Issuer; and

(4) if the accounts of any Subsidiary (not being a Subsidiary referred to in proviso (1) above) are not consolidated with those of the Issuer, then the determination of whether or not such Subsidiary is a Principal Subsidiary shall be based on a pro-forma consolidation of its accounts (consolidated where applicable, but without intercompany adjustments for consolidation with the Issuer) with the then latest consolidated audited accounts (determined on the basis of the foregoing) of the Issuer; or

(ii) any Subsidiary of the Issuer to which is transferred all or substantially all of the assets of a Subsidiary which immediately prior to such transfer was a Principal Subsidiary, provided that the Principal Subsidiary which so transfers its assets shall forthwith upon such transfer cease to be a Principal Subsidiary.

"*Receivable*" means a right to receive payment arising from a sale or lease of goods (including oil or gas reserves and equipment) or the performance of services by a Person pursuant to an arrangement with another Person pursuant to which such other Person is obligated to pay for such goods or services under terms that permit the purchase of such goods and services on credit.

"*Relevant GAAP*" shall mean such accounting principles which are generally accepted in Korea at the date or time of any computation.

"*Subsidiary*" means, at any particular time, (i) at least 50% of whose issued equity share capital (or equivalent) is then beneficially owned, by the Issuer, (ii) any person which is then directly or indirectly controlled by the Issuer or (iii) any subsidiary subject to consolidation with the Issuer's financial statements under Relevant GAAP. For a person to be "controlled" by another means that the other (whether directly or indirectly and whether by the ownership of share capital, the possession of voting power, contract or otherwise) has the power to appoint and/or remove a majority of the members of the board of directors or other governing body of that person or otherwise controls or has the power to control the affairs and policies of that person.

5. REDENOMINATION

(a) Redenomination

Where redenomination is specified in the applicable Pricing Supplement as being applicable, the Issuer may, without the consent of the Noteholders, the Receiptholders and the Couponholders, on giving prior notice to the Principal Paying Agent, Euroclear and Clearstream, Luxembourg and at least 30 days' prior notice to the Noteholders in accordance with Condition 15, elect that, with effect from the Redenomination Date specified in the notice, the Notes shall be redenominated in euro.

The election will have effect as follows:

(i) the Notes and the Receipts shall be deemed to be redenominated in euro in the denomination of €0.01 with a nominal amount for each Note and Receipt equal to the nominal amount of that Note or Receipt in the Specified Currency, converted into euro at the Established Rate, provided that, if the Issuer determines, with the agreement of the Principal Paying Agent, that the then market practice in respect of the redenomination in euro of internationally offered securities is different from the provisions specified above, such provisions shall be deemed to be amended so as to comply with such market practice and the Issuer shall promptly notify the Noteholders, the stock exchange (if any) on which the Notes may be listed and the Paying Agents of such deemed amendments;

(ii) save to the extent that an Exchange Notice has been given in accordance with paragraph (iv) below, the amount of interest due in respect of the Notes will be calculated by reference to the aggregate nominal amount of Notes presented (or, as the case may be, in respect of which Coupons are presented) for payment by the relevant holder and the amount of such payment shall be rounded down to the nearest €0.01;

(iii) if definitive Notes are required to be issued after the Redenomination Date, they shall be issued at the expense of the Issuer in the denominations of €1,000, €10,000, €100,000 and (but only to the extent of any remaining amounts less than €1,000 or such smaller denominations as the Principal Paying Agent may approve) €0.01 and such other denominations as the Principal Paying Agent shall determine and notify to the Noteholders;

(iv) if issued prior to the Redenomination Date, all unmatured Coupons denominated in the Specified Currency (whether or not attached to the Notes) will become void with effect from the date on which the Issuer gives notice (the "Exchange Notice") that replacement euro-denominated Notes, Receipts and Coupons are available for exchange (provided that such securities are so available) and no payments will be made in respect of them. The payment obligations contained in any Notes and Receipts so issued will also become void on that date although those Notes and Receipts will continue to constitute valid exchange obligations of the Issuer. New euro-denominated Notes, Receipts and Coupons will be issued in exchange for Notes, Receipts and Coupons denominated in the Specified Currency in such manner as the Principal Paying Agent may specify and as shall be notified to the Noteholders in the Exchange Notice. No Exchange Notice may be given less than 15 days prior to any date for payment of principal or interest on the Notes;

(v) after the Redenomination Date, all payments in respect of the Notes, the Receipts and the Coupons, other than payments of interest in respect of periods commencing before the Redenomination Date, will be made solely in euro as though references in the Notes to the Specified Currency were to euro. Payments will be made in euro by credit or transfer to a euro account (or any other account to which euro may be credited or transferred) specified by the payee or, at the option of the payee, by a euro cheque;

(vi) if the Notes are Fixed Rate Notes and interest for any period ending on or after the Redenomination Date is required to be calculated for a period ending other than on an Interest Payment Date, it will be calculated by applying the Rate of Interest to each Specified Denomination, multiplying such sum by the applicable Day Count Fraction, and rounding the resultant figure to the nearest sub-unit of the relevant Specified Currency, half of any such sub-unit being rounded upwards or otherwise in accordance with applicable market convention;

(vii) if the Notes are Floating Rate Notes, the applicable Pricing Supplement will specify any relevant changes to the provisions relating to interest; and

(viii) such other changes shall be made to this Condition as the Issuer may decide, after consultation with the Principal Paying Agent, and as may be specified in the notice, to conform it to conventions then applicable to instruments denominated in euro.

(b) Definitions

In the Conditions, the following expressions have the following meanings:

"*Established Rate*" means the rate for the conversion of the Specified Currency (including compliance with rules relating to roundings in accordance with applicable European Community regulations) into euro established by the Council of the European Union pursuant to Article 123 of the Treaty;

"*€*" and "*euro*" means the currency introduced at the start of the third stage of European economic and monetary union pursuant to the Treaty;

"*Redenomination Date*" means (in the case of interest bearing Notes) any date for payment of interest under the Notes or (in the case of Zero Coupon Notes) any date, in each case specified by the Issuer in the notice given to the Noteholders pursuant to paragraph (a) above and which falls on or after the date on which the country of the Specified Currency first participates in the third stage of European economic and monetary union; and

"*Treaty*" means the Treaty establishing the European Community, as amended.

6. INTEREST

(a) Interest on Fixed Rate Notes

Each Fixed Rate Note bears interest on its outstanding nominal amount (or, if it is a Partly Paid Note, the amount paid up) from (and including) the Interest Commencement Date at the rate(s) per annum equal to the Rate(s) of Interest. Interest will be payable in arrears on the Interest Payment Date(s) in each year up to (and including) the Maturity Date.

Except as provided in the applicable Pricing Supplement, the amount of interest payable on each Interest Payment Date in respect of the Fixed Interest Period ending on (but excluding) such date will amount to the Fixed Coupon Amount. Payments of interest on any Interest Payment Date will, if so specified in the applicable Pricing Supplement, amount to the Broken Amount so specified.

As used in the Conditions, "Fixed Interest Period" means the period from (and including) an Interest Payment Date (or the Interest Commencement Date) to (but excluding) the next (or first) Interest Payment Date.

If interest is required to be calculated for a period ending other than a Fixed Interest Period, such interest shall be calculated by applying the Rate of Interest to each Specified Denomination, multiplying such sum by the applicable Day Count Fraction, and rounding the resultant figure to the nearest sub-unit of the relevant Specified Currency, half of any such sub-unit being rounded upwards or otherwise in accordance with applicable market convention.

"*Day Count Fraction*" means, in respect of the calculation of an amount of interest in accordance with this Condition 6(a):

(i) if "Actual/Actual (ICMA)" is specified in the applicable Pricing Supplement:

(a) in the case of Notes where the number of days in the relevant period from (and including) the most recent Interest Payment Date (or, if none, the Interest Commencement Date) to (but excluding) the relevant payment date (the "Accrual Period") is equal to or shorter than the Determination Period during which the Accrual Period ends, the number of days in such Accrual Period divided by the product of (1) the number of days in such Determination Period and (2) the number of Determination Dates (as specified in the applicable Pricing Supplement) that would occur in one calendar year; or

(b) in the case of Notes where the Accrual Period is longer than the Determination Period during which the Accrual Period ends, the sum of:

(1) the number of days in such Accrual Period falling in the Determination Period in which the Accrual Period begins divided by the product of (x) the number of days in such Determination Period and (y) the number of Determination Dates that would occur in one calendar year; and

(2) the number of days in such Accrual Period falling in the next Determination Period divided by the product of (x) the number of days in such Determination Period and (y) the number of Determination Dates that would occur in one calendar year; and

(ii) if "30/360" is specified in the applicable Pricing Supplement, the number of days in the period from (and including) the most recent Interest Payment Date (or, if none, the Interest Commencement Date) to (but excluding) the relevant payment date (such number of days being calculated on the basis of a year of 360 days with 12 30-day months) divided by 360.

In the Conditions:

"*Determination Period*" means each period from (and including) a Determination Date to (but excluding) the next Determination Date (including, where either the Interest Commencement Date or the final Interest Payment Date is not a Determination Date, the period commencing on the first Determination Date prior to, and ending on the first Determination Date falling after, such Determination Date); and

"*sub-unit*" means, with respect to any currency other than euro, the lowest amount of such currency that is available as legal tender in the country of such currency and, with respect to euro, means one cent.

(b) Interest on Floating Rate Notes and Index Linked Interest Notes

(i) Interest Payment Dates

Each Floating Rate Note and Index Linked Interest Note bears interest on its outstanding nominal amount (or, if it is a Partly Paid Note, the amount paid up) from (and including) the Interest Commencement Date and such interest will be payable in arrears on either:

(A) the Specified Interest Payment Date(s) (each an "Interest Payment Date") in each year specified in the applicable Pricing Supplement; or

(B) if no Specified Interest Payment Date(s) is/are specified in the applicable Pricing Supplement, each date (each an "Interest Payment Date") which falls the number of months or other period specified as the Specified Period in the applicable Pricing Supplement after the preceding Interest Payment Date or, in the case of the first Interest Payment Date, after the Interest Commencement Date.

Such interest will be payable in respect of each Interest Period (which expression shall, in these Terms and Conditions, mean the period from (and including) an Interest Payment Date (or the Interest Commencement Date) to (but excluding) the next (or first) Interest Payment Date).

If a Business Day Convention is specified in the applicable Pricing Supplement and (x) if there is no numerically corresponding day on the calendar month in which an Interest Payment Date should occur or (y) if any Interest Payment Date would otherwise fall on a day that is not a Business Day, then, if the Business Day Convention specified is:

(1) in any case where Specified Periods are specified in accordance with Condition 6(b)(i)(B) above, the Floating Rate Convention, such Interest Payment Date (i) in the case of (x) above, shall be the last day that is a Business Day in the relevant month and the provisions of (B) below shall apply mutatis mutandis or (ii) in the case of (y) above, shall be postponed to the next day which is a Business Day unless it would thereby fall into the next calendar month, in which event (A) such Interest Payment Date shall be brought forward to the immediately preceding Business Day and (B) each subsequent Interest Payment Date shall be the last Business Day in the month which falls the Specified Period after the preceding applicable Interest Payment Date occurred; or

(2) the Following Business Day Convention, such Interest Payment Date shall be postponed to the next day which is a Business Day; or

(3) the Modified Following Business Day Convention, such Interest Payment Date shall be postponed to the next day which is a Business Day unless it would thereby fall into the next calendar month, in which event such Interest Payment Date shall be brought forward to the immediately preceding Business Day; or

(4) the Preceding Business Day Convention, such Interest Payment Date shall be brought forward to the immediately preceding Business Day.

In these Conditions, "Business Day" means a day that is both:

(A) a day on which commercial banks and foreign exchange markets settle payments and are open for general business (including dealing in foreign exchange and foreign currency deposits) in London and any Additional Business Centre specified in the applicable Pricing Supplement; and

(B) either (1) in relation to any sum payable in a Specified Currency other than euro, a day on which commercial banks and foreign exchange markets settle payments and are open for general business (including dealing in foreign exchange and foreign currency deposits) in the principal financial centre of the country of the relevant Specified Currency (if other than London and any Additional Business Centre and which, if the Specified Currency is Australian dollars or New Zealand dollars, shall be Melbourne or Wellington, respectively) or (2) in relation to any sum payable in euro, a day on which the Trans-European Automated Real-Time Gross Settlement Express Transfer (TARGET 2) System (the "TARGET 2 System") is open.

(ii) Rate of Interest

The Rate of Interest payable from time to time in respect of Floating Rate Notes and Index Linked Interest Notes will be determined in the manner specified in the applicable Pricing Supplement.

(A) ISDA Determination for Floating Rate Notes

Where ISDA Determination is specified in the applicable Pricing Supplement as the manner in which the Rate of Interest is to be determined, the Rate of Interest for each Interest Period will be the relevant ISDA Rate plus or minus (as indicated in the applicable Pricing Supplement) the Margin (if any). For the purposes of this sub-paragraph (A), "ISDA Rate" for an Interest Period means a rate equal to the Floating Rate that would be determined by the Principal Paying Agent under an interest rate swap transaction if the Principal Paying Agent were acting as Calculation Agent for that swap transaction under the terms of an agreement incorporating the 2006 ISDA Definitions, as published by the International Swaps and Derivatives Association, Inc. and as amended and updated as at the Issue Date of the first Tranche of the Notes (the "ISDA Definitions") and under which:

(1) the Floating Rate Option is as specified in the applicable Pricing Supplement;

(2) the Designated Maturity is a period specified in the applicable Pricing Supplement; and

(3) the relevant Reset Date is either (i) if the applicable Floating Rate Option is based on the London inter-bank offered rate ("LIBOR") or on the Euro-zone inter-bank offered rate ("EURIBOR"), the first day of that Interest Period or (ii) in any other case, as specified in the applicable Pricing Supplement.

For the purposes of this sub-paragraph (A), "Floating Rate," "Calculation Agent," "Floating Rate Option," "Designated Maturity" and "Reset Date" have the meanings given to those terms in the ISDA Definitions.

(B) Screen Rate Determination for Floating Rate Notes

Where Screen Rate Determination is specified in the applicable Pricing Supplement as the manner in which the Rate of Interest is to be determined, the Rate of Interest for each Interest Period will, subject as provided below, be either:

(1) the offered quotation; or

(2) the arithmetic mean (rounded if necessary to the fifth decimal place, with 0.000005 being rounded upwards) of the offered quotations, (expressed as a percentage rate per annum) for the Reference Rate which appears or appear, as the case may be, on the Relevant Screen Page as at 11:00 a.m. (London time, in the case of LIBOR, or Brussels time, in the case of EURIBOR) on the Interest Determination Date in question plus or minus (as indicated in the applicable Pricing Supplement) the Margin (if any), all as determined by the Principal Paying Agent. If five or more of such offered quotations are available on the Relevant Screen Page, the highest (or, if there is more than one such highest quotation, one only of such quotations) and the lowest (or, if there is more than one such lowest quotation, one only of such quotations) shall be disregarded by the Principal Paying Agent for the purpose of determining the arithmetic mean (rounded as provided above) of such offered quotations.

The Agency Agreement contains provisions for determining the Rate of Interest in the event that the Relevant Screen Page is not available or if, in the case of (1) above, no such offered quotation appears or, in the case of (2) above, fewer than three such offered quotations appear, in each case as at the time specified in the preceding paragraph.

If the Reference Rate from time to time in respect of Floating Rate Notes is specified in the applicable Pricing Supplement as being other than LIBOR or EURIBOR, the Rate of Interest in respect of such Notes will be determined as provided in the applicable Pricing Supplement.

(iii) Minimum Rate of Interest and/or Maximum Rate of Interest

If the applicable Pricing Supplement specifies a Minimum Rate of Interest for any Interest Period, then, in the event that the Rate of Interest in respect of such Interest Period determined in accordance with the provisions of paragraph (ii) above is less than such Minimum Rate of Interest, the Rate of Interest for such Interest Period shall be such Minimum Rate of Interest.

If the applicable Pricing Supplement specifies a Maximum Rate of Interest for any Interest Period, then, in the event that the Rate of Interest in respect of such Interest Period determined in accordance with the provisions of paragraph (ii) above is greater than such Maximum Rate of Interest, the Rate of Interest for such Interest Period shall be such Maximum Rate of Interest.

(iv) Determination of Rate of Interest and calculation of Interest Amounts

The Principal Paying Agent, in the case of Floating Rate Notes, and the Calculation Agent, in the case of Index Linked Interest Notes, will at or as soon as practicable after each time at which the Rate of Interest is to be determined, determine the Rate of Interest for the relevant Interest Period. In the case of Index Linked Interest Notes, the Calculation Agent will notify the Principal Paying Agent of the Rate of Interest for the relevant Interest Period as soon as practicable after calculating the same.

The Principal Paying Agent will calculate the amount of interest (the "Interest Amount") payable on the Floating Rate Notes or Index Linked Interest Notes in respect of each Specified Denomination for the relevant Interest Period. Each Interest Amount shall be calculated by applying the Rate of Interest to each Specified Denomination, multiplying such sum by the applicable Day Count Fraction, and rounding the resultant figure to the nearest sub-unit of the relevant Specified Currency, half of any such sub-unit being rounded upwards or otherwise in accordance with applicable market convention.

"*Day Count Fraction*" means, in respect of the calculation of an amount of interest in accordance with this Condition 6(b):

(i) if "Actual/365" or "Actual/Actual" is specified in the applicable Pricing Supplement, the actual number of days in the Interest Period divided by 365 (or, if any portion of that Interest Period falls in a leap year, the sum of (A) the actual number of days in that portion of the Interest Period falling in a leap year divided by 366 and (B) the actual number of days in that portion of the Interest Period falling in a non-leap year divided by 365);

(ii) if "Actual/365 (Fixed)" is specified in the applicable Pricing Supplement, the actual number of days in the Interest Period divided by 365;

(iii) if "Actual/365 (Sterling)" is specified in the applicable Pricing Supplement, the actual number of days in the Interest Period divided by 365 or, in the case of or Interest Payment Date falling in a leap year, 366;

(iv) if "Actual/360" is specified in the applicable Pricing Supplement, the actual number of days in the Interest Period divided by 360;

(v) if "30/360," "360/360" or "Bond Basis" is specified in the applicable Pricing Supplement, the number of days in the Interest Period divided by 360 (the number of days to be calculated on the basis of a year of 360 days with 12 30-day months (unless (a) the last day of the Interest Period is the 31st day of a month but the first day of the Interest Period is a day other than the 30th or 31st day of a month, in which case the month that includes that last day shall not be considered to be shortened to a 30-day month, or (b) the last day of the Interest Period is the last day of the month of February, in which case the month of February shall not be considered to be lengthened to a 30-day month)); and

(vi) if "30E/360" or "Eurobond Basis" is specified in the applicable Pricing Supplement, the number of days in the Interest Period divided by 360 (the number of days to be calculated on the basis of a year of 360 days with 12 30-day months, without regard to the date of the first day or last day of the Interest Period unless, in the case of the final Interest Period, the Maturity Date is the last day of the month of February, in which case the month of February shall not be considered to be lengthened to a 30-day month).

(v) Notification of Rate of Interest and Interest Amounts

The Principal Paying Agent will cause the Rate of Interest and each Interest Amount for each Interest Period and the relevant Interest Payment Date to be notified to the Issuer and, upon consultation with the Issuer, to any stock exchange (other than the Singapore Stock Exchange) on which the relevant Floating Rate Notes or Index Linked Interest Notes are for the time being listed and notices to Noteholders will be published in accordance with Condition 15 as soon as possible after their determination but in no event later than the fourth London Business Day thereafter. Each Interest Amount and Interest Payment Date so notified may subsequently be amended (or appropriate alternative arrangements made by way of adjustment) without prior notice in the event of an extension or shortening of the Interest Period. Any such amendment will be promptly notified to each stock exchange on which the relevant Floating Rate Notes or Index Linked Interest Notes are for the time being listed and to the Noteholders in accordance with Condition 15. For the purposes of this paragraph, the expression "London Business Day" means a day (other than a Saturday or a Sunday) on which banks and foreign exchange markets are open for general business (including dealing in foreign exchange and foreign currency deposits) in London.

(vi) Certificates to be final

All certificates, communications, opinions, determinations, calculations, quotations and decisions given, expressed, made or obtained for the purposes of the provisions of this Condition 6(b), whether by the Principal Paying Agent or, if applicable, the Calculation Agent, shall (in the absence of willful default, bad faith or manifest error) be binding on the Issuer, the Principal Paying Agent, the Calculation Agent (if applicable), the other Paying Agents and all Noteholders, Receiptholders and Couponholders and (in the absence as aforesaid) no liability to the Issuer, the Noteholders, the Receiptholders or the Couponholders shall attach to the Principal Paying Agent or the Calculation Agent (if applicable) in connection with the exercise or non-exercise by it of its powers, duties and discretions pursuant to such provisions.

(c) Interest on Dual Currency Notes

The rate or amount of interest payable in respect of Dual Currency Interest Notes shall be determined in the manner specified in the applicable Pricing Supplement.

(d) Interest on Partly Paid Notes

In the case of Partly Paid Notes (other than Partly Paid Notes which are Zero Coupon Notes), interest will accrue as aforesaid on the paid-up nominal amount of such Notes and otherwise as specified in the applicable Pricing Supplement.

(e) Accrual of interest

Each Note (or in the case of the redemption of part only of a Note, that part only of such Note) will cease to bear interest (if any) from the date for its redemption unless, upon due presentation thereof, payment of principal is improperly withheld or refused. In such event, interest will continue to accrue until whichever is the earlier of:

(1) the date on which all amounts due in respect of such Note have been paid; and

(2) five days after the date on which the full amount of the moneys payable in respect of such Note has been received by the Principal Paying Agent or the Registrar, as the case may be, and notice to that effect has been given to the Noteholders in accordance with Condition 15.

7. PAYMENTS

(a) Method of payment

Subject as provided below:

(i) payments in a Specified Currency other than euro will be made by credit or transfer to an account in the relevant Specified Currency (which, in the case of a payment in Japanese Yen to a non-resident of Japan, shall be a non-resident account) maintained by the payee with, or, at the option of the payee, by a cheque in such Specified Currency drawn on, a bank in the principal financial centre of the country of such Specified Currency (which, if the Specified Currency is Australian dollars or New Zealand dollars, shall be Melbourne or Wellington, respectively); and

(ii) payments in euro will be made by credit or transfer to a euro account (or any other account to which euro may be credited or transferred) specified by the payee or, at the option of the payee, by a euro cheque.

Payments will be subject in all cases to any fiscal or other laws and regulations applicable thereto in the place of payment, but without prejudice to the provisions of Condition 9.

(b) Presentation of definitive Bearer Notes, Receipts and Coupons

Payments of principal in respect of definitive Bearer Notes will (subject as provided below) be made in the manner provided in paragraph (a) above only against presentation and surrender (or, in the case of part payment of any sum due, endorsement) of definitive Bearer Notes, and payments of interest in respect of definitive Bearer Notes will (subject as provided below) be made as aforesaid only against presentation and surrender (or, in the case of part payment of any sum due, endorsement) of Coupons, in each case at the specified office of any Paying Agent outside the United States (which expression, as used herein, means the United States of America (including the States and the District of Columbia, its territories, its possessions and other areas subject to its jurisdiction)).

Payments of installments of principal (if any) in respect of definitive Bearer Notes, other than the final installment, will (subject as provided below) be made in the manner provided in paragraph (a) above against presentation and surrender (or, in the case of part payment of any sum due, endorsement) of the relevant Receipt in accordance with the preceding paragraph. Payment of the final installment will be made in the manner provided in paragraph (a) above only against presentation and surrender (or, in the case of part payment of any sum due, endorsement) of the relevant Bearer Note in accordance with the preceding paragraph. Each Receipt must be presented for payment of the relevant installment together with the definitive Bearer Note to which it appertains. Receipts presented without the definitive Bearer Note to which they appertain do not constitute valid obligations of the Issuer. Upon the date on which any definitive Bearer Note becomes due and repayable, unmatured Receipts (if any) relating thereto (whether or not attached) shall become void and no payment shall be made in respect thereof.

Fixed Rate Notes in definitive bearer form (other than Dual Currency Notes, Index Linked Notes or Long Maturity Notes (as defined below)) should be presented for payment together with all unmatured Coupons appertaining thereto (which expression shall for this purpose include Coupons falling to be issued on exchange of matured Talons), failing which the amount of any missing unmatured Coupon (or, in the case of payment not being made in full, the same proportion of the amount of such missing unmatured Coupon as the sum so paid bears to the sum due) will be deducted from the sum due for payment. Each amount of principal so deducted will be paid in the manner mentioned above against surrender of the relative missing Coupon at any time before the expiry of five years after the Relevant Date (as defined in Condition 9) in respect of such principal (whether or not such Coupon would otherwise have become void under Condition 10) or, if later, two years from the date on which such Coupon would otherwise have become due, but in no event thereafter.

Upon any Fixed Rate Note in definitive bearer form becoming due and repayable prior to its Maturity Date, all unmatured Talons (if any) appertaining thereto will become void and no further Coupons will be issued in respect thereof.

Upon the date on which any Floating Rate Note, Dual Currency Note, Index Linked Interest Note or Long Maturity Note in definitive bearer form becomes due and repayable, unmatured Coupons and Talons (if any) relating thereto (whether or not attached) shall become void and no payment or, as the case may be, exchange for further Coupons shall be made in respect thereof. A "Long Maturity Note" is a Fixed Note (other than a Fixed Rate Note which on issue had a Talon attached) whose nominal amount on issue is less than the aggregate interest payable thereon, *provided that* such Note shall cease to be a Long Maturity Note on the Fixed Interest Date on which the aggregate amount of interest remaining to be paid after that date is less than the nominal amount of such Note.

If the due date for redemption of any definitive Bearer Note is not an Interest Payment Date, interest (if any) accrued in respect of such Note from (and including) the preceding or Interest Payment Date or, as the case may be, the Interest Commencement Date shall be payable only against surrender of the relevant definitive Bearer Note.

(c) Payments in respect of Bearer Global Notes

Payments of principal and interest (if any) in respect of Notes represented by any Global Note in bearer form will (subject as provided below) be made in the manner specified above in relation to definitive Bearer Notes and otherwise in the manner specified in the relevant Global Note against presentation or surrender, as the case may be, of such Global Note at the specified office of any Paying Agent outside the United States. A record of each payment made against presentation or surrender of any Global Note in bearer form, distinguishing between any payment of principal and any payment of interest, will be made on such Global Note by the Paying Agent to which it was presented and such record shall be prima facie evidence that the payment in question has been made.

(d) Payments in respect of Registered Notes

Payments of principal (other than installments of principal prior to the final installment) in respect of each Registered Note (whether or not in global form) will be made against presentation and surrender (or, in the case of part payment of any sum due, endorsement) of the Registered Note at the specified office of the Registrar or any of the Paying Agents. Such payments will be made by transfer to the Designated Account (as defined below) of the holder (or the first named of joint holders) of the Registered Note appearing in the register of holders of the Registered Notes maintained by the Registrar (the "Register") at the close of business on the third business day (being for this purpose a day on which banks are open for business in the city where the specified office of the Registrar is located) before the relevant due date. Notwithstanding the previous sentence, if (i) a holder does not have a Designated Account or (ii) the principal amount of the Notes held by a holder is less than U.S.$250,000 (or its approximate equivalent in any other Specified Currency), payment will instead be made by a cheque in the Specified Currency drawn on a Designated Bank (as defined below) and mailed by uninsured mail as soon as reasonably practicable after the relevant due date to the holder (or the first named of joint holders) of the Registered Note appearing in the Registrar at the close of business on the Record Date (as defined below). For these purposes, "Designated Account" means the account (which, in the case of a payment in Japanese Yen to a non-resident of Japan, shall be a non-resident account) maintained by a holder with a Designated Bank and identified as such in the Register and "Designated Bank" means (in the case of payment in a Specified Currency other than euro) a bank in the principal financial centre of the country of such Specified Currency (which, if the Specified Currency is Australian dollars or New Zealand dollars, shall be Sydney or Auckland, respectively) and (in the case of a payment in euro) any bank which processes payments in euro.

Payments of interest and payments of installments of principal (other than the final installment) in respect of each Registered Note (whether or not in global form) will be made by a cheque in the Specified Currency drawn on a Designated Bank and mailed by uninsured mail on the business day in the city where the specified office of the Registrar is located immediately preceding the relevant due date to the holder (or the first named of joint holders) of the Registered Note appearing in the Register (i) where in global form, at the close of the business day (being for the purpose a day on which DTC and/or Euroclear and Clearstream, Luxembourg, as applicable, are open for business) and (ii) where in definitive form, at the close of business on the fifteenth day (whether or not such fifteenth day is a business day) before the relevant due date (the "Record Date") at his address shown in the Register on the Record Date and at his risk. Upon application of the holder to the specified office of the Registrar not less than three business days in the city where the specified office of the Registrar is located before the due date for any payment of interest in respect of a Registered Note, the payment may be made by transfer on the due date in the manner provided in the preceding paragraph. Any such application for transfer shall be deemed to relate to all future payments of interest (other than interest due on redemption) and installments of principal (other than the final installment) in respect of the Registered Notes which become payable to the holder who has made the initial application until such time as the Registrar is notified in writing to the contrary by such holder. Payment of the interest due in respect of each Registered Note on redemption and the final installment of principal will be made in the same manner as payment of the principal amount of such Registered Note.

Holders of Registered Notes will not be entitled to any interest or other payment for any delay in receiving any amount due in respect of any Registered Note as a result of a cheque posted in accordance with this Condition arriving after the due date for payment or being lost in the post. No commissions or expenses shall be charged to such holders by the Registrar in respect of any payments of principal or interest in respect of the Registered Notes.

All amounts payable to DTC or its nominee as registered holder of a Registered Global Note in respect of Notes denominated in a Specified Currency other than U.S. dollars shall be paid by transfer by the Registrar to an account in the relevant Specified Currency of the Exchange Agent on behalf of DTC or its nominee for conversion into and payment in U.S. dollars in accordance with the provisions of the Agency Agreement.

None of the Issuer or the Agents will have any responsibility or liability for any aspect of the records relating to, or payments made on account of, beneficial ownership interests in the Registered Global Notes or for maintaining, supervising or reviewing any records relating to such beneficial ownership interests.

(e) General provisions applicable to payments

The holder of a Global Note shall be the only person entitled to receive payments in respect of Notes represented by such Global Note and the Issuer will be discharged by payment to, or to the order of, the holder of such Global Note in respect of each amount so paid. Each of the persons shown in the records of Euroclear or Clearstream, Luxembourg as the beneficial holder of a particular nominal amount of Notes represented by such Global Note must look solely to Euroclear or Clearstream, Luxembourg, as the case may be, for his share of each payment so made by the Issuer to, or to the order of, the holder of such Global Note.

Notwithstanding the foregoing provisions of this Condition, if any amount of principal and/or interest in respect of Bearer Notes is payable in U.S. dollars, such U.S. dollar payments of principal and/or interest in respect of such Notes will be made at the specified office of a Paying Agent in the United States if:

(i) the Issuer has appointed Paying Agents with specified offices outside the United States with the reasonable expectation that such Paying Agents would be able to make payment in U.S. dollars at such specified offices outside the United States of the full amount of principal and interest on the Bearer Notes in the manner provided above when due;

(ii) payment of the full amount of such principal and interest at all such specified offices outside the United States is illegal or effectively precluded by exchange controls or other similar restrictions on the full payment or receipt of principal and interest in U.S. dollars; and

(iii) such payment is then permitted under United States law without involving, in the opinion of the Issuer, adverse tax consequences to the Issuer.

(f) Payment Day

If the date for payment of any amount in respect of any Note, Receipt or Coupon is not a Payment Day, the holder thereof shall not be entitled to payment until the next following Payment Day in the relevant place and shall not be entitled to further interest or other payment in respect of such delay. For these purposes, "Payment Day" means any day that (subject to Condition 9) is:

(i) either (1) in relation to any sum payable in a Specified Currency other than euro, a day on which commercial banks and foreign exchange markets settle payments and are open for general business (including dealing in foreign exchange and foreign currency deposits) in the principal financial centre of the country of the relevant Specified Currency (if other than the place of presentation and any Additional Financial Centre and which if the Specified Currency is Australian dollars or New Zealand dollars shall be Melbourne and Wellington, respectively) or (2) in relation to any sum payable in euro, a day on which the TARGET 2 System is open; and

(ii) a day on which commercial banks and foreign exchange markets settle payments and are open for general business (including dealing in foreign exchange and foreign currency deposits) in:

(A) the relevant place of presentation (in the case of Notes in definitive form); and

(B) London and any Additional Financial Centre specified in the applicable Pricing Supplement.

(g) Interpretation of principal and interest

Any reference in these Terms and Conditions to principal in respect of the Notes shall be deemed to include, as applicable:

(i) any additional amounts which may be payable with respect to principal under Condition 9;

(ii) the Final Redemption Amount of the Notes;

(iii) the Early Redemption Amount of the Notes;

(iv) the Optional Redemption Amount(s) (if any) of the Notes;

(v) in relation to Notes redeemable in installments, the Installment Amounts;

(vi) in relation to Zero Coupon Notes, the Amortized Face Amount (as defined in Condition 8(e)); and

(vii) any premium and any other amounts which may be payable by the Issuer under or in respect of the Notes.

Any reference in these Terms and Conditions to interest in respect of the Notes shall be deemed to include, as applicable, any additional amounts which may be payable with respect to interest under Condition 9.

8. REDEMPTION AND PURCHASE

(a) Redemption at maturity

Unless previously redeemed or purchased and cancelled as specified below, each Note (including each Index Linked Redemption Note and Dual Currency Note) will be redeemed by the Issuer at its Final Redemption Amount specified in, or determined in the manner specified in, the applicable Pricing Supplement in the relevant Specified Currency on the Maturity Date.

(b) Redemption for tax reasons

The Notes may be redeemed at the option of the Issuer in whole, but not in part, at any time (if this Note is neither a Floating Rate Note nor an Index Linked Interest Note nor a Dual Currency Interest Note) or on any Interest Payment Date (if this Note is either a Floating Rate Note or an Index Linked Interest Note or a Dual Currency Interest Note), on giving not less than 30 nor more than 60 days' notice to the Principal Paying Agent and, in accordance with Condition 15, the Noteholders (which notice shall be irrevocable), if:

(i) on the occasion of the next payment due under the Notes, the Issuer has or will become obliged to pay additional amounts as provided or referred to in Condition 9 as a result of any change in, expiration of or amendment to the laws or regulations of a Tax Jurisdiction (as defined in Condition 9), or any change in the application or official interpretation of such laws or regulations, which change or amendment becomes effective on or after the date on which agreement is reached to issue the first Tranche of the Notes; and

(ii) such obligation cannot be avoided by the Issuer taking reasonable measures available to it, *provided that* (1) no such notice of redemption shall be given earlier than 60 days prior to the earliest date on which the Issuer would be obliged to pay such additional amounts were a payment in respect of the Notes then due and (2) at the time of such notice of redemption is given, such obligation to pay such additional amounts remains in effect.

Prior to the publication of any notice of redemption pursuant to this Condition, the Issuer shall deliver to the Principal Paying Agent (1) a certificate signed by an authorized officer of the Issuer stating that the Issuer is entitled to effect such redemption and setting forth a statement of facts showing that the conditions precedent to the right of the Issuer so to redeem have occurred and (2) an opinion of independent legal advisers of recognized standing to the effect that the Issuer has or will become obliged to pay such additional amounts as a result of such change or amendment.

Notes redeemed pursuant to this Condition 8(b) will be redeemed at their Early Redemption Amount referred to in paragraph (e) below together (if appropriate) with interest accrued to (but excluding) the date of redemption.

(c) Redemption at the option of the Issuer (Issuer Call)

If Issuer Call is specified in the applicable Pricing Supplement, the Issuer may, having given:

(i) not less than 15 nor more than 30 days' notice to the Noteholders in accordance with Condition 15; and

(ii) not less than 15 days before the giving of the notice referred to in (i), notice to the Principal Paying Agent and is the case of a redemption of Registered Notes, the Registrar (which notices shall be irrevocable and shall specify the date fixed for redemption),

redeem all or some only of the Notes then outstanding on any Optional Redemption Date and at the Optional Redemption Amount(s) specified in, or determined in the manner specified in, the applicable Pricing Supplement together, if appropriate, with interest accrued to (but excluding) the relevant Optional Redemption Date. Any such redemption must be of a nominal amount not less than the Minimum Redemption Amount and more than the Higher Redemption Amount, in each case as may be specified in the applicable Pricing Supplement. In the case of a partial redemption of Notes, the Notes to be redeemed ("Redeemed Notes") will be selected individually by lot, in the case of Redeemed Notes represented by definitive Notes, and in accordance with the rules of Euroclear, Clearstream, Luxembourg and/or DTC in the case of Redeemed Notes represented by a Global Note, not more than 30 days prior to the date fixed for redemption (such date of selection being hereinafter called the "Selection Date"). In the case of Redeemed Notes represented by definitive Notes, a list of the serial numbers of such Redeemed Notes will be published in accordance with Condition 15 not less than 15 days prior to the date fixed for redemption. The aggregate nominal amount of Redeemed Notes represented by definitive Notes shall bear the same proportion to the aggregate nominal amount of all Redeemed Notes as the aggregate nominal amount of definitive Notes outstanding bears to the aggregate nominal amount of the Notes outstanding, in each case on the Selection Date, *provided that* such first mentioned nominal amount shall, if necessary, be rounded downwards to the nearest integral multiple of the Specified Denomination, and the aggregate nominal amount of Redeemed Notes represented by a Global Note shall be equal to the balance of the Redeemed Notes. No exchange of the relevant Global Note will be permitted during the period from (and including) the Selection Date to (and including) the date fixed for redemption pursuant to this paragraph (c) and notice to that effect shall be given by the Issuer to the Noteholders in accordance with Condition 15 at least five days prior to the Selection Date.

(d) Change of Control; Redemption of the Notes only at the option of the Noteholders (Investor Put)

(i) Change of Control

Upon the occurrence of a Change of Control (as defined below), each holder of the Notes will have the right to require the Issuer to redeem all or any part of such holder's Notes at a redemption price equal to 100% of the principal amount thereof plus accrued but unpaid interest, if any, to the date of redemption (the "Change of Control Redemption Price"). Within 30 days following a Change of Control, the Issuer shall cause the Principal Paying Agent to deliver a notice to each holder stating that (i) a Change of Control has occurred and that such holder has the right to require the Issuer to redeem such holder's Notes at the Change of Control Redemption Price; (ii) the redemption date (which shall be no earlier than 30 days nor later than 60 days from the date such notice is delivered); and (iii) the procedures determined by the Issuer, consistent with the Notes and the Agency Agreement, that a holder must follow in order to have its Notes redeemed.

"*Change of Control*" means the central government of Korea ceasing to own and control (directly or indirectly or in combination) at least 51% of the Issuer's issued and outstanding capital stock.

(ii) Redemption of the Notes only at the option of the Noteholders (Investor Put)

If Investor Put is specified in the applicable Pricing Supplement with respect to any Series of Notes, upon the holder of any Note giving to the Issuer in accordance with Condition 15 not less than 15 nor more than 30 days' notice the Issuer will, upon the expiry of such notice, redeem, subject to, and in accordance with, the terms specified in the applicable Pricing Supplement, in whole (but not in part), such Note on the Optional Redemption Date and at the Optional Redemption Amount together, if appropriate, with interest accrued to (but excluding) the Optional Redemption Date. Registered Notes may be redeemed under this Condition 8(d)(ii) in any multiple of their lowest Specified Denomination.

To exercise the right to require redemption of this Note, the holder of this Note must deliver, at the specified office of any Paying Agent (in the case of Bearer Notes) or the Registrar (in the case of Registered Notes) at any time during normal business hours of such Paying Agent or, as the case may be the Registrar falling within the notice period, a duly completed and signed notice of exercise in the form (for the time being current) obtainable from any specified office of any Paying Agent or, as the case may be the Registrar (a "Put Notice") and in which the holder must specify a bank account (or, if payment is required to be made by cheque, an address) to which payment is to be made under this Condition and, in the case of Registered Notes, the nominal amount thereof to be redeemed and, if less than the full nominal amount of the Registered Notes so surrendered is to be redeemed, an address to which a new Registered Note in respect of the balance of such Registered Notes is to be sent subject to and in accordance with the provisions of Condition 2(b). If this Note is in definitive form, the Put Notice must be accompanied by this Note or evidence satisfactory to the Paying Agent concerned that this Note will, following delivery of the Put Notice, be held to its order or under its control.

Any Put Notice given by a holder of any Note pursuant to this paragraph shall be irrevocable except where prior to the due date of redemption an Event of Default shall have occurred and be continuing in which event such holder, at its option, may elect by notice to the Issuer to withdraw the notice given pursuant to this paragraph and instead to declare such Note forthwith due and payable pursuant to Condition 11.

(e) Early Redemption Amounts

For the purpose of paragraph (b) above and Condition 11, each Note will be redeemed at the Early Redemption Amount calculated as follows:

(i) in the case of a Note with a Final Redemption Amount equal to the Issue Price, at the Final Redemption Amount thereof;

(ii) in the case of a Note (other than a Zero Coupon Note but including an Installment Note) with a Final Redemption Amount which is or may be less or greater than the Issue Price or which is payable in a Specified Currency other than that in which the Notes are denominated, at the amount specified in, or determined in the manner specified in, the applicable Pricing Supplement or, if no such amount or manner is so specified in the applicable Pricing Supplement, at its nominal amount; or

(iii) in the case of a Zero Coupon Note, at an amount (the "Amortized Face Amount") calculated in accordance with the following formula:

Early Redemption Amount = $RP \times (1+AY)y$

where:

"RP" means the Reference Price;

"AY" means the Accrual Yield expressed as a decimal; and

"y" is a fraction the numerator of which is equal to the number of days (calculated on the basis of a 360-day year consisting of 12 months of 30 days each) from (and including) the Issue Date of the first Tranche of the Notes to (but excluding) the date fixed for redemption or (as the case may be) the date upon which such Note becomes due and repayable and the denominator of which is 360,

or on such other calculation basis as may be specified in the applicable Pricing Supplement.

(f) Installments

Installment Notes will be redeemed in the Installment Amounts and on the Installment Dates. In the case of early redemption, the Early Redemption Amount will be determined pursuant to paragraph (e) above.

(g) Partly Paid Notes

Partly Paid Notes will be redeemed, whether at maturity, early redemption or otherwise, in accordance with the provisions of this Condition and the applicable Pricing Supplement.

(h) Purchases

The Issuer may at any time purchase Notes by tender (available to all holders of the Notes alike) or in the open market at any price. If the Issuer shall acquire any Notes, such acquisition shall not operate as or be deemed for any purpose to be a satisfaction of the indebtedness represented by such Notes unless and until such Notes are delivered to the Principal Paying Agent for cancellation and are cancelled and retired by the Principal Paying Agent. The Issuer will not sell, and will cause its affiliates not to sell, any Notes as to which it or they hold or acquire any beneficial interest; *provided* that affiliates of the Issuer may sell Notes to the Issuer or to other such affiliates. Notes purchased or otherwise acquired by the Issuer may be held, resold or, at its discretion, surrendered to the Principal Paying Agent for cancellation.

(i) Cancellation

All Notes that are redeemed will forthwith be cancelled (together with all unmatured Receipts, Coupons and Talons attached thereto or surrendered therewith at the time of redemption). All Notes so cancelled and the Notes purchased and cancelled pursuant to paragraph (g) above (together with all unmatured Receipts, Coupons and Talons cancelled therewith) shall be forwarded to the Principal Paying Agent and cannot be reissued or resold.

(j) Late payment on Zero Coupon Notes

If the amount payable in respect of any Zero Coupon Note upon redemption of such Zero Coupon Note pursuant to paragraph (a), (b), (c) or (d) above or upon its becoming due and repayable as provided in Condition 11 is improperly withheld or refused, the amount due and repayable in respect of such Zero Coupon Note shall be the amount calculated as provided in paragraph (e)(iii) above as though the references therein to the date fixed for the redemption or the date upon which such Zero Coupon Note becomes due and payable were replaced by references to the date which is the earlier of:

(i) the date on which all amounts due in respect of such Zero Coupon Note have been paid; and

(ii) five days after the date on which the full amount of the moneys payable in respect of such Zero Coupon Notes has been received by the Principal Paying Agent or the Registrar and notice to that effect has been given to the Noteholders in accordance with Condition 15.

9. TAXATION

All payments of principal and interest in respect of the Notes, Receipts and Coupons by the Issuer will be made without withholding or deduction for or on account of any present or future taxes, duties, assessments or governmental charges of whatever nature imposed or levied by or on behalf of a Tax Jurisdiction unless such withholding or deduction is required by law. In such event, the Issuer will pay such additional amounts as shall be necessary in order that the net amounts received by the holders of the Notes, Receipts or Coupons after such withholding or deduction will not be less than the respective amounts of principal and interest which would otherwise have been receivable in respect of the Notes, Receipts or Coupons, as the case may be, in the absence of such withholding or deduction; except that no such additional amounts shall be payable with respect to any Note, Receipt or Coupon:

(i) to or on behalf of a holder of such Note, Receipt or Coupon who is subject to such taxes, duties, assessments or governmental charges in respect of such Note by reason of such holder being or having been connected with a Tax Jurisdiction other than merely by holding such Note or receiving principal or interest in respect thereof; or

(ii) to or on behalf of a holder of such Note, Receipt or Coupon who would not be liable for or subject to such deduction or withholding by making a declaration of non-residence or other similar claim for exemption to the relevant tax authority if, after having been requested in writing by the Issuer to make such a declaration or claim, such holder fails to do so; or

(iii) to or on behalf of a holder of such Note, Receipt or Coupon who presents a Note (where presentation is required) more than 30 days after the relevant date except to the extent that the holder thereof would have been entitled to such additional amounts on presenting the same for payment on the last day of such 30-day period; for this purpose the "relevant date" means:

(a) the due date for payment thereof; or

(b) if the full amount of the moneys payable on such date has not been received by the Principal Paying Agent or the Registrar, as the case maybe, on or prior to such due date, the date on which, the full amount of such moneys having been so received, notice to that effect is duly given to the Noteholders in accordance with Condition 15; or

(iv) to or on behalf of a holder of a holder of such Note, Receipt or Coupon who would have been able to avoid the withholding or deduction by the presentation (where presentation is required) of the relevant Note, Receipt or Coupon to, or otherwise accepting payment from, another paying agent in a Member State of the European Union; or

(v) any combination of (i), (ii), (iii), or (iv) above.

The obligation of the Issuer to pay additional amounts in respect of taxes, duties, assessments and governmental charges shall not apply to (i) any estate, inheritance, gift, sales, transfer, personal property or any similar tax, assessment or other governmental charge or (ii) any tax, assessment or other governmental charge which is payable otherwise than by deduction or withholding from payments of principal and interest in respect of the Notes, Receipts and Coupons; *provided that*, except as otherwise set forth in these Conditions and in the Agency Agreement, the Issuer shall pay all stamp or other similar duties, if any, which may be imposed by a Tax Jurisdiction, the United States or any respective political subdivision thereof or any taxing authority of or in the foregoing, with respect to the Notes or the Agency Agreement or as a consequence of the issuance of the Notes.

As used herein: "Tax Jurisdiction" means Korea or any political subdivision or any authority thereof or therein having power to tax.

10. PRESCRIPTION

The Notes (whether in bearer form or registered form), Receipts and Coupons will become void unless presented for payment within a period of five years (in the case of principal) and two years (in the case of interest) after the Relevant Date (as defined in Condition 9) therefor.

There shall not be included in any Coupon sheet issued on exchange of a Talon any Coupon the claim for payment in respect of which would be void pursuant to this Condition or Condition 7(b) or any Talon that would be void pursuant to Condition 7(b).

11. EVENTS OF DEFAULT

The occurrence and continuance of any of the following events will constitute an event of default ("Event of Default"):

(i) default in the payment of any installment of interest upon any of the Notes as and when the same shall become due and payable, and continuance of such default for a period of 30 days;

(ii) default in the payment of all or any part of the principal of any of the Notes as and when the same shall become due and payable, whether at maturity, upon redemption or otherwise;

(iii) breach or failure to observe or perform any other of the covenants or agreements on the part of the Issuer contained in these Conditions for a period of 60 days after the date on which written notice specifying such default or breach, stating that such notice is a "Notice of Default" under these Conditions and demanding that the Issuer remedy the same, shall have been given to the Issuer, with a copy to the Principal Paying Agent and the Registrar, by the Noteholders of at least 10% in aggregate principal amount of the Notes at the time outstanding;

(iv) any Debt of the Issuer in the aggregate outstanding principal amount of US$10,000,000 or more either (a) becoming due and payable prior to the due date for payment thereof by reason of acceleration thereof following default by the Issuer or (b) not being repaid at, and remaining unpaid after, maturity as extended by the period of grace, if any, applicable thereto, or any guarantee given by the Issuer in respect of Debt of any other person not being honored when, and remaining dishonored after becoming, due and called; *provided* that, in the case of (a) above, if any such default under any such Debt shall be cured or waived, then the default under the Notes by reason thereof shall be deemed to have been cured and waived;

(v) the entry of a decree or order for relief in respect of the Issuer by a court or administrative or other governmental agency or body having jurisdiction in the premises in an involuntary case under any applicable bankruptcy, insolvency, reorganization, rehabilitation, compulsory composition or other similar law in effect on the date of the Notes or thereafter, or appointing a receiver, liquidator, assignee, custodian, trustee or sequestrator (or similar official) of the Issuer or for any substantial part of its property or ordering the winding up, dissolution or liquidation of its affairs, or shall otherwise adjudicate or find the Issuer to be bankrupt or insolvent, and continuance of any such decree or order unstayed and in effect for a period of 60 consecutive days; or

(vi) the commencement by the Issuer of a voluntary case under any applicable bankruptcy, insolvency, reorganization, rehabilitation, compulsory composition or other similar law in effect on the date of the Notes or thereafter, or consent to the entry of an order for relief in an involuntary case under any such law, or consent to the appointment or taking possession by a receiver, liquidator, assignee, custodian, trustee or sequestrator (or similar official) of the Issuer or for any substantial part of its property, or cease to carry on the whole or substantially the whole of its business, or make any general assignment for the benefit of creditors, or enter into any composition with its creditors, or take corporate action in furtherance of any such action.

If an Event of Default with respect to the Notes occurs and is continuing, the Notesholders of not less than 25% in aggregate principal amount of the Notes then outstanding may declare the principal amount (and premium, if any) of, and all accrued but unpaid interest on, all the Notes to be due and payable immediately, by a notice in writing to the Issuer at the office of the Principal Paying Agent, and upon such declaration, any such principal amount (and premium, if any) and interest shall become immediately due and payable. Upon such declaration, the Principal Paying Agent shall give notice thereof to the Issuer and to the Noteholders in writing. If, after any such declaration and before any judgment or decree for the payment of the moneys due shall have been obtained or entered, the Issuer pays or deposits with the Principal Paying Agent all amounts then due with respect to the Notes (other than amounts due solely because of such declaration) and cures all other Events of Default with respect to the Notes, such defaults may be waived and such declaration may be annulled and rescinded by the Noteholders of more than 50% in aggregate principal amount of the Notes then outstanding by written notice thereof to the Issuer at the office of the Principal Paying Agent.

In this Condition, "*Debt*" means, with respect to any person as of any date of determination, without duplication, (i) all obligations, contingent or otherwise, of such person for borrowed money, (ii) all obligations of such person evidenced by bonds, notes or other similar instruments, (iii) all obligations of such person in respect of letters of credit or other similar instruments, (iv) all obligations of such person to pay the unpaid purchase price of any property or service, (v) all obligations secured by any mortgage, charge, pledge, encumbrance or other security interest (a "Lien") on any property or asset of such person, whether or not such obligations are assumed by such person and (vi) all obligations of others guaranteed by such person to the extent of such guarantees and, for clauses (i) through (vi), which are denominated in a currency other than the currency of Korea and which has a final maturity of one year or more. The amount of Debt of any person as of any date of determination shall be the outstanding balance at such date of all unconditional obligations as described above, the maximum liability of such person for any such contingent obligations at such date and, in the case of clause (v), the lesser of the fair market value (as determined in good faith by the board of directors of such person) at such date of the property or asset of such person subject to a Lien securing the obligations of others and the amount of such obligations secured.

12. REPLACEMENT OF NOTES, RECEIPTS, COUPONS AND TALONS

Should any Note, Receipt, Coupon or Talon be lost, stolen, mutilated, defaced or destroyed, it may be replaced at the specified office of the Principal Paying Agent (in the case of Bearer Notes, Coupons or Talons) or the Registrar (in the case of Registered Notes) upon payment by the claimant of such costs and expenses as may be incurred in connection therewith and on such terms as to evidence and indemnity as the Issuer may reasonably require. Mutilated or defaced Notes, Receipts, Coupons or Talons must be surrendered before replacements will be issued.

13. PAYING AGENTS

The names of the initial Paying Agents and their initial specified offices are set out below.

The Issuer is entitled to vary or terminate the appointment of any Paying Agent and/or appoint additional or other Paying Agents and/or approve any change in the specified office through which any Paying Agent acts, *provided that*:

(a) there will at all times be a Principal Paying Agent;

(b) so long as the Notes are listed on any stock exchange, there will at all times be a Paying Agent (in the case of Bearer Notes) and a Transfer Agent (in the case of Registered Notes) with a specified office in such place as may be required by the rules and regulations of the relevant stock exchange or any other relevant authority;

(c) so long as any of the Registered Global Notes payable in a Specified Currency other than U.S. dollars are held through DTC or its nominee, there will at all times be an Exchange Agent with a specified office in New York City; and

(d) so long as the Notes are listed on the Singapore Exchange Securities Trading Limited (the "Singapore Stock Exchange") and the rules of the Singapore Stock Exchange so require, if the Notes are issued in definitive form, there will at all times be a Paying Agent in Singapore unless the Issuer obtains an exemption from the Singapore Stock Exchange.

In addition, the Issuer shall forthwith appoint a Paying Agent having a specified office in New York City in the circumstances described in Condition 7(e). Any variation, termination, appointment or change with respect to any Paying Agent shall only take effect (other than in the case of insolvency, when it shall be of immediate effect) after not less than 30 nor more than 45 days' prior notice thereof shall have been given to the Noteholders in accordance with Condition 15.

In acting under the Agency Agreement, the Paying Agents act solely as agents of the Issuer and do not assume any obligation to, or relationship of agency or trust with, any Noteholders, Receiptholders or

Couponholders. The Agency Agreement contains provisions permitting any entity into which any Paying Agent is merged or converted or with which it is consolidated or to which it transfers all or substantially all of its assets to become the successor paying agent.

14. EXCHANGE OF TALONS

On and after the Interest Payment Date on which the final Coupon comprised in any Coupon sheet matures, the Talon (if any) forming part of such Coupon sheet may be surrendered at the specified office of the Principal Paying Agent or any other Paying Agent in exchange for a further Coupon sheet including (if such further Coupon sheet does not include Coupons to (and including) the final date for the payment of interest due in respect of the Note to which it appertains) a further Talon, subject to the provisions of Condition 10.

15. NOTICES

All notices regarding the Bearer Notes will be deemed to be validly given if published (i) in a leading English language daily newspaper of general circulation in London and Asia. It is expected that such publication will be made in the Financial Times in London and the Asian Wall Street Journal. The Issuer shall also ensure that notices are duly published in a manner which complies with the rules of any stock exchange or other relevant authority on which the Bearer Notes are for the time being listed or by which they have been admitted to listing. Any such notice will be deemed to have been given on the date of the first publication or, where required to be published in more than one newspaper, on the date of the first publication in all required newspapers.

All notices regarding the Registered Notes will be deemed to be validly given if sent by first class mail or (if posted to an address overseas) by airmail to the holders (or the first named of joint holders) at their respective addresses recorded in the Register and will be deemed to have been given on the fourth day after mailing and, in addition, for so long as any Registered Notes are listed on a stock exchange and the rules of that stock exchange (or any other relevant authority) so require, such notice will be published in a daily newspaper of general circulation in the place or places required by those rules.

Until such time as any definitive Notes are issued, there may, so long as any Global Notes representing the Notes are held in their entirety on behalf of Euroclear, Clearstream, Luxembourg and/or DTC, be substituted for such publication in such newspaper(s) the delivery of the relevant notice to Euroclear, Clearstream, Luxembourg, and/or DTC for communication by them to the holders of the Notes and, in addition, for so long as any Notes are listed on a stock exchange and the rules of that stock exchange or relevant authority so require, such notice will be published in a daily newspaper of general circulation in the place or places required by those rules. Any such notice shall be deemed to have been given to the holders of the Notes one day after the day on which the said notice was given to Euroclear, Clearstream, Luxembourg and/or DTC.

Notices to be given by any Noteholder shall be in writing and given by lodging the same, together (in the case of any Note in definitive form) with the relative Note or Notes, with the Principal Paying Agent (in the case of Bearer Notes) or the Registrar (in the case of Registered Notes). Whilst any of the Notes are represented by a Global Note, such notice may be given by any holder of a Note to the Principal Paying Agent or the Registrar through Euroclear, Clearstream, Luxembourg and/or DTC, as the case may be, in such manner as the Principal Paying Agent, the Registrar and Euroclear, Clearstream, Luxembourg and/or DTC, as the case may be, may approve for this purpose.

16. MEETINGS OF NOTEHOLDERS, MODIFICATION AND WAIVER

The Agency Agreement contains provisions for convening meetings of the Noteholders to consider any matter affecting their interests, including the sanctioning by Extraordinary Resolution of a modification of the Notes, the Receipts, the Coupons or any of the provisions of the Agency Agreement. Such a meeting may be convened by the Issuer or Noteholders holding not less than 10 per cent. in nominal amount of the Notes for the time being remaining outstanding. The quorum at any such meeting for passing an Extraordinary Resolution is one or more persons holding or representing not less than 50 per cent. in nominal amount of the Notes for the time being outstanding, or at any adjourned meeting one or more persons being or representing Noteholders whatever the nominal amount of the Notes so held or represented, except that at any meeting the business of which includes the modification of certain provisions of the Notes, Receipts or Coupons (including modifying the date of maturity of the Notes or any date for payment of interest thereof, reducing or cancelling the amount of principal or the rate of interest payable in respect of the Notes or altering the currency of payment of the Notes, Receipts or Coupons), the quorum shall be one or more persons holding or representing in the aggregate not less than 75 per cent. in nominal amount of the Notes for the time being outstanding, or at any adjourned such meeting one or more persons holding or representing in the aggregate a clear majority, in nominal amount of the Notes for the time being outstanding. An Extraordinary Resolution passed at any meeting of the Noteholders shall be binding on all the Noteholders, whether or not they are present at the meeting, and on all Receiptholders and Couponholders.

The Principal Paying Agent and the Issuer may agree, without the consent of the Noteholders, Receiptholders or Couponholders, to:

(i) any modification (except as mentioned above) of any of the provisions of the Notes, the Receipts, the Coupons, the Conditions, or the Agency Agreement which is not prejudicial to the interests of the Noteholders; or

(ii) any modification of the Notes, the Receipts, the Coupons, the Conditions, the Deed of Covenant or the Agency Agreement which is of a formal, minor or technical nature or is made to correct a manifest error or to comply with mandatory provisions of the law of the jurisdiction in which the Issuer is incorporated.

Any such modification shall be binding on the Noteholders, the Receiptholders and the Couponholders and any such modification shall be notified to the Noteholders in accordance with Condition 15 as soon as practicable thereafter.

17. FURTHER ISSUES

The Issuer shall be at liberty from time to time without the consent of the Noteholders, the Receiptholders or the Couponholders to create and issue further notes having terms and conditions the same as the Notes or the same in all respects save for the amount and date of the first payment of interest thereon and so that the same shall be consolidated and form a single Series with the outstanding Notes.

18. CONTRACTS (RIGHTS OF THIRD PARTIES) ACT 1999

No rights are conferred on any person under the Contracts (Rights of Third Parties) Act 1999 to enforce any term of this Note, but this does not affect any right or remedy of any person which exists or is available apart from that Act.

19. GOVERNING LAW AND SUBMISSION TO JURISDICTION

(a) Governing law

The Agency Agreement, the Deed Poll, the Deed of Covenant, the Notes, the Receipts and the Coupons are governed by, and shall be construed in accordance with, English law. Any matter, claim or dispute arising out of or in connection with the Agency Agreement, the Deed Poll, the Deed of Covenant, the Notes, the Receipts and the Coupons, whether contractual or non-contractual, shall be governed by and determined in accordance with English law.

(b) Submission to jurisdiction

The Issuer agrees, for the exclusive benefit of the Noteholders, the Receiptholders and the Couponholders, that the courts of England are to have jurisdiction to settle any disputes which may arise out of or in connection with the Notes, the Receipts and/or the Coupons and that accordingly any suit, action or proceedings (together referred to as "Proceedings") arising out of or in connection with the Notes, the Receipts and the Coupons may be brought in such courts.

The Issuer hereby irrevocably waives any objection which it may have now or hereafter to the laying of the venue of any such Proceedings in any such courts and any claim that any such Proceedings have been brought in an inconvenient forum and hereby further irrevocably agrees that a judgment in any such Proceedings brought in the English courts shall be conclusive and binding upon it and may be enforced in the courts of any other jurisdiction.

Nothing contained in this Condition shall limit any right to take Proceedings against the Issuer in any other court of competent jurisdiction, nor shall the taking of Proceedings in one or more jurisdictions preclude the taking of Proceedings in any other jurisdiction, whether concurrently or not.

(c) Appointment of Process Agent

The Issuer appoints Dana Petroleum Limited at its registered office at Kings Close, 62 Huntly Street, Aberdeen AB10 1RS, United Kingdom as its agent for service of process and undertakes that, in the event of Dana Petroleum Limited ceasing so to act or ceasing to be registered in England it will appoint another person as its agent for service of process in England in respect of any Proceedings. Nothing in this clause shall affect the right to serve process in any other manner permitted by law.

(d) Waiver of immunity

The Issuer hereby irrevocably and unconditionally waives with respect to Notes, the Receipts and the Coupons any right to claim sovereign or other immunity from jurisdiction or execution and any similar defense and irrevocably and unconditionally consents to the giving of any relief or the issue of any process, including without limitation, the making, enforcement or execution against any property whatsoever (irrespective of its use or intended use) of any order or judgment made or given in connection with any proceedings.

(e) Other documents

The Issuer has in the Agency Agreement, the Deed Poll and the Deed of Covenant submitted to the jurisdiction of the English courts and has appointed an agent for service of process in terms substantially similar to those set out above.

USE OF PROCEEDS

The net proceeds from each issue of Notes will be applied by the Issuer for its general corporate purposes, including working capital, financing capital expenditures and repayment of outstanding borrowings.

EXCHANGE RATES

The table below sets forth, for the periods and dates indicated, information concerning the Market Average Exchange Rate, announced by Seoul Money Brokerage Services, Ltd., between Won and dollars and rounded to the nearest tenth of one Won. No representation is made that the Won or dollar amounts referred to herein could have been or could be converted into dollars or Won, as the case may be, at any particular rate or at all.

Period	At End of Period	Average Rate(1)	High	Low
	(Won per US$1.00)			
2012	1,071.1	1,126.9	1,181.8	1,071.1
2013	1,055.3	1,095.0	1,159.1	1,051.5
2014	1,099.2	1,053.2	1,118.3	1,008.9
2015	1,172.0	1,131.5	1,203.1	1,068.1
2016	1,208.5	1,160.5	1,240.9	1,093.2
2017 (through March 16)	1,146.3	1,161.5	1,208.5	1,131.0
January	1,157.8	1,185.1	1,208.5	1,157.8
February	1,132.1	1,144.9	1,165.5	1,131.0
March (through March 16)	1,146.3	1,148.8	1,158.2	1,132.3

Source: Seoul Money Brokerage Services, Ltd.

(1) The average rate for each year is calculated as the average of the Market Average Exchange Rates on each business day during the relevant year (or portion thereof). The average rate for a month is calculated as the average of the Market Average Exchange Rates on each business day during the relevant month (or portion thereof).

CAPITALIZATION

The following table sets forth the Company's capitalization (defined as the sum of consolidated long-term debt and total equity) as of December 31, 2016, which is derived from the Company's audited consolidated financial statements as of December 31, 2016. This table should be read in conjunction with the Company's audited consolidated financial statements included in this Offering Circular.

	As of December 31, 2016(1)	
	(In billions of Won and in millions of dollars)	
Long-term debt:		
Long-term borrowings, net of discounts	₩ 1,096	$ 907
Bonds payable, net of discounts and including premiums	10,251	8,483
Total long-term debt	₩11,348	$ 9,390
Owner's equity:		
Share capital	₩10,347	$ 8,562
Accumulated deficit	(7,634)	(6,317)
Other components of equity	(314)	(260)
Non-controlling interests	1,110	918
Total equity	3,509	2,904
Total capitalization(2)	₩14,857	$12,294

(1) Translated Won and dollar amounts at the Market Average Exchange Rate of Won 1,208.5 to US$1.00 on December 31, 2016.

(2) Except as set forth herein, there has been no material change in the Company's capitalization since December 31, 2016.

SELECTED FINANCIAL AND OTHER DATA

Selected Financial Data

The following tables present selected consolidated financial and other data of the Company. This data should be read in conjunction with the consolidated financial statements of the Company and the notes thereto, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and other historical financial information included elsewhere in, or incorporated by reference into, this Offering Circular. The selected consolidated financial data as of and for the years ended December 31, 2014, 2015 and 2016 have been derived from the consolidated financial statements of the Company included in this Offering Circular. The financial statements included in this Offering Circular have been prepared in accordance with Korean IFRS. All financial data and other data in this Offering Circular regarding the Company's activities, financial condition and results of operations are presented on a consolidated basis.

In November 2014, the Company disposed of North Atlantic Refining Limited, which held the Company's downstream operations and related assets, for cash considerations of approximately Won 67 billion and classified all income and expenses relating to the downstream operations as discontinued operations for the year ended December 31, 2014. See Note 37 to the Company's audited consolidated financial statements as of and for the years ended December 31, 2015 and 2014 included in this Offering Circular.

	As of December 31,		
	2014	2015	2016
	(In billions of Won)		
Consolidated Statement of Financial Position Data:			
Total assets	₩26,889	₩23,205	₩22,067
Total liabilities	18,520	19,010	18,558
Total equity	8,370	4,196	3,509
Share capital	10,092	10,208	10,347
Total liabilities and equity	26,889	23,205	22,067

	For the Year Ended December 31,		
	2014	2015	2016
	(In billions of Won)		
Consolidated Statement of Comprehensive Loss Data:			
Continuing Operations			
Revenue	₩ 4,358	₩ 3,433	₩ 2,430
Cost of sales	(3,440)	(3,524)	(2,410)
Gross profit	918	(90)	20
Selling and administrative expenses	(445)	(355)	(261)
Operating profit (loss)	473	(445)	(241)
Other non-operating income	139	153	236
Other non-operating expenses	(267)	(299)	(119)
Other loss, net	(1,720)	(3,075)	(424)
Finance income	80	95	183
Finance costs	(621)	(1,400)	(728)
Loss on investments in associates and joint ventures, net	(42)	(501)	(240)
Loss before income tax	(1,957)	(5,472)	(1,333)
Income tax benefit	(684)	(972)	(214)
Loss from continuing operations	(1,273)	(4,500)	(1,119)

	For the Year Ended December 31,		
	2014	2015	2016
	(In billions of Won)		
Discontinued Operations			
Loss from discontinued operations, net of tax	(338)	—	—
Loss for the period	(1,611)	(4,500)	(1,119)
Loss attributable to:			
Owners of the Company	(1,603)	(4,360)	(1,092)
Non-controlling interests	(9)	(140)	(27)
Other comprehensive income (loss), net of tax:			
Items that will never be reclassified to profit or loss:			
Actuarial losses on defined benefit plans	(18)	(3)	(2)
Retained earnings adjustments in equity method	(4)	0	0
Items that are or may be reclassified to profit or loss:			
Net change in the unrealized fair value of available-for-sale financial investments, net of tax	(156)	—	(2)
Net change in fair value of available-for-sale financial assets reclassified to profit or loss	4	178	—
Equity adjustments arising from investments in equity-method investees	(5)	36	(4)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	20	9	(1)
Foreign currency translation differences	(147)	1	(103)
Other comprehensive income (loss) for the period, net of tax	(303)	222	(113)
Total comprehensive loss for the period, net of tax	₩(1,914)	₩(4,278)	₩(1,232)
Total comprehensive income (loss) attributable to:			
Owners of the Company	(1,924)	(4,171)	(1,242)
Non-controlling interests	10	(107)	10
Consolidated Cash Flow Data:			
Net cash provided by operating activities	1,542	231	372
Net cash used in investing activities	2,025	1,665	752
Net cash provided by financing activities	17	1,702	451

Selected Reserve, Production and Operating Data

The Company's engineers estimate its proved oil and gas reserve quantities based on its internal surveys and data collected from third-party operators of production facilities in which the Company has a working interest, including those held by the Company's subsidiaries. All information in this Offering Circular relating to oil and gas reserves is net to the Company's interest unless stated otherwise. The following table sets forth the present value and estimated volume of the Company's oil and gas proved reserves, as well as other figures relevant to the Company's operations.

	As of or for the Year Ended December 31,		
	2014	**2015**	**2016**
Proved reserves[1]:			
Crude oil (million barrels)	461.4	517.3	489.1
Natural gas (billions of cubic feet)	1,338.4	1,164.9	1,139.6
Total (million barrels of oil equivalent)	687.3	715.6	683.6
Oil and gas production[2]:			
Crude oil (million barrels)	45.7	50.1	42.4
Natural gas (billions of cubic feet)	189.2	200.2	174.9
Total (million barrels of oil equivalent)	78.1	84.2	72.2
Average daily oil and gas production[3]:			
Crude oil (barrels)	125,075.1	137,193.7	116,305.7
Natural gas (millions of cubic feet)	518.2	548.6	493.2
Total (barrels of oil equivalent)	213,867.6	230,736.5	200,632.9
Average sales prices[4]:			
Crude oil (US$/barrel)	83.72	45.05	35.78
Natural gas (US$/thousands of cubic feet)	5.22	3.50	3.10
Reserves to production ratio	8.8	8.5	9.5

(1) The reserve data include reserve data of Harvest Operations as estimated under Canadian oil and gas reporting standards, COGEH and NI 51-101, as evaluated by the Independent Reserves Evaluators. If the reserve data of Harvest Operations as estimated under the Securities Act oil and gas reporting standards were included, the proved crude oil reserves, natural gas reserves and combined reserves as of December 31, 2014, 2015 and 2016 may differ from the corresponding amounts shown in the table above.

(2) Includes production volume from subsidiaries or assets acquired during the period after their respective acquisition dates.

(3) Calculated by dividing the total oil and gas production by the actual number of days in the period.

(4) Calculated by dividing total consolidated revenue from sale of oil or gas, as applicable, by total amount of oil or gas sold, as applicable. As such, excludes from calculation any production from the Company's affiliates where the Company's interests are accounted for either as available-for-sale securities or by using the equity method.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

All financial information included below is given on a consolidated Korean IFRS basis, unless otherwise specified. The following discussion and analysis should be read in conjunction with the Company's consolidated financial statements, together with the accompanying notes, included elsewhere in this Offering Circular.

Overview

The Company is the national oil and gas company of Korea and is wholly owned by the Government. The Company's revenues are derived principally from the sales of crude oil and natural gas produced from 18 production projects located in Korea and abroad. As of December 31, 2016, the Company had a daily crude oil and natural gas production of approximately 200,633 barrels of oil equivalent. In addition, the Company conducts oil and gas exploration activities and had interests in ten exploratory projects across five countries. The Company derives its sales from the following six business segments: oil and gas sales, petroleum distribution, oil stockpiling, financing, drillship chartering and others. Until November 2014, the Company also generated revenues from the refinery segment, which it classified as discontinued operations following the disposal of the downstream operations. Previously included in the refinery segment were revenues from the sale of refined oil products produced from the refinery operated through Harvest Operations. In November 2014, the Company disposed of North Atlantic Refining Limited, which held the Company's downstream operations and related assets, for cash considerations of approximately Won 67 billion and classified all income and expenses relating to the downstream operations as discontinued operations for the year ended December 31, 2014. See Note 37 to the Company's audited consolidated financial statements as of and for the years ended December 31, 2015 and 2014 included in this Offering Circular. See "Risk Factors — Risks Relating to the Company — If the Company is unable to achieve the expected benefits of acquisitions, including realization of adequate rate of return on prices paid, successful integration of the acquired businesses and/or assets, the Company's business, financial condition and results of operations may be adversely affected."

The following is a brief explanation of the Company's current operating segments.

Oil and gas sales. Included in this segment are revenues from (1) sale of oil and gas produced from the Company's production projects, and (2) oil trading activities. The main factors affecting the Company's revenues from this segment are sales volume and sales prices of oil and refined oil products, and to a lesser extent, volume of trading transactions undertaken by the Company and the level of profits generated in those transactions.

Petroleum distribution. Included in this segment are revenues from the wholesale gasoline and gas oil distribution business, and from operation of approximately 1,168 discount gas stations located throughout Korea as of December 31, 2016.

Oil stockpiling. Income from this segment consists principally of income from the lease of its stockpile facilities and lending of stockpile oil to domestic refineries. The revenues derived from the lease of stockpile facilities are dependent on the volume of oil stored in the Company's stockpile facilities on behalf of the Company's customers and the level of lease fees received from these customers. The revenues derived from the lending and sale of stockpile oil to domestic refineries are dependent on the price of crude oil and the volume of crude oil lent or sold.

Financing. The Company records as its assets and liabilities the SAER loans that are borrowed and used directly for the Company's own exploration and production projects, and also receives as 'administration fees' the difference between the interest the Company charges other oil and gas developers for the SAER loans that it on-lends and the interest that the Company is required to pay the Government for such loans. Such fees are recorded as income under this segment, with no associated expenses. The main factors affecting the Company's revenues from this segment are the volume of SAER loans on-lent by the Company and the difference in the interest rate it charges the borrowers and the interest rate it pays the Government.

Drillship chartering. The revenues from leasing the Doo Sung, the Company's semi-submersible drillship, are determined primarily by the number of days the drillship is on lease during the financial reporting period and the day rates received for the lease by the Company.

Others. Included in this segment are revenues from the oil information services, other research services and other miscellaneous services incidental to the Company's operations.

Major Factors Affecting the Company's Results of Operations

The Company's results of operations have been affected primarily by the following factors:

- fluctuations in prices of crude oil and natural gas;
- the production volumes of the Company's crude oil and natural gas;
- the Company's strategy to expand production levels; and
- the Government's support for the Company.

Crude Oil and Natural Gas Prices

The prices at which the Company's crude oil is sold fluctuate generally in line with the fluctuation in international crude oil prices, and natural gas sales price generally move in line with crude oil prices. International crude oil prices have demonstrated significant volatility during the last several years, driven largely by changes in global energy demand and the current economic downturn caused by the credit crisis. For example, the Company's average sales prices for crude oil were US$83.72, US$45.05 and US$35.78 per barrel in 2014, 2015 and 2016, respectively.

Crude Oil and Natural Gas Production Volumes

The Company's crude oil and natural gas production volumes depend primarily on the level of the proven and developed reserves in the projects in which it has an interest, as well as other factors such as crude oil and natural gas prices, political and military events in countries where the Company's producing projects are located, and actions by members of OPEC that affect production levels. The level of proven and developed reserves is affected by such factors as:

- the extent to which the Company acquires interests in producing reserves or acquires other companies that own producing reserves;
- the rate at which explorations lead to successful discoveries and the speed at which successful exploration and development move to production;
- the speed at which the Company and its joint venture partners deplete the reserves through production of crude oil and natural gas; and
- the expiration and extension of the terms of the concessions under which the Company and its joint venture partners produces crude oil and natural gas.

See "Business — Reserves Data — Reserves" for additional information on the Company's reserves.

Strategy to Expand Production Levels

A major element of the Company's business strategy is to achieve organic growth through exploration activities and pursue selective acquisitions to optimize its asset portfolio, which would provide the basis for the Company to compete with larger global oil companies engaged in oil and gas exploration, development and production. In pursuit of this strategy, the Company made several acquisitions, including the following acquisitions:

- a 50% interest in OIG for US$600 million in February 2009;
- a 100% interest in Harvest Energy Trust for Won 2,677 billion in December 2009;
- an 85% interest in KNOC Caspian LLP (formerly known as Sumbe JSC) for US$335 million in December 2009;

- a 100% interest in Dana Petroleum for Won 3,442 billion in October 2010;
- a 95% interest in Altius for US$515 million in March 2011;
- a 23.7% interest in Eagle Ford shale oil formation in the Maverick Basin from Anadarko through KNOC Eagle Ford Corporation for approximately US$1.55 billion in March 2011. The Company's investment in Eagle Ford was made entirely in the form of a carry without payment of any upfront cash, funding 100% of Anadarko's 2011 capital costs in the basin, and up to 90% thereafter until the carry was exhausted at the end of 2013;
- certain offshore oil producing assets from Northstar Offshore Energy Partners LLC ("Northstar") in the Gulf of Mexico region (the "Northstar Assets") for approximately US$201 million (the Company's share being 67%), through ANKOR E&P Holdings Corporation and in consortium with GS E&R Offshore LLC (formerly known as STX Energy E&P Offshore Management, LLC) and SCL Resources, LLC, in December 2011;
- a 10.0% interest in Parallel Petroleum Corp. from PLLL Holdings, LLC, an affiliate of Apollo Global Management LLC, for approximately US$72 million, in consortium with Samsung C&T Corp. in December 2011;
- a 28.3% additional stake in the Bittern oilfields located in the North Sea from Hess Corp. for approximately US$135 million through Dana Petroleum in September 2012, raising the Company's total interest in the field to 33%. The additionally acquired interest added approximately 5,500 barrels of oil equivalent to the Company's daily production volume from the Bittern oilfields;
- a 14.99% interest in EP Energy Global LLC and its subsidiaries ("EPE Global"), which holds all of the oil and gas exploration and production assets of El Paso in May 2012. The Company, as part of a consortium led by Apollo Global Management, LLC, signed a definitive agreement with El Paso to acquire a 14.99% interest in EPE Global for approximately US$500 million. EPE Global holds several unconventional oil and gas exploration and production assets located throughout the United States as well as Brazil and Egypt. In January 2014, EP Energy Corporation ("EP Energy"), which holds assets previously held by EPE Global, completed its initial public offering of 35,200,000 shares of its common stock, and the Company's ownership interest decreased from 14.99% to 12.82% as the initial public offering increased the total number of EP Energy's common stock; and
- a 30.0% interest in two onshore and one offshore oil fields located in the United Arab Emirates in March 2012. The Company, in consortium with GS Energy Corp., signed an agreement with Abu Dhabi National Oil Corporation ("ADNOC") to acquire a 40.0% interest in the fields (with GS Energy Corp. acquiring 10.0%). The remaining 60.0% interest in the fields is owned by ADNOC.

The Company funded these acquisitions through debt financing, cash on hand and capital contributions by the Government. Exploration and development of oil and natural gas are capital intensive activities. The Company relies on loans, internally generated funds and capital contributions from the Government to fund such activities. The implementation by the Company of its strategy to increase its production levels may lead to increased levels of debt and debt servicing costs in the future.

Government Support and Regulation

The Company is wholly owned by the Government. The Government provides financial support for the Company, mainly in the form of capital contributions used mainly for acquisition of oil producing assets and stockpile oil, and in the form of SAER loans used for the Company's exploration and production activities.

While receiving support from the Government, the Company is also heavily regulated by a variety of laws and government bodies, including the Ministry of Trade, Industry and Energy and the Ministry of Strategy and Finance. The Government, among other things, approves the Company's annual budget, guides the Company's long-term business strategy, and appoints the Company's management, including its President.

Through its control of the Company, the Government has historically influenced, and is likely to continue to influence, the Company's strategy and operations. From time to time, the Company is required to take actions in furtherance of public policy considerations and the Government's broader objectives for the oil and gas industry, which may not necessarily be in the Company's best commercial interests. See "Risk Factors — Risks Relating to the Company — The Company is subject to the control of the Government, and its activities are heavily regulated," and "Business — Relationship with the Government."

Critical Accounting Policies

The preparation of the Company's financial statements requires the Company's management to select and apply significant accounting policies and to make estimates and judgments that affect the Company's reported financial condition and results of operations. See Notes 2 and 4 to the Company's audited consolidated financial statements as of and for the years ended December 31, 2016 and 2015 included in this Offering Circular for a summary of the Company's significant accounting policies that are critical to the portrayal of the Company's financial condition and results of operations.

Recent Accounting Changes and Pronouncements

The preparation of the Company's financial statements is affected by accounting changes and pronouncements made by the Korea Accounting Standards Board from time to time.

K-IFRS No. 1109 "Financial Instruments" is effective for annual periods beginning on or after January 1, 2018. The Company has not performed an assessment of the impact resulting from the application of K-IFRS No. 1109 on its financial statements as of the date of this Offering Circular. See Notes 3 and 4 to the Company's audited consolidated financial statements as of and for the years ended December 31, 2016 and 2015 included in this Offering Circular for a summary of recent accounting changes and pronouncements, as well as a summary of accounting standards issued but not yet effective.

Results of Operations

2016 Compared to 2015

	For the Year Ended December 31,		Changes	
	2015	2016	Amount	%
	(In billions of Won, except percentages)			
Continuing Operations				
Revenue	₩ 3,433	₩ 2,430	₩(1,003)	(29.2)%
Cost of sales	(3,524)	(2,410)	1,113	(31.6)
Gross profit (loss)	(90)	20	110	N.A.*
Selling and administrative expenses	(355)	(261)	94	(26.5)
Operating loss	(445)	(241)	204	(45.9)
Other non-operating income	153	236	82	53.6
Other non-operating expenses	(299)	(119)	180	(60.1)
Other loss, net	(3,075)	(424)	2,651	(86.2)
Finance income	95	183	88	92.4
Finance costs	(1,400)	(728)	672	(48.0)
Loss on investments in associates and joint ventures, net	(501)	(240)	261	(52.1)
Loss before income tax	(5,472)	(1,333)	4,139	(75.6)
Income tax benefit	(972)	(214)	758	(78.0)
Loss for the period	₩(4,500)	₩(1,119)	₩ 3,381	(75.1)

* Not Applicable

Revenue

The following table presents a breakdown of the Company's revenue and changes therein for 2015 and 2016.

	For the Year Ended December 31,		Changes	
	2015	2016	Amount	%
	(In billions of Won, except percentages)			
Oil and gas sales	₩2,507	₩1,779	₩ (729)	(29.1)%
Petroleum distribution	663	488	(175)	(26.4)
Oil stockpiling	122	119	(3)	(2.8)
Financing	1	1	(0)	(13.5)
Drillship chartering	66	4	(62)	(93.8)
Others	73	40	(33)	(45.8)
Total revenue	₩3,433	₩2,430	₩(1,003)	(29.2)

The Company's total revenue in 2016 decreased by 29.2% to Won 2,430 billion from Won 3,433 billion in 2015. The decrease in total revenue was primarily attributable to a decrease in revenues from oil and gas sales and petroleum distribution.

Oil and gas sales. Revenues from oil and gas sales decreased by 29.1% to Won 1,779 billion in 2016 from Won 2,507 billion in 2015. The decrease in sales was primarily due to a decrease in oil and gas prices in 2016, as a result of decreases in international crude oil and natural gas prices in 2016 compared to 2015, which was exacerbated by a decrease in the volume of oil and gas sold. The Company's average oil sales price per barrel decreased by 20.6% to US$35.78 per barrel in 2016 from US$45.05 per barrel in 2015, and average gas sales price per thousand cubic feet decreased by 11.4% to US$3.10 in 2016 from US$3.50 in 2015. The volume of oil and gas sold decreased by 14.6% to 53.9 million barrels of oil equivalent in 2016 from 63.1 million barrels of oil equivalent in 2015, primarily due to the disposal of certain oil and gas properties of Harvest Operations, as well as reduced production in light of the low oil and gas price environment in 2016.

Petroleum distribution. Revenues from petroleum distribution decreased by 26.4% to Won 488 billion in 2016 from Won 663 billion in 2015 primarily due to a decrease in the volume of oil trading in a contango market. This decrease was partially offset by a 16.2% increase in the volume of gasoline and gas oil sold at the Company's discount gas stations to 751 million liters in 2016 from 646 million liters in 2015.

Oil Stockpiling. Revenues from oil stockpiling activities decreased slightly by 2.8% to Won 119 billion in 2016 from Won 122 billion in 2015 primarily due to a decrease in income from lending the Company's stockpiled crude oil to other companies, which was mostly offset by an increase in income from lending the stockpile facilities to other companies.

Financing. Revenues from financing activities decreased by 13.5% to Won 1.3 billion in 2016 from Won 1.5 billion in 2015 primarily due to a decrease in interest income from loans resulting from a decrease in the amount of outstanding interest-earning loans.

Drillship chartering. Revenues from drillship chartering activities decreased by 93.8% to Won 4 billion in 2016 from Won 66 billion in 2015. The decrease in revenues from drillship chartering activities was primarily due to lower utilization of the drillship in 2016. The drillship's utilized days decreased to 60 days in 2016 from 244 days in 2015 due to the termination of the Company's drilling obligations for 2016 under its drilling contract with Gazprom Subsidiary as described in "Business — Other Businesses — Operation of Semi-submersible Drillship."

Cost of Sales and Gross Profit

The Company's cost of sales decreased by 31.6% to Won 2,410 billion in 2016 from Won 3,524 billion in 2015 primarily due to a decrease in cost of sales relating to the Company's oil and gas sales segment to

Won 1,777 billion in 2016 from Won 2,687 billion in 2015, primarily due to a decrease in the volume of oil and gas sold as described above, as well as a decrease in cost of sales relating to the Company's petroleum distribution segment to Won 448 billion in 2016 from Won 619 billion in 2015 due to the decrease in the unit price of gasoline and gas sold as described above.

In terms of cost of sales by type of cost, the Company's cost of sales decreased primarily as a result of a decrease in the cost of sales relating to depreciation and purchase of inventories, which was partially offset by an increase in costs relating to changes in merchandise inventories. Costs relating to depreciation decreased by 34.5% to Won 935 billion in 2016 from Won 1,428 billion in 2015, as oil and gas properties decreased to Won 8,215 billion as of December 31, 2015 from Won 11,448 billion as of December 31, 2014 in connection with the impairment losses recognized with respect to such properties in 2015. Cost of sales relating to purchase of inventories decreased by 43.1% to Won 376 billion in 2016 from Won 660 billion in 2015 primarily due to a decrease in the price of oil products in light of the low oil and gas price environment. The Company's cost of sales relating to changes in merchandise inventories, which primarily relate to changes in inventories of crude oil purchased for the Company's oil trading activities and gasoline and gas oil purchased for the Company's discount gas stations (and are calculated by subtracting the inventory amount at the end of the period from the inventory amount at the beginning of the period) changed to a decrease in inventories of Won 54 billion in 2016 from an increase in inventories of Won 51 billion in 2015 primarily due to the purchase of oil for trading purposes during the second half of 2015 which were sold in 2016.

The Company recorded gross profit of Won 20 billion in 2016 compared to a gross loss of Won 90 billion in 2015 primarily due to a higher rate of decrease in cost of sales in 2016 compared to the rate of decrease in revenues. The Company's gross profit margin, which represents the ratio of gross profit to total revenue (or gross profit of the segment to revenue for the segment, as applicable), was 0.8% in 2016 compared to a gross loss margin of 2.6% in 2015. The Company's gross profit margin was 0.1% for the oil and gas segment in 2016 compared to a gross loss margin of 7.2% in 2015 primarily due to the Company's continuing efforts to reduce costs in light of the low oil and gas price environment. Gross profit margin for the petroleum distribution segment increased to 8.1% in 2016 from 6.6% in 2015 primarily due to a decrease in storage tank leasing costs related to discount gas stations. Gross loss margin for the oil stockpiling segment decreased to 41.4% in 2016 from 46.0% in 2015 primarily due to a decrease in maintenance and labor costs related to the stockpile facilities. The Company's gross loss margin was 228.4% for the drillship chartering segment in 2016 compared to a gross profit margin of 49.9% in 2015 primarily due to lower utilization of the drillship in 2016 as described above, thereby resulting in a higher rate of decrease in revenues for the segment compared to the rate of decrease in cost of sales, as the cost of sales for the drillship, which primarily relate to labor costs for the ship's crew, maintenance costs and depreciation expenses, do not vary significantly based on the drillship's utilization. Gross profit margin for the financing segment was 100.0% for 2016 and 2015, as there was no cost of sales incurred for this segment in such periods.

Selling and Administrative Expenses

Selling and administrative expenses decreased by 26.5% to Won 261 billion in 2016 from Won 355 billion in 2015 primarily due to decreases in rental tax and salaries. Rental tax decreased by 58.2% to Won 26 billion in 2016 from Won 62 billion in 2015. The Company pays rental tax on exports to the Kazakhstan government for crude oil generated from Kazakhstan and such rental tax on exports is recognized as sales commission expense. As the rental tax on exports is a graduated tax that is based on international crude oil prices, the applicable tax rates for rental tax on exports was reduced in 2016 due to the decrease in international crude oil and natural gas prices, which further resulted in a decrease in sales commission. Salaries decreased by 12.8% to Won 98 billion in 2016 from Won 112 billion in 2015 primarily due to a decrease in the number of employees at the Company's subsidiaries as part of its efforts to run its operations more efficiently and a decrease in overall salaries as part of the Company's cost reduction measures.

Operating Profit

As a result of the foregoing, the Company's operating loss decreased by 45.9% to Won 241 billion in 2016 from Won 445 billion in 2015. Operating loss margin, which represents the ratio of operating loss to total revenue, decreased to 9.9% in 2016 from 13.0% in 2015. Primarily for the reasons described above, for the oil and gas segment, operating loss decreased by 59.3% to Won 185 billion in 2016 from Won 455 billion in 2015 and operating loss margin decreased to 10.4% in 2016 from 18.1% in 2015. For the petroleum distribution segment, operating profit decreased by 11.8% to Won 39 billion in 2016 from Won 44 billion in 2015 but operating profit margin increased to 8.0% in 2016 from 6.6% in 2015. For the oil stockpiling segment, operating loss decreased by 12.4% to Won 49 billion in 2016 from Won 56 billion in 2015 and operating loss margin decreased to 41.4% in 2016 from 46.0% in 2015. For the drillship chartering segment, the Company recorded an operating loss of Won 9 billion in 2016 compared to an operating profit of Won 33 billion in 2015 whereas operating loss margin was 228.4% in 2016 compared to an operating profit margin of 49.9% in 2015. For the financing segment, operating profit decreased by 25.4% to Won 0.6 billion in 2016 from Won 0.8 billion in 2015 and operating profit margin decreased to 46.8% in 2016 from 54.2% in 2015.

Other Non-Operating Income

Other non-operating income increased by 53.6% to Won 236 billion in 2016 from Won 153 billion in 2015 primarily due to a significant increase in gain on exemption of debt to Won 220 billion in 2016 from Won 99 billion in 2015 primarily due to the termination of exploration projects in Korea's Block VIII and the resulting Korean government's forgiveness of the SAER loan used by the Company for exploration activities at such sites. Such increase was partially offset by a decrease in reversal of provisions by 88.1% to Won 3 billion in 2016 from Won 25 billion in 2015 primarily due to a reversal of provisions in 2015 relating to a lawsuit in connection with the refund of premiums to the plaintiffs in a production project.

Other Non-Operating Expenses

Other non-operating expenses decreased by 60.1% to Won 119 billion in 2016 from Won 299 billion in 2015 primarily due to decreases in other bad debt expenses. Other bad debt expenses decreased by 91.6% to Won 15 billion in 2016 from Won 172 billion in 2015 primarily due to the failure to discover any commercially viable oil and gas reserves in the Kazakhstan Zhambyl Block and the subsequent write-downs by the Company in 2015, whereas there were no projects with significant write-downs during 2016.

Other Loss, Net

The following table presents a breakdown of the Company's net other loss for 2015 and 2016.

	For the Year Ended December 31,		Changes	
	2015	**2016**	**Amount**	**%**
	(In billions of Won, except percentages)			
Gains on disposal of property, plant and equipment, net	₩ 141	₩ 47	₩ (94)	66.7%
Gains (losses) on disposal of intangible assets other than goodwill, net	2	(66)	(68)	N.A.*
Impairment losses on property, plant and equipment, net of reversals	(2,341)	(33)	2,308	(98.6)
Impairment losses on intangible assets, net of reversals	(830)	(371)	459	(55.3)
Losses on foreign currency translation, net	(41)	(5)	35	(87.1)
Gains (losses) on foreign currency transactions, net	(7)	1	8	N.A.*
Other gains, net(1)	0	3	3	1,313.2
Total other loss, net	₩(3,075)	₩(424)	₩2,651	(86.2)

(1) Includes net other gains and losses, net losses on transaction of derivatives and net losses on valuation of derivatives.

* Not Applicable

Net other losses decreased by 86.2% to Won 424 billion in 2016 from Won 3,075 billion in 2015 primarily due to a decrease in impairment losses on property, plant and equipment, net of reversals, and a decrease in impairment losses on intangible assets, net of reversals.

- Impairment losses on property, plant and equipment, net of reversals decreased by 98.6% to Won 33 billion in 2016 from Won 2,340 billion in 2015, as the Company recorded impairment losses incurred on oil and gas properties of Won 2,362 billion in 2015 as described in "— 2015 Compared to 2014," whereas such impairment losses, net of reversals, in 2016 were significantly lower at Won 33 billion.
- Impairment losses on intangible assets, which comprise of impairment losses recognized in connection with unsuccessful oil or gas exploration projects, as well as impairment losses on goodwill, decreased by 55.3% to Won 371 billion in 2016 from Won 830 billion in 2015 as a result of a 94.3% decrease in impairment losses on goodwill to Won 32 billion in 2016 from Won 559 billion in 2015. The Company recorded Won 32 billion in impairment losses on goodwill of Harvest Operations in 2016 compared to Won 173 billion in impairment losses on goodwill of Harvest Operations and Won 386 billion in impairment losses on goodwill of Dana Petroleum in 2015, due to larger decline in long-term forecasts of oil and gas prices in 2015 compared to 2016.

Finance Income (Costs), Net

The following table presents a breakdown of the Company's net finance income (costs) and changes therein for 2015 and 2016.

	For the Year Ended December 31,		Changes	
	2015	2016	Amount	%
	(In billions of Won, except percentages)			
Interest expenses, net	₩ (376)	₩(387)	₩ (11)	2.9%
Impairment losses on available-for-sale financial assets	(450)	(46)	405	(89.9)
Gains on disposal of financial assets	—	26	26	N.A.*
Gains on redemption of financial liabilities	—	17	17	N.A.*
Losses on foreign currency translation, net	(434)	(146)	288	(66.4)
Gains (losses) on foreign currency transactions, net	(3)	27	30	N.A.*
Others, net(1)	(42)	(37)	5	(10.9)
Total finance costs, net	₩(1,305)	₩(545)	₩760	(58.2)

(1) Includes dividend income, net gains (losses) on transactions of derivatives and other financial costs.

* Not Applicable

Net finance costs decreased by 58.2% to Won 545 billion in 2016 from Won 1,305 billion in 2015 primarily due to decreases in impairment losses on available-for-sale financial assets and net losses on foreign currency translation.

- Impairment losses on available-for-sale financial assets decreased by 89.9% to Won 46 billion in 2016 from Won 450 billion in 2015, as the Company recorded significant impairment on equity investments in EP Energy, Faroe Petroleum plc and Troika Resource Investment PEF, whereas such losses in 2016, from impairment on equity investments in PETRO ONADO S.A., Troika Resource Investment PEF and Global Dynasty Natural Resource PEF, were significantly lower.
- Net losses on foreign currency translations decreased by 66.4% to Won 146 billion in 2016 from Won 434 billion in 2015 primarily due to fluctuations in the average value of the British Pound against the U.S. dollar during 2016 compared to 2015 in connection with U.S. dollar-denominated indebtedness

of our foreign subsidiaries. The Company, in preparing its consolidated financial statements, aggregates the foreign currency translation gains and losses of itself and its subsidiaries, and as such, the Company's consolidated foreign currency gains and losses are affected by changes in the exchange rates of the dollar, the functional currency of the Company, as well as the functional currencies of its subsidiaries.

Loss on Investments in Associates and Joint Ventures, Net

Loss on investments in associates and joint ventures decreased by 52.1% to Won 240 billion in 2016 from Won 501 billion in 2015 primarily as a result of a decrease in impairment loss from the Company's interest in OIG to Won 117 billion in 2016 from Won 243 billion in 2015 and a decrease in share of equity method loss from Deep Basin Partnership to Won 45 billion in 2016 from Won 93 billion in 2015, due to larger decline in long-term forecasts of global oil prices in 2015 compared to 2016.

Profit (Loss) Before Income Tax

As a result of the foregoing, the Company's loss before income tax decreased by 75.6% to Won 1,333 billion in 2016 from Won 5,472 billion in 2015.

Income Tax Benefit

Income tax benefit decreased by 78.0% to Won 214 billion in 2016 from Won 972 billion in 2015 primarily due to the decrease in loss before income tax in 2016 compared to 2015 and the resulting decrease in the recognized deferred tax assets. Effective tax rate decreased slightly to 16.06% in 2016 from 17.76% in 2015 primarily due to a decrease in differences in tax rates in overseas entities to Won 1 billion in 2016 from Won 295 billion in 2015 (which resulted in a decrease in effective tax rate by 5.3%), which impact was partially offset primarily by a decrease in temporary differences not recognized in deferred tax assets to Won 156 billion in 2016 from Won 442 billion in 2015 (which resulted in an increase in effective tax rate by 3.6%). See Note 35 to the Company's audited consolidated financial statements as of and for the years ended December 31, 2016 and 2015 included in this Offering Circular.

The Company is subject to Korean income taxes, including resident surtax, at the aggregate statutory rate of 11.0% on taxable income up to Won 200 million, 22.0% on taxable income in excess of Won 200 million up to Won 20 billion and 24.2% on taxable income in excess of Won 20 billion, as well as income and other taxes in the jurisdictions in which it operates. The statutory tax rates applicable to the Company's overseas subsidiaries (such as Dana Petroleum) in the jurisdictions in which they operate are typically different from the Korean statutory rate applicable to the Company. Therefore, the income tax benefit or expense recognized in the Company's consolidated statement of comprehensive loss, which aggregates the tax expense or benefit of the Company and its subsidiaries, are generally different from the amount of income tax benefit or expense calculable by applying the Korean statutory rate to the Company's consolidated income or loss before income tax.

Loss for the Year

As a result of the foregoing, the Company's loss for the period decreased by 75.1% to Won 1,119 billion in 2016 from Won 4,500 billion in 2015. Net loss margin, which represents the ratio of net loss to total revenue, decreased to 46.0% in 2016 from 131.1% in 2015.

2015 Compared to 2014

	For the Year Ended December 31,		Changes	
	2014	2015	Amount	%
	(In billions of Won, except percentages)			
Continuing Operations				
Revenue	₩ 4,358	₩ 3,433	₩ (925)	(21.2)%
Cost of sales	(3,440)	(3,524)	(84)	2.4
Gross profit (loss)	918	(90)	(1,009)	N.A.*
Selling and administrative expenses	(445)	(355)	91	(20.3)
Operating profit (loss)	473	(445)	(918)	N.A.*
Other non-operating income	139	153	14	10.0
Other non-operating expenses	(267)	(299)	(32)	12.1
Other loss, net	(1,720)	(3,075)	(1,355)	78.8
Finance income	80	95	15	18.9
Finance costs	(621)	(1,400)	(779)	125.4
Loss on investments in associates and joint ventures, net	(42)	(501)	(460)	1,105.3
Loss before income tax	(1,957)	(5,472)	(3,515)	179.6
Income tax benefit	(684)	(972)	(287)	42.0
Loss from continuing operations	(1,273)	(4,500)	(3,227)	253.6
Discontinued Operations				
Loss from discontinued operations, net of tax	(338)	—	(338)	N.A.*
Loss for the year	₩(1,611)	₩(4,500)	₩(2,889)	179.3

* Not Applicable

Revenue

The following table presents a breakdown of the Company's revenue and changes therein for 2014 and 2015.

	For the Year Ended December 31,		Changes	
	2014	2015	Amount	%
	(In billions of Won, except percentages)			
Oil and gas sales	₩3,817	₩2,507	₩(1,310)	(34.3)%
Petroleum distribution	222	663	441	198.1
Oil stockpiling	148	122	(25)	(17.2)
Financing	2	1	(1)	(30.8)
Drillship chartering	97	66	(31)	(32.3)
Others	72	73	1	1.9
Total revenue	₩4,358	₩3,433	₩ (925)	(21.2)

The Company's total revenue in 2015 decreased by 21.2% to Won 3,433 billion from Won 4,358 billion in 2014. The decrease in total revenue was primarily attributable to a decrease in revenues from oil and gas sales.

Oil and gas sales. Oil and gas sales decreased by 34.3% to Won 2,507 billion in 2015 from Won 3,817 billion in 2014. The decrease in sales was primarily due to a decrease in oil and gas prices in 2015, as a result of decreases in international crude oil and natural gas prices in 2015 compared to 2014, which was partially offset by an increase in the volume of oil and gas sold. The Company's average oil sales price per barrel decreased by 46.2% to US$45.05 per barrel in 2015 from US$83.72 per barrel in 2014, and average gas sales price per thousand cubic feet decreased by 33.0% to US$3.50 in 2015 from US$5.22 in 2014. The volume of oil and gas sold increased by 8.6% to 63.1 million barrels of oil equivalent in 2015 from 58.1 million barrels of oil equivalent in 2014, primarily due to an increase in production from new production wells in Vietnam, United Kingdom, Netherlands and Egypt, as well as an increase in production to raise the Company's operating cash flow.

Petroleum distribution. Revenues from petroleum distribution almost tripled to Won 663 billion in 2015 from Won 222 billion in 2014 primarily due to an increase in the volume of oil trading in a contango market. This increase was partially offset by a 30.2% decrease in the volume of gasoline and gas oil sold at the Company's discount gas stations to 646 million liters in 2015 from 925 million liters in 2014 as a result of increased competition from gas stations operated by domestic refineries, due in part to a decrease in exports of refined oil products by such refineries.

Oil Stockpiling. Revenues from oil stockpiling activities decreased by 17.2% to Won 122 billion in 2015 from Won 148 billion in 2014 primarily due to a decrease in income from lending of the Company's stockpiled crude oil to other oil companies due to the contango market situation.

Financing. Revenues from financing activities decreased by 30.8% to Won 1 billion in 2015 from Won 2 billion in 2014 primarily due to a decrease in interest income from loans resulting from a decrease in the amount of outstanding interest-earning loans. The balance of outstanding SAER funds administered by the Company increased to Won 2,171 billion as of December 31, 2015 from Won 2,093 billion as of December 31, 2014, primarily due to the decrease in value of the Won against the dollar as of such dates, even though the amount of outstanding funds decreased in dollar terms.

Drillship chartering. Revenues from drillship chartering activities decreased by 32.3% to Won 66 billion in 2015 from Won 97 billion in 2014. The decrease in revenues from drillship chartering activities was primarily due to lower utilization of the drillship in 2015. The drillship's utilized days decreased to 244 days in 2015 from 330 days in 2014, primarily due to mutual termination of a drilling contract with the contract counterparty in February 2015.

Cost of Sales and Gross Profit

The Company's cost of sales increased by 2.4% to Won 3,524 billion in 2015 from Won 3,440 billion in 2014 primarily due to a significant increase in cost of sales relating to the Company's petroleum distribution segment to Won 619 billion in 2015 from Won 214 billion in 2014, primarily due to an increase in the volume of oil trading as described above.

In terms of cost of sales by type of cost, the Company's cost of sales increased primarily as a result of an increase in the cost of sales relating to purchase of inventories, which was partially offset by a decrease in costs relating to repairs and amortization. Cost of sales relating to purchase of inventories more than tripled to Won 660 billion in 2015 from Won 211 billion in 2014 primarily due to purchases of oil products for trading purposes during 2015 due to contango market conditions. Such increase in cost of sales was partially offset by a 31.0% decrease in costs relating to repairs to Won 178 billion in 2015 from Won 258 billion in 2014 primarily due to the large amount of repairs conducted prior to 2015 resulting in a reduction of repair work in 2015 and the cancellation of repairs of oil wells with low production. Costs relating to amortization decreased by 21.0% to Won 202 billion in 2015 from Won 256 billion in 2014 as a result of a decrease in amortization of mining rights primarily due to an increase in proved reserves of the Eagle Ford shale oil formation.

The Company recorded gross loss of Won 90 billion in 2015 compared to a gross profit of Won 918 billion in 2014 primarily due to a significant decrease in revenues in 2015 accompanied by a slight increase in cost of sales, as a significant portion of the Company's cost of sales, relating primarily to fixed facility maintenance and labor costs for its oil and gas fields, as well as depreciation costs on the Company's oil and gas assets, do not vary significantly based on changes in global oil or gas prices, while revenues are more directly affected by changes in oil and gas prices and the Company's sales volume. The Company's gross loss margin, which represents the ratio of gross loss to total revenue (or gross loss of the segment to revenue for the segment, as applicable), was 2.6% in 2015 compared to a gross profit margin of 21.1% in 2014. The Company's gross loss margin was 7.2% for the oil and gas sales segment in 2015 compared to a gross profit margin of 21.0% in 2014 primarily due to a decrease in the Company's average sales price for crude oil and natural gas as discussed above. Gross profit margin for the petroleum distribution segment increased to 6.6% in 2015 from 3.9% in 2014 primarily due to an increase in volume of oil trading as discussed above. Gross loss margin for the oil stockpiling segment increased to 46.0% in 2015 from 18.8% in 2014 primarily due to a decrease in income from lending of the Company's stockpiled crude oil to other oil companies as discussed above as well as an increase in rental fees for storage facilities in connection with the Company's oil trading activities. Gross profit margin for the drillship chartering segment decreased to 49.9% in 2015 from 66.6% in 2014 primarily due to lower utilization of the drillship in 2015 as described above, thereby resulting in a decrease in revenues for the segment, while the cost of sales remained relatively constant, as the cost of sales for the drillship, which primarily relate to labor costs for the ship's crew, maintenance costs and depreciation expenses, do not vary significantly based on the drillship's utilization. Gross profit margin for the financing segment was 100.0% for 2015 and 2014, as there was no cost of sales incurred for this segment.

Selling and Administrative Expenses

Selling and administrative expenses decreased by 20.3% to Won 355 billion in 2015 from Won 445 billion in 2014 primarily due to decreases in sales commission expenses and commissions and fees expenses. Sales commission expenses, which mainly related to sales of oil and gas by the Company, decreased by 27.1% to Won 99 billion in 2015 from Won 136 billion in 2014 primarily due to the decrease in oil and gas sales as discussed above. Commissions and fees expenses, which comprise of audit fees and other fees paid for engaging professional services, decreased by 47.6% to Won 30 billion in 2015 from Won 58 billion in 2014 primarily due to the Company's continuing efforts to reduce such expenses in light of the low oil and gas price environment.

Operating Profit

As a result of the foregoing, the Company recorded an operating loss of Won 445 billion in 2015 compared to an operating profit of Won 473 billion in 2014. Operating loss margin, which represents the ratio of operating loss to total revenue, was 13.0% in 2015, while operating margin, which represents the ratio of operating profit to total revenue, was 10.9% in 2014. Primarily for the reasons described above, for the oil and gas segment, the Company recorded an operating loss of Won 455 billion in 2015 compared to an operating profit of Won 439 billion in 2014 whereas operating loss margin was 18.1% in 2015 compared to an operating profit margin of 11.5% in 2014. For the petroleum distribution segment, operating profit more than quadrupled to Won 44 billion in 2015 from Won 9 billion in 2014 and operating profit margin increased to 6.6% in 2015 from 3.9% in 2014. For the oil stockpiling segment, operating loss more than doubled to Won 56 billion in 2015 from Won 28 billion in 2014 and operating loss margin increased to 46.0% in 2015 from 18.8% in 2014. For the drillship chartering segment, operating profit decreased by 49.3% to Won 33 billion in 2015 from Won 65 billion in 2014 and operating profit margin decreased to 49.9% in 2015 from 66.6% in 2014. For the financing segment, operating profit decreased by 22.1% to Won 0.8 billion in 2015 from Won 1 billion in 2014 but operating profit margin increased to 54.2% in 2015 from 48.2 % in 2014.

Other Non-Operating Income

Other non-operating income increased by 10.0% to Won 153 billion in 2015 from Won 139 billion in 2014, primarily due to a reversal of other provisions of Won 25 billion in 2015 compared to no such reversals in 2014. In 2014, the Company accrued provisions for litigations in light of its assessment of the estimated outcome of two lawsuits in connection with the refund of premiums to the plaintiffs in a production project. In 2015, the relevant district court ruled partially in favor of the Company in one of the lawsuits which led to such reversal of provisions.

Other Non-Operating Expenses

Other non-operating expenses increased by 12.1% to Won 299 billion in 2015 from Won 267 billion in 2014 primarily due to an increase in other bad debt expense. Other bad debt expense more than doubled to

Won 172 billion in 2015 from Won 69 billion in 2014 primarily due to the failure to discover any commercially viable oil and gas reserves in the Kazakhstan Zhambyl Block and the subsequent write-downs by the Company. Such increase was partially offset by a 35.4% decrease in accrual for other provisions to Won 108 billion in 2015 from Won 168 billion in 2014 primarily due to the accrual of provisions for litigations in 2014 as described above compared to no such accrual in 2015.

Other Loss, Net

The following table presents a breakdown of the Company's net other loss for 2014 and 2015.

	For the Year Ended December 31,		Changes	
	2014	2015	Amount	%
	(In billions of Won, except percentages)			
Gains on disposal of property, plant and equipment, net	₩ 363	₩ 141	₩ (222)	61.2%
Gains (losses) on disposal of intangible assets other than goodwill, net	(40)	2	42	N.A.*
Impairment losses on property, plant and equipment, net of reversals	(776)	(2,341)	(1,565)	201.8
Impairment losses and write-off of intangible assets	(1,283)	(830)	453	(35.3)
Gains (losses) on foreign currency translation, net	(22)	(41)	(19)	88.0
Gains (losses) on foreign currency transactions, net	8	(7)	(14)	N.A.*
Other gains, net(1)	29	0	(29)	(99.2)
Total other loss, net	₩(1,720)	₩(3,075)	₩(1,355)	78.8

(1) Includes net other gains and losses, net gains on transaction of derivatives and net losses on valuation of derivatives.

* Not Applicable

Net other losses increased by 78.8% to Won 3,075 billion in 2015 from Won 1,720 billion in 2014 primarily due to an increase in impairment losses on property, plant and equipment, which was partially offset by a decrease in impairment losses and write-off of intangible assets other than goodwill.

- Impairment losses on property, plant and equipment, net of reversals more than tripled to Won 2,341 billion in 2015 from Won 776 billion in 2014 primarily due to impairment loss on oil and gas properties, due in turn to significantly declining oil and gas prices during 2015 and the corresponding reduction in the estimated cash flow from the recoverable oil and gas from the Company's properties, which fell below the properties' book value.

- Impairment losses and write-off of intangible assets, which comprise of impairment losses and write-offs recognized in connection with unsuccessful oil or gas exploration projects, decreased by 35.3% to Won 830 billion in 2015 from Won 1,283 billion in 2014 primarily as a result of fewer terminations of significant exploration projects in 2015 compared to 2014. In 2015, the Company recorded Won 271 billion of impairment loss on intangible assets other than goodwill, primarily relating to the termination of exploration contracts in Europe and the impairment of mining rights due to the decrease in oil and gas prices. In 2014, the Company recorded Won 826 billion of impairment loss on intangible assets other than goodwill, primarily relating to the termination of exploration contracts in Europe due to the failure to discover commercially viable oil and gas reserves and the expiration of mining rights in Africa.

Finance Income (Costs), Net

The following table presents a breakdown of the Company's net finance income (costs) and changes therein for 2014 and 2015.

	For the Year Ended December 31,		Changes	
	2014	2015	Amount	%
	(In billions of Won, except percentages)			
Interest expenses, net	₩(360)	₩ (376)	₩ (16)	4.4%
Dividend income	5	4	(1)	(19.6)
Impairment of available-for-sale financial assets	—	(450)	(450)	N.A.*
Gain on disposal of financial assets	3	—	(3)	N.A.*
Losses on foreign currency translation, net	(137)	(434)	(296)	215.8
Gains (losses) on foreign currency transactions, net	2	(3)	(5)	N.A.*
Others, net(1)	(53)	(46)	8	(14.7)
Total finance costs, net	₩(541)	₩(1,305)	₩(763)	141.2

(1) Includes net losses on valuation of derivatives financial instruments, net gains on settlement of derivative financial instruments and other financial costs.

* Not Applicable

Net finance costs more than doubled to Won 1,305 billion in 2015 from Won 541 billion in 2014 primarily due to an increase in impairment losses on available-for-sale financial assets and net losses on foreign currency translation.

- The Company recorded impairment of available-for-sale financial assets of Won 450 billion in 2015 compared to no such impairment in 2014 primarily due to the impairment of the Company's equity investment in EP Energy, Faroe Petroleum plc and Troika Resource Investment PEF, as the fair value of the securities fell below the acquisition cost.
- Net losses on foreign currency translation more than tripled to Won 434 billion in 2015 from Won 137 billion in 2014 primarily as a result of a larger depreciation in the average value of other currencies against the U.S. dollar during 2015 compared to 2014 in connection with U.S. dollar-denominated indebtedness of our foreign subsidiaries. The Company, in preparing its consolidated financial statements, aggregates the foreign currency translation gains and losses of itself and its subsidiaries, and as such, the Company's consolidated foreign currency gains and losses are affected by changes in the exchange rates of the dollar, the functional currency of the Company, as well as the functional currencies of its subsidiaries.

Gain (Loss) on Investments in Associates and Joint Ventures, Net

Loss on investment in associates and joint ventures increased significantly to Won 501 billion in 2015 from Won 42 billion in 2014 primarily as a result of an impairment loss of Won 243 billion from OIG and share of equity method losses of Won 93 billion from Deep Basin Partnership and Won 60 billion from OIG due to declining global oil prices and the corresponding decrease in the net income of these companies.

Profit (Loss) Before Income Tax

As a result of the foregoing, the Company's loss before income tax increased significantly to Won 5,472 billion in 2015 from Won 1,957 billion in 2014.

Income Tax Benefit

Income tax benefit increased by 42.0% to Won 972 billion in 2015 from Won 684 billion in 2014 primarily due to the increase in loss before income tax and the effect of reduction in the statutory tax rate of Dana

Petroleum from 62% to 50% between the periods and the resulting decrease in the recognized deferred tax liability, as well as the increase in loss before income tax during 2015 and the resulting increase in the recognized deferred tax assets. See Note 36 to the Company's audited consolidated financial statements as of and for the years ended December 31, 2015 and 2014 included in this Offering Circular.

The Company is subject to Korean income taxes, including resident surtax, at the aggregate statutory rate of 11.0% on taxable income up to Won 200 million, 22.0% on taxable income in excess of Won 200 million up to Won 20 billion and 24.2% on taxable income in excess of Won 20 billion, as well as income and other taxes in the jurisdictions in which it operates. The statutory tax rates applicable to the Company's overseas subsidiaries (such as Dana Petroleum) in the jurisdictions in which they operate are typically different from the Korean statutory rate applicable to the Company. Therefore, the income tax benefit or expense recognized in the Company's consolidated statement of comprehensive income (loss), which aggregates the tax expense or benefit of the Company and its subsidiaries, are generally different from the amount of income tax benefit or expense calculable by applying the Korean statutory rate to the Company's consolidated income or loss before income tax.

Loss from Continuing Operations

As a result of the foregoing, the Company's loss from continuing operations increased significantly to Won 4,500 billion in 2015 from Won 1,273 billion in 2014.

Loss from Discontinued Operations, Net of Tax

In November 2014, the Company disposed of North Atlantic Refining Limited, which held the Company's downstream operations and related assets, for cash considerations of approximately Won 67 billion and classified all income and expenses relating to the downstream operations as discontinued operations for the year ended December 31, 2014.

As a result, the Company recorded loss from discontinued operations, net of tax of Won 338 billion in 2014, whereas it did not record any corresponding income or loss in 2015. The loss from discontinued operations in 2014 was due to the declining profit by North Atlantic Refining Limited, resulting from declining refining margins, as well as global decline in refined product prices.

Profit (Loss) for the Year

As a result of the foregoing, the Company's loss for the year increased significantly to Won 4,500 billion in 2015 from Won 1,611 billion in 2014. Net loss margin, which represents the ratio of net loss to total revenue, increased to 131.1% in 2015 from 37.0% in 2014.

Financial Condition, Liquidity and Capital Resources

Cash Flows

The following table sets forth a summary of the Company's consolidated cash flows for the periods indicated.

	For the Year Ended December 31,		
	2014	2015	2016
	(In billions of Won)		
Net cash flows provided by operating activities	₩ 1,542	₩ 231	₩ 372
Net cash flows used in investing activities	(2,025)	(1,664)	(752)
Net cash flows provided by financing activities	17	1,702	451
Effect of exchange rate fluctuations on cash held	8	13	(44)
Net increase (decrease) in cash and cash equivalents	(458)	282	27
Cash and cash equivalents at the beginning of the period	966	509	790
Cash and cash equivalents at the end of the period	506	784	813

The Company reported net cash flows provided by operating activities of Won 1,542 billion in 2014, Won 231 billion in 2015 and Won 372 billion in 2016. The significant change in cash from operating activities between 2015 and 2014 was primarily due to the significant decrease in global oil and gas prices between the periods, and the corresponding decrease in cash generated from oil and gas sales, as well as cash used for purchases of oil products for trading purposes and repayment of debt which are related to operating activities.

The Company's net cash provided by operating activities increased in 2016 from 2015 primarily due to the Company's effort to run its operations more efficiently and reduce costs in light of the low oil and gas price environment.

Net cash flows used in investing activities was Won 2,025 billion in 2014, Won 1,664 billion in 2015 and Won 752 billion in 2016.

The Company's net cash used in investing activities in 2014 consisted primarily of cash outflows of Won 2,452 billion for acquisition of property, plant and equipment and Won 360 billion for acquisition of intangible assets other than goodwill, which were offset in part by a cash inflow of Won 851 billion in proceeds from disposal of property, plant and equipment. The cash outflows from the acquisition of property, plant and equipment, and acquisition of intangible assets other than goodwill reflect the capital expenditures made by the Company for various production assets in 2014. The proceeds from disposal of property, plant and equipment reflect proceeds from the sale of the Company's property in Ulsan during 2014.

The Company's net cash used in investing activities in 2015 consisted primarily of cash outflows of Won 1,229 billion for acquisition of property, plant and equipment and Won 279 billion for acquisition of intangible assets other than goodwill. The cash outflows from the acquisition of property, plant and equipment, and acquisition of intangible assets other than goodwill reflect the capital expenditures made by the Company for various production assets in 2015. The decrease in cash used in investing activities in 2015 from 2014 primarily reflect decreased investments in new ventures in light of the low oil and gas price environment.

The Company's net cash used in investing activities in 2016 consisted primarily of cash outflows of Won 641 billion for acquisition of property, plant and equipment. The cash outflows from the acquisition of property, plant and equipment reflect the capital expenditures made by the Company for various production assets in 2016. The decrease in cash used in investing activities in 2016 from 2015 primarily reflected decreased investments in new ventures in light of the low oil and gas price environment.

The Company had net cash flows provided by financing activities of Won 17 billion in 2014, Won 1,702 billion in 2015 and Won 451 billion in 2016.

The Company's net cash provided by financing activities in 2014 consisted primarily of cash inflows from net increase in long-term borrowings of Won 299 billion, net increase in short-term borrowings of Won 43 billion and proceeds from increase in share capital of Won 61 billion, which were offset in large part by cash outflows from repayment of current portion of long-term liabilities of Won 220 billion and net decrease in bonds payables of Won 105 billion.

The Company's net cash provided by financing activities of Won 1,702 billion in 2015 consisted primarily of cash inflows from net increase in bonds of Won 929 billion, net increase in long-term borrowings of Won 434 billion and net increase in short-term borrowings of Won 235 billion. The Company's bonds and other borrowings increased to finance the Company's capital expenditures and other operating activities, to help offset the decrease in cash flows from operating activities as discussed above.

The Company's net cash provided by financing activities of Won 451 billion in 2016 consisted primarily of cash inflows from capital contribution from non-controlling interest of Won 452 billion and net proceeds from issuance of bonds Won 410 billion. The decrease in cash provided by financing activities from 2015 to 2016 mainly resulted from the decrease in the Company's capital expenditures and other operating activities, as well as the Company's continuing effort to reduce its debt and interest expenses.

Capital Requirements

The Company requires capital primarily to invest in exploration, development and production projects, to purchase interests in other companies engaged in exploration, development and production activities, to purchase crude oil for its stockpile program, for capital expenditures relating to the construction and maintenance of stockpile facilities, the maintenance of its semi-submersible drillship, and for the repayments of outstanding debt.

The Company incurred capital expenditures (consisting of cash used for acquisitions of (1) property, plant and equipment, (2) intangible assets other than goodwill and (3) investments in associates and joint ventures) of Won 2,891 billion for 2014, Won 1,583 billion for 2015 and Won 728 billion for 2016.

The Company had previously committed to provide US$1.9 billion of SOC construction in the Kurdistan region of Iraq, in return for its acquisition of oil exploratory wells in 2007 from the Kurdistan regional government, and made a payment of US$25 million for SOC construction and US$200 million as a signing bonus. Pursuant to an amendment to the Production Sharing Contract with the Kurdistan regional government in 2010, the parties agreed that, in addition to the US$700 million of construction which is currently being funded by the Company, the Kurdistan regional government will undertake the remaining US$1.175 billion of SOC construction and the Company will pay for such SOC construction instead of directly providing the construction. Pursuant to a further amendment to the Production Sharing Contract with the Kurdistan regional government in July 2012, the Company committed to make a cash payment of US$100 million as "capacity building payment", and return all of the Company's interests in two exploratory fields and half of its interest in one exploratory field which did not show significant development potential. Pursuant to the same agreement, the Company's remaining obligation to pay for the remaining US$1.075 billion of SOC construction was extinguished in return for a reduction in the amount of guaranteed crude oil to be provided by the Kurdistan regional government in connection with the original acquisition. In relation to the SOC construction discussed above, the Company recognized Won 1,394 billion as mining rights, and the corresponding SOC-related liabilities of Won 133 billion as current provision as of December 31, 2016. See Note 42 to the Company's audited consolidated financial statements included in this Offering Circular.

The Company expects that investments in exploration, development and production projects will continue to be the primary use for its capital requirements. The Company may adjust its capital spending on an on-going basis subject to changes in the price of oil, the production outlook of the global crude oil and natural gas industry and global economic conditions in general. The Company also may delay or not implement some of its current capital spending plans based on its assessment of market conditions. In addition, the Company expects to incur costs for the management and construction of the stockpile facilities, as well as purchases of stockpile oil upon annual consultation with the Korean government and in accordance with the stockpiling master plan in effect.

Repayment of both short-term and long-term borrowings will also require considerable resources. In the ordinary course of its business, the Company enters into short-term and long-term borrowing arrangements for general operations and to fund its oil stockpile activities. The Company also provides payment and performance guarantees for Harvest Operations, Dana Petroleum and ANKOR E&P Holdings Corporation as of December 31, 2016. For Harvest Operations, the Company provided guarantees of US$196 million for bonds issued in June 2016, US$630 million for bonds issued in May 2013 and CAD 1 billion for a credit facility. For Dana Petroleum, the Company provided performance guarantees of GBP 58 million for expenses in restoring, decommissioning, dismantling and removing facilities and structures in the field and NOK 235 million for transferring restoring obligations. For ANKOR E&P Holdings Corporation, the Company provided a payment guarantee up to US$108 million for borrowings and a performance guarantee of US$127 million for restoration of oil and gas sites held by the affiliate. See Note 42 to the Company's audited consolidated financial statements included in this Offering Circular.

The following table sets forth contractual maturities of the Company's financial liabilities (excluding financial guarantee liabilities), significant contractual obligations and estimated commitments as of December 31, 2016.

	Payments Due by Period				
Financial Liabilities	**Contractual Cash Flows[1]**	**Less than 1 Year**	**1 to 2 Year**	**2 to 5 Years**	**After 5 Years**
	(In billions of Won)				
Bonds payable	₩13,890	₩2,331	₩2,839	₩3,818	₩4,902
Borrowings	2,303	1,177	777	23	326
Trade and other payables	1,267	973	24	51	219
Derivative liabilities	190	43	31	69	47
Total	₩17,650	₩4,524	₩3,671	₩3,961	₩5,494
Contractual Obligations and Estimated Commitments					
Purchase commitments[2]	₩ 86	₩ 22	₩ 17	₩ 25	₩ 22
Decommissioning and environmental liabilities	2,646	23	83	338	2,202
Others	457	190	91	95	81
Total	₩ 3,189	₩ 235	₩ 191	₩ 458	₩2,305

(1) Includes interest payments, but excludes the effect of offsetting contracts.

(2) Includes drilling commitments and others.

Capital Resources and Liquidity

The Company operates in an industry with significant financing requirements and has historically financed its operations primarily through capital contributions from the Government, cash generated by operating activities and short-term and long-term borrowings. The Company expects that these sources will continue to be its principal sources of cash in the future.

The Company's share capital is allowed to be invested solely by the Government in accordance with the KNOC Act. The Company increased its share capital by Won 61 billion in 2014, Won 116 billion in 2015 and Won 139 billion in 2016. The Company increased its paid-in capital in recent periods to increase its stockpile reserve amount, fund the construction and maintenance of stockpile facilities and fund the development of oil production fields. The Company's total equity was Won 8,370 billion as of December 31, 2014, Won 4,196 billion as of December 31, 2015 and Won 3,509 billion as of December 31, 2016.

Total long-term borrowings, excluding current portion, were Won 1,894 billion as of December 31, 2014, Won 1,552 billion as of December 31, 2015 and Won 1,096 billion as of December 31, 2016. Total bonds payable, excluding current portion and net of discounts and premiums, were Won 8,864 billion as of December 31, 2014, Won 9,360 billion as of December 31, 2015 and Won 10,251 billion as of December 31, 2016. Total short-term borrowings and current portion of long-term borrowings and bonds payable were Won 1,258 billion as of December 31, 2014, Won 3,339 billion as of December 31, 2015 and Won 3,166 billion as of December 31, 2016. The Company plans to fund a portion of its investments in exploration, development and production projects with loans from the SAER. For SAER loans, in the event the exploration project does not result in successful production of oil or gas, the Company may apply to have such loans forgiven after satisfying certain criteria set by the Ministry of Trade, Industry and Energy. The Company issued US$250 million floating rate notes and HKD390 million fixed rate notes in February 2012, CHF300 million fixed rate notes and €50 million fixed rate notes in March 2012, US$1 billion fixed rates notes in April 2012, two series of an aggregate US$1 billion fixed rate notes in January 2014, two series of an aggregate US$800 million fixed rate notes in July 2014, US$600 million fixed rate notes in September 2015, AUD325 million floating rate notes in February 2016 and two series of an aggregate US$1 billion fixed rate notes in April 2016 and October 2016 for general corporate purposes including its capital expenditure needs.

In May 2013, Harvest Operations also issued US$630 million 2.125% senior notes due 2018, which was unconditionally and irrevocably guaranteed by the Company. In addition, in June 2016, Harvest Operations issued US$196 million 2.33% senior notes due 2021 unconditionally and irrevocably guaranteed by the Company pursuant to an exchange offer by Harvest Operations for its 6⅞% senior notes due 2017, of which US$218 million aggregate principal amount were validly tendered and accepted.

The Company's ability to rely on debt financing could be affected by such factors as the liquidity of the Korean and the global financial markets, prevailing interest rates, the Company's credit ratings and the Government's policies and support regarding Won currency and foreign currency borrowings.

The Company had a working capital (current assets minus current liabilities) deficit of Won 1,252 billion as of December 31, 2014, Won 2,804 billion as of December 31, 2015 and Won 2,823 billion as of December 31, 2016.

The Company currently anticipates that expected future capital contributions from the Government, the issuance of debt securities from time to time and the cash flow that the Company generates from its operations, together with its existing cash and cash equivalents and credit sources (including its credit facilities), will be sufficient to meet its currently anticipated needs for working capital, capital expenditures and investments in the near future. The Company has established a contingency plan to minimize the impact of changes in global oil and gas prices on the Company's liquidity, and to maintain a stable cash flow. The Company plans to undertake selective exploration activities based on projected cash flows from the project, as part of its efforts to reduce capital expenditures. The Company is also continually evaluating overall lifting costs from each of its producing fields, to achieve an optimal level of production and to reduce its operating expenses.

However, the Company may need to raise additional capital sooner than it expects among others in order to respond to changes in Government policies, fund more rapid expansion and respond to changes in the global crude oil and natural gas market conditions. Furthermore, to fund any such expansion plans as required by future government policies, the Company's debt-to-equity ratio may rise significantly from its current levels.

Market Risks

In the ordinary course of business, the Company is exposed to certain financial and market risks, including primarily risks arising from fluctuations in oil and gas prices and exchange rate between the dollar and the Won.

Commodity Price Risk

The Company is exposed to fluctuations in prices of crude oil, natural gas and other petroleum products, which are commodities whose prices are determined by reference to international market prices. International oil and gas prices are volatile and are influenced by global as well as regional supply and demand conditions. This volatility has a significant effect on the Company's sales and profit.

Historically, prices for oil have fluctuated widely for many reasons, including:

- global and regional supply and demand, and expectations regarding future supply and demand for crude oil and petroleum products;
- political, economic and military developments in oil producing regions, particularly the Middle East;
- access to pipelines, railways and other means of transporting crude oil, gas and petroleum products;
- prices and availability of alternative fuels and energy technologies;
- the ability of the members of OPEC and other crude oil producing nations, to set and maintain specified levels of production and prices;
- domestic and foreign governmental regulations and actions, including export restrictions and taxes; and
- global and regional economic conditions, weather and natural disasters, including any major oil spills.

International gas prices typically follow changes in international oil prices, although movements in sale prices of natural gas are not always directly proportional to those of crude oil prices. The Company and its subsidiaries use forward commodity contracts to hedge market risks resulting from fluctuations in oil and gas prices for its oil and gas productions, and any gains or losses arising from changes in fair value on such derivatives are recognized directly in the statements of other comprehensive income, as the Company classifies such hedging activities as a cash flow hedge. As of December 31, 2015 and 2016, a 10% increase in crude oil prices, with all other variables held constant, would have increased the Company's profit before tax by Won 201 billion and Won 140 billion, respectively, with a 10% decrease in crude oil prices having the opposite effect.

Foreign Currency Risk

The Company's foreign exchange exposure gives rise to market risk associated with exchange rate movements, which primarily relate to the Company's operating activities and its investments in foreign subsidiaries. Foreign exchange gain/loss resulting from sales of crude oil and natural gas is determined by the exchange rates as of the dates on which the sales are recorded during the period. The functional currencies of the Company, Harvest Operations and Dana Petroleum are the U.S. dollar, the Canadian dollar and the British Pound, respectively. The Company enters into currency forward contracts and cross currency swaps to hedge the risks from changes in foreign currency exchange rates.

As of December 31, 2015 and 2016, the Company had foreign currency assets with aggregate Won equivalent amounts of Won 472 billion and Won 255 billion, respectively. As of December 31, 2015 and 2016, the Company had significant foreign currency liabilities with aggregate Won equivalent amounts of Won 2,844 billion and Won 2,229 billion, respectively. As of December 31, 2015 and 2016, a 5% increase in exchange rates of all foreign currencies, with all other variables held constant, would have decreased the Company's profit before tax by Won 115 billion and Won 99 billion, respectively, with a 5% decrease in exchange rates having the opposite effect.

Interest Rate Risk

The Company is exposed to interest rate risks arising from its debt. Upward fluctuations in interest rates increase the cost of new debt and the interest cost of outstanding floating rate borrowings. Certain portions of the Company's long-term debt and all of the Company's short-term borrowings have floating interest rates that are determined by reference to the 1-month to 6-month London interbank offered rates, respectively. For the year ended December 31, 2015, a 1% increase in interest rates of such floating rate borrowings, with all other variables held constant, would have decreased the Company's profit before tax by Won 36 billion, with a 1% decrease having the opposite effect. For the year ended December 31, 2016, a 1% increase in interest rates of such floating rate borrowings, with all other variables held constant, would have decreased the Company's profit before tax by Won 37 billion, with a 1% decrease having the opposite effect.

The Company uses interest rate swaps to hedge against its interest rate exposure. As of December 31, 2016, the Company recognized Won 1 billion as non-current interest rate swap derivative assets in its audited consolidated statement of financial position as of December 31, 2016 associated with the interest rate swaps.

Inflation

Inflation in Korea was 1.3% in 2014, 0.7% in 2015 and 1.0% in 2016. The effects of inflation in Korea on the Company's financial condition and results of operations are reflected primarily in salary and selling and administration expenses. Inflation in Korea has not had a significant impact on the Company's results of operations to date.

BUSINESS

Overview

The Company is the national oil and gas company of Korea and is wholly owned by the Government. The Company was incorporated in 1979 under the KNOC Act to serve as the executing body for oil-related policies of the Government. The Company engages in a wide range of oil and gas activities, including:

- exploration, development and production of crude oil and natural gas in Korea and abroad;
- stockpiling of oil in furtherance of the Government's energy policies, as well as engaging in wholesale gasoline, gas oil and kerosene distribution and discount gas station businesses and construction of related stockpile facilities;
- management of the SAER funds on behalf of the Government; and
- performance of other activities related to its business purpose, such as the operation of a semi-submersible drillship, collection and publication of oil-related information, and conducting research and development related to oil and natural gas.

Until November 2014, the Company also engaged in a downstream refining business through Harvest Operations.

The Company carries out the Government's oil policy objectives by engaging in exploration and production activities, managing the nation's oil stockpile and acting as the administrator of the SAER funds pursuant to master plans announced by the Government. The Company receives substantial financial support from the Government in the form of capital contributions and SAER loans to undertake these activities. The Ministry of Trade, Industry and Energy directs and supervises the Company's business activities, as well as appointing its standing directors and the President pursuant to the KNOC Act and other laws applicable to the Company. The Company is audited from time to time by the Board of Audit and Inspection and is required to regularly report its business activities and plans to the Government.

As of December 31, 2016, the Company had a daily crude oil and natural gas production of approximately 200,633 barrels of oil equivalent, and had interests in 18 production projects and ten exploratory projects, located across 17 countries. Starting from January 1, 2014, the Company revised its method of classifying its oil and gas assets, by classifying them as projects within certain regions, rather than by individual fields. The Company is seeking to maintain its production level at approximately 188,000 barrels of oil equivalent per day until the end of 2017, but hopes to increase the Company's production level further in the near future through organic growth, production optimization and selective acquisitions, which would provide the basis for the Company to compete with larger global oil companies engaged in oil and gas exploration, development and production. The Company acquired a 50% interest in OIG in February 2009, a 100% interest in Harvest Energy Trust and an 85% interest in KNOC Caspian LLP (formerly known as Sumbe JSC) in December 2009, a 100% interest in Dana Petroleum in October 2010, a 95% interest in Altius and a 23.7% interest in the Eagle Ford shale oil formation in March 2011 and certain offshore oil producing assets from Northstar in the Gulf of Mexico region (the Company's share being 67%) and a 10% interest in Parallel Petroleum Corp. in December 2011. In May 2012, the Company, as part of a consortium led by Apollo Global Management, LLC, acquired a 14.99% interest in EPE Global (which holds all of the oil and gas exploration and production assets of El Paso Corporation) for approximately US$500 million. In September 2012, the Company, through Dana Petroleum, acquired a 28.3% additional stake in the Bittern oilfields located in the North Sea from Hess Corp. for approximately US$135 million, raising its total interest in the field to 33%.

In June 2016, the Ministry of Strategy and Finance and the Ministry of Trade, Industry and Energy announced the June 2016 Government Plan, which included broad-based measures to rationalize the overseas natural resource exploration, development and production activities of government-controlled enterprises, including the Company. According to the June 2016 Government Plan, the Company is expected to develop and implement a plan for the sale of its interests in overseas exploration, development and production operations, other than core assets (taking into consideration strategic value and profitability), to third parties with preference given to institutional investors in Korea if possible and with an aim to maximize the returns on such sales. The timing of any such sales will be subject to market conditions and the Company will be limited from entering into any new overseas investments other than any such investments that are in furtherance of important policy objectives.

Since 1980, the Company has also been operating and managing Korea's national oil stockpile facilities and reserves in response to the global oil shocks during the 1970s. Aiming to further strengthen Korea's ability to cope with market disruptions caused by short-term oil shortages, the Government announced the Fourth Stockpiling Master Plan in December 2014. Pursuant to the Fourth Stockpiling Master Plan, the Company is required to maintain its stockpiling capacity at 146 million barrels until the end of 2025. The Company had reserve levels of approximately 94.3 million barrels as of December 31, 2016, and the Company is seeking to reach a stockpile reserve level of 107 million barrels by 2025 pursuant to the Fourth Stockpiling Master Plan. The Company also generates income from the stockpiling program by leasing a part of its storage facilities to foreign oil producing companies and domestic refineries, as well as by engaging in lending activities with respect to part of its stockpile reserves. In furtherance of the Government's policy to control increasing gasoline prices, the Company engages in the wholesale gasoline, gas oil and kerosene distribution business, and also operates approximately 1,168 discount gas stations or "Al-tteul Gas Stations" located throughout Korea with Korea Expressway Corporation and National Agricultural Cooperative Federation, as of December 31, 2016. To support the Company's stockpiling projects, the Company also constructs the stockpiling facilities.

To ensure a stable supply of energy and natural resources for the Korean economy and to promote the development of new energy resources, the Government established the SAER in 1995 which combines six energy-related funds that the Government had been operating previously. Pursuant to the SAER Act, the Minister of Trade, Industry and Energy oversees the management and operation of the SAER, and has delegated to the Company the administrative tasks related to the day-to-day operation of SAER and the administration of the SAER loans for oil-related projects. However, pursuant to the June 2016 Government Plan, the Ministry of Trade, Industry and Energy announced that it will transfer responsibilities relating to SAER, other than the administration of taxes and dues, from the Company to the Korea Energy Agency by July 2017. The Company is currently in the process of amending regulations relating to the management and operation of the SAER in connection with such anticipated transfer. The Company also borrows a portion of the SAER funds to further expand its exploration and other oil-related activities.

The Company also performs various other functions related to its status as Korea's largest oil and gas developer and the Government's policy-executing arm for matters related to oil. The Company owns the Doo Sung, Korea's only semi-submersible drillship, which operates in various exploration projects around the world. However, the Company is in the process of reviewing the sale of Doo Sung within 2017 as a follow-up measure to the June 2016 Government Plan. The Company also collects, compiles and publishes both domestic and international oil-related statistics, as well as conducting research related to the exploration, development and production of oil and natural gas.

For the year ended December 31, 2015, the Company had revenue of Won 3,433 billion, operating loss of Won 445 billion and loss for the year of Won 4,500 billion. The Company had total assets of Won 23,205 billion and total equity of Won 4,196 billion as of December 31, 2015. For the year ended December 31, 2016, the Company had revenue of Won 2,430 billion, operating loss of Won 241 billion and loss for the period of Won 1,119 billion. The Company had total assets of Won 22,067 billion and total equity of Won 3,509 billion as of December 31, 2016.

Relationship with the Government

The Company was established as a statutory juridical entity in 1979 under the KNOC Act to ensure a stable supply of oil and to support the development of the Korean economy by developing oil fields in Korea and abroad, stockpiling petroleum reserves and engaging in other oil-related activities.

The Company is wholly owned by the Government, as the Government is required under the KNOC Act to contribute all of the Company's authorized capital of up to Won 13 trillion. The Company may only be privatized through an amendment of Article 4 of the KNOC Act by the National Assembly, which states that the

Government shall fund the Company's authorized capital. Pursuant to the KNOC Act, the Government may also guarantee the repayment of the Company's bonds and its other loans, and provide financial subsidies for the Company's business activities, although it is not obligated to do so.

The Government, through the Ministry of Trade, Industry and Energy, directs and supervises the Company's activities relating to the exploration, development and production of oil resources in Korea and abroad, the purchase and stockpiling of oil reserves, the construction and management of stockpile facilities, the collection, processing and publication of oil trading information and enhancement of oil distribution channels. Pursuant to the KNOC Act and the Act on the Management of Public Agencies, the President of Korea appoints, and has the authority to remove, the Company's President and the standing member of the Audit Committee, while the Minister of Strategy and Finance appoints the Company's non-standing directors. Furthermore, the Company is required to publicly disclose certain information relating to its operation and management, including, among other matters, its management objectives, budget and business plan, financial statements, personnel data, articles of incorporation, bond register and the minutes of the board of directors (other than certain confidential information) and the audit reports of its Audit Committee.

The Board of Audit and Inspection, which is an independent Government agency that audits all Governmental agencies and Government-controlled entities, audits the Company from time to time. The audit includes a review of the Company's financial statements and an inspection of the Company's business operations and performance. The Board of Audit and Inspection reports its audit results to the President of Korea. The Company must report any issues identified by the Board of Audit and Inspection during the audit, as well as plans to remedy such issues, to the relevant standing committee of the National Assembly of Korea. The Company must also present mid- to long-term management objectives covering five fiscal years to the Minister of Trade, Industry and Energy and the Minister of Strategy and Finance on an annual basis. The Company is further subject to unscheduled inspections and investigations from time to time by the National Assembly under the Act on Inspection and Investigation of Government Administration of 1988, as amended.

Energy Development Base Plan

Under the Low Carbon Green Growth Act, effective as of October 31, 2013 (the "Green Growth Act") and the Energy Act, effective as of October 31, 2013 (the "Energy Act"), the Government must establish 20-year master plans, revised every five years, for the development, distribution, research and management of energy resources both domestic and abroad. The First Energy Development Base Plan, issued in 2008, sought to improve Korea's energy security, use efficiency and the environment.

The Second Energy Development Base Plan was issued in January 2014 and its objectives include the following:

- reduction of energy and electricity demand in Korea through efficient management of resources and tariffs;
- improving distribution network of electricity;
- enhancing environmental protection and safety requirements;
- strengthening Korea's energy security through development of alternative energy sources and overseas energy development;
- establish network for more stable distribution of traditional energy sources, such as oil and gas; and
- implement energy policies to further improve quality of life for Korean citizens as well as improving transparency in energy policy determination processes.

To further strengthen offshore resources development, the Second Energy Base Plan seeks to increase KNOC's ratio of investment in exploratory sites from around 10% currently to 20% or more by 2017, to promote more organic growth of its production capacity compared to previous growth primarily through acquisition of production assets, as well as promoting exchanges of technology, information and manpower, and joint exploratory projects with leading foreign global enterprises.

Furthermore, the Second Energy Base Plan requires KNOC to make its storage facilities available to foreign oil producing countries for storing oil and petroleum products in Korea, which may be subject to preemptive use by Korea in times of emergency, to ensure stability in the supply of oil resources and enhance Korea's energy security.

Overseas Resources Development Master Plan

Under the Overseas Resources Development Business Act of 1983, as last amended on July 24, 2015 and effective as of October 25, 2015 (the "Overseas Resources Development Act"), the Government must establish 10-year master plans, revised every five years, for the development of overseas natural resources. Under the Overseas Resources Development Act, if a Korean resident plans to develop overseas natural resources, such person must report his or her plans to the Minister of Trade, Industry and Energy.

Pursuant to the Overseas Resources Development Act, the Government is authorized to provide funds to a Korean resident to conduct necessary research and analysis for an overseas resources development business and to acquire the rights to develop such resources. The Government may also provide funds for the installation and operation of facilities required for the development, and funds for leasing or buying the necessary land for the development.

To ensure the proper use of Government funds, the Ministry of Trade, Industry and Energy delegated to the Company the authority to inspect the books, documents and materials of oil-related businesses to which the Government has provided financial support and to evaluate the feasibility of the Government's financial support for the costs being incurred by such businesses.

In September 2014, the Ministry of Trade, Industry and Energy issued the Fifth Overseas Resources Development Master Plan, covering the period from 2013 to 2022 pursuant to the Overseas Resources Development Act. Objectives of the Fifth Overseas Resources Development Master Plan include the following:

- increase Korea's self-sufficiency rate for oil and gas, calculated by dividing the amount of oil and gas produced by domestic entities by the amount of oil and gas imported into Korea, to 25.0% by 2022 from a rate of 13.6% in 2013. The target self-sufficiency rate for oil and gas is calculated by taking into account (i) production plans of currently acquired exploration, development and production fields; (ii) projected production volume in light of the exploration success rate; and (iii) production volume of new fields planned to be acquired;
- assist the growth of the Company, Korea Gas Corporation and Korea Resources Corporation into global natural resource development corporations;
- expand the global presence of the Company and other companies investing in the development of overseas resources by establishing development strategies tailored for each resource-producing region, including by entering into partnerships or forming consortiums with other Korean companies to provide construction or other services along with resource development activities;
- support the operation and growth of the Company and other companies involved in development of overseas resources by increasing the size of Export-Import Bank of Korea's funds earmarked for such purpose;
- expand the infrastructure for development of overseas resources by supporting research and development activities of state-owned enterprises engaged in resource development; and
- focus on the development of rare metals including lithium, non-traditional energy sources and the polar regions.

Stockpiling Master Plan

The Company operates and manages Korea's national oil stockpile facilities and reserves, which began in 1980 in response to the global oil shocks during the 1970s. Pursuant to the Petroleum and Petroleum Substitute Fuel Business Act (the "Petroleum Business Act"), the Ministry of Trade, Industry and Energy sets goals for the national oil stockpile program and announces a master plan to implement these goals. The stockpiling master plan must include matters relating to the oil stockpile target level, the types and amount of oil to be stockpiled and the management of stockpile facilities.

Pursuant to the Petroleum Business Act, the Government announced the Fourth Stockpiling Master Plan in December 2014. Under the Fourth Stockpiling Master Plan, the Company is required to maintain its stockpiling capacity at 146 million barrels until the end of 2025. The Company had reserve levels of approximately 94.3 million barrels as of December 31, 2016, and the Company is seeking to reach a stockpile reserve level of 107 million barrels by 2025 pursuant to the Fourth Stockpiling Master Plan. Under the Fourth Stockpiling Master Plan, the estimated budget for achieving the Company’s stockpiling capacity target is Won 40 billion and the budget for achieving the Company’s reserve level target is Won 1.7 trillion.

Under the Petroleum and Petroleum Substitute Fuel Business Enforcement Regulation, the Ministry of Trade, Industry and Energy has the authority to require the Company to give priority to financing the purchase of a portion of the target stockpile reserves and the construction and expansion of the stockpiling facilities with the revenue generated from the Company’s stockpiling activity. To support the Fourth Stockpiling Master Plan, the Company expects to generate income from the stockpiling program by leasing a part of its storage facilities to foreign oil producing companies and domestic refineries, and by engaging in trading activities with respect to part of its stockpile reserves.

Administration of the Special Accounts for Energy and Resources

In 1995, the Government established the SAER pursuant to the SAER Act, which combines six energy-related funds that were previously operated by the Government. Prior to 1995, to ensure a stable supply of energy and natural resources for the Korean economy and to promote the development of new energy resources, the Government operated six energy and resources related funds, namely the Oil Business Fund, the Coal Industry Support Fund, the Coal Industry Stabilization Fund, the Overseas Mineral Resources Development Fund, the Energy Use Rationalization Fund and the Natural Gas Safety Management Fund. These funds were designed to support a variety of public and private projects, including those relating to the exploration and development of energy resources both domestically and abroad, the stockpiling of energy resources, the restructuring of the coal and other energy-related industries, the safe distribution of natural gas, the development of alternative energy sources and research activities related to the foregoing.

The Government’s annual budget for the SAER is prepared with input from Government-controlled and private entities engaged in the energy and natural resources business, the Ministry of Trade, Industry and Energy and the Ministry of Strategy and Finance, and approved by the National Assembly. The SAER budget in 2014, 2015 and 2016 amounted to Won 5,491 billion, Won 5,592 billion and Won 5,873 billion, respectively, and has been set at Won 5,761 billion for 2017.

Pursuant to the SAER Act, the Minister of Trade, Industry and Energy oversees the management and operation of the SAER. The Minister of Trade, Industry and Energy has delegated to the Company the administrative tasks related to the day-to-day operation of the SAER and the administration of SAER loans for oil-related projects. The day-to-day administrative tasks include the collection of various taxes, assessments and other government revenues which constitute a part of the sources for the SAER funds as well as the disbursement of the SAER funds according to the budget. These administrative activities do not have any significant impact on the Company’s financial condition and results of operation. The only tasks that are not delegated to the Company are (i) the maintenance of the coal stockpile and coal stockpile facilities, which is delegated to Korea Coal Corporation and (ii) the administration of the mining damage prevention funds under the Mining Damage Prevention and Restoration Act of Korea, which is delegated to Korea Mine Reclamation Corporation.

A significant portion of the SAER budget consists of loans to be made for various energy- and resource-related projects. The funds for the loans are first provided by the Company, as the day-to-day administrator of the entire SAER, to the following six government agencies that manage and on-lend the funds: the Company, Korea Resources Corporation, Korea Coal Corporation, Korea Energy Agency, Mine Reclamation Corp. and Korea Gas Safety Corporation. The Company manages the SAER loans related to the oil industry, while the other loans are managed by the other five Government agencies for their respective energy fields.

There are generally two types of SAER loans for the oil industry: loans for domestic and international oil exploration and production projects and loans to support general oil-related projects, such as the construction of oil pipelines. The loans for the oil industry are available for use by the Company and by certain qualifying third-party borrowers engaging in oil-related businesses.

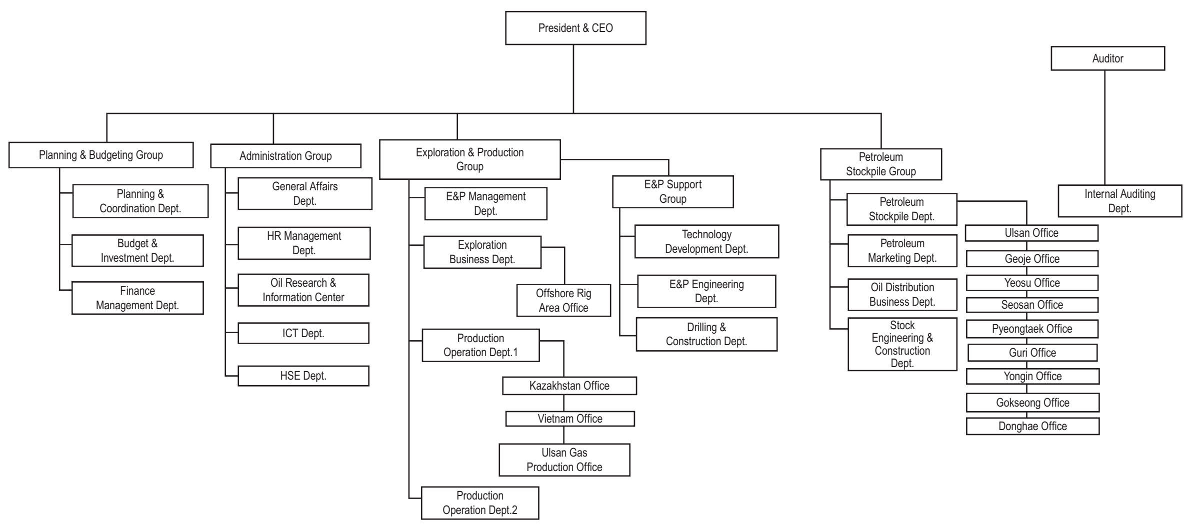
The funds from the SAER that are earmarked for loans to the oil industry are provided to the Company and then on-lent by the Company to third parties; therefore, such funds are not recorded as loans or borrowings on the Company's financial statements.

However, pursuant to the June 2016 Government Plan, the Ministry of Trade, Industry and Energy announced that it will transfer the responsibility for administrative tasks related to the day-to-day operation of the SAER and the administration of SAER loans for oil-related projects from the Company to the Korea Energy Agency by the first half of 2017.

The SAER loans used by the Company that were outstanding as of December 31, 2016 equaled Won 262 billion (after excluding loans relating to exploration fields which failed to discover commercially viable oil reserves, as payment obligations for such loans will be relieved). In administering the oil related SAER loans, the Company receives applications for the loans, which are reviewed by the Government's loan review committee to analyze the technical feasibility of the projects and the business plans. Under the SAER Act, loans used to fund exploration projects that do not result in discoveries are exempted from repayment of all or part of the principal amount of the loan and interest if they meet established criteria set by the Ministry of Trade, Industry and Energy.

Organizational Structure

The following diagram illustrates the Company's organizational structure as of the date hereof.



The Company has broadly organized its divisions by function and has an integrated exploration and development structure whereby separate divisions specialize in, and are responsible for, individual stages of exploration, development and production. The Exploration & Production Group oversees all exploration- and production-related activities and includes regional Business Departments and the Technology Department which focuses on establishing the Company's mid-to-long-term research and development strategy and conducting research and development to enhance the Company's technological competitiveness. The Petroleum Stockpile Group oversees all activities relating to the operations of stockpiling facilities, as well as the Company's oil trading business.

Exploration, Development and Production

Overview

The Company engages in crude oil and natural gas exploration, development and production in Korea and abroad. The Company's operations include projects that the Company operates with a 100% ownership interest or a shared ownership with joint venture partners.

Contractual arrangements among participants in a joint venture are usually governed by an operating agreement, which usually provides that costs, entitlements to production, and liabilities are to be shared according to each party's percentage interest in the joint venture. Upon completion of the initial exploration phase, and if the Company and its joint venture partners determine that a project has commercially viable development potential, the project will enter the development phase and join the production and development portfolio.

As of December 31, 2016, the Company had interests in 28 projects, and it was the operator in 19 projects.

Reserves Data

The Company's estimated proved reserves of crude oil and natural gas as of December 31, 2016 totaled approximately 489.1 million barrels of crude oil and approximately 1,139.6 billion cubic feet of natural gas, respectively. As of December 31, 2016, proved developed reserves accounted for 51.5% and 64.8% of the Company's total proved crude oil and natural gas reserves, respectively.

The following table sets forth the Company's estimated proved reserves (including proved developed reserves and proved undeveloped reserves) and proved developed reserves of crude oil and natural gas as of December 31, 2014, 2015 and 2016. The reserve data presented below and elsewhere in this Offering Circular are based on the Company's valuation of the reserves as of the date hereof, and are therefore subject to changes if further valuations of the reserves are conducted which revises the prior estimates.

	Crude Oil	Natural Gas	Combined
	(Millions of barrels)	(Billions of cubic feet)	(Barrel of oil equivalent, in millions)
Proved developed and undeveloped reserves			
Reserves as of December 31, 2014[1]	461.4	1,338.4	687.3
Revisions of previous estimates	53.5	(207.6)	21.8
Extensions and discoveries	52.5	233.1	90.6
Improved recovery	0.1	0.0	0.1
Acquisitions	(0.1)	1.2	0.0
Disposals	0.0	0.0	0.0
Production for the year	(50.1)	(200.2)	(84.2)
Reserves as of December 31, 2015[1]	517.3	1,164.9	715.6
Revisions of previous estimates	27.9	139.8	51.7
Extensions and discoveries	0.2	23.5	4.8
Improved recovery	0.0	2.0	0.4
Acquisitions	0.0	0.0	0.0
Disposals	(13.9)	(15.7)	(16.7)
Production for the year	(42.4)	(174.9)	(72.2)
Reserves as of December 31, 2016[1]	489.1	1,139.6	683.6
Proved developed reserves[1]			
As of December 31, 2014	246.0	769.8	378.3
As of December 31, 2015	279.7	811.5	418.7
As of December 31, 2016	249.0	764.4	379.6

(1) The reserve data include reserve data of Harvest Operations, as estimated under Canadian oil and gas reporting standards, COGEH and NI 51-101, as evaluated by the Independent Reserves Evaluator. If the

reserve data of Harvest Operations as estimated under the Securities Act oil and gas reporting standards were included, the proved developed and undeveloped crude oil reserves, natural gas reserves and combined reserves as of December 31, 2014, 2015 and 2016 may differ from the corresponding amounts shown in the tables above.

In general, the Company's engineers estimate its proved crude oil and natural gas reserve quantities based on its internal surveys, external reserve reports and data collected from third-party operators of production facilities in which the Company has a working interest.

The following tables set forth the Company's crude oil and natural gas proved reserves (including proved developed and proved undeveloped reserves) and proved developed reserves by country as of December 31, 2014, 2015 and 2016.

	As of December 31,					
	2014		2015		2016	
	Proved Developed and Undeveloped	Proved Developed	Proved Developed and Undeveloped	Proved Developed	Proved Developed and Undeveloped	Proved Developed
	(millions of barrels)					
Crude oil reserves						
Korea	0.0	0.0	0.2	0.2	0.2	0.2
Canada(1)	169.1	60.6	161.2	50.2	144.1	36.0
Peru	28.2	17.3	19.5	12.1	14.4	13.9
Vietnam	16.9	16.8	12.8	12.8	9.5	9.5
United States of America	113.5	87.4	160.5	84.7	176.0	87.8
United Kingdom(2)	66.0	33.3	67.7	43.9	54.1	30.3
Libya	5.5	5.5	5.3	5.3	5.3	5.3
Iraq	23.4	5.4	20.9	1.3	20.7	1.2
Indonesia	—	—	—	—	—	—
Kazakhstan	36.1	17.7	31.8	31.8	27.5	27.5
Venezuela	2.7	0.1	2.7	2.7	2.7	2.7
United Arab Emirates	—	—	34.7	34.7	34.7	34.7
China	—	—	—	—	—	—
Total	461.4	246.0	517.3	279.7	489.1	249.0
	(billions of cubic feet)					
Natural gas reserves						
Korea	20.8	13.4	13.6	13.6	12.8	12.8
Vietnam	141.9	141.9	120.2	120.2	101.0	101.0
Canada(1)	290.6	208.5	322.9	210.1	317.2	189.2
Peru	7.2	11.0	8.8	5.5	9.0	9.0
Yemen	77.7	77.7	76.7	76.7	76.7	76.7
United States of America	727.7	270.1	446.0	265.6	469.9	279.0
United Kingdom(2)	57.5	47.0	161.7	104.9	138.0	81.7
Indonesia	—	—	—	—	—	—
Venezuela	15.1	0.2	15.0	15.0	15.0	15.0
Total	1,338.4	769.8	1,164.9	811.5	1,139.6	764.4

(1) The reserve data of Harvest Operations are as estimated under Canadian oil and gas reporting standards, COGEH and NI 51-101, as evaluated by the Independent Reserves Evaluators. The reserves of Harvest Operations as estimated under the Securities Act oil and gas reporting standards as of December 31, 2014, 2015 and 2016 may differ from the amounts shown in the tables above.

(2) Indicates the reserve data of Dana Petroleum, whose headquarters are located in the United Kingdom. However, Dana Petroleum's production sites are located throughout Europe and Africa, including the Netherlands, Norway and Egypt.

Estimation and evaluation of reserves naturally involve multiple uncertainties. The accuracy of any reserve evaluation depends on the quality of available information and engineering and geological interpretation. Based on the results of drilling, testing and production after the date of this Offering Circular, reserves may be significantly restated upwards or downwards. Changes in the price of crude oil and natural gas may also affect the Company's reserve estimates as well as estimates of the Company's discounted future net cash flows because those reserves are evaluated, and the discounted future net cash flows are estimated, based on prices and costs as of the date of the evaluation. A relative decrease in the amount of the Company's estimated proved reserves and future discounted net cash flows could, if material, affect the amount of the Company's depreciation and depletion expenses, impairment charges or certain other financial information derived from or relating to such information reported in the Company's financial statements in future periods. Significant changes in these amounts could have a material adverse effect on the Company's financial condition and results of operations and cause future results to differ materially from those reported in this Offering Circular. See "Risk Factors — Risks Relating to the Company — The crude oil and natural gas reserve estimates in this Offering Circular are only estimates, and may require substantial revisions as a result of future drilling, testing and production, and as such, the Company's actual production, revenues and expenditures may also differ materially from estimates."

Production and Development

The Company is the largest producer of oil and gas in Korea, contributing to approximately 41.5% of Korea's total oil and natural gas production for the six months ended June 30, 2016. The Company currently has 18 projects in production. There are currently no projects that are under development.

As of December 31, 2016, the Company's daily average net production was approximately 200,633 barrels of oil equivalent. Oil producing projects owned by Dana Petroleum, oil producing projects owned by Harvest Operations in Canada and oil producing projects located in the Maverick Basin Eagle Ford shale oil formation in the United States owned by KNOC Eagle Ford Corporation are the Company's most important operating oil producing projects, accounting for approximately 32%, 16% and 15%, respectively, of the Company's net oil production for the year ended December 31, 2016. Gas producing projects located in the Maverick Basin Eagle Ford shale oil formation in the United States owned by KNOC Eagle Ford Corporation, gas producing projects owned by Harvest Operations in Canada and gas producing projects owned by Dana Petroleum are the Company's most important operating gas producing projects, accounting for approximately 13%, 22% and 39%, respectively, of the Company's net natural gas production for the year ended December 31, 2016. The following is a summary of the Company's current production activities by country and region.

Country	Project Name	Type of Project	KNOC Share	Investment as of 12/31/16	Operated by	Arrangement Type	Participation Year
				(In thousands)			
Production Projects							
Korea	Donghae-1	Gas	100.00%	US$854,129	KNOC	Concession agreement	1998
	Donghae-2	Gas	70.00%	US$99,223	KNOC	Concession agreement	2016
Canada	Harvest	Oil & Gas	100.00%	US$4,079,678(1)	KNOC	Lease	2009
Vietnam	15-1	Oil	14.25%	US$2,042,069	Joint	PSA*	1998
Vietnam	11-2	Gas	39.75%	US$686,458	KNOC	PSA	1992
USA	ANKOR Offshore	Oil	51.00%	US$897,944	KNOC	Lease	2008
	Eagle Ford	Shale Oil	23.70%	US$1,927,989	Third Party	Lease	2011
	EP Energy	Oil & gas	12.82%	US$500,300	Third Party	Lease	2012
United Kingdom (three projects) . . .	Dana Petroleum	Oil & gas	100.00%	US$4,957,086(2)	KNOC	Concession agreement	2010

Country	Project Name	Type of Project	KNOC Share	Investment as of 12/31/16	Operated by	Arrangement Type	Participation Year
				(In thousands)			
Peru	8	Oil	20.00%	US$1,037,443	Third Party	Concession agreement	1995
	Savia Peru (Z-2B)	Oil	50.00%	US$707,080	Joint	Service agreement	2009
Libya	Elephant	Oil	2.00%	US$210,025	Third Party	PSA	1990
Yemen	LNG	Gas	1.06%	US$28,721	Third Party	Gas Development Agreement	1997
Venezuela	Onado	Oil	5.64%	US$34,197	Third Party	Available for Sale	1997
Kazakhstan	Altius	Oil	95.00%	US$518,068	KNOC	Concession agreement	2011
	ADA	Oil	40.00%	US$84,829	KNOC	Concession Agreement	2005
	KNOC Caspian	Oil	85.00%	US$360,571	KNOC	Concession agreement	2009
Iraq	Hawler Area	Oil	15.00%	US$167,461	KNOC	Concession agreement	2008

* Production Sharing Agreement.

(1) Interests in these projects are held through Harvest Operations. US$4,079,678 represents the total amount of investment made by the Company in Harvest Operations, which was acquired by a subsidiary of the Company in December 2009.

(2) Interests in these projects are held through Dana Petroleum. US$4,957,086,000 represents US$3,496,454,000 of investment made by the Company in Dana Petroleum, which was acquired through a hostile tender offer in October 2010, and US$1,460,632,000 of investments made by the Company in Korea Captain Company Limited, which the Company transferred entirely to Dana Petroleum in October 2011, in consideration for additional shares issued by Dana Petroleum to the Company.

Major Production Projects

Korea

Donghae-1 Gas Project. In 1998, the Company discovered a commercially viable gas field located under the sea near the southeastern coast of Korea, and named it "Donghae-1." Located about 60 kilometers southeast of Ulsan city, the Donghae-1 gas project is estimated to hold recoverable reserves of about 4 billion cubic feet of natural gas with approximately 53 thousand barrels of condensate as of December 31, 2016. The Donghae-1 gas project was the first commercially productive gas field within Korean boundaries, and it allowed the Company to advance its knowledge and skill in gas field development and production. The Company owns 100.00% of the Donghae-1 gas project, and expects to deliver natural gas from the project daily to domestic consumers until about 2018.

Donghae-2 Gas Project. In 2005, the Company discovered a commercially viable gas field located about 5.4 kilometers southwest of Donghae-1, and named it "Donghae-2." The Company owns a 70.0% interest in the Donghae-2 gas project and POSCO Daewoo owns a 30.0% interest. In March 2014, the Company started to explore the Donghae-2 gas project and drilled one production well named DH 2-1P in December 2015. The Donghae-2 gas project is estimated to hold recoverable reserves of about 18 billion cubic feet of natural gas with approximately 190,000 barrels of condensate as of December 31, 2016.

Canada

Harvest Projects. The Company's interests in production fields located in Canada are owned through Harvest Operations, a wholly owned subsidiary of the Company acquired in December 2009. Harvest Operations' upstream operations are principally located in the western Canadian sedimentary basin. Harvest

Operations has a high degree of operational control as it is the operator on properties that generate the majority of its production. Harvest Operations' major production fields include Hay River, Red Earth, West Central Alberta, East Central Alberta, Deep Basin and Heavy Oil, which are located throughout Alberta and British Columbia. Harvest Operations had net interests in approximately 1,907 gross producing oil wells and approximately 1,522 net producing oil wells, and in approximately 1,177 gross producing gas wells and approximately 425 net producing gas wells, located throughout Alberta and British Columbia as of December 31, 2016, and had a daily crude oil and natural gas production of approximately 36,754 barrels of oil equivalent for the year ended December 31, 2016.

Oil and gas produced from these fields, which ranged from approximately 36,000 to 37,000 barrels of oil equivalent per day in 2016, are sometimes processed at nearby processing facilities and are transported to sales points through pipelines or other infrastructures, both of which may be owned by Harvest Operations or other third parties.

BlackGold Oil Sands Project. The Company acquired a 100.0% interest in an oil sands lease for the BlackGold area in August 2006. The BlackGold area is located 140 kilometers southeast of Fort McMurray within the Athabasca Oil Sands region of northern Alberta. Oil sands contain crude bitumen, which is a heavy and thick form of crude oil that does not flow unless it is heated or diluted with lighter hydrocarbons. In August 2010, the Company transferred its interest in the BlackGold project to Harvest Operations for approximately CAD 374 million, which was funded by Harvest Operations through the issuance of additional capital stock to the Company. To help the Harvest Operations fund BlackGold project's initial capital, the Company has also injected approximately CAD 86 million of capital through the issuance of additional capital stock by Harvest Operations in 2010.

Harvest Operations received the relevant regulatory approval for the initial phase of the BlackGold project, for production of 10,000 barrels per day and a second phase expansion that would increase production to 30,000 barrels per day was approved in 2013. In early 2015, construction of the BlackGold central processing facility, well pads, and connecting pipelines was substantially completed. Subsequently, Harvest Operations has been performing commissioning activities at a measured pace. Several systems have since been commissioned and others will be progressed slowly within a limited budget. Harvest Operations postponed commencing the project production process in response to the unfavorable heavy oil price environment and will continually assess the commodity price environment to determine when to complete commissioning the central processing facility and commence the production process.

Peru

Block 8. The Company acquired a 20.00% interest in Block 8 in 1996 through a competitive bidding process. The three other equity holders in Block 8 are Daewoo International Corporation, SK Innovation Co., Ltd. and Pluspetrol Norte S.A., who own an 11.70%, 8.30% and 60.00% interest, respectively. Block 8 is located in Maranon Basin in northern Peru, covering an area of approximately 1,800 square kilometers. Block 8 consists of four oil fields, Corrientes, Pavayacu, Yanayacu and Chambira, with approximately 56 active wells. Hydrocarbon in Block 8 was first discovered in 1971, and production began in 1974. For the year ended December 31, 2016, Block 8 produced approximately 5,200 barrels of crude oil per day, and as of December 31, 2016, has produced 133 million barrels of oil since the Company acquired an equity interest. Approximately 65% of the oil produced in Block 8 comes from the Corrientes field. The crude oil produced in Block 8 is mostly sold to refineries located in the western coast and inland Peru through the North Peru pipeline, and to refineries in the east of the field through river barges.

Block Z-2B. In February 2009, the Company acquired a 50.00% interest in OIG, whose subsidiary, Savia Peru S.A. ("Savia Peru", formerly Petro-Tech Peruana S.A.), has an operation service contract for a producing field in Block Z-2B in the Talara Basin off the northwestern coast of Peru. Ecopetrol S.A., the national oil company of Colombia, acquired the other 50.00% interest in OIG. For the year ended December 31, 2016, Savia Peru produced approximately 9,600 barrels of crude oil per day and 20 million cubic feet of gas per day in its field in Block Z-2B, which covers an area of approximately 1,303 square kilometers.

United States of America

ANKOR Offshore Project. In March 2008, the Company and Samsung C&T Corporation each acquired an 80.00% and a 20.00% interest, respectively, in the ANKOR Offshore Project located on the shelf of the Gulf of Mexico. ANKOR Offshore Project contains several significant producing fields. In February 2012, the Company sold a 29.0% interest in the ANKOR Offshore Project to a consortium of Korean companies for approximately US$308 million, as part of an effort to increase Korean private sector involvement in resource development and to enhance the Company's liquidity. As a result of the sale, the Company's interest in the ANKOR Project was reduced from 80% to 51%. ANKOR E&P Holdings Corporation, a wholly-owned subsidiary of the Company that holds the Company's interests in the ANKOR Offshore Project, and Samsung C&T Corporation formed ANKOR Energy to manage their respective interests in the ANKOR Offshore Project. ANKOR Energy began its operations in March 2008, and currently produces approximately 4,056 barrels of oil equivalent per day. It has estimated oil and gas reserves of approximately 24.6 million barrels of oil equivalent.

Eagle Ford. In March 2011, KNOC Eagle Ford Corporation, a wholly owned subsidiary of the Company, entered into a joint venture agreement with Anadarko. Under the joint venture agreement, the Company, through KNOC Eagle Ford Corporation, acquired a 23.7% interest in Anadarko's Maverick Basin assets, located in southwest Texas, which is mainly comprised of the liquids-rich Eagle Ford shale assets. In exchange, the Company funded approximately US$1.55 billion of Anadarko's 3-year capital costs from 2011 to 2013 in the Maverick Basin, and reimbursed Anadarko for net cash outflows relative to the Company's interests. For the year ended December 31, 2016, Anadarko produced approximately 209,213 barrels of oil equivalent per day. In addition, as part of the arrangement with Anadarko, the Company acquired a 24.9% working interest in midstream (gathering, processing, treating and transporting) systems and facilities associated with the Maverick Basin assets for approximately US$27 million. In December 2012 and January 2013, KNOC Eagle Ford Corporation sold 4.74% interests in each of the upstream asset and midstream asset to Vogo Eagle Ford LLC, for US$321 million and US$32 million, respectively. In March 2017, Anadarko sold its interest in the Maverick Basin assets to Sanchez Energy Corporation. Sanchez Energy Corporation holds approximately 288,046 net acres with an average working interest of approximately 71% in the Maverick Basin, of which the Company is entitled to interests in 80,000 net acres in Eagle Ford shale and approximately 16,000 additional prospective net acres for the deeper dry-gas Pearsall shale, as well as Pearsall opportunities underlying the Eagle Ford shale.

Old Home. In December 2010, the Company and GS E&R Co. Ltd. (formerly known as STX Energy Co., Ltd.) jointly acquired a 46.8% interest in an oil field located in Escambia County, Alabama, for US$49 million from Renaissance Petroleum Company, LLC, which owns the remaining interest in the field. The Company has approximately a 23.4% interest in the field. In June 2016, the Company sold all production assets in the field to De Soto Oil & Gas Corp. but has retained an interest in the exploration assets in the field.

Northstar Project. In December 2011, the Company, through ANKOR E&P Holdings Corporation and in consortium with GS E&R Co. Ltd. (formerly known as STX Energy E&P Offshore Management, LLC) and SCL Resources, LLC, jointly acquired a 100.0% interest in an offshore oil field located in the Gulf of Mexico region for approximately US$201 million from Northstar. The Company has approximately a 67.0% interest in the field. The field produces approximately 2,381 barrels of oil equivalent of crude oil and gas per day, and has estimated oil and gas reserves of approximately 11.9 million barrels of oil equivalent.

Parallel Projects. In December 2011, the Company, in consortium with Samsung C&T Corp., jointly acquired a 100.0% interest in Parallel Petroleum Corp. (with the Company's share being 10.0%) from PLLL Holdings, LLC, an affiliate of Apollo Global Management LLC, for approximately US$722 million. Parallel Petroleum Corp. holds eight onshore producing oil fields and two onshore producing gas fields located throughout Texas and New Mexico in the United States. The fields on a combined basis produce approximately 10,196 barrels of oil equivalent of oil and gas per day, and have a combined estimated oil and gas reserves of approximately 59.2 million barrels of oil equivalent.

EPE Global Projects. In February 2012, the Company, as part of a consortium led by Apollo Global Management, LLC, signed a definitive agreement with El Paso to acquire a 100.0% interest in EPE Global (with the Company's share being 14.99%) for approximately US$7.15 billion. EPE Global held several conventional and unconventional oil and gas exploration and production assets located throughout primarily in the United

States as well as Brazil. In January 2014, EP Energy, which now holds the interest in assets previously held by EPE Global, completed its initial public offering of 35,200,000 shares of its common stock at a public offering price of US$20.00 per share. EP Energy's common stock commenced trading on the New York Stock Exchange on January 17, 2014 under the ticker symbol "EPE." As the IPO has increased the total number of EP Energy's common stock, the Company's share has decreased from 14.99% to 12.82%. EPE Global holds approximately one million net acres of oil and gas properties located throughout the United States. For the year ended December 31, 2016, EPE Global had approximately 521.0 million barrels of oil equivalent (proved reserves) and fields held by EPE Global produced approximately 105,598 barrels of oil equivalent of oil and gas per day.

River Bend. In November 2011, the Company, in consortium with GS E&R Co., Ltd., acquired a 15.0% interest (with the Company's share being 7.5%) in the River Bend field in Alabama, United States. The operators attempted 13 exploratory drillings from 2013 to 2015 and discovered commercially viable oil and gas from seven wells. The field began active production in December 2013 and produces approximately 671 barrels of oil equivalent of oil and gas per day.

Vietnam

Block 15-1. The Company entered into a production sharing agreement (a "PSA") for a 14.25% interest in Block 15-1 with PetroVietnam Exploration and Production Company (which owns 50.00%), Perenco (which owns 23.25%), SK Innovation (which owns 9.00%) and Geopetrol (which owns 3.50%) in September 1998. Block 15-1 is located 50 kilometers offshore of Vietnam, and covers an area of 800 square meters. Cuu Long Joint Operating Company is the operating company for Block 15-1. The Company performed a leading role in the exploration stage and discovered a large, high-quality oil field in Su Tu Den field in September 2000, which was selected as "One of the World's Top Discoveries of 2000" by the American Association of Petroleum Geologists. Oil production in Su Tu Den field began in October 2003.

Following the discovery at Su Tu Den field, Cuu Long Joint Operating Company successfully discovered oil in Su Tu Vang field in October 2001, natural gas and condensate in Su Tu Trang field in November 2003, and oil in Su Tu Nau field in September 2005. In Su Tu Den Southwest and Northeast fields, 39 production wells are producing oil and gas at an average of 17,775 barrels of oil equivalent per day as of December 31, 2016. In the Su Tu Vang field, 13 production wells are producing oil and gas at an average of 6,551 barrels of oil equivalent per day as of December 31, 2016. The Su Tu Trang field also commenced production in 2012 and produces approximately 18,900 barrels of oil equivalent of oil and gas per day. In the Su Tu Nau field, ten production wells are producing approximately 26,140 barrels of oil equivalent of oil and gas per day as of December 31, 2016.

Block 11-2. The Company first obtained operatorship of Block 11-2 in May 1992, and discovered the Rong Doi and Rong Doi Tay gas fields in May 1998. The Company entered into a gas sales purchase agreement with PetroVietnam, and commenced development construction, with gas production in the fields beginning in December 2006. The Company is the sole operator and carries out exploration, development and production activities within Block 11-2, which is located 320 kilometers offshore of Vietnam and covers an area of 691 square kilometers. The Company owns a 39.75% interest in Block 11-2 and holds a 35.25% interest on behalf of a Korean consortium, which is comprised of LG International Corp., Daesung Industrial Company, Daewoo International Corp., Hyundai Corp. and Seoul City Gas Co., Ltd. PetroVietnam Exploration and Production Company holds the remaining 25.00% participating interest in Block 11-2. Eight production wells in Block 11-2 are producing natural gas and condensate at an average of 105 million cubic feet per day and approximately 2,488 barrels per day. The recoverable reserves are estimated at 24 million barrels of oil equivalent.

United Kingdom

Dana Petroleum Projects. In October 2010, the Company acquired a 100% interest in Dana Petroleum through a hostile tender offer. Dana Petroleum is an oil and gas exploration and production company incorporated in the United Kingdom and headquartered in Aberdeen, United Kingdom, with a significant portion of its production and exploration assets located in the North Sea and Egypt. In March 2011, Dana Petroleum added six new offshore production fields through acquisition of production assets from Petro-Canada UK Limited. In October 2011, the Company transferred its entire interest in the KCCL to Dana Petroleum in consideration for additional shares issued by Dana Petroleum to the Company. In September 2012, the Company, through Dana Petroleum, acquired a 28.3% additional stake in the Bittern oilfields located in the North Sea from Hess Corp. for approximately US$135 million, raising its total interest in the field to 33%, together with the 4.7% interest that Dana Petroleum had already owned. In October 2013, the Company, through Dana Petroleum, sold a 19% stake in the Otter oilfield located in the North Sea to Abu Dhabi National Energy Company PJSC for approximately US$4.28 million. Dana Petroleum had proved and probable oil and gas reserves of approximately 161 million barrels of oil equivalent as of December 31, 2016, and had average daily oil and gas production of approximately 48,054 barrels of oil equivalent in 2016. As of December 31, 2016, Dana Petroleum had interests in 55 production fields, which included 25 fields in the United Kingdom, eight fields in Egypt and 22 fields in the Netherlands. The reserve levels of Dana Petroleum are currently undergoing evaluation by professional reserve estimators and are subject to change. The most significant contributions in terms of production are associated with participation in the fields of Greater Guillemot Area, Greater Kittiwake Area, Hudson and Bittern in the United Kingdom, East Zeit in Egypt, the Dutch assets purchased through the acquisition of Petro Canada Netherlands B.V. on August 13, 2010 and production from the Babbage field in the United Kingdom which started production in August 2010. As of December 31, 2016, the Company has provided guarantees to creditors for certain obligations of Dana Petroleum. See “Related Party Transactions.”

Western Isles Project. Dana Petroleum, which the Company acquired in October 2010, has a 77% interest in the development of the Western Isles region. Dana Petroleum is developing two discovered oil fields in the North Sea and these fields are estimated to hold proved and probable reserves of approximately 39.3 million barrels of oil equivalent of crude oil and gas. The first oil production is expected in November 2017.

Libya

Elephant Project. The Company initially acquired a 5.80% interest in the Elephant project pursuant to an exploration PSA in October 1990. The Company entered into an extension in 2008, which extended the termination date until 2033 from 2015, but reduced the Company’s interest to 2.00%. The Elephant project is located in the Murzuk Basin, 850 kilometers south of Tripoli, and covers an area of approximately 139 square kilometers. Mellitah Oil & Gas B.V. is the operator of the Elephant project. Oil was first discovered on this site in February 1999 and commercial production began in May 2004. The Elephant project had proved and probable reserves of approximately 14.9 million barrels of crude oil as of December 31, 2016. The crude oil produced in the Elephant project is transported through a pipeline from El-Sharara Field to the Mellitah plant near the Mediterranean Sea. However, the operator of the project ceased production in April 2015 due to security concerns around the region. The Company and the other participant of the project are continually monitoring the situation to re-start production as soon as practicable.

Venezuela

Onado Project. The Company currently owns a 5.64% interest in the Onado Project, after initially acquiring a 12.00% interest in 1997 and undergoing ownership changes in 1998, 2002 and 2006. Other owners are Corporación Venezolana del Petróleo, S.A., Compañía General de Combustibles S.A. and EP Petroecuador, which own 60.00%, 26.00% and 8.36% interest, respectively. The Onado Project is located near Maturin in the center of Venezuela, and covers an area of approximately 160 square kilometers. Petronado Empresa Mixta S.A. is the current operator of the Onado Project. Hydrocarbon in the Onado Project was first discovered in 1971, and the Onado Project currently produces crude oil and natural gas in an amount of approximately 900 barrels of oil equivalent per day.

Yemen

LNG Project. The Company began participation in the Yemen LNG Project as part of the SK consortium in 1997 and currently owns a 1.06% interest in the project. The project launched an LNG liquefaction plant in 2005, which was completed in 2010. The reserves within the Marib area which are currently dedicated to the project include 7.2 trillion cubic feet of proven gas reserves and an additional 7.9 trillion cubic feet of probable gas reserves. The plant and terminal are located in Balhaf, Yemen. First shipment was in November 2009. The operator of the project ceased production in April 2015 due to security concerns around the region. The Company and other participants of the project are continually monitoring the situation to re-start production as soon as practicable.

Block 4-Production. The Company owns a 50.0% interest in Block 4 pursuant to a PSA entered into with the Yemeni government in 2007, and the subsequent dissolution of the consortium which initially purchased the interest in the block. Block 4 is located in the Sabatayn (Marib – Shabwa) basin, in the southeastern part of Yemen, covering an area of approximately 2,000 square kilometers. A total of 91 exploratory and development wells have been drilled since 1987 and three oil fields, West Ayad, Amal and East Ayad, have been discovered as a result. Block 4 is classified as both a production project (pursuant to the Company's classification, even though the field is in a development state) and an exploratory project, as the Company conducted both production/development activities and exploratory activities in the area. In July 2013, the board of directors of the Company approved a withdrawal plan from the field due to the failure to discover viable oil reserves and the political instability in the region and in September 2013, the Company notified the Yemeni government of the withdrawal and the return of the Company's interests. The Company is currently in the process of carrying out the withdrawal plan.

Kazakhstan

Akzhar, Besbolek, Karataikyz and Alimbai Blocks. The Company acquired a 95.0% interest in Altius, a Canadian company listed on the Kazakhstan Stock Exchange, for US$515 million in March 2011. A local partner of the Company acquired the remaining 5.0%. Altius owns the Akzhar, Besbolek, Karataikyz and Alimbai blocks in western Kazakhstan, which hold estimated reserves of 34.9 million barrels, 1.3 million barrels, 0.2 million barrels and 0.5 million barrels of oil, respectively. The four fields Altius owns are in the production stage and Alimbai block changed its contract condition to production stage from exploration stage in January 2014. The Akzhar, Besbolek, Karataikyz and Alimbai fields have daily oil production of approximately 5,205 barrels, 1,171 barrels, 115 barrels, and 303 barrels, respectively, from 307 production wells as of December 31, 2016.

Arystan and Kulzhan projects. In December 2009, KNOC Kaz B.V., a wholly owned subsidiary of the Company located in Kazakhstan, acquired an 85% ownership interest in KNOC Caspian LLP (formerly known as Sumbe JSC) in Kazakhstan, which owns the Arystan and Kulzhan projects located in western Kazakhstan. The Arystan project has daily production of approximately 5,284 barrels of oil equivalent as of December 31, 2016, and holds estimated reserves of 51.4 million barrels as of December 31, 2016. Kulzhan project has daily production of approximately 1,623 barrels of oil equivalent as of December 31, 2016 and holds estimated reserves of 4.3 million barrels as of December 31, 2016.

ADA Block. The Company acquired a 22.50% interest pursuant to a share purchase agreement with LGI Corporation in the ADA Block in November 2005. The Company purchased an additional 17.50% interest in the ADA Block in June 2009 and currently owns a total 40.00% interest. The ADA Block, covering an area of 31.2 square kilometers, is located in the northeastern part of Kazakhstan. The Company's exploratory drilling in the Bashenkol prospect resulted in the discovery of a well with proved oil reserves of approximately 19 million barrels, test production of which was approved by Kazakhstan authorities in 2009. The contract for commercial production was entered into in April 2013 between ADA Oil LLP, the operator, and the Kazakhstan government. Since the test production, the Company has produced approximately 7 million barrels of crude oil from this block.

Iraq

Hawler Area Block. The Company acquired a 15.00% interest in the Hawler Area Block in the Kurdistan autonomous region in Iraq in November 2008. Other participants in the project are Oryx Petroleum, which also serves as the operator and owns a 65.00% interest, and the Kurdistan regional government, which owns a 20.00% interest. Located in the Zagros basin in the northeast onshore area of Iraq, the Hawler Area Block covers an area of 788 square kilometers. The operator of the block drilled three exploratory wells and discovered oil and gas reservoirs in all of the three wells through well testing in 2013. In February 2014, the operator of the block announced its first discovery of an exploratory well in the Hawler Area Block at the Demir Dagh-2 site. As of December 31, 2016, the block is estimated to hold proved and probable reserves of approximately 365 million barrels of oil and has daily production of approximately 2,800 barrels of oil equivalent.

Production Volume and Pricing

The following table sets forth the Company's historical annual crude oil and natural gas production by country and the Company's average sales price for the years ended December 31, 2014, 2015 and 2016.

	For the Year Ended December 31,		
	2014	**2015**	**2016**
Crude oil production(1)(2)			
(thousands of barrels, except percentages or otherwise indicated)			
Korea	198	115	86
Canada	10,948	9,037	7,054
Vietnam	2,666	4,039	3,334
United States of America	12,592	14,493	11,358
Peru	2,991	2,653	2,133
United Kingdom	10,443	13,861	13,589
Indonesia	—	—	—
Libya	423	175	1
Kazakhstan	5,293	5,548	4,717
Venezuela	18	15	12
Yemen	—	—	—
Iraq	80	138	136
China	—	—	—
Total	45,652	50,074	42,420
Average sales price(3) (US$ per barrel)	83.72	45.05	35.78
Natural gas production(1)(2)(4)			
(millions of cubic feet, except percentages or otherwise indicated)			
Korea	11,589	7,024	5,028
Canada	38,982	44,428	38,388
Vietnam	17,382	21,760	19,201
United States of America	85,260	94,895	84,334
United Kingdom	27,574	26,794	23,194
Peru	3,335	3,388	3,659
Indonesia	—	—	—
Kazakhstan	822	936	1,038
Yemen	4,133	953	—
Venezuela	77	52	38
Total	189,154	200,230	174,880
Average sales price(3) (US$ per thousand cubic feet)	5.22	3.50	3.10

(1) Production volumes for regions where the Company does not own 100% interest consist of the Company's share of the production from all of the Company's cooperative projects with other companies in that region.

(2) Includes production volume from subsidiaries or assets acquired during the period after their respective acquisition dates.

(3) Calculated by dividing total consolidated revenue from sale of oil or gas, as applicable, by total amount of oil or gas sold, as applicable. As such, excludes from calculation any production from the Company's affiliates where the Company's interests are accounted for either as available-for-sale securities or by using the equity method.

(4) Represents production of natural gas for sale.

Major Exploration Projects

The Company undertakes a number of projects to expand its commercially viable production facilities and fields. As exploring for oil and gas is a time-consuming and capital-intensive process, the Company's New Ventures and Exploration Group carefully analyzes each prospective location along with its partners and third party technical experts to determine the proper scope of each project, as well as consult an internal committee composed of heads of other departments and technical experts before making investment decisions. The Company is currently conducting exploratory activities in ten projects. The following is a summary of the Company's major exploration projects as of December 31, 2016.

Exploration Projects	Company Ownership	Arrangement Type	Status	Operated By
Yemen 70	12.35%	PSA[1]	Exploration suspended due to force majeure	Third party
Nigeria 0PL 321 & 323	43.88%	PSA	Litigation with Nigerian government for revocation of exploration rights has been decided in favor of the Company. See "— Legal Matters."	KNOC
Uzbekistan West Fergana & Chinabad	65.00%	Exploration Agreement	Geological and geophysical evaluation	KNOC
United Arab Emirates Areas 1, 2 and 3	30.00%	Joint Venture & Field Entry Agreement	Appraisal drilling and 3D seismic data acquisition	Joint
Korea (Block JDZ-Subzone 1 /Block VI-1 South, Central, East)	30.00 ~ 100.00%	Exploration Right	Application for joint development in progress/ preparing for 3D seismic data acquisition	KNOC/ Third Party

(1) Production Sharing Agreement

Yemen

Block 70. The Company entered into a PSA with the Yemeni government for a 61.75% interest in Block 70 as part of a Korean consortium through direct negotiation in April 2005. In August 2008, the Korean consortium sold a 30.88% interest in Block 70 to Total E&P Yemen, and again sold a portion of its interest to Total E&P Yemen and OMV Aktiengesellschaft in June 2010, which reduced the Company's interest in Block 70 to 12.35%. Total E&P Yemen is the operator for the block. Block 70 is located in the Sab'atayn basin in the middle onshore area of Yemen, and covers an area of 1,367 square kilometers. The Company and its partners collected new 2D seismic survey data from February 2007 to April 2007 and finished processing and interpreting the data in August 2007. Total E&P Yemen, the operator of the project, declared force majeure and suspended exploration activity in April 2015 due to internal military conflict within Yemen.

Nigeria

OPL 321 & 323. The Company signed PSAs with the Nigerian National Petroleum Corporation in March 2006 for a 43.88% interests in each of OPL 321 and OPL 323, offshore deepwater blocks located in the Gulf of

Guinea, West Africa. OPL 321 is located about 80 kilometers from Lagos and OPL 323 is adjacent to the east of OPL 321, with OPL 321 covering an area of 1,166 square meters and OPL 323 covering an area of 994 square kilometers. Through geological and geophysical surveys conducted in 2007 and 2008, the Company discovered several prospects in OPL 321 and OPL 323. The Company's legal proceeding against the Nigerian government regarding the cancellation of the PSA for OPL 321 and OPL 323 has been decided in favor of the Company. See "— Legal Matters."

Uzbekistan

West Fergana & Chinabad. The Company signed an Exploration Agreement in February 2010 with Uzbekistan's state-owned energy firm Uzbekneftegaz for a 65% interest in West Feragana and Chinabad. POSCO holds a 20% interest and Samchully holds the remaining 15% interest in the project. West Fergana and Chinabad are onshore blocks with the combined size of approximately 2,780 square kilometers, located in the eastern part of Uzbekistan bordering Kyrgyzstan. Exploration started in August 2011 and the Company interpreted newly acquired geophysical exploration data in 2014. The Company has acquired 35,827 L-kilometers of 2D seismic data as of December 31, 2016.

United Arab Emirates ("UAE")

Areas 1, 2 and 3, Abu Dhabi. The Company acquired a 30% interest in Areas 1, 2 and 3 in Abu Dhabi through a Joint Venture Field Entry Agreement ("JVFEA") entered into with ADNOC in March 2012, in consideration of cash payments and a commitment to engage in exploration and appraisal activities. Area 1 and Area 2 are on-shore fields whereas Area 3 is an off-shore area in the region. Al Dhafra Petroleum Operations Company Ltd. ("Al Dhafra"), serving as the co-operator, was established in December 2013. Haliba field in Area 1 is evaluated to have 185 million barrels of oil reserves and Al Dhafra established the Haliba Field Development Plan to develop three reservoirs and is updating the Haliba Field Development Plan to optimize and accommodate the increased reserves. The Company is currently in the process of preparing a final engineering, procurement and construction plan to produce 30,000 barrels of oil per day in the Haliba field from 2019.

Korea

Korea is surrounded by extensive continental shelves with an area of approximately 300,000 square kilometers, which contain potential for oil and gas reserves. Between 1972 and 1982, oil and gas exploration in Korea was led by western oil companies. In 1983, the Company began its own exploration projects within Korea, and has conducted significant 2D seismic surveys and drilled many exploratory wells since then.

There are currently three offshore sedimentary basins (Yellow Sea Basin (West Sea Basin), Jeju Basin and Ulleung Basin) around the Korean peninsula.

Yellow Sea Basin. The Yellow Sea Basin is composed of three exploration blocks containing numerous sub-basins that are relatively less explored than the other sedimentary basins in offshore Korea. The Company and several foreign companies conducted seismic data acquisition and offshore drilling, totaling 35,827 L-kilometers of 2D seismic data, 298 square kilometers of 3D seismic data and six exploratory wells. Although exploration results have not been successful, the Company has been trying to make hydrocarbon discoveries in the region. Based on studies conducted by the Industry-University-Institute Cooperation in 2013, the Company identified several potential areas in the West Sea Basin. The Company and China National Offshore Oil Corporation ("CNOOC") have been conducting joint studies to better understand the geologic information on the South Yellow Sea Basin ("SYSB") since 2002. The Company and CNOOC will also conduct further studies to identify hydrocarbon potential areas in the SYSB.

Jeju Basin. The Jeju Basin is in the northeastern part of the East China Sea Shelf Basin, which is the largest Mesozoic-Cenozoic basin in the continental margin of China. The Jeju Basin is sub-divided into the Socotra sub-basin located in Block IV and Block V, the Domi sub-basin located in Block VI-2 and the Jeju sub-basin spanning Block V and the western part of the Joint Development Zone (the "JDZ") between Korea and Japan. Exploration at these blocks began in the 1960s by foreign oil companies, and there are currently 57,133 L-kilometers of 2D seismic data and 563 square kilometers of 3D seismic data as well as 15 exploratory wells in the region. The Company and several Japanese oil companies also conducted joint studies on petroleum potential throughout the JDZ from 2004 to 2009, which involved integrating existing data with satellite-derived oil seepage slicks. Although the exploration and studies in the region have resulted in only a few oil and gas showings and have yet to reveal reserves substantial enough for commercial development, the Company believes there is significant potential for oil and gas reserves in the Jeju Basin judging by the discovery of oil and gas fields in the Chinese part of the East China Sea Shelf Basin.

Ulleung Basin. The Ulleung Basin is located in the southwestern part of the East Sea, and contains Block VI-1 and Block VIII, each covering an area of 12,917 square kilometers and 8,481 square kilometers, respectively. Initial exploration efforts in Block VI-1 began in 1970 by the Royal Dutch Shell Oil Company. It acquired 5,193 L-kilometers of 2D seismic survey data and drilled one exploratory well. Although not tested, the exploratory well encountered numerous gas shows. Since 1983, the Company and other oil companies have conducted 23,589 L-kilometers of 2D seismic survey and 3,975 square kilometers of 3D seismic survey and drilled 26 exploratory wells, most of which are focused on the shelf area and found twelve minor gas deposits. These efforts led to the eventual discovery of Donghae-1 gas project in 1998. Additional gas reservoirs around Donghae-1 gas project were confirmed in 2005 and 2006, and were further developed between 2008 and 2009.

Starting in 2003, the Company expanded its exploration efforts to the continental slope and the deep-sea area of the Ulleung Basin. In February 2007, Woodside Energy (Korea) Pte. Ltd. (“Woodside”) and the Company agreed to explore deep-sea areas of Block VIII and the northern part of Block VI-1(“8/6-1N”). Pursuant to a Joint Operating Agreement, the Company and Woodside hold each a 50% interest in 8/6-1N. The exploration rights in 8/6-1N have expired in December 2016 and the Company is currently preparing to acquire new exploration rights in the deep-sea area. The Company and Woodside conducted a 2D seismic survey of approximately 5,107 L-kilometers in 2008 and drilled an exploratory well named Jujak-1 in 2012. The Company and Woodside conducted 504 square kilometers of 3D marine seismic survey and drilled an exploratory well named Hongge-1 in September 2015. In 2011, POSCO Daewoo Corporation (“POSCO Daewoo”), holding a 70% interest and serving as the operator, started the exploration of the southern part of Block VI-1(“6-1S”). POSCO Daewoo and the Company conducted a 3D seismic survey of 1,086 square kilometers and drilled one appraisal well so far in 6-1S. In the first half of 2014, the Company started to develop the middle section of Block VI-1 (“6-1C”), covering approximately 2,710 square kilometers. In September 2011, the Company obtained the right to explore underwater resources at 6-1C pursuant to an agreement entered into with the Korean government. Currently, the Company holds a 70.0% interest in 6-1C and POSCO Daewoo holds a 30.0% interest in 6-1C. In March 2014, the Company started to explore the Donghae-2 gas project (within 6-C) located approximately 5.4 kilometers away from the Donghae-1 gas project, and drilled one production well named DH 2-1P in December 2015. The Company acquired the right to explore the eastern part of Block VI-1 (“6-1E”) from the Korean government in 2013, and conducted a review of 6-1E during 2014 as part of the overall evaluation of the Company’s projects in Korea. The Company conducted a 3D seismic survey of 224 square kilometers in 2015 and is currently reviewing the evaluation data and considering additional exploration in 6-1E.

Types of Exploration, Development and Production Agreements Entered into by the Company

The Company participates in the exploration, development and production of crude oil and natural gas (“E&P project”) in a number of countries and geographic regions and is therefore subject to a broad range of rules and regulations which cover many aspects of exploration, development and production activities, including lease tenure, production sharing rates, royalties, pricing, environmental protection, export taxes and foreign exchange. The Company enters into a wide range of contractual arrangements governing the Company’s E&P projects and its interest in oil and natural gas from those projects. Depending on the type of E&P project, the Company holds its interest in a project or an area through a PSA, concession agreement or service contract, or permits and licenses from a government-controlled entity or a national oil company of the country in which such E&P project is located. After acquiring its interest in an E&P project, the Company also enters into joint operating agreements to designate an operator of the E&P project and to determine the operational details of the exploration, development and production process.

The terms of different contractual arrangements vary substantially among different countries and geographic regions, project types and the time the agreements were entered into. To evaluate geological, geophysical, engineering and transportation issues involved in exploration and production, the Company also may enter into a technical evaluation agreement prior to entering into a PSA, which contains terms similar to a PSA.

Production Sharing Agreements

Most of the Company's exploration, development and production arrangements are governed by PSAs. Under a typical PSA, the government or the national oil company owning rights over the particular block at issue is the licensee and the Company and its partners, if any, assume the role of a contractor engaged in the exploration and development of the specific block, usually on the condition that the host government does not directly participate in the E&P project. The contractor is typically required to provide all the financing and bear all exploration and development costs and the associated risks. To compensate for these investments and the risks, upon the successful development and production of oil or natural gas in the relevant block, the contractor recovers its costs and receives the economic benefit of a portion of the produced oil and natural gas in accordance with a production sharing formula set out in the PSA.

A typical PSA has a term of two to six years for the exploration period, renewable upon the parties' agreement. During the exploration period, the contractor may be required to relinquish a portion of the original contract block to the government or the national oil company, excluding the areas in which oil or natural gas has been discovered. Moreover, the contractor is usually required to complete a minimum amount of survey and drilling during the exploration period.

Concession Agreements, Permits and Licenses

In addition to PSAs, the Company also enters into concession agreements. In a concession agreement, the government grants to the contractor an exclusive right to explore for, develop, produce, transport and dispose of crude oil and natural gas within a specified block. Thus the contractor bears the risk of exploration, development and production activities as well as the related costs, including financing for the operations. In principle, the contractor has the right to all of the production, less any production related fees, royalties or taxes that are payable in cash or in kind. The contractor recovers its investments and associated operating, exploration and development costs from the sale proceeds of the oil or natural gas produced, after such deductions.

A concession agreement usually requires the contractor to undertake a minimum amount of exploratory work as scheduled in the agreement. From the commencement date, the contractor is usually required to pay the host governmental entity an annual fixed sum for its exploration and development rights. Once crude oil and natural gas are produced in commercial quantities, the contractor is required to pay a royalty in lieu of the annual fixed payment. The amount of royalty payment is usually higher than that of the annual fixed payment. In addition, the contractor is required to pay the governmental entity bonuses when the production volume reaches the thresholds specified in the agreement, and production taxes to the host country's government. The contractor may also be obligated to grant to the host country's government a right to purchase certain amounts of crude oil at discounted prices.

The Company and its partners, if any, also enter into arrangements similar to concession agreements called "permits", "licenses", or "exploration and production contracts" granted by the relevant governmental authority to explore and develop specified areas. Under permits, licenses or exploration and production contracts, the contractor bears the risk of exploration, development and production activities and is responsible for the related financing. The contractor has the right to all of the production less any royalties that are payable in kind or cash whereby it can recover all of its investments and associated operating, exploration and development costs from the sale proceeds of the oil or natural gas produced. The Company is generally required to pay production taxes, bonuses or royalties, the amount of which may be in proportion to the actual volume of the produced oil or natural gas. Moreover, similar to the concession arrangements in the Middle East or typical PSAs, the contractor is also obligated to complete a minimum amount of exploration work as specified in the applicable agreement.

Service Contract

A service contract is a particular exploration, development and production arrangement entered into in countries where local laws restrict the ownership by foreign investors over domestic oil and natural gas. A foreign company, as a contractor, enters into a service contract with the host government or the national oil company, which delineates certain exploration, development and production targets that the contractor is obligated to meet within a specified period. Upon completion of the exploration and development stages and the commencement of oil and natural gas production, the ownership of certain facilities, such as exploration and developmental wells along with operational facilities, are transferred to the relevant host government or the national oil company, which then assumes the production activities.

Pursuant to a compensation agreement entered into with the host government or the national oil company together with a service contract, the contractor under the service contract recovers all investments and financing costs associated with the project from the produced crude oil and natural gas. In addition, the contractor receives compensation for its services, typically a predetermined percentage of the proceeds from the sale of the produced oil and natural gas received by the host government or the national oil company for a certain period, either in cash or in kind. Certain countries allow the contractors to purchase the produced oil or natural gas themselves.

Joint Operating Agreements

When the Company participates in exploration, development and production projects together with other companies, it enters into joint operating agreements ("JOAs"). Under a typical JOA, a joint venture is formed and each joint venture partner holds its respective undivided proportionate interest in the underlying contractual arrangement and the rights and obligations under such arrangement. The JOA typically designates an operator who is exclusively in charge of all petroleum-related operations, which usually includes preparing work programs and budgets, procuring equipment and materials relating to operations, establishing insurance programs, and issuing cash call notices to the joint venture partners. The operator is also responsible for determining and executing operation and budget plans and managing all day-to-day operational matters.

The operational activities conducted by the operator are generally funded by monthly cash calls based on the annual work program and budget approved by the operating committee, which is usually composed of representatives from each of the joint venture partners. If the operational costs exceed the approved operational budget, the operator is usually required to obtain an additional approval of the operating committee. The operating committee has the authority to make all material decisions concerning the joint operating project.

Representatives of each joint venture partner review joint venture accounts and records and provide reports before they are sent to the relevant government entities. Liabilities with respect to uninsured operations are generally borne by all joint venture partners in proportion to their respective interests in the project. The JOAs generally specify that the operator will acquire insurance on behalf of the joint venture partners, unless such joint venture partner or partners choose to acquire insurance individually, or self-insure their risks.

The JOAs generally terminate on the earlier of an agreement by the parties to terminate the joint venture or the termination of the underlying contractual arrangements. In addition, the ability of the joint venture partners (including the operator) to transfer or assign their rights under the JOA or otherwise withdraw from the joint venture is generally subject to pre-emptive or first refusal rights in favor of the remaining joint venture partners as set forth in the relevant JOA.

Exploratory and Development Wells

The following table sets forth the number of net exploratory and development wells the Company drilled, or in which the Company participated, and the results thereof, for the periods indicated.

Exploratory and Development Wells

Year		Total
2014	**Net exploratory wells drilled**(1)	18.88
	Crude oil	10.34
	Natural gas	2.43
	Dry(2)	6.11
	Net development wells drilled(1)	276.98
	Crude oil	266.45
	Natural gas	10.53
	Dry(2)	—
2015	**Net exploratory wells drilled**(1)	3.35
	Crude oil	1.00
	Natural gas	1.00
	Dry(2)	1.35
	Net development wells drilled(1)	113.96
	Crude oil	106.28
	Natural gas	7.68
	Dry(2)	—
2016	**Net exploratory wells drilled**(1)	1.20
	Crude oil	—
	Natural gas	—
	Dry(2)	1.20
	Net development wells drilled(1)	15.3
	Crude oil	11.3
	Natural gas	3.9
	Dry(2)	—

(1) "Net" wells refer to the wells after deducting interests of others.

(2) "Dry" wells are wells with insufficient reserves to sustain commercial production.

Sales and Marketing

The Company sells all of its domestically produced natural gas to Korea Gas Corporation. Natural gas produced in other countries, such as Vietnam and Indonesia, is sold directly to customers worldwide, including energy companies and trading companies. Most of the Company's crude oil and natural gas produced outside of Korea is sold to major domestic and international refineries, and energy and resource trading companies.

Sales of Crude Oil

The Company sells various types of crude oil with different gradations of quality and chemical content. The Company generally sells its crude oil and condensate oil to oil refineries, trading companies and petrochemical companies worldwide. The Company estimates the demand for crude oil from potential buyers and uses such estimates to determine the volume of crude oil to supply.

The price of crude oil is directly correlated to the global market price because it is a publicly traded commodity. The contract price of crude oil is determined through negotiations or tenders with buyers based upon the pricing standards adopted by each oil-producing country. For example, the price of oil produced in Indonesia is determined based on the Indonesian Crude Oil Price, which is based on price assessments announced by three private oil-rating companies in Indonesia. Prices of oil produced in other regions are typically determined based on the prevailing international oil price in the region. Spot oil prices are determined by either adding a premium or providing a discount to the public crude oil prices discussed above.

The crude oil and condensates are generally sold under free on board terms directly or through trading companies to oil refineries, power companies and petrochemical companies. Generally, there are two types of oil sales contracts — term contracts and spot contracts. A term contract is typically an annual contract usually lasting from January to December of the same year or from April to March of next year (each such period, a "term year"). The Company determines the sales volume for the term year based on the estimated production for such term year estimated by the project operator at the end of the year before the beginning of the corresponding term year.

The Company decides when and to whom it sells its products taking market conditions into consideration. The Company also maintains favorable business relationships with major domestic refineries to ensure stable energy supply into Korea. The Company partially conducts its crude oil marketing and sales activities through its Petroleum Marketing Department, usually pursuant to term contracts. The Company hedges a portion of its crude oil sales through swap or option contracts and such hedging decisions are recommended by its Risk Management Department and decided on by the relevant subsidiaries.

Harvest Operations markets its crude oil and natural gas liquids ("NGLs") production to a diverse portfolio of intermediaries and end users with the majority of oil contracts continually renewing on a 30 day basis and the NGL contracts on one year terms with the prices of both commodities derived from the prevailing monthly market prices. Harvest Operations has a small number of condensate purchase contracts, required for blending heavy oil to meet pipeline specifications, that are a combination of one year and monthly spot contracts, both with prices derived from the prevailing monthly market prices.

Sales of Natural Gas

The Company sells and supplies natural gas to Korea Gas Corporation, as well as various customers around the world. The Company's revenues derived from natural gas sales accounted for approximately 18% of its total sales for the year ended December 31, 2016. Due to its gaseous state, natural gas must be transported to the market either through pipelines or by a tanker after liquefaction into liquefied natural gas ("LNG"). Petroleum gas or propane and butane are also liquefied for transportation. Such liquefying facilities and pipelines require significant capital investment. In order to recover the high cost of investment, suppliers of LNG or natural gas seek buyers to whom they can sell a steady volume of gas over a long period of time to ensure consistent flow of future revenue. Moreover, upstream natural gas suppliers, such as the Company, have commonly sold gas products jointly with other companies instead of individually. For example in Vietnam, the Company and other oil and gas companies supply most of their natural gas to Vietnam Oil and Gas Corporation, Vietnam's state-owned oil and gas corporation pursuant to long-term gas supply agreements. Vietnam Oil and Gas Corporation, in turn, sells the natural gas to various purchasers, including power companies, gas companies, petrochemical companies, trading companies and oil refineries within Vietnam and worldwide pursuant to long-term sales contracts and purchase agreements. The Company supplies 100% of the natural gas produced at the domestic Donghae-1 gas project to Korea Gas Corporation pursuant to a long-term supply contract.

The majority of Harvest Operations' natural gas production is currently being sold at the monthly average price of Alberta Energy Company ("AECO"), the benchmark price for natural gas in Western Canada.

Petroleum Stockpiling

Overview and Strategy

Korea is the world's eighth largest consumer of petroleum according to the 2015 Statistical Review of World Energy by BP p.l.c. and meets substantially all of its oil needs from imports. To mitigate the risks to the Korean economy posed by disruptions in oil supply or fluctuations in oil prices, the Government has adopted a series of oil stockpiling plans which have been implemented by the Company. The Company currently owns and operates nine stockpiling facilities, with a total storage capacity of 133 million barrels. The Company stockpiles crude oil, refined oil products (including kerosene, gasoline and diesel) and liquefied petroleum gas ("LPG"). The Company's stockpile facilities are located in Yeosu, Ulsan, Seosan, Geoje, Pyeong-taek, Guri, Yong-in, Donghae and Gokseong.

Under the Government's Third Stockpiling Master Plan, which was announced in May 2009, the Company's total stockpiling capacity was increased to 146 million barrels in April 2010. Pursuant to the Fourth Stockpiling Master Plan, which was announced in December 2014, the Company is seeking to reach a stockpile reserve level of 107 million barrels by 2025. Korea's stockpile reserve level as of December 31, 2016, which includes the reserves held by the Company and companies in private industry, is approximately 237 days of net oil imports based on calculation standards of the International Energy Agency (the "IEA"). Korea joined the IEA as a member in 2002 and became a party to the Agreement on an International Energy Program, which requires that participating countries maintain oil reserve levels of at least 90 days of net oil imports. The Government contributed a total of approximately Won 5.1 trillion to the Company for execution of the Stockpiling Master Plans as of December 31, 2016, of which approximately Won 2.4 trillion was used to construct stockpile facilities and Won 2.7 trillion was used to purchase additional stockpile oil reserves.

The Company's stockpiling strategy prior to 1999 consisted mainly of purchasing and storing oil supplies and providing oil to domestic refineries when anticipated deliveries of crude oil do not arrive on time or when there is a shortage of crude oil due to other emergencies. The Company also leases excess storage facilities to domestic oil companies. Since 1999, the Company has sought to increase its stockpile level and generate more income from its stockpiling activities by participating in international stockpile arrangements and engaging in oil trading activity.

International Stockpiling. As a means of increasing the Company's stockpile level, the Company enters into contracts with national oil companies of oil-producing countries, major international oil companies and oil trading companies to store their petroleum in the Company's stockpile facilities as part of these companies' distribution network for markets in northeast Asia. The Company receives a fee for allowing these companies to use its stockpile facilities, and as part of the arrangement, these companies are obligated to supply petroleum to the Company at the market price up to the volume of the leased storage space during periods of oil shortage or other emergencies. Participation in international stockpiling arrangements has allowed the Company to increase its oil reserve levels, generate revenue from its stockpile facilities and create opportunities to purchase crude oil for domestic use in emergencies.

Oil Trading. Since 2000, the Company has been engaging in swap trading for a portion of its oil reserves to supplement its revenues and increase its oil reserves, but only at levels that would not compromise its oil reserve maintenance objectives. The Company uses its oil reserves as well as its storage facilities to enter into oil trading transactions with oil and commodities trading companies. The Company fixes its buy or sell price using hedging financial products before entering into the trading transactions to minimize its risks.

Gasoline and Gas Oil Wholesale and Discount Gas Stations. In order to reform the oil product distribution landscape in Korea and to minimize price increase, the Company began engaging in gasoline and gas oil wholesale and operation of discount gas stations with the opening of the first discount gas station in December 2011. The Company purchases gasoline and gas oil at wholesale prices from refineries, as well as acquiring them from overseas sources utilizing its stockpile facilities, and delivers such oil to the discount gas stations. As of December 31, 2016, the Company, along with Korea Expressway Corporation and National Agricultural Cooperative Federation, operated approximately 1,168 such discount gas stations located throughout Korea. The Company believes that the discount gas stations have the effect of also lowering the prices of other commercial gas stations located nearby, and hopes to continue to increase the number of such stations in the near future. Pursuant to a mandate from the Government, the Company may consider a spin-off of its gasoline and gas oil wholesale and distribution business in the future.

Operation of Stockpiling Facilities

The Company's stockpile facilities are located throughout Korea.

Ulsan

The Ulsan stockpile facility is located on a 1.8 square kilometer tract of land in Ulsan on Korea's southeastern coast, and first began operation in 1981. As of December 31, 2016, the Ulsan facility had underground storage facilities with a capacity of 6.5 million barrels of crude oil. Aboveground storage facilities are being replaced by underground storage facilities of 10.3 million barrels of crude oil, which are currently under construction and expected to be completed by December 2020.

Geoje

The Geoje stockpile facility, which has been in operation since 1985, is located on a 2.7 square kilometer tract of land near Korea's southern coast in South Kyungsang province. As of December 31, 2016, the Geoje facility had storage tanks both aboveground and underground, with total storage capacity of 47.5 million barrels of crude oil. The Company recently completed the construction of a loading dock near the facility to assist in the transportation of crude oil into the facility. See "— Engineering and Construction — Construction of Petroleum and LPG Stockpile Facilities."

Yeosu

The Yeosu stockpile facility has been in operation since 1998 and is located on a 3.8 square kilometer tract of land in South Jeolla province near the southern coast of Korea. As of December 31, 2016, the Yeosu site, which has both aboveground and underground storage facilities, had a total capacity of 49.7 million barrels of crude oil. Additional aboveground storage facilities with a total capacity of 2.5 million barrels of crude oil are under construction, which the Company expects to complete by September 2017.

Seosan

The Seosan stockpile facility has been in operation since 2005 and is located on a 0.9 square kilometer tract of land near Korea's southwestern coast in South Choongchong province. As of December 31, 2016, the Seosan facility, which is aboveground, had a total capacity of 11.0 million barrels of crude oil and 3.6 million barrels of refined oil products.

Pyeong-taek

The Pyeong-taek stockpile facility, which has been in operation since 1989, is located on a 0.7 square kilometer tract of land near Seoul in Gyeonggi province. As of December 31, 2016, the Pyeong-taek facility had storage tanks both aboveground and underground, with a total capacity of 4.4 million barrels of LPG and 1.8 million barrels of refined oil products.

Guri

The Guri stockpile facility, which has been in operation since 1981, is located on a 0.6 square kilometer tract of land near Seoul in Gyeonggi province. The Guri facility is underground, with a capacity to store 3.0 million barrels of refined oil products as of December 31, 2016.

Yong-in

The Yong-in stockpile facility, which commenced operation in 1998, is located on a 1.2 square kilometer site near Seoul in Gyeonggi province. The Yong-in facility is aboveground, and as of December 31, 2016, it housed 11 storage tanks with a total stockpile capacity of 2.5 million barrels of refined oil products, with each tank having a storage capacity ranging from 150,000 barrels to 275,000 barrels. Due to the facility's proximity to populated areas, it is constructed with a concrete membrane and is designed to withstand earthquakes to the same extent as nuclear power plants in Korea.

Gokseong

The Gokseong stockpile facility has been in operation since 1999 and is located on a 0.4 square kilometer tract of land in South Jeolla province. As of December 31, 2016, the Gokseong facility, which is located aboveground, had a total capacity of 2.1 million barrels of refined oil products.

Donghae

The Donghae stockpile facility is located on a 0.1 square kilometer site in Kangwon province and has been operational since 2000. It is located on the eastern coast of Korea, and as of December 31, 2016, it housed five aboveground storage tanks with a total capacity of 1.1 million barrels of refined oil products, with each tank having a storage capacity ranging from 100,000 barrels to 300,000 barrels.

Engineering and Construction

Overview

In support of the Company's stockpiling and exploration and production business, the Company is also engaged in the construction of crude oil and gas storage facilities throughout Korea, as well as the construction of production facilities. The Company constructed nine stockpile facilities that it currently operates pursuant to the Stockpiling Master Plans, as well as the production facilities used in the Donghae-1 gas project and the Vietnam Block 11-2 gas project. Pursuant to the Third Stockpiling Master Plan, the Company completed the construction of a loading dock at Geoje in July 2012 and also completed additional stockpile facilities at its Pyeong-taek site in May 2009 and at its Ulsan site in April 2010. The Company completed the construction of a new storage facility at its Pyeong-taek location with a capacity of 225,000 barrels of refined oil products in June 2014, which is being used to supply products to Al-tteul gas stations operated by the Company. The Company also plans to replace certain aboveground storage facilities at its Ulsan site by constructing new underground storage facilities, which is expected to be completed by 2020, and also build additional aboveground storage facilities at its Yeosu site, which is expected to be completed by 2017. Furthermore, the Company completed construction of additional pipelines between the Company's Seosan stockpile facility and the petrochemical complex operated by Hanhwa Total Petrochemical Co., Ltd. in August 2015, to ensure stable supply of oil to domestic refineries even during energy distribution emergencies. The Company is also working to expand its construction business overseas and assisting domestic construction companies to increase their competitiveness in overseas construction markets by providing technological support.

Construction of Petroleum and LPG Stockpile Facilities

Stockpile facilities consist of aboveground tank facilities or underground cavern facilities. Aboveground facilities are easier to construct, and thus require a shorter construction period, usually from three to five years, are easier to maintain initially, and are not restricted in where they can be built or in the types of product that can be stored there. However, aboveground facilities are also more vulnerable to external threats such as theft, terrorist attacks or fires, more expensive to construct, and have a shorter life cycle, usually lasting from 15 to 20 years. Underground facilities provide higher security and safety, have a semi-permanent life cycle, are more environmentally friendly and require lower construction and maintenance costs. However, they also take longer to build, usually from five to eight years, may be built only on sites that meet specific geological requirements, and are limited in the types of petroleum products that can be stored in them. The Company currently has eight aboveground tank facilities and five underground facilities.

The Company recently began updating the repair system at its Geoje underground storage facilities to further upgrade and enhance its existing storage capacity, which is estimated to be completed by 2018. Furthermore, as part of the Government's plan to develop a new seaport in Ulsan, the Company is currently transferring the Ulsan storage facility's offshore loading platform to another location, which is expected to be completed by the end of 2017.

Construction of Production Facilities

The Company also supports its exploration and development projects by constructing production facilities used at some of its oil and gas fields. The Company constructed the offshore platform, onshore terminal, subsea production system, and the subsea and onshore pipeline at the Donghae-1 gas project. The Company also constructed the natural gas production facilities at the Vietnam Block 11-2 gas project in Rong Doi, consisting of two offshore platforms, a subsea pipeline and a floating storage and offloading unit. The Company also provides construction support for construction of production platforms or pipelines at several of its production or exploration sites, including Vietnam Block 15-1, Western Isle block, BlackGold Project and Arystan block.

Other Businesses

Operation of Semi-submersible Drillship

The Company owns and operates a semi-submersible drillship, named "Doo Sung", and leases this facility and its crew under contracts to international, government-owned or independent oil and gas companies for use in their drilling activities in offshore oil and natural gas fields. The Doo Sung was constructed in 1984, and carries a crew of approximately 112 at maximum. The Doo Sung has successfully drilled 121 boreholes in locations such as Alaska, China, Vietnam, Malaysia, Russia, Myanmar and Indonesia. Semi-submersible drillships are floating vessels that can be submerged by means of a water ballast system such that the lower hulls are below the water surface during drilling operations. The Doo Sung is moved from one drilling site to another with the assistance of tugboats.

The Company's revenues from the drillship chartering segment was Won 4 billion, and the Doo Sung had a utilization rate of 16% with a contracted day rate of US$250,000, which averaged US$58,000 per day for the year ended December 31, 2016. The contract drilling industry remains highly competitive. Demand for the Company's drilling services is based upon many factors which are beyond its control, including:

- market price of oil and natural gas and the stability thereof;
- production levels and related activities of the OPEC and other oil and natural gas producers;
- global oil supply and demand;
- regional natural gas supply and demand;
- worldwide expenditures for offshore oil and natural gas drilling;
- long-term effect of worldwide energy conservation measures;
- the development and use of alternatives to hydrocarbon-based energy sources; and
- worldwide economic activity.

Drilling contracts are generally awarded on a competitive bid basis. Pricing, safety record and technical expertise are key factors in determining which qualified contractor is awarded a job. Other drillship availability, location and specifications also can be significant factors in the determination. The Doo Sung has been engaged mainly on drilling sites located in Korea, Southeast Asia and the eastern coast of Russia. Operators also may consider crew experience and efficiency. Some of the Company's contracts are on a negotiated basis.

The Doo Sung entered into two contracts for 2013 and 2014. One contract was with Malaysia Shell at a day rate of US$215,280 for the period from January 2013 to May 2013 and from January 2014 to May 2014. The other contract was with Gazprom Subsidiary at a day rate of US$300,000 for the period from June to November of both 2013 and 2014. In addition, the Doo Sung completed a contract with Daewoo International for its domestic drilling project, at a day rate of US$265,000 for the period from December 2014 to January 2015. The Company mutually terminated a drilling contract for operations offshore of Brunei with a contracting counterparty in April 2015, which limited the drillship's utilization during the first six months of 2015.

The Doo Sung entered into a three-year drilling contract with Gazprom Subsidiary, a subsidiary of Gazprom OAO, at a total estimated fee of approximately US$170 million for the periods from May to November of each year from 2015 to 2017. Primary drilling operations were completed in August 2015 and the drillship was successfully demobilized from the drilling location in September 2015. The Company terminated its obligations under the drilling contract for 2016 and 2017 due to the designation that the relevant drilling location was subject to sanctions. The Company has no further outstanding obligations under such contract with Gazprom Subsidiary. Gazprom OAO is currently on the Sectoral Sanctions Identifications List maintained by OFAC, and the Entity List maintained by the BIS, and the Company may be subject to sanctions under relevant laws and regulations as a result of the contract, although the Company has stripped the Doo Sung of all U.S.-origin equipment and parts to minimize the Company's exposure to sanctions. See "Risk Factors — Risks Relating to the Company — The Company engages in certain activities relating to Russia and may become subject to sanctions under relevant laws and regulations of the United States and other jurisdictions as a result of such activities, which may adversely affect its business and reputation."

The Company is in the process of reviewing the sale of Doo Sung within 2017 as a follow-up measure to the June 2016 Government Plan.

The following table sets forth the utilization rate, calculated as a percentage of the number of days for which the Doo Sung was utilized, over the number of days in the year, and the range of contracted day rates for the Doo Sung for each of the years ended December 31, 2014, 2015 and 2016.

	For the Year Ended December 31,		
	2014	2015	2016
Utilization rate	90%, 330 days	67%, 244 days	16%, 60 days
Contracted day rates	US$215,280~ US$300,000	US$125,000~ US$300,000	US$250,000

Petroleum Information and Publication

Due to Korea's heavy dependence on foreign oil, efficient and accurate collection of information related to the global oil market is essential to Korea's ability to promptly respond to international market developments. In furtherance of its position as the execution arm of Korea's oil-related policies and operations, the Company, through its Oil Research & Information Center, also engages in collection, compilation, analysis and publication of domestic and international oil-related information. The information provided by the Company is used widely not only in the oil industry, but also in decision-making process for oil policies by the Government. The Company is currently certified by the Government to provide the official domestic oil usage and pricing data.

The Company currently publishes oil-related information through the following media:

Publication Title	Content	Medium	Language
Petronet	Multimedia internet website with comprehensive oil information service network, consisting of an extensive database on all Korean oil-related information. Both paid and free subscriptions are available.	Internet	Korean/ English
Korea Monthly Oil Statistics	Provides historical and up-to-date statistics on Korean oil supply and demand, including export, import, throughput, consumption and inventories, as well as analysis of Korean oil statistics.	Internet	Korean/ English
Korean Oil News	Provides comprehensive monthly news coverage of the Korean oil industry and economic trends, as well as expert opinions and analysis of the Korean oil market, renewable and alternative energy, Government policies and oil and gas exploration and development by Korean companies. It also includes the latest statistics on Korean oil supply, demand and local prices for oil products.	Internet	English

Publication Title	Content	Medium	Language
Daily Petroleum Status	Provides key international oil prices and indices, major news related to the domestic and international oil market, and prices of domestic oil (crude and refined) products.	Internet	Korean
Weekly International Oil Price Status	Provides weekly price status of international crude oil, oil products, as well as an update on the status of the Singapore oil market.	Internet	Korean
Weekly Domestic Oil Price Status	Provides weekly price status of domestic oil products, classified by gas stations, refineries and distributors.	Internet	Korean
Annual Oil Supply Statistics	Compilation of annual statistics relating to domestic oil imports, refineries and distributors.	Printed	Korean
Opinet	Publishes real-time product prices for domestic gas stations, as well as oil sale prices for all domestic oil distributors and refineries, both through www.opinet.co.kr and other devices such as Global Positioning System navigators and mobile phones.	Internet	Korean

Affiliates

Of the Company's affiliates, certain information with regard to affiliates that are accounted for using the equity method as of such date are set forth in the table below.

	As of or for the year ended December 31, 2016					
Entity	Country of Incorporation	Equity Interest	Total Assets	Total Liabilities	Revenue	Net Income (Loss)
	(In billions of Won, except for percentages)					
Kernhem B. V.	Netherlands	37%	205	254	27	11
Oilhub Korea Yeosu Co., Ltd.	Korea	29%	555	402	77	18
ADA OIL LLP(1)	Kazakhstan	13%	92	144	27	16
Parallel Petroleum LLC	United States	10%	435	287	65	(1)
KNOC Bazian Limited	Malaysia	67%	151	214	—	(6)
KNOC Nigerian West Oil Company Limited	Nigeria	75%	165	246	—	(9)
KNOC Nigerian East Oil Company Limited	Nigeria	75%	273	361	—	(12)
KNOC Aral Ltd	Malaysia	51%	42	42	—	(0)
KC Kazakh B. V.	Netherlands	35%	346	924	—	(373)
Offshore International Group Inc.	United States	50%	927	365	135	(96)
KNOC Ferghana Ltd.	Malaysia	50%	64	73	—	(2)
KNOC Ferghana2 Ltd	Malaysia	65%	23	25	—	(1)
KADOC Ltd.	Malaysia	75%	313	357	—	(12)
Korea Oil Terminal Co., Ltd	Korea	82%	4	5	—	(1)
Deep Basin Partnership	Canada	82%	188	149	33	(45)
HKMS Partnership	Canada	70%	100	101	21	(1)

(1) As ADA OIL LLP is an affiliate of Kernhem B.V., equity method for ADA OIL LLP was applied considering the indirect ownership interest held by Kernhem B.V.

Employees and Labor Relations

As of December 31, 2016, the Company had 1,330 employees on a non-consolidated basis. The following table describes the total number of employees by department as of the periods indicated.

Department	As of December 31, 2016
Strategy & Planning	129
Administration (inclusive of HSE Dept.)	184
E&P Management	44
Exploration	63
Production	180
Overseas E&P Offices	78
Petroleum Stockpile & Business	123
Stockpile Offices	272
Legal & Secretariat	19
E&P Support (inclusive of Technology Dept.)	133
Auditing	23
Others (Task force, Training, Labor union, etc.)	82
Total	1,330

Most of the Company's eligible employees are members of the labor union. The Company has not experienced any strikes, work stoppages, labor disputes or actions which affected the operation of any of the Company's businesses, and the Company considers its relations with its workforce to be generally good. The Company re-negotiated its collective bargaining agreement with the labor union in August 2016, which is scheduled to expire in August 2018. The negotiation for a new collective bargaining agreement will begin upon expiration of the current agreement. The collective bargaining agreement provides for, among other things, various employment benefits, the scope of union activities and negotiation procedures.

The Company, like most Korean companies, grants its employees annual increases in basic wages and pays periodic bonuses. Employees and directors with more than one year of service are entitled to receive a lump-sum payment upon termination of their service with the Company, based on their length of service and rate of pay at the time of termination.

Safety and Environmental Matters

Safety

Safety standards and regulations in the domestic oil industry are issued, and compliance is monitored, by the Ministry of Trade, Industry and Energy and the Korea Occupational Safety and Health Agency, a Government body under the control of the Ministry of Employment and Labor.

Because a number of the Company's stockpile facilities are located in industrial areas, the Company has established a series of preventative measures to improve the safety of its employees and surrounding communities and minimize disruptions or other adverse effects on its business, such as providing each individual member of the communities in areas surrounding its stockpile facilities with printed materials to explain and illustrate safety and protection knowledge and skills.

The Company has also undertaken various measures including improving its computer systems, increasing safety and maintenance training for employees and improving the Company's patrolling equipment (used to detect leaks, fire and other defects in pipes and stockpile facilities). The Company believes that its safety standards are at least comparable to domestic and international safety standards relating to the oil industry. In addition, the Company has been operating its safety system in compliance with international safety standards such as Process Safety Management since 1996 and International Organization for Standardization ("ISO") 9001 since 1998.

The Government from time to time conducts spot-checks of the Company's facilities to ensure that they are in compliance with occupational health and safety regulations. These spot-checks have never identified any major violations or resulted in monetary fines or other penalties.

To further enhance its management of such safety and other operational risks, which may increase as the Company follows its expansion plans, the Company implemented a comprehensive enterprise risk management ("ERM") system in November 2010. The ERM system allows the Company to centralize the detection, analysis and management of various safety, financial and other operational risks related to its business.

Environmental Matters

The Company is subject to numerous international, national, regional and local environmental laws and regulations concerning its oil and gas exploration and production operations, stockpiling operation and other activities. In particular, these laws and regulations:

- require an environmental impact assessment report to be submitted and approved prior to the commencement of exploration, development and production activities;
- restrict the type, quantities and concentration of various substances that can be released into the environment in connection with oil and gas exploration and production activities;
- limit or prohibit drilling activities on certain lands lying within protected areas and certain other areas; and
- impose penalties for pollution resulting from oil, natural gas and petrochemical operations, including criminal and civil liabilities for serious pollution.

These laws and regulations may also restrict air emissions and discharge to surface and subsurface water resulting from the operation of oil and natural gas processing plants, pipeline systems and other facilities that the Company and its joint venture partners own or operate. In addition, the Company's operations may be subject to laws and regulations relating to the generation, handling, storage, transportation, disposal and treatment of waste materials. Moreover, since exploration and production activities may take place on sites that are ecologically sensitive (tropical forest, marine environment, etc.), each site may require a specific approach to minimize the impact on the related ecosystem, biodiversity and human health.

The Company anticipates that the environmental laws and regulations to which it is subject will become increasingly strict and therefore likely to have an increasing impact on its operations. It is impossible, however, to predict accurately the effect of future developments in such laws and regulations on the Company's future earnings and operations. Some risk of environmental costs and liabilities is inherent in certain of the Company's operations and products, as it is with other companies engaged in similar businesses, and there can be no assurance that material costs and liabilities will not be incurred. The Company does not currently expect any material adverse effect on its financial conditions or results of operations as a result of compliance with such laws and regulations. In addition to complying with laws, regulations and standards to which the Company is subject, it is the Company's policy to exercise maximum due care with respect to environmental matters in the course of its operations, and to maintain adequate insurance coverage.

The Company also has been conducting regular environmental audits on its operations and facilities by a third-party auditors, pursuant to the ISO 14001 since 1998, to identify any potential areas of problem and to assess ways of improving its compliance with environmental laws.

Insurance

The Company's operations are subject to hazards and risks inherent in the drilling, production and storage of petroleum products. As protection against these operations risks, the Company maintains insurance coverage against some, but not all, potential losses, including the loss of wells, as well as liabilities related to costs of pollution control and environmental compliance. In some cases, the agreement under which the Company operates its fields and sells the petroleum products require it to carry insurance, while in other cases, the

Company's management exercises its discretion and determines the fields for which to purchase insurance coverage, taking into account the costs of such insurance and related risks. The Company's insurance coverage includes property damage insurance for certain of its oil and gas fields, its stockpile facilities and the semi-submersible drillship and business interruption insurance for its production activities. The Company also has insurance against damage from terrorism for all of its stockpile and offshore facilities. The Company is not delinquent on any of its insurance payments. The Company believes that its insurance coverage is comparable to that of other companies engaged in similar businesses.

Legal Matters

From time to time the Company is involved in litigations or proceedings that have arisen in the ordinary course of its business, including disputes with respect to its exploration, development and production rights.

In January 2008, the Company and other participating companies were notified by the Iraqi federal government that the Company's agreement with the Kurdistan regional government for participating in the development of the oil blocks in the Kurdistan autonomous region in northern Iraq would be invalid without obtaining proper approval from the Iraqi federal government. The Iraqi federal government's actions stemmed from a proposed amendment in Iraqi energy resources law. The Company was initially advised by legal consultants in England and Iraq that there is no legal basis for the above alleged invalidity of the agreement. Discussions between the Iraqi federal government and the Kurdistan regional government regarding the validity of production agreements entered into by the Kurdistan regional government independent of the Iraqi federal government, as well as the legality of the Kurdistan regional government's authority to export oil, is currently on-going. In November 2014, the Company returned its interests in the Bazian Block, one of its exploration blocks in the Kurdistan autonomous region in Iraq, to the Iraqi federal government.

In January 2009, the Company was notified by the Nigerian government that the PSA entered into in 2006 in respect of the OPL 321 and OPL 323 offshore blocks will be revoked. The Nigerian Ministry of Petroleum Resources alleged that the revocation was due to the Company's failure to make payment in full of a certain signing bonus promised by the Company as the winning bidder during the initial bidding process for the blocks in 2005. The Company and its subsidiaries, KNOC Nigerian East Oil Company Limited and KNOC Nigerian West Oil Limited, filed for judicial review of the Nigerian government's decision with the Federal High Court of Nigeria in March 2008 to declare the revocation null and void, claiming that the Nigerian government has already acknowledged the receipt of full payment of the signing bonus. Owel Petroleum Services Nig. Limited ("Owel Petroleum"), which had allegedly been the local vehicle for the losing bidder during the bidding process for the OPL blocks, later joined the proceedings to be awarded the OPL blocks. In August 2009, the Federal High Court of Nigeria ruled in favor of the Company, and Owel Petroleum and the Nigerian government have subsequently appealed the decision. In April 2012, the Nigerian Court of Appeal partially ruled against Owel Petroleum, and both the Company and Owel Petroleum appealed that decision in June 2012. In February 2017, the Nigerian Supreme Court affirmed the decision of the Court of Appeal and declared the revocation illegal.

In May 2015, 208 employees belonging to the Company's labor union filed a lawsuit at the Seoul Central District Court for unpaid wages amounting to approximately Won 5 billion. On August 23, 2016, the Seoul Central District Court ruled partially in favor of the labor union and ruled that the Company pay Won 3.3 billion in unpaid wages. The case has been appealed to the Seoul High Court in October 2016, where it is currently pending. While the number of total employees eligible to file a similar lawsuit cannot be ascertained at this time, the Company believes that is it unlikely that additional employees will file similar lawsuits, as the initial lawsuit was initiated by the Company's labor union upon discussion with employees belonging to the labor union.

As of the date of this Offering Circular, it is the Company's view that other than as disclosed above and in "Risk Factors — The Company's business may be materially and adversely affected by legal claims and regulatory actions against it," there are no other current or expected litigation or governmental proceedings involving the Company or any of its affiliates the outcome of which may have a material adverse effect on the results of operations or financial condition of the Company.

Intellectual Property and Research & Development

The Company's general policy is to seek intellectual property protection for those inventions and improvements likely to be utilized by its activities or to give it a competitive advantage compared to other fuel sources. The Company relies on a variety of patents, copyrights, trade secrets, trademarks and proprietary information to maintain and enhance its competitive position. The Company's principal brand names are registered trademarks in Korea.

The Company held 28 patents and eight trademarks as of December 31, 2016. The Company does not believe that any individual property right or related group of intellectual property rights is of such importance that its expiration or termination would materially affect the business of the Company.

As of December 31, 2016, the Company employed 94 researchers (including 12 with doctorate and 42 with master's degrees). The Company incurred research and development costs of approximately Won 2 billion in 2015 and Won 0.3 billion in 2016.

Properties

The Company's headquarters and principal offices are located in Ulsan, at 305, Jongga-ro, Jung-gu, Ulsan, 44538, Korea. On January 31, 2017, the Company disposed of its headquarters building and entered into a lease contract for the same premises. The Company has title over nine stockpile branch offices and the stockpile facilities at Ulsan, Yeosu, Pyeong-taek, Geoje, Seosan, Guri, Yong-in, Gokseong and Donghae, as well as the production office for the Donghae-1 gas project.

MANAGEMENT

The Company's Articles of Incorporation provide that the board of directors shall be made up of no more than seven standing directors (including the President, who also serves as the Chief Executive Officer of the Company) and eight non-standing directors. The Articles of Incorporation also requires the Company to establish an Audit Committee as a committee of the board of directors. All non-standing directors are independent. The directors have terms of two years (with the exception of the President, whose term is for three years). The activities within the discretion of the board of directors are subject to the Act on the Management of Public Agencies, the KNOC Act, the Company's Articles of Incorporation and its internal regulations, and include establishing the budget, issuing debentures and amending the Company's Articles of Incorporation when necessary.

Under the KNOC Act, the Act on the Management of Public Agencies and the Articles of Incorporation of the Company, the President, who serves as the Company's chief executive, is nominated by the Company's Officer and Executive Recommending Committee. The Officer and Executive Recommendation Committee recommends a pool of candidates, which is then deliberated by the Committee for Management of Public Agencies established pursuant to the Act on Management of Public Agencies. After such deliberations, the President is appointed by the President of Korea upon the recommendation of the Minister of Trade, Industry and Energy.

The President is deemed to have the capacity of a representative director where the Korean Commercial Code applies and thus administers most of the day-to-day business that is not specifically designated as a responsibility of the board of directors. The President must enter into a management contract with the Ministry of Trade, Industry and Energy pursuant to which the President must meet a certain minimum level of performance each year. Under the current management contract with the President and the Articles of Incorporation of the Company, if the board of directors of the Company determines that the President's ability to perform its duties has been seriously impaired (due to reasons such as the President's violation of applicable laws or the Company's Articles of Incorporation, or the President's failure to diligently perform its duties), the board of directors may pass a resolution to propose dismissal of the President to the Minister of Trade, Industry and Energy.

Standing directors other than the President and the standing member of the Audit Committee are appointed by the President. The standing directors assist the President and act on his or her behalf when the President is unable to act.

The non-standing directors are appointed by the Minister of Strategy and Finance, after being selected by the Committee for Management of Public Agencies from a pool of candidates recommended by the Officer and Executive Recommendation Committee.

Pursuant to the Articles of Incorporation of the Company or, if applicable, as mandated by applicable laws, the board of directors may establish by resolution committees to facilitate its efficient operation in carrying out various management functions. The Audit Committee and the Officer and Executive Recommendation Committee have been established pursuant to applicable laws.

The Audit Committee is comprised of three members, of whom two members are non-standing directors. The Audit Committee has at least one member who is an accounting or financial expert, and its chairperson is a non-standing director. The principal function of the Audit Committee is to conduct internal review of the Company's operations and accounting, and to present its opinion to the board of directors, thereby ensuring the independence and professionalism of the Company.

The Officer and Executive Recommendation Committee is comprised of non-standing directors and private citizens appointed by the board of directors, and is chaired by one of the non-standing directors elected by the members of the Committee to serve as chairperson. The Officer and Executive Recommendation Committee is responsible for the selection and recommendation of candidates to serve as President, standing member of the Audit Committee or non-standing directors.

In addition to the Audit Committee and the Officer and Executive Recommendation Committee, the board of directors has established the Investment Risk Management Committee as well as various other committees to further facilitate the management activities of the board of directors.

The Investment Risk Management Committee is comprised of no more than seven members, including three internal and three external experts as well as the standing director in charge of risk management. The Investment Risk Management Committee reviews and makes recommendations to the board of directors with respect to the Company's new oil and gas projects, acquisitions or disposals of equity interests and other investment activities of the Company, including issues relating to risks associated with international and domestic oil and gas prices and the liquidity of the Company.

The Company's address is 305, Jongga-ro, Jung-gu, Ulsan, 44538, Korea. Summary biographical information regarding the Company's directors is set out below.

Standing Directors

The Company's standing directors are as follows:

Name	Age	Position	Director Since	Date Term Ends
Jung Rae Kim	62	President and Chief Executive Officer	February 2016	February 2019
Youn Sung Byun	59	Standing Member of Audit Committee	February 2015	February 2017*
Kang Hyun Shin	56	Executive Vice President of the Petroleum Stockpile Group	September 2013	March 2017*
Jae Woong Lee	56	Executive Vice President of the Planning & Budgeting Group	July 2016	July 2018
Si Woo Kim	62	Executive Vice President of the Administration Group	July 2016	July 2018
Seung Kook Lee	54	Executive Vice President of the Exploration & Production Group	July 2016	July 2018

* The term of this director has expired, but pursuant to the Act on the Management of Public Institutions, the director is continuing his duties until his term is officially extended or a successor is appointed.

Jung Rae Kim has served as a standing director, president and chief executive officer of the Company since February 2016. Mr. Kim previously served as president and chief executive officer of Hyundai Heavy Industries Co., Ltd. and Hyundai Corporation. He holds a bachelor's degree in business from Seoul National University and a master's degree in industrial engineering from Korea Advanced Institute of Science and Technology.

Youn Sun Byun has served as standing member of the Audit Committee of the Company since February 16, 2015. Prior to joining the Company, Mr. Byun previously served as the representative chief executive officer of PEACH Holdings Co., Ltd. and PEACH Telecom Co., Ltd. He holds a bachelor's degree in electrical engineering from Korea University and a doctorate in economics from Georgia State University.

Kang Hyun Shin has served as a standing director and executive vice president for the Petroleum Stockpile Group since September 13, 2013. Mr. Shin previously served as vice president of the Company's Petroleum Marketing Department and as manager of Management Planning Team. He holds a bachelor's degree in civil administration from University of Seoul.

Jae Woong Lee has served as a standing director and executive vice president for the Planning & Budget Group since July 22, 2016. Mr. Lee previously served as the executive vice president of the Company's Administration Group. He holds a bachelor's degree in business from Chungnam National University and a master's degree in business from Hanyang University.

Si Woo Kim has served as a standing director and executive vice president for the Administration Group since July 22, 2016. Mr. Kim previously served as the chief administrative officer of SK hynix Inc. He holds a bachelor's degree in law from Seoul National University.

Seung Kook Lee has served as a standing director and executive vice president for the Exploration & Production Group since July 22, 2016. Mr. Lee previously served as the vice president of the Company's Exploration Department. He holds both a bachelor's degree and a master's degree in natural resources engineering from Hanyang University.

Non-Standing Directors

The Company's non-standing directors are as follows:

Name	Age	Position	Director Since	Date Term Ends
Byeong ok Ahn	61	Professor, Gongju University	January 2014	January 2018
Hag Yong Sung	60	Professor, Ulsan University	August 2014	August 2017
Han Joo Yoo	57	Professor, Soongsil University	October 2014	October 2016*
Woon Wha Park	50	CEO, KT&C Co., Ltd.	October 2014	October 2017
Bo Hyun Chon	62	Professor, Inha University	February 2015	February 2017*
Yong Seok Kim	67	Head of Operations, National Crisis Management Institute of Dankook University	April 2016	April 2018
Tae-Young Kim	53	Attorney at Law, Gangnam LLP	April 2016	April 2018

* The term of this director has expired, but pursuant to the Act on the Management of Public Institutions, the director is continuing his duties until his term is officially extended or a successor is appointed.

Byeong ok Ahn has served as a non-standing director since January 28, 2014. Mr. Ahn currently serves as a professor at Gongju University. He holds a bachelor's degree in law from Korea University, a master's degree in public administration from Yonsei University and a doctorate in political science from Kyeonghui University.

Hag Yong Sung has served as a non-standing director since August 12, 2014. Mr. Sung is currently a professor of business administration at Ulsan University. He holds a bachelor's degree in chemical engineering from Pusan National University and a master's degree in business administration from Ulsan University.

Han Joo Yoo has served as a non-standing director since October 28, 2014. Mr. Yoo is currently a professor of business administration at Soongsil University. He holds a bachelor's degree and a master's degree in business administration from Sogang University and a doctorate in business administration from Korea University.

Woon Wha Park has served as a non-standing director since October 28, 2014. Mr. Park is currently the chief executive officer of KT&C Co., Ltd. He holds a bachelor's degree in French literature from Dangook University.

Bo Hyun Chon has served as a non-standing director since February 9, 2015. Mr. Chon is currently a professor of energy resource engineering at Inha University. He holds a bachelor's degree in mineral and petroleum engineering from Seoul National University and a master's degree and a doctorate in petroleum engineering from Texas A&M University.

Yong Seok Kim has served as a non-standing director since April 12, 2016. Mr. Kim is currently the head of operations at the National Crisis Management Institute of Dankook University. He holds a bachelor's degree in politics from the Korea Military Academy and Seoul National University and a master's degree and a doctorate in business administration from Dongkuk University.

Tae-Young Kim has served as a non-standing director since April 12, 2016. Mr. Kim is currently an attorney at law at Gangnam LLP. He holds a bachelor's degree in law from Seoul National University.

RELATED PARTY TRANSACTIONS

The Company engages in a variety of transactions with related parties in its ordinary course of business, including providing long-term loans to its affiliates from time to time. The following table sets forth the amount of long-term loans outstanding with respect to loans made to affiliates as of December 31, 2014, 2015 and 2016. See Note 40 to the Company's audited consolidated financial statements as of and for the years ended December 31, 2016 and 2015 and Note 43 to the Company's audited consolidated financial statements as of and for the years ended December 31, 2015 and 2014 included elsewhere in this Offering Circular for further information about the Company's related party transactions.

	As of December 31,		
Related Parties	**2014**	**2015**	**2016**
	(In millions of Won)		
KNOC Kamchatka Petroleum Ltd.	₩ 83	₩ —	₩ —
KNOC Nigerian West Oil Company Ltd	24,277	26,127	31,239
KNOC Nigerian East Oil Company Ltd	29,137	28,506	34,928
KC Kazakh B. V.	133,723	—	—
Offshore International Group, Inc.	—	—	68,280
KNOC Ferghana2 Ltd.	12,061	13,332	—
KADOC Ltd	98,430	163,814	185,739
Kernhem B.V.	48,082	39,280	41,989
ADA Oil LLP	10,913	11,635	11,998
Parallel Petroleum LLC	—	5,852	6,213

The Company also provides payment and performance guarantees for Harvest Operations, Dana Petroleum and ANKOR E&P Holdings Corporation as of December 31, 2016. For Harvest Operations, the Company provided guarantees of US$196 million for bonds issued in June 2016, US$630 million for bonds issued in May 2013 and CAD 1 billion for a credit facility. For Dana Petroleum, the Company provided performance guarantees of GBP 58 million for expenses in restoring, decommissioning, dismantling and removing facilities and structures in the field and NOK 235 million for transferring restoring obligations. For ANKOR E&P Holdings Corporation, the Company provided a payment guarantee up to US$108 million for borrowings and a performance guarantee of US$127 million for restoration of oil and gas sites held by the affiliate. See Note 42 to the Company's audited consolidated financial statements included in this Offering Circular.

REGULATION

The Company was established as a juridical entity under the KNOC Act and is subject to the rules and regulations of the KNOC Act. The Company is also subject to all general rules and regulations applicable to corporations under the Act on the Management of Public Agencies, unless otherwise provided for in the KNOC Act.

The KNOC Act

Under the KNOC Act, the Company is established as a statutory juridical entity for the purpose of efficient performance of businesses relating to development of oil resources, oil stockpile and enhancement of oil distribution channels. In order to achieve these objectives, the KNOC Act allows the Company to undertake, among others, the following activities:

- Exploration and development of oil resources;
- Export and import, stockpiling, transportation, lease and sales of crude oil and oil products;
- Construction, maintenance, management and lease of oil stockpile facilities;
- Enhancement of oil distribution channels;
- Investment, financing, guarantee of debt and materials lease for corporations engaged in businesses relating to energy and resources; and
- Technology support, research and development and provision of information for businesses set forth above.

The Company's authorized capital is Won 13 trillion which is to be funded solely by the Government. Under the KNOC Act, the Ministry of Trade, Industry and Energy is granted the power to direct and supervise the Company's activities relating to its business of exploration, development and production of oil resources inside and outside of Korea, purchase and operation of the oil stockpile, construction and management of oil stockpile facilities, collection, processing and production of oil trading information, and enhancement of oil distribution channels.

In addition, the Company may issue bonds for its business to the extent not exceeding 200% of the sum of the Company's capital and reserve, by a resolution of its board of directors in accordance with the KNOC Act. The Company may also incur indebtedness (such as loans) for its operations. The Government may guarantee the repayment of the Company's bonds and the principal and interest amount of its loans, and provide subsidies in respect of the Company's business activities. However, the Notes are not guaranteed by the Government.

Petroleum and Petroleum Substitute Fuel Business Act

Under the Petroleum Business Act, the Ministry of Trade, Industry and Energy is required to set goals for oil stockpiling to stabilize the supply and demand of oil as well as its prices, and develop a master plan each year to implement these goals. The stockpiling master plan must include matters relating to the oil stockpile target level, categories of oil to be stockpiled and stockpiling facilities. Under the Government's Fourth Stockpiling Master Plan, the Company is required to implement the Government's goal of maintaining the stockpile capacity at 146 million barrels and achieve stockpile oil reserves of 107 million barrels.

Persons who intend to operate an oil export-import business are required to have their business registered with the Minister of Trade, Industry and Energy. However, this requirement does not apply to exports and imports of oil undertaken by the Company to implement the oil stockpile plan under the KNOC Act.

Overseas Resources Development Business Act

Under the Overseas Resource Development Business Act, the development of overseas resources may be conducted in one of the following manners:

- a Korean national developing overseas resources individually or jointly with foreigners (including development through local companies established overseas);
- a Korean national providing technical services to foreigners that are developing overseas resources; or
- a Korean national providing funding to foreigners that are developing overseas resources and importing all or part of the overseas resources they develop.

The Government must establish and execute a master plan for the development of overseas resources. If a Korean national desires to operate an overseas resources development business, such person must report the plan for overseas resources development to the Minister of Trade, Industry and Energy.

The Government may provide funds to an overseas resource developer to conduct the necessary research and analysis for starting an overseas resources development business and to acquire the right to develop such resources. The Government may also provide funds for the installation and operation of facilities required for an overseas resources development business, and funds for leasing or buying land necessary to conduct an overseas resources development business.

If the stability and normal functioning of the national economy are harmed or feared to be harmed when a serious disruption to the supply and demand of resources occurs due to an imbalance of supply and demand of resources in Korea and abroad, or there are concerns over such occurrence, the Minister of Trade, Industry and Energy may order overseas resources developers to bring to Korea the whole or part of the overseas resources developed by such developer to stabilize the supply and demand of resources, and the overseas resources developers subject to such an order must comply with the order in the absence of special circumstances.

The Company has been delegated by the Ministry of Trade, Industry and Energy to inspect or investigate matters necessary for the operation of overseas oil development businesses.

Submarine Mineral Resources Development Act

The Submarine Mineral Resources Development Act aims to contribute to the growth of the Korean industry by developing, in a reasonable manner, submarine resources in (i) the Korean peninsula, (ii) the ocean adjacent to the coastlines of islands belonging to Korea, and (iii) the continental shelf under Korea's control to the greatest extent possible. Submarine mining rights are the rights authorized by the Ministry of Trade, Industry and Energy to explore, gather and acquire submarine resources from submarine resource areas owned by Korea, and such rights are categorized into exploration rights and production rights. The exploration rights cannot be granted for a period greater than 10 years from the date of the issuance unless there are special circumstances. The production rights cannot be granted for a period exceeding 30 years from the date of the issuance. A holder of a submarine mining right must pay a mining fee to the Ministry of Trade, Industry and Energy in accordance with the standard stipulated in the Presidential Decree when producing submarine resources in the submarine resource areas. If the submarine resource produced by the holder of production rights is natural gas, the natural gas may be sold to gas wholesalers pursuant to the Urban Gas Business Act or to installers of gas supply facilities other than urban gas businesses. In such cases, there is no need to obtain a permit under the Urban Gas Business Act relating to the gas wholesale business.

Legislation Relating to the Operation and Management of the Company

Act on the Management of Public Agencies

The KNOC Act prescribes that the affairs regarding the Company's structure and management must be governed by the Act on the Management of Public Agencies. Under the Act on the Management of Public Agencies, the Company is required to make public many aspects of its affairs including, among others, the objectives of management, its budget and business plan, its financial statements and supplementary documents, status of personnel including directors and officers, its articles of incorporation, its bond register and the minutes of the board of directors (but confidential information on the management provided for in the minutes of board of directors need not be disclosed to the public) and the audit report of its Audit Committee. Full-time officers and employees may not be engaged in activities having purposes of commercial advantage. The Company's fiscal year must be the same as the Korean government's fiscal year. The Company must present mid- to long-term management objectives covering five fiscal years to the Minister of Trade, Industry and Energy and the Minister of Strategy and Finance on an annual basis. The Company may be audited by the Board of Audit and Inspection of Korea based on its business activities and accounting.

Act on the Special Accounts for Energy and Resources

The SAER Act has been enacted to implement certain special accounts for energy and resources-related projects so as to supply energy, stabilize prices and efficiently promote resources-related projects. The SAER Act is managed and supervised by the Ministry of Trade, Industry and Energy. Those accounts may be categorized into investment accounts and loan accounts.

Revenue from the investment account is primarily composed of surcharges and additional charges arising out of the Petroleum Business Act, the Urban Gas Business Act and the Mining Industry Act. Expenditure from the investment account is primarily composed of operating expenses needed for energy and resources related businesses and contributions or subsidies for such businesses as well as contributions or investments to institutions or groups engaged in the energy and resources-related businesses.

Revenue from the loan account is primarily composed of income from the principal and interest amount arising out of the loan amount. Expenditure is primarily composed of loans to the subject institutions to support energy and resources- related businesses.

If there are insufficient funds to meet the expenditure, long term loans may be arranged within the limits set by the resolution of the National Assembly. Temporary loans may also be arranged if there is a temporary shortage of funds, provided that repayment on the principal amount of the temporary loan must be made within the relevant accounting year. Any expenditure not made within the relevant accounting year may be carried over to the following accounting year notwithstanding any provisions in the State Finance Act.

The Ministry of Trade, Industry and Energy may commission the Company to manage finances such as the receipt of revenue, payment and settlement of the budget relating to this account (excluding management of coal stockpiling facilities and coal reserves) and to manage the reserve funds.

Regulations on Contractual Business of Public Enterprises and Semi-Government Institutions

Contracts entered into by the Company must conform to Regulations on Contractual Business of Public Enterprises and Semi-Governmental Institutions ("Regulations on Contractual Business") determined by the Ministry of Strategy and Finance in accordance with the Act on the Management of Public Agencies. According to the Regulations on Contractual Business, if it is deemed necessary for the business characteristics of public enterprises and semi-government entities or for fairness and transparency, or if there are any other inevitable reasons, a standard or procedure different from those set forth in the Regulations on Contractual Business may be newly established. For those matters not specified in the Regulations on Contractual Business, the Act on Contracts to which the Government Is a Party will be applied. In principle, contracts must be made through open bids, but if it is deemed necessary, nominated competitive bids or private contracts may also be made.

Environmental Legislation

Air Environment Preservation Act

The purpose of the Air Environment Preservation Act is to protect public health and prevent environmental damage arising from air pollution. The Air Environment Preservation Act provides for the Ministry of

Environment to determine standards for the sulphur content of fuel. The Ministry of Environment can determine the supply area and range of facilities to use the respective fuels and may in some circumstances prohibit or restrict the production, sale or use of certain fuels. According to the Air Environment Preservation Act, the Minister of Environment or mayor or provincial governor may prohibit the use of fuels other than gaseous fuel such as LNG and LPG which release relatively smaller amounts of pollutants in an area or facility designated by the Enforcement Decree of the Air Environment Preservation Act as a place where these permitted fuels should be used, regardless of the restriction measures on the use of fuel under the Air Environment Preservation Act.

Marine Environment Management Act

The purpose of the Marine Environment Management Act is to prevent dangers arising from marine life damage or marine pollution, and create a clean and safe marine environment. Under the Marine Environment Management Act, no one may discharge pollutants from a ship, marine facility or marine space to the ocean or discharge waste generated from land. Any person who owns a marine facility must prepare and keep a log of noxious liquid substances in the facility, including the volume of use and matters relating to the carrying in and out of such noxious liquid substances. The owner of a marine facility must equip the marine facility with the materials and chemicals used for the prevention and control of pollutants.

Soil Environment Conservation Act

The purpose of the Soil Environment Conservation Act is to prevent potential danger or injury to public health and the environment due to soil contamination and to conserve the soil ecosystem by properly maintaining and preserving soil, including by restoring contaminated soil.

The level of soil contamination is determined by the ordinance of the Ministry of Environment. A person who causes soil contamination must, where any damages occur due to such soil contamination, compensate for the damages caused and restore the contaminated soil. Where there exist two or more persons who cause soil contamination, and it is impossible to determine which one has caused the damages, each of them must jointly and severally compensate for such damages and restore the contaminated soil.

If anyone who produces, transports, stores, handles, processes or treats soil contaminants discharges or leaks them in the process, such person must report such fact without delay to the competent administrative agency. The competent administrative agency that receives such a report may survey the cause and the level of soil contamination. If the competent administrative agency determines that the soil has been contaminated, then the person who causes such soil contamination may be ordered to restore the contaminated soil and, if such order is not complied with, such person will become subject to criminal liabilities.

Environmental Impact Assessment Act

The purpose of the Environmental Impact Assessment Act is to promote the environmentally friendly and sustainable development of business by assessing in advance the impact on the environment of the business which is subject to the environmental impact assessment when the business plan is established and implemented and, thus, promoting the comfortable and secure lives of citizens. Anyone who desires to operate a business that is subject to the environmental impact assessment must prepare such assessment which will be reviewed by the Minister of Environment. The Minister of Environment may supplement or adjust the business plan according to its review.

To avoid damage to the environment from of the operation of a business, its impact on the environment must be investigated according to the assessment items agreed in advance and the result must be notified to the approval institution or the Minister of Environment ("Post Investigation of Impact on the Environment"). An energy development business is one of the businesses that are subject to the environmental impact assessment and the Post Investigation of Impact on the Environment. Among other things, the following businesses are subject to the environmental impact assessment and the Post Investigation of Impact on the Environment:

- Businesses in the development of underwater mining under the Submarine Mineral Resources Development Act which have the objective of energy development;

- Businesses in the mining industry under the Mining Industry Act having the objective of energy development (limited to those equal to or exceeding 300,000 square meters of mining area); and
- Oil business operator's installation of (i) oil storage facilities under the Petroleum Business Act and (ii) oil stockpile facilities under the KNOC Act (limited to those equal to or exceeding 100,000 kilo liters of storage volume).

TAXATION

United States Taxation

The following is a summary of certain United States federal income tax considerations that may be relevant to a holder of a Note that is, for U.S. federal income tax purposes, a citizen or resident of the United States or a domestic corporation or that otherwise is subject to United States federal income taxation on a net income basis in respect of the Note (a “United States holder”). This summary is based on laws, regulations, rulings and decisions now in effect, all of which are subject to change. This summary deals only with United States holders that will hold Notes as capital assets, and does not address tax considerations applicable to investors that may be subject to special tax rules, such as banks, tax-exempt entities, insurance companies, dealers in securities or currencies, traders in securities electing to mark to market, persons that will hold Notes as a position in a “straddle” or conversion transaction, or as part of a “synthetic security” or other integrated financial transaction, persons that hold Notes in bearer form, entities taxed as partnerships or the partners therein or persons that have a “functional currency” other than the U.S. dollar. This summary also does not address consequences arising under state, local or foreign tax laws, or the Medicare tax on net investment income. Because Bearer Notes cannot be offered or sold in connection with their initial distribution to U.S. citizens or residents (or to other persons located in the United States), this summary does not discuss special tax considerations relevant to the ownership and disposal of Bearer Notes by United States holders. Any special United States federal income tax considerations relevant to a particular issue of Notes, including any Index Linked Notes or Dual Currency Notes, will be provided in the applicable Pricing Supplement.

Investors should consult their own tax advisors in determining the tax consequences to them of holding Notes, including the application to their particular situation of the United States federal income tax considerations discussed below, as well as the application of state, local, foreign or other tax laws.

Payments of Interest and Additional Amounts. The gross amount of payments of “qualified stated interest” (as defined below under “Original Issue Discount”) and additional amounts, if any (*i.e.*, without reduction for Korean withholding taxes), but excluding any pre-issuance accrued interest, on a Note will be taxable to a United States holder as ordinary interest income at the time that such payments are accrued or are received (in accordance with the United States holder’s method of tax accounting).

If payments of this kind are made with respect to a note denominated in a single currency other than the U.S. dollar (a “Foreign Currency Note”), the amount of interest income realized by a United States holder that uses the cash method of tax accounting will be the U.S. dollar value of the Specified Currency payment based on the exchange rate in effect on the date of receipt regardless of whether the payment in fact is converted into U.S. dollars. A United States holder that uses the accrual method of accounting for tax purposes will accrue interest income on the Note in the relevant foreign currency and translate the amount accrued into U.S. dollars based on the average exchange rate in effect during the interest accrual period (or portion thereof within the United States holder’s taxable year), or, at the accrual basis United States holder’s election, at the spot rate of exchange on the last day of the accrual period (or the last day of the taxable year within such accrual period if the accrual period spans more than one taxable year), or at the spot rate of exchange on the date of receipt, if such date is within five business days of the last day of the accrual period. A United States holder that makes such election must apply it consistently to all debt instruments from year to year and cannot change the election without the consent of the Internal Revenue Service (the “IRS”). A United States holder that uses the accrual method of accounting for tax purposes will recognize foreign currency gain or loss, as the case may be, on the receipt of an interest payment made with respect to a Foreign Currency Note if the exchange rate in effect on the date the payment is received differs from the rate applicable to a previous accrual of that interest income. Amounts attributable to pre-issuance accrued interest will generally not be includable in income, except to the extent of foreign currency gain or loss attributable to any changes in exchange rates during the period between the date the United States holder acquired the Note and the first Interest Payment Date. This foreign currency gain or loss will be treated as ordinary income or loss but generally will not be treated as an adjustment to interest income received on the Note.

Purchase, Sale and Retirement of Notes. A United States holder’s tax basis in a Note generally will equal the cost of such Note to such holder, increased by any amounts includible in income by the holder as original issue discount and market discount and reduced by any amortized premium (each as described below) and any payments other than payments of qualified stated interest made on such Note. In the case of a Foreign Currency Note, the cost of such Note to a United States holder will be the U.S. dollar value of the foreign currency purchase price on the date of purchase. In the case of a Foreign Currency Note that is traded on an established securities market, a cash basis United States holder (and, if it so elects, an accrual basis United States holder) will determine the U.S. dollar value of the cost of such Note by translating the amount paid at the spot rate of exchange on the settlement date of the purchase. The amount of any subsequent adjustments to a United States holder's tax basis in a Note in respect of original issue discount, market discount and premium denominated in a Specified Currency will be determined in the manner described under "Original Issue Discount" and "Premium and Market Discount" below. The conversion of U.S. dollars to a Specified Currency and the immediate use of the Specified Currency to purchase a Foreign Currency Note generally will not result in taxable gain or loss for a United States holder.

Upon the sale, exchange or retirement of a Note, a United States holder generally will recognize gain or loss equal to the difference between the amount realized on the sale, exchange or retirement (less any accrued qualified stated interest, which will be taxable as such) and the United States holder's tax basis in such Note. If the United States holder receives property (other than cash) in respect of the sale, exchange or retirement of a Note, the amount realized will be the fair market value of such property at the time of such sale, exchange or retirement. If a United States holder receives a currency other than the U.S. dollar in respect of the sale, exchange or retirement of a Note, the amount realized will be the U.S. dollar value of the currency received calculated at the exchange rate in effect on the date the instrument is disposed of or retired. In the case of a Foreign Currency Note that is traded on an established securities market, a cash basis United States holder, and if it so elects, an accrual basis United States holder will determine the U.S. dollar value of the amount realized by translating such amount at the spot rate on the settlement date of the sale. The election available to accrual basis United States holders in respect of the purchase and sale of Foreign Currency Notes traded on an established securities market, discussed above, must be applied consistently to all debt instruments from year to year and cannot be changed without the consent of the IRS.

Except as discussed below with respect to market discount, Short-Term Notes (as defined below) and foreign currency gain or loss, gain or loss recognized by a United States holder generally will be long-term capital gain or loss if the United States holder has held the Note for more than one year at the time of disposition. Long-term capital gains recognized by an individual holder generally are subject to tax at a lower rate than short-term capital gains or ordinary income. The deduction of capital losses is subject to limitations.

Gain or loss recognized by a United States holder on the sale, exchange or retirement of a Foreign Currency Note generally will be treated as ordinary income or loss to the extent that the gain or loss is attributable to changes in exchange rates during the period in which the holder held such Note. This foreign currency gain or loss will not be treated as an adjustment to interest income received on the Notes.

Original Issue Discount. If the Issuer issues Notes at a discount from their stated redemption price at maturity (as defined below), and the discount is equal to or more than the product of one-fourth of one percent (0.25 percent) of the stated redemption price at maturity of such Notes multiplied by the number of full years to their maturity (the "*de minimis* threshold"), such Notes will be "OID Notes." The difference between the issue price and the stated redemption price at maturity of such Notes will be the "original issue discount" ("OID"). The "issue price" of a Note will be the first price at which a substantial amount of the Notes is sold to the public (*i.e.*, excluding sales of the Notes to underwriters, placement agents, wholesalers, or similar persons). The "stated redemption price at maturity" will include all payments under a Note other than payments of qualified stated interest.

United States holders of Notes generally will be subject to the special tax accounting rules for obligations issued with original issue discount provided by the Internal Revenue Code of 1986, as amended, and certain regulations promulgated thereunder (the "OID Regulations"). United States holders of such Notes should be aware that, as described in greater detail below, they generally must include OID in ordinary gross income for United States federal income tax purposes as it accrues, in advance of the receipt of cash attributable to that income.

In general, each United States holder of an OID Note, regardless of whether the holder uses the cash or the accrual method of tax accounting, will be required to include in ordinary gross income the sum of the "daily portions" of OID on the Note for all days during the taxable year that the United States holder owns the Note. The daily portions of OID on an OID Note are determined by allocating to each day in any accrual period a ratable portion of the OID allocable to that accrual period. Accrual periods may be any length and may vary in length over the term of an OID Note, provided that no accrual period is longer than one year and each scheduled payment of principal or interest occurs on either the final day or the first day of an accrual period. In the case of an initial holder, the amount of OID on an OID Note allocable to each accrual period is determined by (a) multiplying the "adjusted issue price" (as defined below) of the OID Note at the beginning of the accrual period by its yield to maturity (appropriately adjusted to reflect the length of the accrual period) and (b) subtracting from that product the amount (if any) of qualified stated interest allocable to that accrual period. The "yield to maturity" of a Note is the discount rate that causes the present value of all payments on the Note as of its original issue date to equal the issue price of the Note. The "adjusted issue price" of an OID Note at the beginning of any accrual period will generally be the sum of its issue price (generally including accrued interest, if any) and the amount of OID allocable to all prior accrual periods, reduced by the amount of all payments other than payments of qualified stated interest (if any) made with respect to such Note in all prior accrual periods. The term "qualified stated interest" generally means stated interest that is unconditionally payable in cash or property (other than debt instruments of the issuer) at least annually during the entire term of an OID Note at a single fixed rate of interest or, subject to certain conditions, based on one or more interest indices. As a result of this "constant yield" method of including OID in income, the amounts includible in income by a United States holder in respect of an OID Note denominated in U.S. dollars generally are lesser in the early years and greater in the later years than the amounts that would be includible on a straight-line basis.

All payments on an OID Note (other than payments of qualified stated interest) will generally be viewed first as payments of previously-accrued OID (to the extent thereof), with payments attributed first to the earliest-accrued OID, then as payments of principal.

A United States holder generally may make an irrevocable election to include in its income its entire return on a Note (*i.e.*, the excess of all remaining payments to be received on the Note, including payments of qualified stated interest, over the amount paid by such United States holder for such Note) under the constant-yield method described above. For Notes purchased at a premium or bearing market discount in the hands of the United States holder, the United States holder making such election will also be deemed to have made the election (discussed below in "Premium and Market Discount") to amortize premium or to accrue market discount in income currently on a constant-yield basis.

In the case of an OID Note that is also a Foreign Currency Note, a United States holder should determine the U.S. dollar amount includible in income as OID for each accrual period by (a) calculating the amount of OID allocable to each accrual period in the Specified Currency using the constant-yield method described above, and (b) translating the amount of the Specified Currency so derived at the average exchange rate in effect during that accrual period (or portion thereof within a United States holder's taxable year) or, at the United States holder's election (as described above under "— Payments of Interest"), at the spot rate of exchange on the last day of the accrual period (or the last day of the taxable year within such accrual period if the accrual period spans more than one taxable year), or at the spot rate of exchange on the date of receipt, if such date is within five business days of the last day of the accrual period. Because exchange rates may fluctuate, a United States holder of an OID Note that is also a Foreign Currency Note may recognize a different amount of OID income in each accrual period than would the holder of an otherwise similar OID Note denominated in U.S. dollars. All payments on an OID Note (other than payments of qualified stated interest) will generally be viewed first as payments of previously-accrued OID (to the extent thereof), with payments attributed first to the earliest-accrued OID, and then as payments of principal. Upon the receipt of an amount attributable to OID (whether in connection with a payment of an amount that is not qualified stated interest or the sale or retirement of the OID Note), a United States holder will recognize ordinary income or loss measured by the difference between the amount received (translated into U.S. dollars at the exchange rate in effect on the date of receipt or on the date of disposition of the OID Note, as the case may be) and the amount accrued (using the exchange rate applicable to such previous accrual).

A subsequent United States holder of an OID Note that purchases the Note at a cost less than its remaining redemption amount (as defined below), or an initial United States holder that purchases an OID Note at a price other than the Note's issue price, also generally will be required to include in gross income the daily portions of OID, calculated as described above. However, if the United States holder acquires the OID Note at a price greater than its adjusted issue price, such holder is required to reduce its periodic inclusions of OID income to reflect the premium paid over the adjusted issue price. The "remaining redemption amount" for a Note is the total of all future payments to be made on the Note other than payments of qualified stated interest.

Floating Rate Notes generally will be treated as "variable rate debt instruments" under the OID Regulations. Accordingly, the stated interest on a Floating Rate Note generally will be treated as "qualified stated interest" and such a Note will not have OID solely as a result of the fact that it provides for interest at a variable rate. If a Floating Rate Note qualifying as a "variable rate debt instrument" is an OID Note, for purposes of determining the amount of OID allocable to each accrual period under the rules above, the Note's "yield to maturity" and "qualified stated interest" will generally be determined as though the Note bore interest in all periods at a fixed rate equal to the rate that would be applicable to the interest payments on the Note on its date of issue or, in the case of certain Floating Rate Notes, the rate that reflects the yield that is reasonably expected for such Note. Additional rules may apply if interest on a Floating Rate Note is based on more than one interest index. If a Floating Rate Note does not qualify as a "variable rate debt instrument," the Note will be subject to special rules (the "Contingent Payment Regulations") that govern the tax treatment of debt obligations that provide for contingent payments ("Contingent Debt Obligations"). A detailed description of the tax considerations relevant to United States holders of any such Notes will be provided in the applicable Pricing Supplement.

Certain of the Notes may be subject to special redemption, repayment or interest rate reset features, as indicated in the applicable Pricing Supplement. Notes containing such features, in particular OID Notes, may be subject to special rules that differ from the general rules discussed above. Purchasers of Notes with such features should carefully examine the applicable Pricing Supplement and should consult their own tax advisors with respect to such Notes since the tax consequences with respect to such features, and especially with respect to OID, will depend, in part, on the particular terms of the purchased Notes.

If a Note provides for a scheduled Accrual Period that is longer than one year (for example, as a result of a long initial period on a Note with interest is generally paid on an annual basis), then stated interest on the Note will not qualify as "qualified stated interest" under the applicable Treasury Regulations. As a result, the Note would be an Original Issue Discount Note. In that event, among other things, cash-method United States holders will be required to accrue stated interest on the Note under the rules for OID described above, and all United States holders will be required to accrue OID that would otherwise fall under the *de minimis* threshold.

Premium and Market Discount. A United States holder of a Note that purchases the Note at a cost greater than its remaining redemption amount (as defined in the third preceding paragraph) will be considered to have purchased the Note at a premium, and may elect to amortize such premium (as an offset to interest income), using a constant-yield method, over the remaining term of the Note. Such election, once made, generally applies to all bonds held or subsequently acquired by the United States holder on or after the first taxable year to which the election applies and may not be revoked without the consent of the IRS. A United States holder that elects to amortize such premium must reduce its tax basis in a Note by the amount of the premium amortized during its holding period. OID Notes purchased at a premium will not be subject to the OID rules described above. With respect to a United States holder that does not elect to amortize bond premium, the amount of bond premium will be included in the United States holder's tax basis when the Note matures or is disposed of by the United States holder. Therefore, a United States holder that does not elect to amortize such premium and that holds the Note to maturity generally will be required to treat the premium as capital loss when the Note matures.

In the case of premium in respect of a Foreign Currency Note, a United States holder should calculate the amortization of such premium in the Specified Currency. Amortization deductions attributable to a period reduce interest payments in respect of that period and therefore are translated into U.S. dollars at the exchange rate used by the United States holder for such interest payments. Exchange gain or loss will be realized with respect to amortized bond premium on such a Note based on the difference between the exchange rate on the date or dates such premium is recovered through interest payments on the Note and the exchange rate on the date on which the United States holder acquired the Note.

If a United States holder of a Note purchases a Note, other than a Short-Term Note, at a price that is lower than its remaining redemption amount, or in the case of an OID Note, a price that is lower than its adjusted issue price, by at least 0.25% of its remaining redemption amount multiplied by the number of remaining whole years to maturity, the Note will be considered to have "market discount" in the hands of such United States holder. In such case, gain realized by the United States holder on the disposition of the Note generally will be treated as ordinary income to the extent of the market discount that accrued on the Note while held by such United States holder. In addition, the United States holder could be required to defer the deduction of a portion of the interest paid on any indebtedness incurred or maintained to purchase or carry the Note. In general terms, market discount on a Note will be treated as accruing ratably over the term of such Note, or, at the election of the holder, under a constant-yield method. Market discount on a Foreign Currency Note will be accrued by a United States holder in the Specified Currency. The amount includible in income by a United States holder in respect of such accrued market discount will be the U.S. dollar value of the amount accrued, generally calculated at the exchange rate in effect on the date that the Note is disposed of by the United States holder.

A United States holder may elect to include market discount in income on a current basis as it accrues (on either a ratable or constant-yield basis), in lieu of treating a portion of any gain realized on a sale of a Note as ordinary income. If a United States holder elects to include market discount on a current basis, the interest deduction deferral rule described above will not apply. Any accrued market discount on a Foreign Currency Note that is currently includible in income will be translated into U.S. dollars at the average exchange rate for the accrual period (or portion thereof within the United States holder's taxable year). Any such election, if made, applies to all market discount bonds acquired by the taxpayer on or after the first day of the first taxable year to which such election applies and is revocable only with the consent of the IRS.

Short-Term Notes. The rules set forth above will also generally apply to Notes having maturities of not more than one year ("Short-Term Notes"), but with certain modifications.

First, the OID Regulations treat none of the interest on a Short-Term Note as qualified stated interest. Thus, all Short-Term Notes will be OID Notes. OID will be treated as accruing on a Short-Term Note ratably, or at the election of a United States holder, under a constant yield method.

Second, a United States holder of a Short-Term Note that uses the cash method of tax accounting will generally not be required to include OID in income on a current basis. Such a United States holder may not be allowed to deduct all of the interest paid or accrued on any indebtedness incurred or maintained to purchase or carry such Note until the maturity of the Note or its earlier disposition in a taxable transaction. In addition, such a United States holder will be required to treat any gain realized on a sale, exchange or retirement of the Note as ordinary income to the extent such gain does not exceed the OID accrued with respect to the Note during the period the United States holder held the Note, and as short-term capital gain to the extent the gain exceeds accrued OID. Notwithstanding the foregoing, a cash-basis United States holder of a Short-Term Note may elect to accrue OID into income on a current basis or to accrue the "acquisition discount" on the Note under the rules described below. If a United States holder elects to accrue OID or acquisition discount, the limitation on the deductibility of interest described above will not apply.

A United States holder using the accrual method of tax accounting and certain cash-basis United States holders (including banks, securities dealers, regulated investment companies and common trust funds) generally will be required to include OID on a Short-Term Note in income on a current basis. Alternatively, a United States holder of a Short-Term Note can elect to accrue the acquisition discount, if any, with respect to the Note on a current basis. If such an election is made, the OID rules will not apply to the Note. Acquisition discount is the excess of the Short-Term Note's stated redemption price at maturity (i.e., all amounts payable on the Short-Term Note) over the purchase price. Acquisition discount will be treated as accruing ratably or, at the election of the United States holder, under a constant-yield method based on daily compounding.

Finally, the market discount rules will not apply to a Short-Term Note.

Index Linked Notes and Other Notes Providing for Contingent Payments. The Contingent Payment Regulations, which govern the tax treatment of Contingent Debt Obligations, generally require accrual of interest income on a constant-yield basis in respect of such obligations at a yield determined at the time of their issuance, and may require adjustments to such accruals when any contingent payments are made. A detailed description of the tax considerations relevant to United States holders of any contingent debt obligations will be provided in the applicable Pricing Supplement.

Information Reporting and Backup Withholding. The Paying Agent will be required to file information returns with the IRS with respect to payments made to certain United States holders of Notes. In addition, certain United States holders may be subject to backup withholding tax in respect of such payments if they do not provide their taxpayer identification numbers to the Paying Agent. Persons holding Notes who are not United States holders may be required to comply with applicable certification procedures to establish that they are not United States holders in order to avoid the application of such information reporting requirements and backup withholding tax. Any amounts withheld under the backup withholding rules will be allowed as a credit against a United States holder's United States federal income tax liability, if any, or as a refund, provided the required information is timely furnished to the IRS.

Information with Respect to Foreign Financial Assets. Individual United States holders that own "specified foreign financial assets" with an aggregate value in excess of US$50,000 are generally required to file an information statement along with their tax returns, currently on Form 8938, with respect to such assets. "Specified foreign financial assets" include any financial accounts held at a non-United States financial institution, as well as securities issued by a non-United States issuer (which may include Notes issued in certificated form) that are not held in accounts maintained by financial institutions. Higher reporting thresholds apply to certain individuals living abroad and to certain married individuals. Regulations extend this reporting requirement to certain entities that are treated as formed or availed of to hold direct or indirect interests in specified foreign financial assets based on certain objective criteria. United States holders who fail to report the required information could be subject to substantial penalties. Prospective investors should consult their own tax advisors concerning the application of these rules to their investment in Notes, including the application of the rules to their particular circumstances.

Reportable Transactions. A United States holder that participates in a "reportable transaction" will be required to disclose its participation to the IRS. The scope and application of these rules is not entirely clear. A United States holder may be required to treat a foreign currency exchange loss relating to a Foreign Currency Note as a reportable transaction if the loss exceeds US$50,000 in a single taxable year if the United States holder is an individual or trust, or higher amounts for other United States holders. In the event the acquisition, ownership or disposition of a Foreign Currency Note constitutes participation in a "reportable transaction" for purposes of these rules, a United States holder will be required to disclose its investment to the IRS, currently on Form 8886. Prospective investors should consult their tax advisors regarding the application of these rules to the acquisition, ownership or disposition of Foreign Currency Notes.

Korean Taxation

The information provided below does not purport to be a complete summary of Korean tax law and practice currently applicable. Prospective investors who are in any doubt as to their tax position should consult with their own professional advisors.

The taxation of non-resident individuals and non-Korean corporations ("Non-Residents") depends on whether they have a "permanent establishment" (as defined under Korean law and applicable tax treaty) in Korea to which the relevant Korean source income is attributable or with which such income is effectively connected. Non-Residents without a permanent establishment in Korea are taxed in the manner described below. Non-Residents with permanent establishments in Korea are taxed in accordance with different rules.

Tax on Interest

Interest on the Notes paid to Non-Residents, being foreign currency denominated bonds issued outside of Korea, is exempt from income tax and corporation tax (whether payable by withholding or otherwise) pursuant to the Special Tax Treatment Control Law (the "STTCL").

If the tax exemption under the STTCL referred to above were to cease to be in effect, the rate of income tax or corporation tax applicable to interest on the Notes, for a Non-Resident without a permanent establishment in Korea, would be 14% of income. In addition, a tax surcharge called a local income tax would be imposed at the rate of 10% of the income or corporation tax (raising the total tax rate to 15.4%).

The tax rates may be reduced by an applicable tax treaty, convention or agreement between Korea and the country of the recipient of the income. The relevant tax treaties are discussed below.

In addition, in order to obtain the benefit of a reduced rate available under applicable tax treaties, a Non-Resident holder must submit an application for reduced rate to the party liable for the withholding before the receipt of the relevant interest payment (if there is no change in the contents of such application, it is not required to submit such application again within 3 years thereafter), together with a certificate of the Non-Resident holder's tax residence issued by a competent authority of the Non-Resident holder's resident country. If the Non-resident holder was unable to receive the benefit of a reduced rate due to his or her failure to timely submit the aforementioned application, the Non-Resident holder may still receive a tax return if the submission is made within three years from the last day of the month in which the withholding occurs.

Tax on Capital Gains

Korean tax laws currently exclude from Korean taxation gains made by a Non-Resident without a permanent establishment in Korea from the sale of the Notes to other Non-Residents (other than to their permanent establishments in Korea). In addition, capital gains earned by Non-Residents with or without permanent establishments in Korea from the transfer taking place outside Korea of the Notes are currently exempt from taxation by virtue of STTCL, provided that the issuance of the Notes is deemed to be an overseas issuance under the STTCL.

If the exclusion or exemption from Korean taxation referred to above were to cease to be in effect, in the absence of an applicable treaty reducing or eliminating tax on capital gains, the applicable rate of tax would be the lower of 11% (including local income tax) of the gross realization proceeds or (subject to the production of satisfactory evidence of the acquisition cost and certain direct transaction costs of the relevant Note) 22% (including local income tax) of the realized gain (i.e., the excess of the gross realization proceeds over the acquisition cost and certain direct transaction costs) made. If such evidence shows that no gain (or a loss) was made on the sale, no Korean tax is payable. There is no provision under relevant Korean law to allow offsetting of gains and losses or otherwise aggregating transactions for the purpose of computing the net gain attributable to sales of Notes issued by Korean companies. The purchaser or any other designated withholding agent of Notes is obliged under Korean law to withhold the applicable amount of Korean tax and make payment thereof to the relevant Korean tax authority. Unless the seller can claim the benefit of an exemption from tax under an applicable tax treaty or on the failure of the seller to produce satisfactory evidence of his acquisition cost and certain direct transaction costs in relation to the instruments being sold, the purchaser or such withholding agent must withhold an amount equal to 11% of the gross realization proceeds. Any amounts withheld by the purchaser or such withholding agent must be paid to the competent Korean tax office. The purchaser or withholding agent must pay any withholding tax no later than the tenth day of the month following the month in which the payment for the purchase of the relevant instruments occurred. Failure to transmit the withheld tax to the Korean tax authorities in time subjects the purchaser or such withholding agent to penalties under Korean tax laws. The Korean tax authorities may attempt to collect such tax from a Non-Resident who is liable for payment of any Korean tax on gains, as a purchaser or withholding agent who is obliged to withhold such tax, through proceedings against payments due to the Non-Resident from its Korean investments and the assets or revenues of any of the Non-Resident's branch or representative offices in Korea.

In order to obtain the benefit of a tax treaty exemption, a Non-Resident seller must submit to the purchaser or the withholding agent prior to or at the time of sale, such evidence of tax residence of the seller as the Korean tax authorities may require in support of the claim for treaty protection. Such evidence normally consists of a certificate from the relevant tax authorities confirming the seller's residence in a relevant jurisdiction. In the absence of sufficient proof, the payer or the Company must withhold taxes in accordance with applicable law as discussed above.

Furthermore, for a Non-Resident to obtain the benefit of a tax exemption on certain Korean source income (e.g., interest payments and capital gains) under an applicable tax treaty, Korean tax law requires such Non-Resident (or its agents) to submit to the payer of such Korean source income an application for tax exemption under a tax treaty along with a certificate of tax residency of such Non-Resident issued by a competent authority of the Non-Resident's country of tax residence, subject to certain exceptions. The payer of such Korean source income, in turn, is required to submit such application to the relevant district tax office by the ninth day of the month following the date of the first payment of such income.

Inheritance Tax and Gift Tax

Korean inheritance tax is imposed upon (a) all assets (wherever located) of the deceased if at the time of his death he was domiciled in Korea and (b) all property located in Korea that passes on death (irrespective of the domicile of the deceased). Gift tax is imposed in similar circumstances to the above. The taxes are imposed if the value of the relevant property is above a certain limit and the rate varies from 10% to 50%. At present, Korea has not entered into any tax treaties regarding its inheritance or gift taxes.

Under Korean inheritance and gift tax laws, bonds issued by Korean corporations are deemed located in Korea irrespective of where they are physically located or by whom they are owned, and, consequently, the Korean inheritance and gift taxes may be imposed on transfers of the Notes by inheritance or gift. Prospective purchasers should consult their personal tax advisors regarding the consequences of the imposition of the Korean inheritance or gift tax.

Stamp Duty and Securities Transaction Tax

No stamp, issue or registration duties will be payable in Korea by the holders of the Notes in connection with the issue of the Notes except for a nominal amount of stamp duty on certain documents executed in Korea which will be paid by the Company. No securities transaction tax will be imposed upon the transfer of the Notes.

Tax Treaties

At the date of this Offering Circular, Korea has tax treaties with over 80 countries including, inter alia, Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, The Netherlands, New Zealand, Norway, Singapore, Sweden, Switzerland, the United Kingdom and the United States of America, under which the rate of withholding tax on interest is reduced, generally to between 5 and 16.5% (including local income tax), and the tax on capital gains is often eliminated.

A special withholding tax system took effect on July 1, 2006. Under the system, there is a special procedure to apply the Korea-Malaysia tax treaty on certain Korean source income. Payments made to the residents of Labuan, Malaysia will be subject to the default Korean withholding tax rates (generally 15.4% for interest and the lower of 11% of gross realization proceeds or 22% of capital gains (including local income tax)) rather than the reduced or exempted rate available under the Korea-Malaysia tax treaty. A Labuan taxpayer, however, will be given an opportunity to obtain a refund by proving that it is entitled to the tax treaty benefits as a beneficial owner of the income and is an actual resident of Labuan, Malaysia. A Labuan taxpayer may also file an application with the National Tax Service (the "NTS") for confirmation that it is entitled to the tax treaty benefits and obtain an advance confirmation from the NTS prior to receiving Korean source income.

Each holder of the Notes should inquire whether he or she is entitled to the benefit of a tax treaty with Korea with respect to any transaction involving the Notes. It is the responsibility of the party claiming the benefits of a tax treaty in respect of interest payments to file with the Company, the purchaser or the securities company, as applicable, a certificate as to his or her tax residence. In the absence of sufficient proof, the Company, the purchaser or the securities company, as applicable, must withhold taxes in accordance with the above discussion.

Withholding and Gross Up

As mentioned above, interest on the Notes is exempt from any withholding or deduction on account of income tax or corporation tax pursuant to STTCL. However, in the event that the payer or the Company is required by law to make any withholding or deduction for or on account of any Korean taxes (as more fully described in "Terms and Conditions of the Notes — Taxation") the Company has agreed to pay (subject to the customary exceptions as set out in "Terms and Conditions of the Notes — Taxation") such Additional Amounts as may be necessary in order that the net amounts received by the holder of any Note after such withholding or deduction shall equal the respective amounts which would have been received by such holder in the absence of such withholding or deduction.

The Proposed Financial Transactions Tax

The European Commission has published a proposal (the "Commission's Proposal") for a Directive for a common financial transactions tax ("FTT") in Austria, Belgium, Estonia, France, Germany, Greece, Italy, Portugal, Slovakia, Slovenia and Spain (the "participating Member States"). However, Estonia has since stated that it will not participate.

The Commission's Proposal has very broad scope and could, if introduced in its current form, apply to certain dealings in the Notes in certain circumstances.

Under the Commission's Proposal, the FTT could apply in certain circumstances to persons both within and outside of the participating Member States. Generally, it would apply to certain dealings in the Notes where at least one party is a financial institution, and at least one party is established in a participating Member State. A financial institution may be, or be deemed to be, "established" in a participating Member State in a broad range of circumstances, including (a) by transacting with a person established in a participating Member State or (b) where the financial instrument which is subject to the dealings is issued in a participating Member State.

The FTT remains subject to negotiation between participating Member States and the legality of the proposal is uncertain. It may therefore be altered prior to any implementation, the timing of which remains unclear. Additional EU Member States may decide to participate and/or certain of the participating Member States may decide to withdraw.

Prospective holders of the Notes are advised to seek their own professional advice in relation to the FTT.

United Kingdom Provision of Information Requirements

The comments below are of a general nature and are based on current United Kingdom ("UK") tax law as applied in England and published practice of HM Revenue & Customs ("HMRC"), the UK tax authorities. Such law may be repealed, revoked or modified and such practice may not bind HMRC and/or may change (in each case, possibly with retrospective effect), resulting in UK tax consequences different from those discussed below. The comments below deal only with UK rules relating to information that may need to be provided to HMRC in connection with the Notes. They do not deal with any other UK tax consequences of acquiring, owning or disposing of the Notes. Each prospective investor should seek advice based on its particular circumstances from an independent tax adviser.

Information relating to the Notes may be required to be provided to HMRC in certain circumstances pursuant to certain domestic and international reporting and transparency regimes. This may include (but is not limited to) information relating to the value of the Notes, amounts paid or credited with respect to the Notes, details of the holders or the beneficial owners of the Notes (or the persons for whom the Notes are held), details of the persons who exercise control over entities that are, or are treated as, holders of the Notes, details of the persons to whom payments derived from the Notes are or may be paid and information and documents in connection with transactions relating to the Notes. Information may be required to be provided by, amongst others, the Issuer, the holders of the Notes, persons by or through whom payments derived from the Notes are made or credited or who receive such payments (or who would be entitled to receive such payments if they were made), persons who effect or are a party to transactions relating to the Notes on behalf of others and certain registrars or administrators. Accordingly, in order to enable these requirements to be met, holders of the Notes may be required to provide information to the Issuer or to other persons. In certain circumstances, the information obtained by HMRC may be exchanged with tax authorities in other countries.

INDEPENDENT AUDITORS

The consolidated financial statements of the Issuer as of and for the years ended December 31, 2014, 2015 and 2016, included in this Offering Circular, have been audited by KPMG Samjong Accounting Corp., independent auditors, as stated in their reports appearing herein. KPMG Samjong Accounting Corp.'s report on the consolidated financial statements of the Issuer as of and for the years ended December 31, 2015 and 2014 contain an emphasis-of-matter paragraph that states a significant uncertainty exists with respect to the Issuer's future business results depending on the fluctuation of oil price as described in Note 49 to the consolidated financial statements as of and for the years ended December 31, 2015 and 2014. KPMG Samjong Accounting Corp.'s report on the consolidated financial statements of the Issuer as of and for the years ended December 31, 2016 and 2015 contain an emphasis-of-matter paragraph that states a significant uncertainty exists with respect to the Issuer's future business results depending on the recovery of oil price as described in Note 44 to the consolidated financial statements as of and for the years ended December 31, 2016 and 2015.

SUBSCRIPTION AND SALE AND TRANSFER AND SELLING RESTRICTIONS

The Dealers have, in an amended and restated program agreement dated September 21, 2015 as further amended and/or supplemented from time to time (the "Program Agreement"), agreed with the Issuer a basis upon which they or any of them may from time to time agree to purchase Notes. Any such agreement will extend to those matters stated under "Form of the Notes" and "Terms and Conditions of the Notes." In the Program Agreement, the Issuer has agreed to reimburse the Dealers for certain of their expenses reasonably and properly incurred in protecting or enforcing any of their rights under the Program Agreement and to indemnify the Dealers against certain liabilities incurred by them.

In order to facilitate the offering of any Tranche of the Notes, certain persons participating in the offering of the Tranche may to the extent permitted by applicable laws and regulations engage in transactions that stabilize, maintain or otherwise affect the market price of the relevant Notes for a limited period after the issue date. Specifically such persons may overallot or create a short position in the Notes for their own account by selling more Notes than have been sold to them by the Issuer. Such persons may also elect to cover any such short position by purchasing Notes in the open market. In addition, such persons may stabilize or maintain the price of the Notes by bidding for or purchasing Notes in the open market and may impose penalty bids, under which selling concessions allowed to syndicate members or other broker-dealers participating in the offering of the Notes are reclaimed if Notes previously distributed in the offering are repurchased in connection with stabilization transactions or otherwise. The effect of these transactions may be to stabilize or maintain the market price of the Notes at a level above that which might otherwise prevail in the open market. The imposition of a penalty bid may also affect the price of the Notes to the extent that it discourages resales thereof. No representation is made as to the magnitude or effect of any such stabilizing or other transactions. Such transactions, if commenced, may be discontinued at any time and must be brought to an end after a limited period.

If a jurisdiction requires that any offering of Notes under the Programme be made by a licensed broker or dealer and the Dealers or any affiliate of the Dealers is a licensed broker or dealer in that jurisdiction, the offering shall be deemed to be made by that Dealer or its affiliate on behalf of the Issuer in such jurisdiction.

Certain Relationships

The Dealers and certain of their respective affiliates may have performed certain investment banking, commercial banking and advisory services for the Issuer and its affiliates from time to time for which they have received customary fees and expenses and may, from time to time, engage in transactions with and perform services for the Issuer and its affiliates in the ordinary course of their business. The Dealers or certain of their respective affiliates may purchase the Notes and be allocated the Notes for asset management and/or proprietary purposes but not with a view to distribution.

The Dealers or their respective affiliates may purchase the Notes for their own account and enter into transactions, including credit derivatives, such as asset swaps, repackaging and credit default swaps relating to the Notes and/or other securities of the Issuer or its subsidiaries or associates, at the same time as the offer and sale of the Notes or in secondary market transactions. Such transactions would be carried out as bilateral trades with selected counterparties and separately from any existing sale or resale of the Notes to which this Offering Circular relates (notwithstanding that such selected counterparties may also be purchasers of the Notes).

In addition, in the ordinary course of their business activities, the Dealers and their respective affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers. Such investments and securities activities may involve securities and/or instruments of the Issuer or its affiliates. The Dealers and their respective affiliates may also make investment recommendations and/or publish or express independent research views with respect to such securities or financial instruments and may hold, or recommend to clients that they acquire long and/or short positions in such securities and instruments.

Transfer Restrictions

As a result of the following restrictions, purchasers of Notes in the United States are advised to consult legal counsel prior to making any purchase, offer, sale, resale or other transfer of such Notes.

Each purchaser of Registered Notes (other than a person purchasing an interest in a Registered Global Note with a view to holding it in the form of an interest in the same Global Note) or person wishing to transfer an interest from one Registered Global Note to another or from global to definitive form or vice versa, will be required to acknowledge, represent and agree as follows (terms used in this paragraph that are defined in Rule 144A or in Regulation S are used herein as defined therein):

(a) that either: (i) it is a QIB, purchasing (or holding) the Notes for its own account or for the account of one or more QIBs and it is aware that any sale to it is being made in reliance on Rule 144A or (ii) it is an Institutional Accredited Investor which has delivered an IAI Investment Letter or (iii) it is outside the United States and is not a U.S. person;

(b) that the Notes are being offered and sold in a transaction not involving a public offering in the United States within the meaning of the Securities Act, and that the Notes have not been and will not be registered under the Securities Act or any other applicable U.S. state securities laws and may not be offered or sold within the United States or to, or for the account or benefit of, U.S. persons except as set forth below;

(c) that, unless it holds an interest in a Regulation S Global Note and either is a person located outside the United States or is not a U.S. person, if in the future it decides to resell, pledge or otherwise transfer the Notes or any beneficial interests in the Notes, it will do so, prior to the date which is one year after the later of the last Issue Date for the Series and the last date on which the Issuer or an affiliate of the Issuer was the owner of such Notes, only (i) to the Issuer or any affiliate thereof, (ii) inside the United States to a person whom the seller reasonably believes is a QIB purchasing for its own account or for the account of a QIB in a transaction meeting the requirements of Rule 144A, (iii) outside the United States in compliance with Rule 903 or Rule 904 under the Securities Act, (iv) pursuant to the exemption from registration provided by Rule 144 under the Securities Act (if available) or (v) pursuant to an effective registration statement under the Securities Act, in each case in accordance with all applicable U.S. state securities laws;

(d) it will, and will require each subsequent holder to, notify any purchaser of the Notes from it of the resale restrictions referred to in paragraph (c) above, if then applicable;

(e) that Notes initially offered in the United States to QIBs will be represented by one or more Rule 144A Global Notes, that Notes offered to Institutional Accredited Investors will be in the form of Definitive IAI Registered Notes and that Notes offered outside the United States in reliance on Regulation S will be represented by one or more Regulation S Global Notes;

(f) that the Notes, other than the Regulation S Global Notes, will bear a legend to the following effect unless otherwise agreed to by the Issuer:

"THIS SECURITY HAS NOT BEEN REGISTERED UNDER THE U.S. SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), OR ANY OTHER APPLICABLE U.S. STATE SECURITIES LAWS AND, ACCORDINGLY, MAY NOT BE OFFERED OR SOLD WITHIN THE UNITED STATES OR TO, OR FOR THE ACCOUNT OR BENEFIT OF, U.S. PERSONS EXCEPT AS SET FORTH IN THE FOLLOWING SENTENCE. BY ITS ACQUISITION HEREOF, THE HOLDER (A) REPRESENTS THAT (I) IT IS A "QUALIFIED INSTITUTIONAL BUYER" (AS DEFINED IN RULE 144A UNDER THE SECURITIES ACT) PURCHASING THE SECURITIES FOR ITS OWN ACCOUNT OR FOR THE ACCOUNT OF ONE OR MORE QUALIFIED INSTITUTIONAL BUYERS OR (II) IT IS AN INSTITUTIONAL "ACCREDITED INVESTOR" (AS DEFINED IN RULE 501(A)(1), (2), (3) OR (7) UNDER THE SECURITIES ACT) (AN "INSTITUTIONAL ACCREDITED INVESTOR"); (B) AGREES THAT IT WILL NOT RESELL OR OTHERWISE TRANSFER THE SECURITIES EXCEPT IN ACCORDANCE WITH THE AGENCY AGREEMENT AND, PRIOR TO THE DATE WHICH IS ONE YEAR AFTER THE LATER OF THE LAST ISSUE DATE FOR THE SERIES AND THE LAST DATE ON WHICH THE ISSUER OR AN

AFFILIATE OF THE ISSUER WAS THE OWNER OF SUCH SECURITIES OTHER THAN (I) TO THE ISSUER OR ANY AFFILIATE THEREOF, (II) INSIDE THE UNITED STATES TO A PERSON WHOM THE SELLER REASONABLY BELIEVES IS A QUALIFIED INSTITUTIONAL BUYER WITHIN THE MEANING OF RULE 144A UNDER THE SECURITIES ACT PURCHASING FOR ITS OWN ACCOUNT OR FOR THE ACCOUNT OF A QUALIFIED INSTITUTIONAL BUYER IN A TRANSACTION MEETING THE REQUIREMENTS OF RULE 144A, (III) OUTSIDE THE UNITED STATES IN COMPLIANCE WITH RULE 903 OR RULE 904 UNDER THE SECURITIES ACT, (IV) PURSUANT TO THE EXEMPTION FROM REGISTRATION PROVIDED BY RULE 144 UNDER THE SECURITIES ACT (IF AVAILABLE) OR (V) PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT, IN EACH CASE IN ACCORDANCE WITH ALL APPLICABLE SECURITIES LAWS OF THE STATES OF THE UNITED STATES AND ANY OTHER JURISDICTION; AND (C) IT AGREES THAT IT WILL DELIVER TO EACH PERSON TO WHOM THIS SECURITY IS TRANSFERRED A NOTICE SUBSTANTIALLY TO THE EFFECT OF THIS LEGEND.

THIS SECURITY AND RELATED DOCUMENTATION (INCLUDING, WITHOUT LIMITATION, THE AGENCY AGREEMENT REFERRED TO HEREIN) MAY BE AMENDED OR SUPPLEMENTED FROM TIME TO TIME, WITHOUT THE CONSENT OF, BUT UPON NOTICE TO, THE HOLDERS OF SUCH SECURITIES SENT TO THEIR REGISTERED ADDRESSES, TO MODIFY THE RESTRICTIONS ON AND PROCEDURES FOR RESALES AND OTHER TRANSFERS OF THIS SECURITY TO REFLECT ANY CHANGE IN APPLICABLE LAW OR REGULATION (OR THE INTERPRETATION THEREOF) OR IN PRACTICES RELATING TO RESALES OR OTHER TRANSFERS OF RESTRICTED SECURITIES GENERALLY. THE HOLDER OF THIS SECURITY SHALL BE DEEMED, BY ITS ACCEPTANCE OR PURCHASE HEREOF, TO HAVE AGREED TO ANY SUCH AMENDMENT OR SUPPLEMENT (EACH OF WHICH SHALL BE CONCLUSIVE AND BINDING ON THE HOLDER HEREOF AND ALL FUTURE HOLDERS OF THIS SECURITY AND ANY SECURITIES ISSUED IN EXCHANGE OR SUBSTITUTION THEREFOR, WHETHER OR NOT ANY NOTATION THEREOF IS MADE HEREON).";

(g) if it is outside the United States and is not a U.S. person, that if it should resell or otherwise transfer the Notes prior to the expiration of the distribution compliance period (defined as 40 days after the later of the commencement of the offering and the closing date with respect to the original issuance of the Notes), it will do so only (i)(A) outside the United States in compliance with Rule 903 or 904 under the Securities Act or (B) to a QIB in compliance with Rule 144A and (ii) in accordance with all applicable U.S. state securities laws; and it acknowledges that the Regulation S Global Notes will bear a legend to the following effect unless otherwise agreed to by the Issuer:

"THIS SECURITY HAS NOT BEEN AND WILL NOT BE REGISTERED UNDER THE U.S. SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), OR ANY OTHER APPLICABLE U.S. STATE SECURITIES LAWS AND, ACCORDINGLY, MAY NOT BE OFFERED OR SOLD WITHIN THE UNITED STATES OR TO, OR FOR THE ACCOUNT OR BENEFIT OF, U.S. PERSONS EXCEPT IN ACCORDANCE WITH THE AGENCY AGREEMENT AND PURSUANT TO AN EXEMPTION FROM REGISTRATION UNDER THE SECURITIES ACT OR PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT. THIS LEGEND SHALL CEASE TO APPLY UPON THE EXPIRY OF THE PERIOD OF 40 DAYS AFTER THE COMPLETION OF THE DISTRIBUTION OF ALL THE NOTES OF THE TRANCHE OF WHICH THIS NOTE FORMS PART."; and

(h) that the Issuer and others will rely upon the truth and accuracy of the foregoing acknowledgements, representations and agreements and agrees that if any of such acknowledgements, representations or agreements made by it are no longer accurate, it shall promptly notify the Issuer; and if it is acquiring any Notes as a fiduciary or agent for one or more accounts it represents that it has sole investment discretion with respect to each such account and that it has full power to make the foregoing acknowledgements, representations and agreements on behalf of each such account.

Institutional Accredited Investors who purchase Registered Notes in definitive form offered and sold in the United States in reliance upon the exemption from registration provided by Regulation D of the Securities Act are required to execute and deliver to the Registrar an IAI Investment Letter. Upon execution and delivery of an IAI Investment Letter by an Institutional Accredited Investor, Notes will be issued in definitive registered form, see "Form of the Notes."

The IAI Investment Letter will state, among other things, the following:

(a) that the Institutional Accredited Investor has received a copy of the Offering Circular and such other information as it deems necessary in order to make its investment decision;

(b) that the Institutional Accredited Investor understands that any subsequent transfer of the Notes is subject to certain restrictions and conditions set forth in the Offering Circular and the Notes (including those set out above) and that it agrees to be bound by, and not to resell, pledge or otherwise transfer the Notes except in compliance with, such restrictions and conditions and the Securities Act;

(c) that, in the normal course of its business, the Institutional Accredited Investor invests in or purchases securities similar to the Notes;

(d) that the Institutional Accredited Investor is an Institutional Accredited Investor within the meaning of Rule 501(a)(1), (2), (3) or (7) of Regulation D under the Securities Act and has such knowledge and experience in financial and business matters as to be capable of evaluating the merits and risks of its investment in the Notes, and it and any accounts for which it is acting are each able to bear the economic risk of its or any such accounts' investment for an indefinite period of time;

(e) that the Institutional Accredited Investor is acquiring the Notes purchased by it for its own account or for one or more accounts (each of which is an Institutional Accredited Investor) as to each of which it exercises sole investment discretion and not with a view to any distribution of the Notes, subject, nevertheless, to the understanding that the disposition of its property shall at all times be and remain within its control; and

(f) that, in the event that the Institutional Accredited Investor purchases Notes, it will acquire Notes having a minimum purchase price of at least U.S.$250,000 (or the approximate equivalent in another Specified Currency).

No sale of Legended Notes in the United States to any one purchaser will be for less than U.S.$100,000 (or its foreign currency equivalent) principal amount or, in the case of sales to Institutional Accredited Investors, U.S.$250,000 (or its foreign currency equivalent) principal amount and no Legended Note will be issued in connection with such a sale in a smaller principal amount. If the purchaser is a non-bank fiduciary acting on behalf of others, each person for whom it is acting must purchase at least U.S.$100,000 (or its foreign currency equivalent) or, in the case of sales to Institutional Accredited Investors, U.S.$250,000 (or its foreign currency equivalent) principal amount of Registered Notes.

Selling Restrictions

United States of America

The Notes have not been and will not be registered under the Securities Act and may not be offered or sold within the United States or to, or for the account or benefit of, U.S. persons except in certain transactions exempt from the registration requirements of the Securities Act.

The Notes in bearer form are subject to U.S. tax law requirements and may not be offered, sold or delivered within the United States or its possessions or to a United States person, except in certain transactions permitted by U.S. tax regulations. Terms used in this paragraph have the meanings given to them by the U.S. Internal Revenue Code of 1986 and regulations thereunder.

In connection with any Notes which are offered or sold outside the United States in reliance on an exemption from the registration requirements of the Securities Act provided under Regulation S ("Regulation S

Notes"), each Dealer has represented, warranted and agreed, and each further Dealer appointed under the Program will be required to represent, warrant and agree, that it will not offer, sell or deliver such Notes (i) as part of their distribution at any time or (ii) otherwise until 40 days after the completion of the distribution, as determined and certified by the relevant Dealer or, in the case of an issue of Notes on a syndicated basis, the relevant lead manager, of all Notes of the Tranche of which such Regulation S Notes are a part, within the United States or to, or for the account or benefit of, U.S. persons. Each Dealer has further agreed, and each further Dealer appointed under the Program will be required to agree, that it will send to each dealer to which it sells any Regulation S Notes during the distribution compliance period a confirmation or other notice setting forth the restrictions on offers and sales of the Regulation S Notes within the United States or to, or for the account or benefit of, U.S. persons.

Until 40 days after the commencement of the offering of any Series of Notes, an offer or sale of such Notes within the United States by any dealer (whether or not participating in the offering) may violate the registration requirements of the Securities Act if such offer or sale is made otherwise than in accordance with an available exemption from registration under the Securities Act.

Dealers may arrange for the resale of Notes to QIBs pursuant to Rule 144A and each such purchaser of Notes is hereby notified that the Dealers may be relying on the exemption from the registration requirements of the Securities Act provided by Rule 144A. The minimum aggregate principal amount of Notes that may be purchased by a QIB pursuant to Rule 144A is U.S.$100,000 (or the approximate equivalent thereof in any other currency). To the extent that the Issuer is not subject to or does not comply with the reporting requirements of Section 13 or 15(d) of the Exchange Act or the information furnishing requirements of Rule 12g3-2(b) thereunder, the Issuer has agreed to furnish to holders of Notes and to prospective purchasers designated by such holders, upon request, such information as may be required by Rule 144A(d)(4).

Each issuance of Index Linked Notes or Dual Currency Notes shall be subject to such additional U.S. selling restrictions as the Issuer and the relevant Dealer may agree as a term of the issuance and purchase of such Notes, which additional selling restrictions shall be set out in the applicable Pricing Supplement.

European Economic Area

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each such Member State, a "Relevant Member State"), each Dealer has represented and agreed, and each further Dealer appointed under the Program will be required to represent and agree, that with effect from and including the date on which the Prospectus Directive is implemented in that Relevant Member State (the "Relevant Implementation Date") it has not made and will not make an offer of Notes which are the subject of the offering contemplated by this Offering Circular as completed by the pricing supplement in relation thereto to the public in that Relevant Member State (the "Securities") except that it may, with effect from and including the Relevant Implementation Date, make an offer of such Securities to the public in that Relevant Member State:

(a) if the final terms in relation to the Securities specify that an offer of those Securities may be made other than pursuant to Article 3(2) of the Prospectus Directive in that Relevant Member State (a "Non-exempt Offer"), following the date of publication of a prospectus in relation to such Securities which has been approved by the competent authority in that Relevant Member State or, where appropriate, approved in another Relevant Member State and notified to the competent authority in that Relevant Member State, provided that any such prospectus has subsequently been completed by the final terms contemplating such Non-exempt Offer, in accordance with the Prospectus Directive in the period beginning and ending on the dates specified in such prospectus or final terms, as applicable;

(b) at any time to any legal entity which is a qualified investor as defined in the Prospectus Directive;

(c) at any time to fewer than 150 natural or legal persons (other than qualified investors as defined in the Prospectus Directive) subject to obtaining the prior consent of the relevant Dealer or Dealers nominated by the Issuer for any such offer; or

(d) at any time in any other circumstances falling within Article 3(2) of the Prospectus Directive;

provided that no such offer of Securities referred to in (b) to (d) above shall require the Issuer or any Dealer to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive.

For the purposes of this provision, the expression an "offer to the public" in relation to any Securities in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the Securities to be offered so as to enable an investor to decide to purchase or subscribe the Securities, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State and the expression "Prospectus Directive" means Directive 2003/71/EC (as amended, including by Directive 2010/73/EU), and includes any relevant implementing measure in each Relevant Member State.

The European Economic Area selling restriction described above is in addition to any other applicable selling restriction set out below.

United Kingdom

Each Dealer has represented, warranted and agreed, and each further Dealer appointed under the Program will be required to represent, warrant and agree that:

(a) in relation to any Notes which have a maturity of less than one year, (i) it is a person whose ordinary activities involve it in acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of its business and (ii) it has not offered or sold and will not offer or sell any Notes other than to persons whose ordinary activities involve them in acquiring, holding, managing or disposing of investments (as principal or as agent) for the purposes of their businesses or who it is reasonable to expect will acquire, hold, manage or dispose of investments (as principal or agent) for the purposes of their businesses where the issue of the Notes would otherwise constitute a contravention of Section 19 of the Financial Services and Markets Act 2000 (the "FSMA") by the Issuer;

(b) it has only communicated or caused to be communicated and will only communicate or cause to be communicated an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the FSMA) received by it in connection with the issue or sale of any Notes in circumstances in which Section 21(1) of the FSMA does not apply to the Issuer; and

(c) it has complied and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to any Notes in, from or otherwise involving the United Kingdom.

Japan

The Notes have not been and will not be registered under the Financial Instruments and Exchange Law of Japan (Law. No. 25 of 1948 as amended) (the "FIEL") and disclosure under the FIEL has not been and will not be made with respect to any Notes. Each Dealer has represented, warranted and agreed and each further Dealer appointed under the Program will be required to represent, warrant and agree that it will not offer or sell any Notes, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan), or to others for re-offering or resale, directly or indirectly, in Japan or to a resident of Japan except (1) pursuant to an exemption from the registration requirements of the FIEL and (2) in compliance with any other applicable laws and regulations and ministerial guidelines of Japan.

Hong Kong

Each Dealer has represented, warranted and agreed and each further Dealer appointed under the Program will be required to represent, warrant and agree that:

(a) it has not offered or sold, and will not offer or sell, in Hong Kong Special Administrative Region of the People's Republic of China ("Hong Kong"), by means of any document, any Notes (except for Notes which are a “structured product” as defined in the Securities and Futures Ordinance (Cap. 571) of Hong Kong) other than (i) to “professional investors” as defined in the Securities and Futures Ordinance and any rules made under that Ordinance; or (ii) in other circumstances which do not result in the document being a “prospectus” as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32) of Hong Kong or which do not constitute an offer to the public within the meaning of that Ordinance; and

(b) it has not issued, or had in its possession for the purposes of issue, and will not issue or have in its possession for the purposes of issue, whether in Hong Kong or elsewhere, any advertisement, invitation or document relating to the Notes, which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to the Notes which are or are intended to be disposed of only to persons outside Hong Kong or only to “professional investors” as defined in the Securities and Futures Ordinance of Hong Kong and any rules made thereunder.

Singapore

Each Dealer has acknowledged, and each further Dealer appointed under the Program will be required to acknowledge, that this Offering Circular has not been and will not be registered as a prospectus with the Monetary Authority of Singapore under the Securities and Futures Act, Chapter 289 of Singapore (the “SFA”). Accordingly, each Dealer has represented, warranted and agreed and each further Dealer appointed under the Program will be required to represent, warrant and agree that it has not offered or sold any Notes or caused the Notes to be made the subject of an invitation for subscription or purchase and will not offer or sell the Notes or cause the Notes to be made the subject of an invitation for subscription or purchase, and has not circulated or distributed, nor will it circulate or distribute, this Offering Circular and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the Notes, whether directly or indirectly, to any person in Singapore other than (i) to an institutional investor under Section 274 of the SFA, (ii) to a relevant person pursuant to Section 275(1), or any person pursuant to Section 275(1A), and in accordance with the conditions specified in Section 275, of the SFA, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the Notes are subscribed or purchased under Section 275 of the SFA by a relevant person which is:

(a) a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)), the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or

(b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor,

securities (as defined in Section 239(1) of the SFA) of that corporation or the beneficiaries’ rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the Notes pursuant to an offer made under Section 275 of the SFA except:

(1) to an institutional investor or to a relevant person defined in Section 275(2) of the SFA, or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(i)(B) of the SFA;

(2) where no consideration is or will be given for the transfer;

(3) where the transfer is by operation of law;

(4) as specified in Section 276(7) of the SFA; or

(5) as specified in Regulation 32 of the Securities and Futures (Offers of Investments) (Shares and Debentures) Regulations 2005 of Singapore.

Korea

Each Dealer has represented, warranted and agreed, and each further Dealer appointed under the Program will be required to represent, warrant and agree, that Notes have not been offered, sold or delivered, and will not be offered, sold or delivered, directly or indirectly, to, or for the account or benefit of, any resident of Korea (as defined under the Foreign Exchange Transactions Law of Korea and its Enforcement Decree), except as otherwise permitted by applicable Korean laws and regulations.

General

Each Dealer has agreed and each further Dealer appointed under the Program will be required to agree that it will (to the best of its knowledge and belief) comply with all applicable securities laws and regulations in force in any jurisdiction in which it purchases, offers, sells or delivers Notes or possesses or distributes the Offering Circular and will obtain any consent, approval or permission required by it for the purchase, offer, sale or delivery by it of Notes under the laws and regulations in force in any jurisdiction to which it is subject or in which it makes such purchases, offers, sales or deliveries and neither the Issuer nor any other Dealer shall have any responsibility therefor.

Neither the Issuer nor any of the Dealers represents that Notes may at any time lawfully be sold in compliance with any applicable registration or other requirements in any jurisdiction, or pursuant to any exemption available thereunder, or assumes any responsibility for facilitating any such sale.

With regard to each Tranche, the relevant Dealer will be required to comply with such other additional restrictions as the Issuer and the relevant Dealer shall agree and as shall be set out in the applicable Pricing Supplement.

BOOK-ENTRY CLEARANCE SYSTEMS

The information set out below is subject to any change in or reinterpretation of the rules, regulations and procedures of DTC, Euroclear or Clearstream, Luxembourg (together, the "Clearing Systems") currently in effect. The information in this section concerning the Clearing Systems has been obtained from sources that the Issuer believes to be reliable, but none of the Issuer nor any Dealer takes any responsibility for the accuracy thereof. Investors wishing to use the facilities of any of the Clearing Systems are advised to confirm the continued applicability of the rules, regulations and procedures of the relevant Clearing System. None of the Issuer nor any other party to the Agency Agreement will have any responsibility or liability for any aspect of the records relating to, or payments made on account of, beneficial ownership interests in the Notes held through the facilities of any Clearing System or for maintaining, supervising or reviewing any records relating to such beneficial ownership interests.

Book-entry Systems

DTC

DTC has advised the Issuer that it is a limited purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a "clearing corporation" within the meaning of the New York Uniform Commercial Code and a "clearing agency" registered pursuant to Section 17A of the Exchange Act. DTC holds securities that its participants ("Participants") deposit with DTC. DTC also facilitates the settlement among Participants of securities transactions, such as transfers and pledges, in deposited securities through electronic computerized book-entry changes in Participants' accounts, thereby eliminating the need for physical movement of securities certificates. Direct Participants include securities brokers and dealers, banks, trust companies, clearing corporations and certain other organizations. Access to the DTC System is also available to others such as securities brokers and dealers, banks and trust companies that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants").

Under the rules, regulations and procedures creating and affecting DTC and its operations (the "Rules"), DTC makes book-entry transfers of Registered Notes among Direct Participants on whose behalf it acts with respect to Notes accepted into DTC's book-entry settlement system ("DTC Notes") as described below and receives and transmits distributions of principal and interest on DTC Notes. The Rules are on file with the Securities and Exchange Commission. Direct Participants and Indirect Participants with which beneficial owners of DTC Notes ("Owners") have accounts with respect to the DTC Notes similarly are required to make book-entry transfers and receive and transmit such payments on behalf of their respective Owners. Accordingly, although Owners who hold DTC Notes through Direct Participants or Indirect Participants will not possess Registered Notes, the Rules, by virtue of the requirements described above, provide a mechanism by which Direct Participants will receive payments and will be able to transfer their interest in respect of the DTC Notes.

Purchases of DTC Notes under the DTC system must be made by or through Direct Participants, which will receive a credit for the DTC Notes on DTC's records. The ownership interest of each actual purchaser of each DTC Note ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participant's records. Beneficial Owners will not receive written confirmation from DTC of their purchase, but Beneficial Owners are expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the DTC Notes are to be accomplished by entries made on the books of Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in DTC Notes, except in the event that use of the book-entry system for the DTC Notes is discontinued.

To facilitate subsequent transfers, all DTC Notes deposited by Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co. The deposit of DTC Notes with DTC and their registration in the name of Cede & Co. effect no change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the DTC Notes; DTC's records reflect only the identity of the Direct Participants to whose accounts such DTC Notes are credited, which may or may not be the Beneficial Owners. The Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time.

Redemption notices shall be sent to Cede & Co. If less than all of the DTC Notes within an issue are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such issue to be redeemed.

Neither DTC nor Cede & Co. will consent or vote with respect to DTC Notes. Under its usual procedures, DTC mails an Omnibus Proxy to the Issuer as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the DTC Notes are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal and interest payments on the DTC Notes will be made to DTC. DTC's practice is to credit Direct Participants' accounts on the due date for payment in accordance with their respective holdings shown on DTC's records unless DTC has reason to believe that it will not receive payment on the due date. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC or the Issuer, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal and interest to DTC is the responsibility of the Issuer, disbursement of such payments to Direct Participants is the responsibility of DTC, and disbursement of such payments to the Beneficial Owners is the responsibility of Direct and Indirect Participants.

Under certain circumstances, including if there is an Event of Default under the Notes, DTC will exchange the DTC Notes for definitive Registered Notes, which it will distribute to its Participants in accordance with their proportionate entitlements and which, if representing interests in a Rule 144A Global Note, will be legended as set forth under "Subscription and Sale and Transfer and Selling Restrictions."

Since DTC may only act on behalf of Direct Participants, who in turn act on behalf of Indirect Participants, any Owner desiring to pledge DTC Notes to persons or entities that do not participate in DTC, or otherwise take actions with respect to such DTC Notes, will be required to withdraw its Registered Notes from DTC as described below.

Euroclear and Clearstream, Luxembourg

Euroclear and Clearstream, Luxembourg each holds securities for its customers and facilitates the clearance and settlement of securities transactions by electronic book-entry transfer between their respective account holders. Euroclear and Clearstream, Luxembourg provide various services including safekeeping, administration, clearance and settlement of internationally traded securities and securities lending and borrowing. Euroclear and Clearstream, Luxembourg also deal with domestic securities markets in several countries through established depository and custodial relationships. Euroclear and Clearstream, Luxembourg have established an electronic bridge between their two systems across which their respective participants may settle trades with each other. Euroclear and Clearstream, Luxembourg customers are worldwide financial institutions, including underwriters, securities brokers and dealers, banks, trust companies and clearing corporations. Indirect access to Euroclear and Clearstream, Luxembourg is available to other institutions that clear through or maintain a custodial relationship with an account holder of either system.

Book-entry Ownership of and Payments in respect of DTC Notes

The Issuer may apply to DTC in order to have any Tranche of Notes represented by a Registered Global Note accepted in its book-entry settlement system. Upon the issue of any such Registered Global Note, DTC or its custodian will credit, on its internal book-entry system, the respective nominal amounts of the individual beneficial interests represented by such Registered Global Note to the accounts of persons who have accounts with DTC. Such accounts initially will be designated by or on behalf of the relevant Dealer. Ownership of beneficial interests in such a Registered Global Note will be limited to Direct Participants or Indirect Participants, including, in the case of any Regulation S Global Note, the respective depositaries of Euroclear and Clearstream, Luxembourg. Ownership of beneficial interests in a Registered Global Note accepted by DTC will be shown on, and the transfer of such ownership will be effected only through, records maintained by DTC or its nominee (with respect to the interests of Direct Participants) and the records of Direct Participants (with respect to interests of Indirect Participants).

Payments in U.S. dollars of principal and interest in respect of a Registered Global Note accepted by DTC will be made to the order of DTC or its nominee as the registered holder of such Note. In the case of any payment in a currency other than U.S. dollars, payment will be made to the Exchange Agent on behalf of DTC or its nominee and the Exchange Agent will (in accordance with instructions received by it) remit all or a portion of such payment for credit directly to the beneficial holders of interests in the Registered Global Note in the currency in which such payment was made and/or cause all or a portion of such payment to be converted into U.S. dollars and credited to the applicable Participants' account.

The Issuer expects DTC to credit accounts of Direct Participants on the applicable payment date in accordance with their respective holdings as shown in the records of DTC unless DTC has reason to believe that it will not receive payment on such payment date. The Issuer also expects that payments by Participants to beneficial owners of Notes will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers, and will be the responsibility of such Participant and not the responsibility of DTC, the Principal Paying Agent, the Registrar or the Issuer. Payment of principal, premium, if any, and interest, if any, on Notes to DTC are the responsibility of the Issuer.

Transfers of Notes Represented by Registered Global Notes

Transfers of any interests in Notes represented by a Registered Global Note within DTC, Euroclear and Clearstream, Luxembourg will be effected in accordance with the customary rules and operating procedures of the relevant clearing system. The laws in some States within the United States require that certain persons take physical delivery of securities in definitive form. Consequently, the ability to transfer Notes represented by a Registered Global Note to such persons may depend upon the ability to exchange such Notes for Notes in definitive form. Similarly, because DTC can only act on behalf of Direct Participants in the DTC system who in turn act on behalf of Indirect Participants, the ability of a person having an interest in Notes represented by a Registered Global Note accepted by DTC to pledge such Notes to persons or entities that do not participate in the DTC system or otherwise to take action in respect of such Notes may depend upon the ability to exchange such Notes for Notes in definitive form. The ability of any holder of Notes represented by a Registered Global Note accepted by DTC to resell, pledge or otherwise transfer such Notes may be impaired if the proposed transferee of such Notes is not eligible to hold such Notes through a direct or indirect participant in the DTC system.

Subject to compliance with the transfer restrictions applicable to the Registered Notes described under "Subscription and Sale and Transfer and Selling Restrictions," cross-market transfers between DTC, on the one hand, and directly or indirectly through Clearstream, Luxembourg or Euroclear accountholders, on the other, will be effected by the relevant clearing system in accordance with its rules and through action taken by the Registrar, the Principal Paying Agent and any custodian ("Custodian") with whom the relevant Registered Global Notes have been deposited.

On or after the Issue Date for any Series, transfers of Notes of such Series between accountholders in Clearstream, Luxembourg and Euroclear and transfers of Notes of such Series between participants in DTC will generally have a settlement date three business days after the trade date (T+3). The customary arrangements for delivery versus payment will apply to such transfers.

Cross-market transfers between accountholders in Clearstream, Luxembourg or Euroclear and DTC participants will need to have an agreed settlement date between the parties to such transfer. Because there is no direct link between DTC, on the one hand, and Clearstream, Luxembourg and Euroclear, on the other, transfers of interests in the relevant Registered Global Notes will be effected through the Registrar, the Principal Paying Agent and the Custodian receiving instructions (and, where appropriate, certification) from the transferor and arranging for delivery of the interests being transferred to the credit of the designated account for the transferee. In the case of cross-market transfers, settlement between Euroclear or Clearstream, Luxembourg accountholders and DTC participants cannot be made on a delivery versus payment basis. The securities will be delivered on a free delivery basis and arrangements for payment must be made separately.

DTC, Clearstream, Luxembourg and Euroclear have each published rules and operating procedures designed to facilitate transfers of beneficial interests in Registered Global Notes among participants and accountholders of DTC, Clearstream, Luxembourg and Euroclear. However, they are under no obligation to perform or continue to perform such procedures, and such procedures may be discontinued or changed at any time. None of the Issuer, the Agents or any Dealer will be responsible for any performance by DTC, Clearstream, Luxembourg or Euroclear or their respective direct or indirect participants or accountholders of their respective obligations under the rules and procedures governing their operations and none of them will have any liability for any aspect of the records relating to or payments made on account of beneficial interests in the Notes represented by Registered Global Notes or for maintaining, supervising or reviewing any records relating to such beneficial interests.

GENERAL INFORMATION

Authorization and Regulatory Issues

The establishment of the Program and the issue of the Notes hereunder has been duly authorized by a resolution of the Board of Directors of the Issuer dated August 26, 2010. Each issue of Notes under the Program will be authorized by the Board of Directors of the Issuer at the time of issuance.

Documents Available

So long as Notes are capable of being issued under the Program, copies of the following documents will, when published, be available free of charge from the registered office of the Issuer and from the principal office of the Principal Paying Agent for the time being in London.

(i) the constitutional documents (with an English translation thereof) of the Issuer;

(ii) the consolidated audited financial statements of the Issuer in respect of the years ended December 31, 2014, 2015 and 2016 (in English);

(iii) the most recently published audited annual consolidated financial statements of the Issuer and the most recently published unaudited condensed consolidated interim financial statements of the Issuer;

(iv) the Program Agreement, the Agency Agreement, the Deed Poll, the Deed of Covenant and the forms of the Global Notes, the Notes in definitive form, the Receipts, the Coupons and the Talons;

(v) a copy of this Offering Circular; and

(vi) any future offering circulars, prospectuses, information memoranda and supplements including Pricing Supplements (save that a Pricing Supplement relating to an unlisted Note will only be available for inspection by a holder of such Note and such holder must produce evidence satisfactory to the Paying Agent as to its holding of Notes and identity) to this Offering Circular and any other documents incorporated herein or therein by reference.

Clearing Systems

The Notes have been accepted for clearance through Euroclear and Clearstream, Luxembourg. The appropriate Common Code and ISIN for each Tranche of Notes allocated by Euroclear and Clearstream, Luxembourg will be specified in the applicable Pricing Supplement. If the Notes are to clear through an additional or alternative clearing system the appropriate information will be specified in the applicable Pricing Supplement.

Significant or Material Change

Save as disclosed in the Offering Circular, there has been no significant change in the financial or trading position of the Issuer and its subsidiaries taken as a whole since December 31, 2016 and there has been no material adverse change in the financial position or prospects of the Issuer and its subsidiaries taken as a whole since December 31, 2016.

Litigation

The Issuer is not involved in any legal, arbitration, administrative or other proceedings (including any proceedings which are pending or threatened of which the Issuer is aware) which may have or have had in the 12 months preceding the date of this document a significant effect on the financial position of the Issuer and its subsidiaries taken as a whole.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Independent Auditors' Report

The Board of Directors and Shareholder
Korea National Oil Corporation:

We have audited the accompanying consolidated financial statements of Korea National Oil Corporation and its subsidiaries (the "Group") which comprise the consolidated statements of financial position as at December 31, 2016 and 2015, the consolidated statements of comprehensive loss, changes in equity and cash flows for the years then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Korean International Financial Reporting Standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with Korean Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2016 and 2015 and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with Korean International Financial Reporting Standards.

Emphasis of matter

Without qualifying our opinion, we draw attention to Note 44 to the consolidated financial statements which states that imbalance between supply and demand continues to drive low oil prices in the international crude oil market and oil prices are less likely to bounce back in a short period of time. There is a significant uncertainty with respect to the Group's future business results depending on the recovery of oil prices. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Other matter

The procedures and practices utilized in the Republic of Korea to audit such consolidated financial statements may differ from those generally accepted and applied in other countries.

KPMG Samjong Accounting Corp.

Seoul, Korea
February 28, 2017

This report is effective as of February 28, 2017, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that the above audit report has not been updated to reflect the impact of such subsequent events or circumstances, if any.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Financial Position
As of December 31, 2016 and 2015

	Note	2016	2015
		In thousands of Korean won	
Assets			
Cash and cash equivalents	7,37,39	₩ 812,651,226	783,981,021
Current financial assets	8,9,13,14,37,38,39	19,007,401	17,392,394
Trade and other receivables	10,37,39	567,212,371	712,718,723
Inventories	15	125,113,992	179,822,226
Current income tax assets		15,439,429	14,747,350
Current non-financial assets	16	69,817,482	130,930,261
Current assets		1,609,241,901	1,839,591,975
Non-current financial assets	8,9,11,12,13,37,38,39	884,446,230	865,211,148
Long-term trade and other receivables	10,37,39	118,664,070	104,605,655
Property, plant and equipment	18	10,174,928,224	10,713,420,144
Goodwill	19	244,328,694	301,307,768
Intangible assets other than goodwill	20	3,587,399,646	4,155,280,657
Investments in associates and joint ventures	17	390,475,565	589,317,994
Deferred tax assets	35	1,154,541,941	942,115,987
Non-current non-financial assets	16	3,903,169,409	3,694,313,733
Non-current assets		20,457,953,779	21,365,573,086
Total assets		₩22,067,195,680	23,205,165,061
Liabilities			
Trade and other payables	21,37,39	₩ 973,354,166	851,339,393
Current financial liabilities	9,22,37,39	3,208,454,829	3,439,993,178
Current income tax liabilities		9,868,339	35,473,187
Current non-financial liabilities	25	85,103,193	127,341,266
Current provisions	24	155,940,533	189,404,474
Current liabilities		4,432,721,060	4,643,551,498
Long-term trade and other payables	21,37,39	293,433,599	586,714,571
Non-current financial liabilities	9.22,37,38,39	11,495,471,823	11,045,660,174
Employee benefits	23	14,730,311	18,339,702
Deferred tax liabilities	35	291,310,490	467,685,882
Non-current provisions	24	2,030,796,036	2,247,619,669
Non-current liabilities		14,125,742,259	14,366,019,998
Total liabilities		₩18,558,463,319	19,009,571,496
Equity			
Share capital	26	₩10,346,851,780	10,207,845,780
Accumulated deficit	27	(7,633,552,073)	(6,539,888,833)
Other components of equity	29	(314,455,121)	(166,408,433)
Equity attributable to the owner of the Company		2,398,844,586	3,501,548,514
Non-controlling interests		1,109,887,775	694,045,051
Total equity		₩ 3,508,732,361	4,195,593,565
Total equity and liabilities		₩22,067,195,680	23,205,165,061

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Comprehensive Loss
For the years ended December 31, 2016 and 2015

	Note	2016	2015
		In thousands of Korean won	
Revenue	6,30	₩ 2,430,397,594	3,433,170,643
Cost of sales	6,36	2,410,435,464	3,523,506,626
Gross profit (loss)		19,962,130	(90,335,983)
Selling and administrative expenses	6,36	260,792,013	354,777,155
Operating loss		(240,829,883)	(445,113,138)
Other non-operating income	6,31	235,672,964	153,432,566
Other non-operating expenses	6,31	(119,248,934)	(299,166,643)
Other loss, net	6,32	(423,839,145)	(3,074,968,748)
Finance income	6,33,37	182,857,191	95,034,497
Finance costs	6,34,37	(727,777,698)	(1,400,056,840)
Loss on investments in associates and joint ventures, net	6,17	(239,808,380)	(501,105,498)
Loss before income tax		(1,332,973,885)	(5,471,943,804)
Income tax benefit	35	(214,127,410)	(971,677,358)
Loss for the year		₩(1,118,846,475)	(4,500,266,446)
Other comprehensive income (loss)			
Items that will never be reclassified to profit or loss			
Actuarial losses on defined benefit plans	23	₩ (1,758,211)	(2,648,007)
Retained earnings adjustments in equity method, net of tax		11,669	(10,770)
Items that are or may be reclassified to profit or loss			
Net change in the unrealized fair value of available-for-sale financial assets, net of tax	11	(2,478,854)	—
Net change in fair value of available-for-sale financial assets reclassified to profit or loss, net of tax	11	—	178,152,527
Equity adjustments arising from investments in equity-method investees, net of tax	17	(4,064,426)	36,148,732
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	9	(967,374)	8,840,411
Foreign currency translation differences for foreign operations		(103,397,053)	1,365,992
Other comprehensive income (loss)for the year, net of tax		(112,654,249)	221,848,885
Total comprehensive loss for the year		₩(1,231,500,724)	(4,278,417,561)
Loss attributable to:			
Owners of the Company		₩(1,091,916,698)	(4,359,917,932)
Non-controlling interests		(26,929,777)	(140,348,514)
Loss for the year		₩(1,118,846,475)	(4,500,266,446)
Total comprehensive income (loss) attributable to:			
Owners of the Company		₩(1,241,709,928)	(4,171,481,134)
Non-controlling interests		10,209,204	(106,936,427)
Total comprehensive loss for the year		₩(1,231,500,724)	(4,278,417,561)

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Changes in Equity
For the years ended December 31, 2016 and 2015

	Attributable to owners of the Company					
	Share capital	Accumulated deficit	Other components of equity	Subtotal	Non-controlling interests	Total equity
	In thousands of Korean won					
Balance at January 1, 2015	₩10,091,919,780	(2,177,312,124)	(357,504,008)	7,557,103,648	812,565,107	8,369,668,755
Total comprehensive loss for the year						
Loss for the year	—	(4,359,917,932)	—	(4,359,917,932)	(140,348,514)	(4,500,266,446)
Items that will not be reclassified subsequently to profit or loss						
Defined benefit plan actuarial losses, net of tax	—	(2,648,007)	—	(2,648,007)	—	(2,648,007)
Retained earnings adjustments in equity method	—	(10,770)	—	(10,770)	—	(10,770)
Items that may be reclassified subsequently to profit or loss						
Net change in fair value of available-for-sale financial assets reclassified to profit or loss, net of tax	—	—	178,152,527	178,152,527	—	178,152,527
Equity adjustments arising from investments in equity-method investees, net of tax	—	—	36,148,732	36,148,732	—	36,148,732
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	—	—	8,840,411	8,840,411	—	8,840,411
Foreign currency translation differences for foreign operations	—	—	(32,046,095)	(32,046,095)	33,412,087	1,365,992
Total comprehensive income (loss) for the year	—	(4,362,576,709)	191,095,575	(4,171,481,134)	(106,936,427)	(4,278,417,561)
Transactions with owners of the Company, recognized directly in equity						
Issuance of share capital	115,926,000	—	—	115,926,000	—	115,926,000
Dividends paid	—	—	—	—	(11,314,900)	(11,314,900)
Other distribution to non-controlling interests	—	—	—	—	(268,729)	(268,729)
Total transactions with owners of the Company	115,926,000	—	—	115,926,000	(11,583,629)	104,342,371
Balance at December 31, 2015	₩10,207,845,780	(6,539,888,833)	(166,408,433)	3,501,548,514	694,045,051	4,195,593,565
Balance at January 1, 2016	₩10,207,845,780	(6,539,888,833)	(166,408,433)	3,501,548,514	694,045,051	4,195,593,565
Total comprehensive loss for the year						
Loss for the year	—	(1,091,916,698)	—	(1,091,916,698)	(26,929,777)	(1,118,846,475)

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Changes in Equity—(Continued)
For the years ended December 31, 2016 and 2015

	Attributable to owners of the Company					
	Share capital	Accumulated deficit	Other components of equity	Subtotal	Non-controlling interests	Total equity
			In thousands of Korean won			
Items that will not be reclassified subsequently to profit or loss						
Defined benefit plan actuarial losses, net of tax	—	(1,758,211)	—	(1,758,211)	—	(1,758,211)
Retained earnings adjustments in equity method	—	11,669	—	11,669	—	11,669
Items that may be reclassified subsequently to profit or loss						
Net change in the unrealized fair value of available-for-sale financial assets, net of tax	—	—	(2,478,854)	(2,478,854)	—	(2,478,854)
Equity adjustments arising from investments in equity-method investees, net of tax	—	—	(4,064,426)	(4,064,426)	—	(4,064,426)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	—	—	(967,374)	(967,374)	—	(967,374)
Foreign currency translation differences for foreign operations	—	—	(140,536,034)	(140,536,034)	37,138,981	(103,397,053)
Total comprehensive income (loss) for the year	—	(1,093,663,240)	(148,046,688)	(1,241,709,928)	10,209,204	(1,231,500,724)
Transactions with owners of the Company, recognized directly in equity						
Issuance of share capital	139,006,000	—	—	139,006,000	—	139,006,000
Dividends paid	—	—	—	—	(46,420,000)	(46,420,000)
Contribution by non-controlling interests	—	—	—	—	452,053,520	452,053,520
Total transactions with owners of the Company	139,006,000	—	—	139,006,000	405,633,520	544,639,520
Balance at December 31, 2016	₩10,346,851,780	(7,633,552,073)	(314,455,121)	2,398,844,586	1,109,887,775	3,508,732,361

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Cash Flows
For the years ended December 31, 2016 and 2015

	2016	2015
	In thousands of Korean won	
Cash flows from operating activities		
Loss for the year	₩(1,118,846,475)	(4,500,266,446)
Adjustment for:		
Net pension plan costs	9,656,685	8,365,674
Depreciation of property, plant and equipment	953,689,274	1,447,536,332
Amortization of intangible assets other than goodwill	151,930,271	209,780,647
Bad debt expense	428,504	4,311,473
Reversal of other provisions	—	(25,130,584)
Reversal of bad debt allowance	(670,562)	(2,425,878)
Gains on exemption of debts	(220,473,024)	(99,149,440)
Non-operating income from overseas oil fields (other income)	(7,265,315)	—
Interest costs on provision for decommissioning	93,005,038	108,326,934
Other bad debt expense	14,521,334	172,122,399
Gains on disposal of property, plant and equipment	(55,943,249)	(149,664,545)
Gains on disposal of intangible assets other than goodwill	(483,491)	(1,915,055)
Gains on valuation of derivatives (other profit or loss)	—	(418,347)
Reversal of impairment losses on property, plant and equipment	(400,959,457)	(21,286,571)
Reversal of impairment losses on intangible assets other than goodwill	(6,416,059)	—
Gains on foreign currency translation (other profit or loss)	(21,467,246)	(25,304,795)
Losses on disposal of property, plant and equipment	9,045,000	8,676,197
Losses on disposal of intangible assets other than goodwill	66,325,786	22,327
Losses on valuation of derivatives (other profit or loss)	3,164,396	1,202,085
Impairment losses on property, plant and equipment	433,606,570	2,362,118,964
Impairment losses and write-off of intangible assets other than goodwill	345,031,887	270,800,807
Impairment losses on goodwill	32,440,037	559,062,022
Losses on foreign currency translation (other profit or loss)	26,709,709	66,018,497
Income tax benefit	(214,127,410)	(971,677,358)
Interest income	(37,816,259)	(39,094,156)
Dividends income	(24,114)	(3,863,078)
Gains on disposal of available-for-sale financial investments	(26,232,279)	—
Gains on repayment of financial liabilities	(17,233,744)	—
Gains on transaction of derivatives (finance income)	(737,705)	—
Gains on foreign currency translation (finance income)	(60,053,861)	(43,991,160)
Interest expense	424,597,942	415,090,185
Impairment losses on available-for-sale financial assets	45,576,708	450,369,625
Losses on transaction of derivatives (finance cost)	5,748,906	—
Losses on foreign currency translation (finance cost)	205,689,862	477,838,822
Other finance costs (interest expense)	32,224,499	45,619,089
Share of loss in associates and joint ventures, net	121,681,241	242,929,626
Impairment losses on investments in associates and joint ventures	118,139,758	243,106,016
Gains on disposal of investments in associates and joint ventures	(12,620)	(142,205)
Losses on disposal of investments in subsidiaries	—	15,212,061
	2,023,297,012	5,724,446,610
Changes in:		
Inventories	43,869,162	(25,842,027)
Trade and other receivables	155,555,916	148,238,225
Other receivables relating to operating activities	48,398,420	(34,081,768)
Trade and other payables	(126,602,890)	(430,387,548)
Other payables relating to operating activities	(54,297,941)	43,540,130
Defined benefit liability	(3,682,234)	(839,461)
Provisions	(60,170,625)	(272,996,881)
Cash generated from operating activities	₩ 907,520,345	651,810,834
Dividend received	₩ 14,700,343	3,863,078
Interest paid	(477,471,075)	(404,641,038)

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Cash Flows — (Continued)
For the years ended December 31, 2016 and 2015

	2016	2015
	In thousands of Korean won	
Interest received	17,832,607	8,755,126
Income tax paid	(90,667,506)	(28,409,845)
Net cash provided by operating activities	371,914,714	231,378,155
Cash flows from investing activities:		
Disposal of investments in associates and joint ventures	3,626,880	202,060
Acquisition of investments in associates and joint ventures	(42,176,384)	(75,663,794)
Proceeds from disposal of property, plant and equipment	86,560,097	33,154,586
Acquisition of property, plant and equipment	(640,995,307)	(1,228,755,724)
Proceeds from disposal of assets held for sale	—	66,895,439
Proceeds from disposal of intangible assets other than goodwill	5,725,944	1,852,328
Acquisition of intangible assets other than goodwill	(44,334,731)	(278,819,780)
Proceeds from government grants	—	1,686
Acquisition of non-current non-financial assets	(90,792,457)	(44,597,715)
Proceeds from disposal of available-for-sale financial investments	67,184,859	—
Increase in long-term and short-term financial assets	—	(2,014,653)
Decrease in long-term and short-term financial assets	66,804	2,591,163
Increase in leasehold deposits provided	(18,364,281)	(3,075,419)
Decrease in leasehold deposits provided	16,059,739	1,359,325
Increase in short-term and long-term loans	(107,154,291)	(117,607,431)
Collection of short-term and long-term loans	10,576,677	11,782,950
Increase in leasehold deposits received	1,988,940	3,932,880
Decrease in leasehold deposits received	(29,786)	(3,343,820)
Net cash outflow from change in scope of consolidation	—	(32,431,240)
Net cash used in investing activities	(752,057,297)	(1,664,537,159)
Cash flow from financing activities		
Proceeds from increase in share capital	139,006,000	115,926,000
Proceeds from short-term borrowings	698,772,900	900,796,997
Repayments of short-term borrowings	(1,149,502,996)	(665,734,462)
Proceeds from issue of bond payables	2,576,075,381	2,003,432,759
Repayments of bond payables	(2,165,791,933)	(1,074,915,500)
Proceeds from long-term borrowings	34,826,579	462,525,937
Repayments of long-term borrowings	(87,824,325)	(28,777,650)
Dividends paid	(46,420,000)	(11,314,900)
Net cash inflow from contribution by non-controlling interests	452,053,520	—
Net cash outflow due to other distribution to non-controlling interests interest	—	(268,729)
Net cash provided by financing activities	₩ 451,195,126	1,701,670,452
Net increase in cash and cash equivalents before net effect of foreign exchange differences	₩ 71,052,543	268,511,448
Effect of exchange rate fluctuations on cash held	(44,431,621)	13,178,313
Net Increase in cash and cash equivalents	26,620,922	281,689,761
Cash and cash equivalents at January 1	790,195,584	508,505,823
Cash and cash equivalents at December 31 before deduction of government grants	816,816,506	790,195,584
Government grants	(4,165,280)	(6,214,563)
Cash and cash equivalents at December 31 after deduction of government grants	₩ 812,651,226	783,981,021

See accompanying notes to the consolidated financial statements.

Notes to the Consolidated Financial Statements
For the years ended December 31, 2016 and 2015

1. Reporting Entity

(a) Description of the controlling company

Korea National Oil Corporation (the "Company" or the "Parent Company") was incorporated on March 3, 1979 to engage in the development of oil fields, distribution of crude oil, maintenance of petroleum reserve stock and improvement of the petroleum distribution infrastructure under the Korea National Oil Corporation Act. The Company's head office is located at 305, Jongga-Ro, Jung-Gu, Ulsan in Korea. The Company also has 9 petroleum stockpile sites, 1 domestic gas field management office, 1 overseas office in Kazakhstan and overseas subsidiaries and affiliates in the United States and other countries.

As of December 31, 2016, the Company's share capital is ₩10,346,852 million, which is wholly owned by the government of the Republic of Korea.

The consolidated financial statements comprise the Company and its subsidiaries (together referred to as the "Group" and individually as "Group entities") and the Group's interests in associates and joint ventures.

The list of subsidiaries as of December 31, 2016 and 2015 is disclosed in Note 5.

2. Basis of Preparation

(a) Statement of compliance

The consolidated financial statements have been prepared in accordance with Korean International Financial Reporting Standards ("K-IFRS"), as prescribed in the Act on External Audits of Corporations in the Republic of Korea.

The consolidated financial statements were authorized for issue by the Board of Directors on February 28, 2017.

(b) Basis of measurement

The consolidated financial statements have been prepared on the historical cost basis, except for the following material items in the statement of financial position:

- derivative financial instruments are measured at fair value
- financial instruments at fair value through profit or loss are measured at fair value
- available-for-sale financial assets are measured at fair value
- investments in associates and joint venture are measured at fair value
- liabilities for defined benefit plans are recognized at the net of the total present value of defined benefit obligations less the fair value of plan assets

(c) Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the 'functional currency'). The accompanying consolidated financial statements are prepared in the Group's functional currency, the United States dollar, and presented in Korean won, the Group's presentation currency, for the financial reporting purposes in accordance with K-IFRS No. 1021, 'The Effects of Changes in Foreign Exchange Rates'. The Group is required to present its financial statements in Korean won in accordance with regulations in Korea.

Assets and liabilities for each statement of financial position presented (i.e. including comparatives) were translated at the closing rate at the date of that statement of financial position, income and expenses for each statement presenting profit or loss and other comprehensive income (i.e. including comparatives) were translated at the average exchange rates of the period and all resulting exchange differences were recognized in other comprehensive income.

(d) Use of estimates and judgments

The preparation of the consolidated financial statements in conformity with K-IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimates are revised and in any future periods affected.

(i) Management's judgment

Information about critical judgments in applying accounting policies that have the most significant effect on the amounts recognized in the consolidated financial statements is included in the following notes

Note 17: Investments in Associates and Joint Ventures — Classification of a joint arrangement

(ii) Assumptions and estimation uncertainties

Information about assumptions and estimation uncertainties that have a significant risk of resulting in a material adjustment within the next financial year are included in the following notes

Note 18: Property, Plant and Equipment — estimation of factors for depreciation and recoverable amount

Note 19: Goodwill — main assumptions for recoverable amounts

Note 20: Intangible assets other than goodwill — main assumptions for recoverable amounts

Note 23: Employee Benefits — main actuarial assumptions

Note 24 and 42: Provisions and Contingencies — assumptions for possibility of cash outflows and their amounts

Note 35: Income tax benefit — possibility of realization of deferred tax assets

(iii) Measurement of fair value

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities. The Group has an established control framework with respect to the measurement of fair values. This includes a valuation team that has overall responsibility for overseeing all significant fair value measurements, including Level 3 fair values, and reports directly to the CFO.

The valuation team regularly reviews significant unobservable inputs and valuation adjustments. If third party information, such as broker quotes or pricing services, is used to measure fair values, then the valuation team assesses the evidence obtained from the third parties to support the conclusion that such valuations meet the requirements of K-IFRS, including the level in the fair value hierarchy in which such valuations should be classified.

When measuring the fair value of an asset or a liability, the Group uses market observable data as far as possible. Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows.

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or a liability fall into different levels of the fair value hierarchy, then the fair value measurement is categorized in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

Information about the assumptions made in measuring fair values is included in the following notes:

Note 37 — Categories of financial instruments

Note 39 — Risk Management

3. Changes in Accounting Policies

Except for the changes below, the Group has consistently applied the accounting policies set out in note 4 to all periods presented in these consolidated financial statements. The Group has adopted the following amendments to standards with a date of initial application of January 1, 2016.

(a) K-IFRS No. 1001 'Presentation of Financial Statements'

Information that should be included in, excluded from, or aggregated with other information in the financial statements is clarified by the application of materiality.

Amendments specify considerations when an entity presents subtotals in the financial statements and allow an entity to determine the basis of preparation and the order of its notes in a systematic manner by considering the effect on the understandability and comparability of its financial statements. Also, the other comprehensive income section shall present line items for the amounts for the period of the share of the other comprehensive income of associates and joint ventures accounted for using the equity method, separated into the share of items that will or will not be reclassified subsequently to profit or loss.

(b) K-IFRS No. 1110 'Consolidated financial statements'

Amendments to the K-IFRS No. 1110 'Consolidated Financial Statements' amended conditions to be exempt from preparation of consolidated financial statements for an intermediate parent.

(c) K-IFRS No. 1111 'Joint Arrangements'

Amendment to the K-IFRS No. 1111 'Joint Arrangements' requires the acquirer of an interest in a joint operation in which the activity constitutes a business, as defined in K-IFRS No. 1103 'Business Combinations' to apply all of the principles on the business combinations accounting.

When a joint operator acquires an additional interest in the joint operation and retains joint control, the additional interest is generally measured at its fair value, but previously held interests are not remeasured. It requires to be determined whether the additional interest constitutes a business.

(d) K-IFRS No. 1112 'Disclosure of Interests in Other Entities'

Amendments to the K-IFRS No. 1112 'Disclosure of Interests in Other Entities' introduces scope of subsidiaries which are investment entities.

(e) K-IFRS No. 1028 'Investments in Associates and Joint Ventures'

Amendments to the K-IFRS No. 1028 'Investments in Associates and Joint Ventures' provides exemption from applying equity method for an investment in associate or joint venture which is an investment entity.

(f) Impact of changes in accounting policies.

Management believes the impact of the amendments on the Group's consolidated financial statements is not significant, and the Group did not retrospectively apply the new standards and amendments to standards stated above.

4. Significant Accounting Policies

The significant accounting policies applied by the Group in preparation of its consolidated financial statements are included below. The accounting policies set out below have been applied consistently to all periods presented in these consolidated financial statements, except for changes in accounting policies as explained in note 3.

(a) Basis of consolidation

(i) Non-controlling interests

Non-controlling interests are measured at their proportionate share of the acquiree's identifiable net assets at the date of acquisition. Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

(ii) Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

(iii) Loss of control

When the Group loses control over a subsidiary, it derecognizes the assets and liabilities of the subsidiary, and any related NCI and other components of equity. Any resulting gain or loss is recognized in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

(iv) Interests in equity-accounted investees

The Group's interests in equity-accounted investees comprise interests in associates and a joint venture. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies. A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities.

Interests in associates and the joint venture are accounted for using the equity method. They are initially recognized at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and OCI of equity-accounted investees, until the date on which significant influence or joint control ceases.

(v) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealized income and expenses arising from intra-group transactions, are eliminated. Unrealized gains arising from transactions with equity-accounted investees are eliminated against the investment to the extent of the Group's interest in the investee. Unrealized losses are eliminated in the same way as unrealized gains, but only to the extent that there is no evidence of impairment.

(b) Cash and cash equivalents

Cash and cash equivalents comprise cash on hand, demand deposits, and short-term investments in highly liquid securities that are readily convertible to known amounts of cash with maturities of three months or less from the acquisition date and which are subject to an insignificant risk of changes in value. Equity investments are excluded from cash and cash equivalents unless they are, in substance, cash equivalents, for example in the case of preferred shares when it has a short maturity with a specified redemption date.

(c) Inventories

Inventories are measured at the lower of cost and net realizable value. The cost of inventories is based on the moving-weighted average method, and includes expenditures for acquiring the inventories, production or conversion costs and other costs incurred in bringing them to their existing location and condition. Net realizable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and selling expenses.

The amount of any write-down of inventories to net realizable value and all losses of inventories are recognized as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realizable value, are recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

(d) Non-derivative financial assets

The Group recognizes and measures non-derivative financial assets by the following four categories: financial assets at fair value through profit or loss, held-to-maturity investments, loans and receivables and available-for-sale financial assets. The Group recognizes financial assets in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the instrument.

Upon initial recognition, non-derivative financial assets are measured at their fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the asset's acquisition or issuance.

(i) Financial assets at fair value through profit or loss

A financial asset is classified as financial assets are classified at fair value through profit or loss if it is held for trading or is designated as such upon initial recognition. Upon initial recognition, transaction costs are recognized in profit or loss when incurred. Financial assets at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss.

(ii) Held-to-maturity investments

A non-derivative financial asset with a fixed or determinable payment and fixed maturity, for which the Group has the positive intention and ability to hold to maturity, are classified as held-to-maturity investments. Subsequent to initial recognition, held-to-maturity investments are measured at amortized cost using the effective interest method.

(iii) Loans and receivables

Loans and receivables are financial assets with fixed or determinable payments that are not quoted in an active market. Subsequent to initial recognition, loans and receivables are measured at amortized cost using the effective interest method except for loans and receivables of which the effect of discounting is immaterial.

(iv) Available-for-sale financial assets

Available-for-sale financial assets are those non-derivative financial assets that are designated as available-for-sale or are not classified as financial assets at fair value through profit or loss, held-to-maturity investments or loans and receivables. Subsequent to initial recognition, they are measured at fair value, which changes in fair value, net of any tax effect, recorded in other comprehensive income in equity. Investments in equity instruments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured and derivatives that are linked to and must be settled by delivery of such unquoted equity instruments are measured at cost.

(v) De-recognition of financial assets

The Group derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows on the financial asset in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in transferred financial assets that is created or retained by the Group is recognized as a separate asset or liability.

If the Group retains substantially all the risks and rewards of ownership of the transferred financial assets, the Group continues to recognize the transferred financial assets and recognizes financial liabilities for the consideration received.

(vi) Offsetting between financial assets and financial liabilities

Financial assets and financial liabilities are offset and the net amount is presented in the consolidated statement of financial position only when the Group currently has a legally enforceable right to offset the recognized amounts, and there is the intention to settle on a net basis or to realize the asset and settle the liability simultaneously.

(e) Derivative financial instruments, including hedge accounting

Derivatives are initially recognized at fair value. Subsequent to initial recognition, derivatives are measured at fair value, and changes therein are accounted for as described below.

(i) Hedge accounting

The Group holds forward exchange contracts, interest rate swaps, currency swaps and other derivative contracts to manage interest rate risk and foreign exchange risk. The Group designated derivatives as hedging instruments to hedge the risk of changes in the fair value of assets, liabilities or firm commitments (a fair value hedge) and foreign currency risk of highly probable forecasted transactions or firm commitments (a cash flow hedge).

On initial designation of the hedge, the Group formally documents the relationship between the hedging instrument(s) and hedged item(s), including the risk management objectives and strategy in undertaking the hedge transaction, together with the methods that will be used to assess the effectiveness of the hedging relationship.

Fair value hedge

Changes in the fair value of a derivative hedging instrument designated as a fair value hedge are recognized in gain or loss. The gain or loss from remeasuring the hedging instrument at fair value for a derivative hedging instrument and the gain or loss on the hedged item attributable to the hedged risk are recognized in profit or loss in the same line item of the consolidated statement of comprehensive income.

The Group discontinues fair value hedge accounting if the hedging instrument expires or is sold, terminated or exercised, or if the hedge no longer meets the criteria for hedge accounting. Any adjustment arising from gain or loss on the hedged item attributable to the hedged risk is amortized to profit or loss from the date the hedge accounting is discontinued.

Cash flow hedge

When a derivative is designated to hedge the variability in cash flows attributable to a particular risk associated with a recognized asset or liability or a highly probable forecasted transaction that could affect profit or loss, the effective portion of changes in the fair value of the derivative is recognized in other comprehensive income, net of tax, and presented in the hedging reserve in equity. Any ineffective portion of changes in the fair value of the derivative is recognized immediately in profit or loss.

If the hedging instrument no longer meets the criteria for hedge accounting, expires or is sold, terminated, exercised, or the designation is revoked, then hedge accounting is discontinued prospectively. The cumulative gain or loss on the hedging instrument that has been recognized in other comprehensive income is reclassified to profit or loss in the periods during which the forecasted transaction occurs. If the forecasted transaction is no longer expected to occur, then the balance in other comprehensive income is recognized immediately in profit or loss.

(ii) Separable embedded derivatives

Embedded derivatives are separated from the host contract and accounted for separately only if the following criteria have been met:

① The economic characteristics and risks of the embedded derivative are not closely related to those of the host contract;
② A separate instrument with the same terms as the embedded derivative would meet the definition of a derivative; and
③ The hybrid instrument is not measured at fair value with changes in fair value recognized in profit or loss.

Changes in the fair value of separable embedded derivatives are recognized immediately in profit or loss.

(iii) Other derivative financial instruments

Changes in the fair value of other derivative financial instrument not designated as a hedging instrument are recognized immediately in profit or loss.

(f) Impairment of financial assets

A financial asset not carried at fair value through profit or loss is assessed at each reporting date to determine whether there is objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that a loss event has occurred after the initial recognition of the asset, and that the loss event had a negative effect on the estimated future cash flows of that asset that can be estimated reliably. However, losses expected as a result of future events, regardless of likelihood, are not recognized.

If there is objective evidence that financial instruments are impaired, impairment losses are measured and recognized. In addition, for an investment in an equity security, a significant or prolonged decline in its fair value below its cost is objective evidence of impairment.

(i) Financial assets measured at amortized cost

An impairment loss in respect of a financial asset measured at amortized cost is calculated as the difference between its carrying amount and the present value of its estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognized in profit or loss and reflected in an allowance account. When the Group considers that there are no realistic prospects of recovery of the asset, the relevant amounts are written off. If the amount of impairment loss subsequently decreases and the decrease can be related objectively to an event occurring after the impairment was recognized, then the previously recognized impairment loss is reversed through profit or loss either directly or by adjusting an allowance account.

(ii) Financial assets carried at cost

If there is objective evidence that an impairment loss has occurred on an unquoted equity instrument that is not carried at fair value because its fair value cannot be reliably measured, or on a derivative asset that is linked to and must be settled by delivery of such an unquoted equity instrument, the amount of the impairment loss is measured as the difference between the carrying amount of the financial asset and the present value of estimated future cash flows discounted at the current market rate of return for a similar financial asset. Such impairment losses shall not be reversed.

(iii) Available-for-sale financial assets

When a decline in the fair value of an available-for-sale financial asset has been recognized in other comprehensive income and there is objective evidence that the asset is impaired, the cumulative loss that had been recognized in other comprehensive income shall be reclassified from equity to profit or loss as a reclassification adjustment even though the financial asset has not been derecognized. Impairment losses recognized in profit or loss for an investment in an equity instrument classified as available-for-sale shall not be reversed through profit or loss. If, in a subsequent period, the fair value of a debt instrument classified as available-for-sale increases and the increase can be objectively related to an event occurring after the impairment loss was recognized in profit or loss, the impairment loss shall be reversed, with the amount of the reversal recognized in profit or loss.

(g) Property, plant and equipment

Property, plant and equipment are initially measured at cost and after initial recognition, are carried at cost less accumulated depreciation and accumulated impairment losses. The cost of property, plant and equipment includes expenditures arising directly from the construction or acquisition of the asset, any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management and the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

The following costs are capitalized as oil and gas properties.

- the costs incurred in development stage for constructing facilities and drilling wells for production
- the costs of acquiring production areas or fields with proved reserves
- the construction costs and other expenditures for initiating production
- the estimated costs for decommissioning

Additionally, the Group depreciates the acquisition costs of oil and gas properties which are aggregated on an area-by-area basis or field-by-field basis. For the costs of oil and gas properties which are aggregated on an area-by-area basis, the Group depreciates the acquisition costs using proved reserves as the total estimated production when applying the unit-of-production depreciation method. For the costs of oil and gas properties which are aggregated on a field-by-field basis, the Group depreciates the acquisition costs using proved developed reserves as the total estimated production when applying the unit-of-production depreciation method.

Costs related to undeveloped oil and gas properties are not immediately included in the depletable pool of developed assets but are transferred to the depletable pool as the reserves become proved (for area-by-area basis) or developed (for field-by-filed basis) through drilling activities.

Subsequent costs are recognized in the carrying amount of property, plant and equipment at cost or, if appropriate, as separate items if it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of the replaced part is derecognized. The costs of the day-to-day servicing are recognized in profit or loss as incurred.

Property, plant and equipment, except for land and oil and gas properties, are depreciated on a straight-line basis over estimated useful lives that appropriately reflect the pattern in which the asset's future economic benefits are expected to be consumed.

	Useful lives (years)
Buildings	20 ~ 40 years
Structures	20 ~ 40 years
Machineries	5 ~ 20 years
Vessels	20 years
Tools and fixtures	5 years
Vehicles	5 years

Gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment and are recognized in profit or loss. Depreciation methods, useful lives and residual values are reviewed at the end of each reporting date and adjusted, if appropriate. The change is accounted for as a change in an accounting estimate.

(h) Intangible assets

Intangible assets with finite useful lives acquired separately are carried at cost. Intangible assets acquired in a business combination are initially recognized at their fair value at the acquisition date (which is regarded as their cost). Subsequent to initial recognition, intangible assets acquired in a business combination are reported at cost less accumulated amortization and accumulated impairment losses.

Prior to acquiring the legal rights to explore an area, all costs related to exploration and evaluation of an area are charged directly to the statement of comprehensive loss. Once the legal rights to explore are acquired, all costs associated with acquisition of exploration rights, geological, geophysical and geographical research, drilling costs and evaluation of technical and commercial viability of economic production are capitalized as exploration and evaluation assets. All such costs are subject to review for impairment when facts and circumstances suggest that the carrying amount of the assets exceeds their recoverable amount. When technical feasibility and commercial viability are established, the relevant expenditure is transferred to oil and gas properties after impairment is assessed and any resulting impairment loss is recognized. If no potentially commercial petroleum is discovered from exploration drilling, the relating exploration and evaluation assets are written off through the statement of comprehensive loss.

The useful lives of intangible assets are assessed as either finite or indefinite. Intangible assets with finite lives are amortized over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. The amortization period and the amortization method for intangible assets with a finite useful lives are reviewed at least each financial year end. Changes in the expected useful life or the expected pattern of consumption of future economic benefits embodied in the asset is accounted for by changing the amortization period or method, as appropriate, and are treated as changes in accounting estimates. The amortization expense on intangible assets with finite lives is recognized in the statement of comprehensive income in the expense category consistent with the function of the intangible asset.

Intangible assets with indefinite useful lives such as membership are not amortized, but are tested for impairment annually. Intangible assets with definite useful lives are amortized on a straight-line basis over estimated useful lives of 5 to 20 years.

Gains or losses arising from derecognition of an intangible asset, measured as the difference between the net disposal proceeds and the carrying amount of the asset, and are recognized in income or loss when the asset is derecognized.

(i) Oil stockpiles

The Group stockpiles crude oil and petroleum products to stabilize domestic demand and market prices and classifies those assets as oil stockpiles (non-current non-financial assets) of which the cost is determined using the moving-average method. The Group performs annual impairment test for oil stockpiles.

(j) Borrowing costs

The Group capitalizes borrowing costs directly attributable to the acquisition, construction or production of a qualifying asset as part of the cost of that asset. Other borrowing costs are recognized in expense as incurred. A qualifying asset is an asset that requires a substantial period of time to get ready for its intended use or sale. Financial assets and inventories that are manufactured or otherwise produced over a short period of time are not qualifying assets. Assets that are ready for their intended use or sale when acquired are not qualifying assets.

To the extent that the Group borrows funds specifically for the purpose of obtaining a qualifying asset, the Group determines the amount of borrowing costs eligible for capitalization as the actual borrowing costs incurred on that borrowing during the period less any investment income on the temporary investment of those borrowings. To the extent that the Group borrows funds generally and uses them for the purpose of obtaining a qualifying asset, the Group shall determine the amount of borrowing costs eligible for capitalization by applying a capitalization rate to the expenditures on that asset. The capitalization rate shall be the weighted average of the borrowing costs applicable to the borrowings of the Group that are outstanding during the period, other than borrowings made specifically for the purpose of obtaining a qualifying asset. The amount of borrowing costs that the Group capitalizes during a period shall not exceed the amount of borrowing costs incurred during that period.

(k) Impairment of non-financial assets

The carrying amounts of the Group's non-financial assets, other than assets arising from employee benefits, inventories, deferred tax assets and non-current assets held for sale, are reviewed at the end of the reporting period to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Intangible assets that have indefinite useful lives or that are not yet available for use, irrespective of whether there is any indication of impairment, are tested for impairment annually by comparing their recoverable amount to their carrying amount.

For impairment testing, assets are grouped together into the smallest group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets ("CGUs"). The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. The value in use is estimated by applying a pre-tax discount rate that reflect current market assessments of the time value of money and the risks specific to the asset or CGU for which estimated future cash flows have not been adjusted, to the estimated future cash flows expected to be generated by the asset or CGU.

An impairment loss is recognized in profit or loss if the carrying amount of an asset or a CGU exceeds its recoverable amount.

(l) Non-current assets held for sale

Non-current assets, or disposal groups comprising assets and liabilities, that are expected to be recovered primarily through sale rather than through continuing use, are classified as held for sale. In order to be classified as held for sale, the asset (or disposal group) must be available for immediate sale in its present condition and its sale must be highly probable. The assets or disposal group that are classified as non-current assets held for sale are measured at the lower of their carrying amount and fair value less cost to sell.

The Group recognizes an impairment loss for any initial or subsequent write-down of an asset (or disposal group) to fair value less costs to sell, and a gain for any subsequent increase in fair value less costs to sell, up to the cumulative impairment loss previously recognized in accordance with K-IFRS No. 1036, 'Impairment of Assets'.

A non-current asset that is classified as held for sale or part of a disposal group classified as held for sale is not depreciated (or amortized).

(m) Non-derivative financial liabilities

The Group classifies non-derivative financial liabilities into financial liabilities at fair value through profit or loss or other financial liabilities in accordance with the substance of the contractual arrangement and the definitions of financial liabilities. The Group recognizes financial liabilities in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the financial liability.

(i) Financial assets at fair value through profit or loss

Financial liabilities at fair value through profit or loss include financial liabilities held for trading or designated as such upon initial recognition. Subsequent to initial recognition, financial liabilities at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss. Upon initial recognition, transaction costs that are directly attributable to the acquisition are recognized in profit or loss as incurred.

(ii) Other financial liabilities

Non-derivative financial liabilities other than financial liabilities at fair value through profit or loss are classified as other financial liabilities. At the date of initial recognition, other financial liabilities are measured at fair value minus transaction costs that are directly attributable to the acquisition. Subsequent to initial recognition, other financial liabilities are measured at amortized cost using the effective interest method.

The Group derecognizes a financial liability from the consolidated statement of financial position when it is extinguished (i.e. when the obligation specified in the contract is discharged, cancelled or expires).

(n) Employee benefits

(i) Short-term employee benefits

Short-term employee benefits are employee benefits that are due to be settled within 12 months after the end of the period in which the employees render the related service. When an employee has rendered service to the Group during an accounting period, the Group recognizes the undiscounted amount of short-term employee benefits expected to be paid in exchange for that service.

(ii) Retirement benefits: defined contribution plans

When an employee has rendered service to the Group during a period, the Group recognizes the contribution payable to a defined contribution plan in exchange for that service as a liability (accrued expense), after deducting any contribution already paid. If the contribution already paid exceeds the contribution due for service before the end of the reporting period, the Group recognizes that excess as an asset (prepaid expense) to the extent that the prepayment will lead to a reduction in future payments or a cash refund.

(iii) Retirement benefits: defined benefit plans

A defined benefit plan is a post-employment benefit plan other than a defined contribution plan. The Group’s net obligation in respect of defined benefit plans is calculated by estimating the amount of future benefit that employees have earned in return for their service in the current and prior periods; that benefit is discounted to determine its present value. The fair value of plan assets is deducted. The calculation is performed annually by an independent actuary using the projected unit credit method.

The discount rate is the yield at the reporting date on high-quality corporate bonds that have maturity dates approximating the terms of the Group’s obligations and that are denominated in the same currency in which the benefits are expected to be paid. The Group recognizes all actuarial gains and losses arising from actuarial assumption changes and experiential adjustments in other comprehensive income when incurred.

Re-measurements of net defined benefit liabilities, which comprise actuarial gains and losses, the return on plan assets (excluding interest) and the effect of the asset ceiling (if any, excluding interest), are recognized immediately in other comprehensive income. The Group determines the net interest expense (income) on the net defined benefit liability (asset) for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period to the then-net defined benefit liability (asset), taking into account any changes in the net defined benefit liability (asset) during the period as a result of contributions and benefit payments, net interest expense and other expenses related to defined benefit plans are recognized in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss in curtailment is recognized immediately in profit or loss. The Group recognizes gains and losses on the settlement of a defined benefit plan when the settlement occurs.

(o) Provisions

Provisions are recognized when the Group has a present legal or constructive obligation as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation.

The risks and uncertainties that inevitably surround many events and circumstances are taken into account in reaching the best estimate of a provision. Where the effect of the time value of money is material, provisions are determined at the present value of the expected future cash flows.

Where some or all of the expenditures required to settle a provision are expected to be reimbursed by another party, the reimbursement shall be recognized when, and only when, it is virtually certain that reimbursement will be received if the entity settles the obligation. The reimbursement shall be treated as a separate asset.

Provisions are reviewed at the end of each reporting period and adjusted to reflect the current best estimates. If it is no longer probable that an outflow of resources embodying economic benefits will be required to settle the obligation, the provision is reversed.

When there is a legal or contractual obligation for dismantling, removing facilities and restoring sites on which they are located to their original condition at the end of the useful lives of the facilities, the present value of the estimated future restoration costs are capitalized at the acquisition date as additions to the cost of oil and gas properties and are accounted for as a provision. The Group subsequently depreciates the restoration costs using the unit-of-production method and the difference between estimated restoration costs and their present value is charged to current operations by applying the effective-interest-rate method.

(p) Share Capital

Common stock is classified as equity and the incremental costs arising directly attributable to the issuance of common stock less their tax effects are deducted from equity.

(q) Foreign currencies

Transactions in foreign currencies are translated to the respective functional currencies of Group entities at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are retranslated to the functional currency using the reporting date's exchange rate. Non-monetary assets and liabilities denominated in foreign currencies that are measured at fair value are retranslated to the functional currency at the exchange rate at the date that the fair value was determined. Non-monetary assets and liabilities denominated in foreign currencies that are measured in terms of historical cost in a foreign currency are translated using the exchange rate at the dates of the transactions.

Foreign currency differences arising on retranslation are recognized in profit or loss, except for differences arising on the retranslation of available-for-sale equity instruments, a financial liability designated as a hedge of the net investment in a foreign operation, or qualifying cash flow hedges, which are recognized in other comprehensive income. When gains or losses on non-monetary items are recognized in other comprehensive income, exchange components of those gains or losses are recognized in other comprehensive income. Conversely, when gains or losses on non-monetary items are recognized in profit or loss, exchange components of those gains or losses are recognized in profit or loss.

(r) Revenue

Revenue from sale of goods, rendering of services or use of the Group assets is measured at the fair value of the consideration received or receivable, net of returns, trade discounts and volume rebates. When two or more revenue generating activities or deliverables are sold under a single arrangement, each deliverable that is considered to be a separate unit of account is accounted for separately. The allocation of consideration from a revenue arrangement to its separate units of account is based on the relative fair values of each unit.

(i) Sales of goods

Revenue from the sale of goods in the ordinary course of activities is measured at the fair value of the consideration received or receivable, trade discounts and volume rebates. Revenue is recognized when persuasive evidence exists, usually in the form of an executed sales agreement, that the significant risks and rewards of ownership have been transferred to the buyer, recovery of the consideration is probable, the associated costs can be estimated reliably, there is no continuing management involvement with the goods, and the amount of revenue can be measured reliably. The appropriate timing for transfer of risks and rewards varies depending on the individual terms and conditions of the sales contract. For international sales, this timing depends on the type of international commercial terms of the contract.

The Group recognizes revenue from the sales of product from a production area, only when the Group invests in the production area as a joint operation not as a joint venture. In addition, for the Group's joint operations, the Group capitalizes costs related to the production area as the oil and gas properties even if the Group is a non-operator.

(ii) Sales of other services

Revenue from services rendered is recognized in profit or loss in proportion to the stage of completion of the transaction at the reporting date. The stage of completion is assessed by reference to surveys of work performed or services performed to date as a percentage of total services to be performed or the proportion that costs incurred to date bear to the estimated total costs of the transaction or other methods that reliably measures the services performed.

(s) Finance income and finance costs

Finance income comprises interest income on funds invested (including available-for-sale financial assets), dividend income, gains on the disposal of available-for-sale financial assets and changes in the fair value of financial assets at fair value through profit or loss. Interest income is recognized as it accrues in profit or loss, using the effective interest rate method. Dividend income is recognized in profit or loss on the date that the Group's right to receive payment is established.

Finance costs comprise interest expense on borrowings and changes in the fair value of financial assets at fair value through profit or loss. Borrowing costs are recognized in profit or loss using the effective interest rate method.

(t) Income taxes

Income tax expense comprises current and deferred tax. Current tax and deferred tax are recognized in profit or loss except to the extent that it relates to a business combination, or items recognized directly in equity or in other comprehensive income.

(i) Current tax

Current tax is the expected tax payable or receivable on the taxable profit or loss for the year, using tax rates enacted or substantively enacted at the end of the reporting period and any adjustment to tax payable in respect of previous years. The taxable profit is different from the accounting profit for the period since the taxable profit is calculated excluding the temporary differences, which will be taxable or deductible in determining taxable profit (tax loss) of future periods, and non-taxable or non-deductible items from the accounting profit.

(ii) Deferred tax

The measurement of deferred tax liabilities and deferred tax assets reflects the tax consequences that would follow from the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities. The Group recognizes a deferred tax liability for all taxable temporary differences associated with investments in subsidiaries, associates, and interests in joint ventures, except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. In addition, the Group recognizes a deferred tax asset for all deductible temporary differences to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

The carrying amount of a deferred tax asset is reviewed at the end of each reporting period and reduces the carrying amount to the extent that it is no longer probable that sufficient taxable profit will be available to allow the benefit of part or all of that deferred tax asset to be utilized.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply to the period when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period.

Deferred tax assets and liabilities are offset only if there is a legally enforceable right to offset the related current tax liabilities and assets, and they relate to income taxes levied by the same tax authority and they intend to settle current tax liabilities and assets on a net basis.

(u) New standards and interpretations not yet adopted

The following new standards and amendments to existing standards have been published and are mandatory for the Group for annual period beginning after January 1, 2016 and the Group has not early adopted them.

(i) K-IFRS No. 1007 'Statement of Cash Flows'

Amendments to K-IFRS No. 1007, 'Statement of Cash Flows' require an entity to disclose changes from financing cash flows, changes arising from obtaining or losing control of subsidiaries or other businesses, the effect of changes in foreign exchange rates, changes in fair values and other changes in liabilities arising from financing activities. These amendments are effective for annual periods beginning on or after January 1, 2017. Management is in the process of evaluating the impact of the amendments on the Group's consolidated financial statement, if any.

(ii) K-IFRS No. 1012 'Income taxes'

Amendments to K-IFRS No. 1012, in the case of debt instruments evaluated with fair values, deferred tax accounting treatment is clarified, as the temporary difference is calculated from the difference between the carrying amount and taxable base amount of the debt liabilities, regardless of the expected recovery method. When reviewing the feasibility of deferred tax assets, if there is sufficient evidence that it is likely to recover some part of an entity's assets in excess of the carrying amount, the estimated amount of future taxable income would be included in the estimated future taxable income. In addition, future taxable income estimates are calculated as the amount before deducting the deductible (deduction) effect from deductible temporary differences. These amendments are effective for annual periods beginning on or after January 1, 2017. Management is in the process of evaluating the impact of the amendments on the Group's consolidated financial statement, if any.

(iii) K-IFRS No. 1109 'Financial Instrument'

Amendments to K-IFRS No. 1109, 'Financial Instruments' specify classification and measurement of financial instruments and change the credit loss model into an expected credit loss model from an incurred credit loss model. Additionally, the amendments were aimed to align accounting more closely with risk management and expanded the types of eligible hedged item, hedging instrument, and hedged risk under new hedge accounting model. These amendments are effective for annual periods beginning on or after January 1, 2018. Management has not initiated any changes related to K-IFRS No. 1109, therefore management has not performed an assessment of the impact resulting from the application of K-IFRS No. 1109. Management will complete the analysis of financial impacts arising from applying this standard in 2017.

(iv) K-IFRS No. 1115 'Revenue from Contracts with Customers'

K-IFRS No. 1115, published in January 2016, establishes a comprehensive framework for determining whether, how much and when revenue is recognized. It replaces existing revenue recognition guidance, including K-IFRS No. 1018, 'Revenue', K-IFRS No. 1011, 'Construction Contracts' and K-IFRS No. 2113, 'Customer Loyalty Programmes'. K-IFRS No. 1115 is effective for annual reporting periods beginning on or after January 1, 2018, with early adoption permitted. Management has not initiated any changes related to K-IFRS No. 1115, therefore management has not performed an assessment of the impact resulting from the application of K-IFRS No. 1115. Management will complete the analysis of financial impacts arising from applying this standard in 2017.

5. Subsidiaries

(a) The list of subsidiaries directly owned by the Company as of December 31, 2016 and 2015 are as follows:

Subsidiary name	Principal activity	Country of incorporation	Ownership (%) December 31, 2016	Ownership (%) December 31, 2015
ANKOR E&P Holdings Corp.	Exploration and production ("E&P")	United States	100.00	100.00
Dana Petroleum Limited	E&P	United Kingdom	100.00	100.00
KNOC Eagle Ford Corporation	E&P	United States	100.00	100.00
Harvest Operations Corp.	E&P	Canada	100.00	100.00
KNOC Kaz B.V.(*)	E&P	Netherlands	100.00	100.00
KNOC Exploracao e Producao de Petro do Brasil Ltda	E&P	Brazil	100.00	100.00
KNOC NEMONE Ltd.	E&P	Indonesia	100.00	100.00
KNOC NEMTWO Ltd.	E&P	Indonesia	100.00	100.00
KNOC Sumatra Ltd.	E&P	Indonesia	100.00	100.00
KNOC Yemen Ltd.	E&P	Yemen	60.00	60.00
KNOC Trading Singapore Pte. Ltd.	Trading and Marketing	Singapore	100.00	100.00
KNOC Trading Corporation	Trading and Marketing	United States	100.00	100.00

(*) Bakmura LLP, a subsidiary of KNOC Kaz B.V., was liquidated during the year ended December 31, 2015.

(b) Financial information of subsidiaries

(i) Financial information of subsidiaries as of and for the year ended December 31, 2016 is as follows:

Company	Assets	Liabilities	Revenue	Net profit (loss)
	In millions of Korean won			
ANKOR E&P Holdings Corp.	₩ 628,065	191,894	78,864	(13,685)
Dana Petroleum Limited (*1)	3,734,592	2,574,927	684,022	(104,267)
KNOC Eagle Ford Corporation	2,700,100	246,346	347,601	(148,276)
Harvest Operations Corp.	3,019,766	2,926,659	251,932	(306,387)
KNOC Kaz B.V.(*1)	1,144,608	653,062	155,975	8,546
KNOC Exploracao e Producao de Petro do Brasil Ltda(*2)	21	595	—	95
KNOC NEMONE Ltd.(*2)	—	—	—	—
KNOC NEMTWO Ltd.(*2)	—	—	—	—
KNOC Sumatra Ltd.	891	—	—	(33)
KNOC Yemen Ltd.	15	166,517	—	(57)
KNOC Trading Singapore Pte. Ltd.	342	14	478	33
KNOC Trading Corporation	2,367	—	1,109	454

(*1) The amounts presented are after reflecting the difference between the fair value and the book value that arose during the business combination.

(*2) Entities are in the process of liquidation as of December 31, 2016.

(ii) Financial information of subsidiaries as of and for the year ended December 31, 2015 is as follows:

Company	Assets	Liabilities	Revenue	Net profit (loss)
	In millions of Korean won			
ANKOR E&P Holdings Corp.	₩ 851,343	665,501	106,866	(391,870)
Dana Petroleum Limited	4,434,559	3,015,914	949,938	(585,049)
KNOC Eagle Ford Corporation	2,897,685	777,948	473,821	(63,649)
Harvest Operations Corp.	3,318,620	3,549,937	409,117	(1,625,831)
KNOC Kaz B.V.	1,084,204	613,086	222,836	(290,991)
KNOC Exploracao e Producao de Petro do Brasil Ltda	17	558	—	(214)
KNOC NEMONE Ltd.(*)	—	—	—	46,293
KNOC NEMTWO Ltd.(*)	—	—	—	41,264
KNOC Sumatra Ltd.	898	—	—	(633)
KNOC Yemen Ltd.	72	161,488	—	(61,254)
KNOC Trading Singapore Pte. Ltd.	332	39	588	112
KNOC Trading Corporation	1,846	10	1,442	303

(*) As of December 31, 2015, entities were in the process of liquidation and gains on exemption of loans were recognized based on Special Accounting for Energy and Resources as entities declared exploration failure.

(iii) The financial information of the subsidiaries that are related to the Group's non-controlling interests as of December 31, 2016 is as follows:

Company	ANKOR Energy LLC	KOA Energy LP(*1)	Eagle Ford MS LLC and Eagle Ford Energy LLC	KNOC EF Star LLC(*2)
	In millions of Korean won			
Non-controlling interest	20%	98%	20%	—
Non-current assets	₩ —	164,940	2,547,764	465,273
Current assets	4,271	22,389	98,731	31,646
Non-current liabilities	—	24,247	43,748	—
Current liabilities	4,238	658	4,595	—
Net assets	33	162,424	2,598,152	496,919
Book value of the non-controlling interests	7	159,671	521,521	465,273
Revenue	—	22,658	440,363	1,363
Net income (loss)	—	3,437	(116,551)	1,377
Total comprehensive income (loss)	—	3,437	(116,551)	—
Net gain (loss) distributed to non-controlling interests	—	3,378	(23,310)	—
Total comprehensive gain (loss) distributed to non-controlling interests	—	3,378	(23,310)	—

(*1) According to shareholders' agreement, ANKOR E&P Holdings Corp. holds a de facto control.

(*2) A non-controlling interest has no voting right as non-cumulative and non-participating redeemable preferred shares (see Note 42).

(iv) The financial information of the subsidiaries that are related to the Group's non-controlling interests as of December 31, 2015 is as follows:

Company	ANKOR Energy LLC	KOA Energy LP	Eagle Ford MS LLC and Eagle Ford Energy LLC
	In millions of Korean won		
Non-controlling interest	20%	98%	20%
Non-current assets	₩ —	163,370	2,749,571
Current assets	14,617	14,450	118,116
Non-current liabilities	—	(22,764)	(53,101)
Current liabilities	(14,585)	(1,009)	(11,706)
Net assets	32	154,047	2,802,880
Book value of the non-controlling interests	—	(151,437)	570,943
Revenue	—	29,343	577,809
Net loss	—	(75,513)	(35,863)
Total comprehensive loss	—	(75,513)	(35,863)
Net loss distributed to non-controlling interests	—	(74,233)	(7,173)
Total comprehensive loss distributed to non-controlling interests	—	(74,233)	(7,173)

6. Segment and Other Information

(a) For management purposes, the Group is organized into business units based on their goods and services. The Group's operating segments are 1) oil and gas, 2) petroleum distribution, 3) oil stockpiling, 4) financing, 5) drillship chartering and 6) others.

Segments	Goods and services	Location of business
Oil and gas	Exploration, development and production of domestic and overseas resources and sales of crude oil	Domestic and overseas
Petroleum distribution	Distribution business of gasoline and gas oil and oil trading	Domestic and overseas
Oil stockpiling	Purchase and lending of oil stockpiles, management, operation and lending of oil stockpiling facilities	Domestic
Financing	Financing for companies engaged in energy and natural resources development activities	Domestic
Drillship chartering	Drillship chartering business	Domestic and overseas
Others	Oil information services, other research services, etc.	Domestic and overseas

(b) Segment results for the year

(i) For the year ended December 31, 2016

	Oil and gas	Petroleum distribution	Oil stockpiling	Finan-cing	Drillship chartering	Others	Reportable segment total	Recon-ciling items(*)	Group total
				In millions of Korean won					
Revenue	₩1,778,518	487,970	118,902	1,274	4,043	39,691	2,430,398	—	2,430,398
Cost of sales	1,777,258	448,353	168,175	—	13,279	3,371	2,410,436	—	2,410,436
Gross profit (loss)	1,260	39,617	(49,273)	1,274	(9,236)	36,320	19,962	—	19,962
Selling and administrative expenses	186,342	822	—	678	—	—	187,842	72,950	260,792
Reportable segment operating profit (loss)	(185,082)	38,795	(49,273)	596	(9,236)	36,320	(167,880)	(72,950)	(240,830)
Other income							235,673	—	235,673
Other expenses							119,249	—	119,249
Other loss, net							(423,839)	—	(423,839)
Finance income							182,857	—	182,857
Finance costs							727,778	—	727,778
Loss on investments in associates and joint ventures, net							(239,808)	—	(239,808)
Loss before income tax	₩						(1,260,024)	(72,950)	(1,332,974)
Depreciation and amortization	₩1,009,329	2	78,876	—	3,515	34	1,091,756	13,863	1,105,619
Impairment loss on property, plant and equipment	433,607	—	—	—	—	—	433,607	—	433,607
Reversal of impairment loss on property, plant and equipment	(400,959)	—	—	—	—	—	(400,959)	—	(400,959)
Impairment loss on intangible assets other than goodwill	345,032	—	—	—	—	—	345,032	—	345,032
Reversal of impairment loss on intangible assets other than goodwill	(6,416)	—	—	—	—	—	(6,416)	—	(6,416)
Impairment loss on goodwill	32,440	—	—	—	—	—	32,440	—	32,440

(*) Primarily consists of headquarter salaries, training costs, service fees and other corporate related costs, including depreciation and amortization, that are not allocated to the segments.

(ii) For the year ended December 31, 2015

	Oil and gas	Petroleum distribution	Oil stockpiling	Finan-cing	Drillship chartering	Others	Reportable segment total	Recon-ciling items(*)	Group total
				In millions of Korean won					
Revenue	₩2,507,390	663,175	122,363	1,473	65,595	73,175	3,433,171	—	3,433,171
Cost of sales	2,686,702	619,209	178,620	—	32,863	6,113	3,523,507	—	3,523,507
Gross profit (loss)	(179,312)	43,966	(56,257)	1,473	32,732	67,062	(90,336)	—	(90,336)
Selling and administrative expenses	275,511	—	—	674	—	—	276,185	78,592	354,777
Reportable segment operating profit (loss)	(454,823)	43,966	(56,257)	799	32,732	67,062	(366,521)	(78,592)	(445,113)
Other income							153,433	—	153,433
Other expenses							299,167	—	299,167
Other loss, net							(3,074,969)	—	(3,074,969)
Finance income							95,034	—	95,034
Finance costs							1,400,057	—	1,400,057
Loss on investments in associates and joint ventures, net							(501,105)	—	(501,105)
Loss before income tax	₩						(5,393,352)	(78,592)	(5,471,944)
Depreciation and amortization	₩1,562,353	—	77,180	—	3,676	13	1,643,222	14,095	1,657,317
Impairment loss on property, plant and equipment	2,362,119	—	—	—	—	—	2,362,119	—	2,362,119
Reversal of impairment loss on property, plant and equipment	(21,287)	—	—	—	—	—	(21,287)	—	(21,287)
Impairment loss on intangible assets other than goodwill	270,801	—	—	—	—	—	270,801	—	270,801
Impairment loss on goodwill	559,062	—	—	—	—	—	559,062	—	559,062

(*) Primarily consists of headquarter salaries, training costs, service fees and other corporate related costs, including depreciation and amortization, that are not allocated to the segments.

(c) Segment assets and liabilities

(i) As of December 31, 2016

	Oil and gas	Petroleum distribution	Oil stockpiling	Financing	Drillship chartering	Reconciling items(*2)	Group total
	In millions of Korean won						
Assets	₩14,691,648	90,209	6,166,901	176,881	53,677	—	21,179,316
Adjustments:							
Headquarters' land, buildings, tools & fixtures	—	—	—	—	—	237,332	237,332
Headquarters' software and memberships	—	—	—	—	—	16,186	16,186
Headquarters' loans to employees	—	—	—	—	—	100,315	100,315
Headquarters' deferred tax assets	—	—	—	—	—	496,423	496,423
Headquarters' derivatives assets	—	—	—	—	—	9,011	9,011
Headquarters' financial assets and etc.	—	—	—	—	—	28,613	28,613
	₩14,691,648	90,209	6,166,901	176,881	53,677	887,880	22,067,196
Liabilities	₩18,144,278	68,450	48,524	543	3,474	—	18,265,269
Adjustments:							
Headquarters' derivative liabilities	—	—	—	—	—	190,403	190,403
Headquarters' financial liabilities	—	—	—	—	—	102,791	102,791
	₩18,144,278	68,450	48,524	543	3,474	293,194	18,558,463
Investments in associates and others(*1)	₩ 726,622	44,239	—	—	—	—	770,861
Acquisitions of property, plant and equipment	550,425	—	187,158	—	800	—	738,383
Acquisitions of intangible assets other than goodwill	42,790	—	—	—	—	1,565	44,355

(*1) Investments in associates and others consist of investment in associates and joint ventures and loans to related parties.

(*2) Primarily consists of loans for employees, deferred tax assets and others which are not allocated to the reportable segments.

(ii) As of December 31, 2015

	Oil and gas	Petroleum distribution	Oil stockpiling	Financing	Drillship chartering	Reconciling items(*2)	Group total
	In millions of Korean won						
Assets	₩16,347,460	172,422	5,884,322	2,454	71,668	—	22,478,326
Adjustments:							
Headquarters' land, buildings, tools & fixtures	—	—	—	—	—	217,463	217,463
Headquarters' software and memberships	—	—	—	—	—	13,950	13,950
Headquarters' loans to employees	—	—	—	—	—	96,665	96,665
Headquarters' deferred tax assets	—	—	—	—	—	336,772	336,772
Headquarters' derivative assets	—	—	—	—	—	5,132	5,132
Headquarters' financial assets and etc.	—	—	—	—	—	56,857	56,857
	₩16,347,460	172,422	5,884,322	2,454	71,668	726,839	23,205,165
Liabilities	₩18,402,867	116,959	70,913	—	7,192	—	18,597,931
Adjustments:							
Headquarters' derivative liabilities	—	—	—	—	—	227,975	227,975
Headquarters' financial liabilities	—	—	—	—	—	183,665	183,665
	₩18,402,867	116,959	70,913	—	7,192	411,640	19,009,571
Investments in associates and others(*1)	₩ 835,703	42,206	—	—	—	—	877,909
Acquisitions of property, plant and equipment	1,214,806	—	65,825	—	9,926	3,226	1,293,783
Acquisitions of intangible assets other than goodwill	292,150	—	—	—	—	2,578	294,728

(*1) Investments in associates and others consist of investment in associates and joint ventures and loans to related parties.

(*2) Primarily consists of loans for employees, deferred tax assets and others which are not allocated to the reportable segments.

(d) Information about geographical areas

(i) Revenue by geographic area for the years ended December 31, 2016 and 2015 is as follows:

	2016	2015
	In millions of Korean won	
Domestic	₩ 910,435	1,268,562
Canada	251,932	409,117
United Kingdom	684,022	949,938
United States	427,574	582,130
Kazakhstan	155,975	222,836
Others	460	588
	₩2,430,398	3,433,171

In presenting information about geographical areas, segment revenue is based on the geographical location of the Group's entities which recorded the related revenue.

(ii) Non-current assets by geographic area as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Domestic(*)	₩ 7,121,214	7,026,590
Canada	2,294,904	2,619,428
United Kingdom	3,367,853	3,869,798
United States	3,092,412	3,292,984
Kazakhstan	442,808	471,157
Iraq	1,507,801	1,573,416
Yemen	4,453	4,318
Peru	45,145	54,849
Libya	41,550	61,376
Vietnam	382,161	454,796
Others	—	24,929
	₩18,300,301	19,453,641

(*) The goodwill that cannot be allocated to an individual country amounting to ₩28,890 million and ₩28,023 million as of December 31, 2016 and 2015, respectively is included in domestic.

Non-current assets by geographic area include property, plant and equipment, goodwill, intangible assets other than goodwill, investments in associates and joint ventures, and non-financial assets.

(e) Information about main customers

Customers whose revenue is 10% or more of consolidated revenue are Unipec Asia Co., Ltd. and BP P.L.C. amounting to ₩388,888 million and ₩328,239 million for the year ended December 31, 2016, respectively, and Mercuria Energy Trading Pte. Ltd. of ₩367,265 million for the year ended December 31, 2015. Furthermore, revenues for the year ended December 31, 2016 belong to Petroleum distribution and Oil stockpiling segments and revenues for the year ended December 31, 2015 belong to Petroleum distribution segment.

7. Cash and Cash Equivalents

Cash and cash equivalents in the consolidated statements of cash flows include cash and bank deposit and exclude bank overdrafts. Cash and cash equivalents in the consolidated statements of cash flows for the years ended December 31, 2016 and 2015 are comprised of the following items in the consolidated statements of financial position.

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Cash in hands	₩ 375	330
Other on demand deposits	182,380	181,668
Short-term deposits classified as cash equivalents	464,398	332,117
Short-term investments classified as cash equivalents	169,663	276,081
	816,816	790,196
Government grants	(4,165)	(6,215)
	₩812,651	783,981

8. Restricted deposits

Restricted deposits as of December 31, 2016 and 2015 are as follows:

	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Asset retirement obligation	₩ —	2,426	—	2,282
Deposits for foreign workers	—	5	—	11
Compensations for fishermen	2,032	—	2,000	—
	₩2,032	2,431	2,000	2,293

9. Derivatives

(a) Derivatives as of December 31, 2016 and 2015 are as follows:

	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Derivative assets				
Currency swap	₩ 949	7,854	893	3,602
Interest rate swap	—	1,157	—	637
Other derivatives	—	—	433	—
	₩ 949	9,011	1,326	4,239
Derivative liabilities				
Currency forwards	₩ —	—	6,141	—
Currency swap	42,572	147,831	94,295	133,680
	₩42,572	147,831	100,436	133,680

(b) Details of currency swap contracts as of December 31, 2016 are as follows:

Type	Counter party	Maturity	Contract amount				Contract interest rate per annum	
			Currency	Sell	Currency	Buy	Sell	Buy
			In millions of Korean won and thousands of foreign currencies					
Cash flow hedge	HSBC	2021-02-08	HKD	500,000	USD	64,185	4.38%	5.03%
	BNP	2021-03-04	HKD	390,000	USD	50,081	4.50%	5.20%
	HSBC	2022-02-10	HKD	390,000	USD	50,282	3.95%	4.45%
	UBS	2017-03-08	CHF	100,000	USD	109,733	1.88%	3.34%
	HSBC	2017-03-07	CHF	200,000	USD	219,467	1.88%	3.34%
	BNP	2022-03-28	EUR	50,000	USD	65,075	4.00%	4.55%
	HSBC	2023-01-26	HKD	400,000	USD	51,600	2.85%	3.17%
	HSBC	2018-01-22	HKD	400,000	USD	51,600	1.80%	1.98%
	DBS	2023-02-06	EUR	37,000	USD	49,765	2.40%	3.19%
	HSBC	2025-06-24	EUR	60,000	USD	80,070	3.00%	4.06%
	HSBC	2023-07-03	EUR	50,000	USD	65,670	3.09%	4.31%
	HSBC	2018-07-03	AUD	55,000	USD	51,260	3.23%	3.05%
	HSBC	2018-11-28	CHF	200,000	USD	210,970	1.63%	3.16%
	BNP	2018-11-29	CHF	40,000	USD	42,194	1.63%	3.17%
	HSBC	2019-10-04	AUD	125,000	USD	109,563	4.25%	1.64%
	HSBC	2019-10-04	AUD	75,000	USD	65,738	2.82%	1.71%
	ANZ	2019-10-08	AUD	150,000	USD	131,475	2.82%	1.66%
	SC	2020-01-29	HKD	310,000	USD	39,985	2.18%	2.42%
	HSBC	2020-08-26	KRW	150,000	USD	125,565	2.03%	2.41%
	CITI	2019-02-05	AUD	325,000	USD	230,555	3.04%	2.15%
	BNS	2017-01-25	CAD	200,000	USD	149,254	0.98%	1.46%
	NBC	2017-01-25	CAD	50,000	USD	37,313	0.99%	1.46%
	HSBC	2017-01-25	CAD	250,000	USD	186,567	1.15%	1.46%

(c) Details of interest rate swap contracts as of December 31, 2016 are as follows:

Type	Counterparty	Terms	Contract amount	Contract interest rate per annum	
				Sell	Buy
			In thousands of US dollar		
Cash flow hedge	HSBC	2016-09-07~ 2018-06-05	300,000	3M Libor+1.00%	2.18%
	HSBC	2016-09-07~ 2018-06-05	200,000	3M Libor+0.80%	1.98%

(d) Gains and losses on valuation and transaction of derivatives for the years ended December 31, 2016 and 2015 are as follows:

	Net income effects of valuations		Net income effects of transactions		Other comprehensive income (loss) (*)	
	2016	2015	2016	2015	2016	2015
	In millions of Korean won					
Currency forwards	₩ —	—	—	—	—	(3,059)
Currency swap	—	—	(5,011)	—	(1,330)	15,540
Interest rate swap	—	—	—	—	363	(2,417)
Other derivatives	(3,164)	(784)	(1,423)	5,017	—	(1,224)
	₩(3,164)	(784)	(6,434)	5,017	(967)	8,840

(*) Changes in accumulated other comprehensive income (loss) are net of tax effect amounting to (-)₩1,582 million and (-)₩1,130 million for the years ended December 31, 2016 and 2015, respectively.

10. Trade and Other Receivables

Details of trade and other receivables as of December 31, 2016 and 2015 are as follows:

	December 31, 2016				December 31, 2015		
	Gross amounts	Allowance for doubtful accounts	Present value discount	Book value	Gross amounts	Allowance for doubtful accounts	Book value
	In millions of Korean won						
Current							
Trade accounts receivable	₩298,536	(1,400)	—	297,136	305,958	(1,709)	304,249
Other receivables	270,254	(172)	(6)	270,076	408,470	—	408,470
	568,790	(1,572)	(6)	567,212	714,428	(1,709)	712,719
Non-current							
Trade accounts receivable	—	—	—	—	2,456	—	2,456
Other receivables	118,664	—	—	118,664	102,150	—	102,150
	118,664	—	—	118,664	104,606	—	104,606
	₩687,454	(1,572)	(6)	685,876	819,034	(1,709)	817,325

11. Available-for-sale Financial Instruments

(a) Details of available-for-sale financial instruments as of December 31, 2016 and 2015 are as follows:

		Carrying amount		Fair value	
	Ownership interest(%)	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
		In millions of Korean won			
Non-marketable					
Yemen LNG Company Limited	1.06	₩ 13,613	96,049	13,613	96,049
PETRO ONADO S.A.	5.64	—	19,230	—	19,230
Micronic Korea(*1)(*2)	16.70	925	897	925	897
Troika Resource Investment PEF	14.47	3,666	28,689	3,666	28,689
Global Dynasty Natural Resource PEF	15.67	3,498	5,057	3,498	5,057
Marketable					
EP Energy	12.82	247,576	160,554	247,576	160,554
Faroe Petroleum plc	—	—	45,257	—	45,257
		₩269,278	355,733	269,278	355,733

(*1) The dividend income associated with Micronic Korea for the year ended December 31, 2016 is ₩24 million.

(*2) The carrying amount of non-marketable securities without a quoted price in an active market and a reliable fair value measurement held by the Group that was measured at cost as of December 31, 2016 is ₩925 million.

(b) Changes in available-for-sale financial instruments for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Beginning balance	₩355,733	566,895
Disposals	(40,953)	—
Reclassification adjustments(*1)	—	216,796
Valuation adjustments(*1)	(3,270)	—
Impairment losses(*2)	(45,577)	(450,370)
Effect of movements in exchange rates	3,345	22,412
	₩269,278	355,733

(*1) Amounts are presented without the tax effect amounting to ₩791 million in 2016 and (-)₩38,643 million in 2015, which have been recognized directly in equity.

(*2) The Group recognized impairment losses on PETRO ONADO S.A., Troika Resource Investment PEF and Global Dynasty Resource PEF amounting to ₩19,042 million, ₩24,887 million and ₩1,648 million, respectively.

12. Long-term Loans

Details of long-term loans as of December 31, 2016 and 2015 are as follows:

	December 31, 2016			December 31, 2015		
	Face value	Provision for loans	Carrying amount	Face value	Provision for loans	Carrying amount
	In millions of Korean won					
Loans for tuitions(*1)	₩ 202	—	202	234	—	234
Loans for housing(*2)	99,938	—	99,938	97,587	—	97,587
Loans for vehicles(*3)	350	—	350	375	—	375
General loans	121,256	(1,057)	120,199	114,837	(1,046)	113,791
Loans to related parties(*4)	1,109,773	(729,387)	380,386	983,793	(695,202)	288,591
	₩1,331,519	(730,444)	601,075	1,196,826	(696,248)	500,578

(*1) The Group provides employees who worked over a year with interest-free loans for their children's tuitions. The loans are repaid from their monthly wages.

(*2) The Group provides employees without housing with loans for housing at market interest rates. The loans are due 5~10 years and repaid by lump sum at maturity.

(*3) The Group provides overseas secondees who purchase or lease a vehicle with interest-free loans. The loans are due when the secondees return to Headquarters.

(*4) The Group provided KC Kazakh B.V. and 13 other related parties with loans at interest rates of 2.25~9.00%. The maturities are due 5~25 years and the Group recognized related bad debt expenses of ₩13,457 million and loss in equity method of ₩7,276 million for the year ended December 31, 2016. (see Note 40)

13. Financial Instruments

Details of financial Instruments as of December 31, 2016 and 2015 are as follows:

	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Term deposit	₩2,032	5,083	2,000	4,661

14. Other Financial Assets

Details of other current financial assets as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Overseas field operations quick assets	₩16,026	14,066

15. Inventories

Details of inventories as of December 31, 2016 and 2015 are as follows:

	December 31, 2016			December 31, 2015		
	Acquisition cost	Provision for losses on valuation	Carrying amount	Acquisition cost	Provision for losses on valuation	Carrying amount
	In millions of Korean won					
Raw materials	₩ 5,173	(518)	4,655	5,409	(584)	4,825
Merchandises	14,227	—	14,227	68,436	—	68,436
Work-in-progress	200	—	200	126	—	126
Finished goods	17,961	—	17,961	16,893	—	16,893
Supplies	84,905	—	84,905	87,390	—	87,390
Goods in-transit	3,166	—	3,166	2,152	—	2,152
	₩125,632	(518)	125,114	180,406	(584)	179,822

The reversal of the losses on the valuation of inventories recognized in cost of sales for the year ended December 31, 2016 is ₩66 million, and the reversal of losses on the valuation of inventories recognized in cost of sales for the year ended December 31, 2015 is ₩192 million.

16. Non-Financial Assets

Details of non-financial assets as of December 31, 2016 and 2015 are as follows:

	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Advance payments	₩42,620	—	86,062	—
Prepaid expenses	27,197	9,014	44,868	9,465
Oil stockpiles	—	3,894,155	—	3,684,849
	₩69,817	3,903,169	130,930	3,694,314

17. Investments in Associates and Joint Ventures

(a) Details of investments in associates and joint ventures as of December 31, 2016 and 2015 are as follows:

(i) As of December 31, 2016

Entity	Principal activity	Country	Equity interest (%)	Acquisition cost	Book value
		In millions of Korean won			
<Investments in associates>					
Kernhem B.V.	Exploration and Production (“E&P”)	Netherlands	36.67	₩ 12,348	—
Oilhub Korea Yeosu Co., Ltd.	Storing of oil	Korea	29.00	40,856	44,239
ADA Oil LLP(*1)	E&P	Kazakhstan	12.50	21,209	1,169
Parallel Petroleum LLC(*2)	E&P	United States	10.00	46,366	1,050
				120,779	46,458
<Investments in joint ventures>					
KNOC Inam Ltd.	Exploration	Malaysia	40.00	—	—
KNOC Kamchatka Petroleum Ltd.(*3)	Exploration	Cyprus	55.00	1	—
KC karpovsky B.V.	Exploration	Netherlands	35.00	11	—
KNOC Bazian Ltd.(*3)	Exploration	Malaysia	66.72	—	—
KNOC Nigerian West Oil Company Ltd.(*3)	Exploration	Nigeria	75.00	73	—
KNOC Nigerian East Oil Company Ltd.(*3)	Exploration	Nigeria	75.00	73	—
KNOC Aral Ltd.(*3)	Exploration	Malaysia	51.00	—	—
KNOC kamchatka Co., Ltd.	Exploration	Cyprus	50.00	8,213	—
KC kazakh B.V.	Exploration	Netherlands	35.00	274	—
Offshore International Group, Inc.	E&P	United States	50.00	767,547	247,660
KNOC Ferghana Ltd.	Exploration	Malaysia	50.00	1	—
KNOC Ferghana2 Ltd.(*3)	Exploration	Malaysia	65.00	—	—
KADOC Ltd.(*3)	E&P	Malaysia	75.00	1	—
Korea Oil Terminal Co., Ltd.(*3)	Storing of oil	Korea	82.26	3,967	—
Deep Basin Partnership(*3)	E&P	Canada	82.32	205,296	40,217
HKMS Partnership(*3)	Gas processing plant operation	Canada	70.23	71,042	56,141
				1,056,499	344,018
				₩1,177,278	390,476

(*1) Classified to an investment in associate as the Group’s associate, Kernhem B.V. holds 75% of the equity interest and by effective equity interest, the Group has the ability to exercise significant influence over the entity.

(*2) Classified to an investment in associate as the Group can designate one director in its board of directors. Despite the percentage of ownership is below 20%, the Group has the ability to exercise significant influence over the entity.

(*3) Despite the percentage of ownership of over 50%, the investment is classified to an investment in joint ventures as the Group is unable to exercise control over investees solely.

(ii) As of December 31, 2015

Entity	Principal activity	Country	Equity interest (%)	Acquisition cost	Book value
			In millions of Korean won		
<Investments in associates>					
Kernhem B.V.	Exploration and Production ("E&P")	Netherlands	36.67	₩ 11,975	—
Oilhub Korea Yeosu Co. Ltd.	Storing of oil	Korea	29.00	39,622	39,016
ADA Oil LLP(*1)	E&P	Kazakhstan	12.50	20,569	2,012
Parallel Petroleum LLC(*2)	E&P	United States	10.00	44,965	25,316
				117,131	66,344
<Investments in joint ventures>					
KNOC Inam Ltd.	Exploration	Malaysia	40.00	—	—
KNOC Kamchatka Petroleum Ltd.(*4)	Exploration	Cyprus	55.00	1	—
KC karpovsky B.V.	Exploration	Netherlands	35.00	11	—
KNOC Bazian Ltd.(*4)	Exploration	Malaysia	66.72	—	—
Dolphin Property Ltd.(*3)	Lease	Nigeria	—	—	—
KNOC Nigerian West Oil Company Ltd.(*4)	Exploration	Nigeria	75.00	70	—
KNOC Nigerian East Oil Company Ltd.(*4)	Exploration	Nigeria	75.00	70	—
KNOC Aral Ltd.(*4)	Exploration	Malaysia	51.00	—	—
KNOC kamchatka Co. Ltd.	Exploration	Cyprus	50.00	7,965	—
KC kazakh B.V.	Exploration	Netherlands	35.00	265	—
Offshore International Group, Inc.	E&P	United States	50.00	748,015	419,099
KNOC Ferghana Ltd.	Exploration	Malaysia	50.00	1	—
KNOC Ferghana2 Ltd.(*4)	Exploration	Malaysia	65.00	—	—
KADOC Ltd.(*4)	E&P	Malaysia	75.00	1	—
Korea Oil Terminal Co., Ltd.(*4)	Storing of oil	Korea	82.26	3,190	3,190
Deep Basin Partnership(*4)	E&P	Canada	81.71	156,829	42,375
HKMS Partnership(*4)	Gas processing plant operation	Canada	69.93	68,012	58,310
				984,430	522,974
				₩1,101,561	589,318

(*1) Classified to an investment in associate as the Group's associate, Kernhem B.V. holds 75% of the equity interest and by effective equity interest, the Group has the ability to exercise significant influence over the entity.

(*2) Classified to an investment in associate as the Group can designate one director in its board of directors. Despite the percentage of ownership is below 20%, the Group has the ability to exercise significant influence over the entity.

(*3) Liquidated for the year ended December 31, 2015.

(*4) Despite the percentage of ownership of over 50%, the investment is classified to an investment in joint ventures as the Group is unable to exercise control over investees solely.

(b) Changes in carrying value of investments in associates and joint ventures for the years ended December 31, 2016 and 2015 are as follows:

(i) For the year ended December 31, 2016

Entity	Beginning balance	Acquisition	Disposals	Dividends received	Share of profit and loss of equity method (*1)	Changes in equity adjustments in equity method	Impairment losses (*2)	Other changes (*3)	Ending balance
					In millions of Korean won				
<Investment in associates>									
Kernhem B.V.	₩ —	—	—	—	1,978	(1,978)	—	—	—
Oilhub Korea Yeosu Co. Ltd.	39,016	—	—	—	5,305	(1,456)	—	1,374	44,239
ADA Oil LLP	2,012	—	—	—	1,467	(966)	(1,371)	27	1,169
Parallel Petroleum LLC	25,316	—	—	—	(24,059)	—	—	(207)	1,050
	66,344	—	—	—	(15,309)	(4,400)	(1,371)	1,194	46,458
<Investment in joint ventures>									
KNOC Inam Ltd.	—	—	—	—	—	—	—	—	—
KNOC Kamchatka Petroleum Ltd.	—	—	—	—	—	—	—	—	—
KC karpovsky B.V.	—	—	—	—	—	—	—	—	—
KNOC Bazian Ltd.	—	—	—	—	—	—	—	—	—
KNOC Nigerian West Oil Company Ltd.	—	—	—	—	—	—	—	—	—
KNOC Nigerian East Oil Company Ltd.	—	—	—	—	—	—	—	—	—
KNOC Aral Ltd.	—	—	—	—	—	—	—	—	—
KNOC kamchatka Co. Ltd.	—	—	—	—	—	—	—	—	—
KC kazakh B.V.	—	—	—	—	—	—	—	—	—
Offshore International Group, Inc.	419,099	—	(3,614)	—	(56,780)	—	(116,769)	5,724	247,660
KNOC Ferghana Ltd.	—	—	—	—	—	—	—	—	—
KNOC Ferghana2 Ltd.	—	—	—	—	—	—	—	—	—
KADOC Ltd.	—	—	—	—	—	—	—	—	—
Korea Oil Terminal Co., Ltd.	3,190	650	—	—	(4,156)	347	—	(31)	—
Deep Basin Partnership	42,375	41,852	—	(1,436)	(45,001)	—	—	2,427	40,217
HKMS Partnership	58,310	876	—	(13,241)	6,841	—	—	3,355	56,141
	522,974	43,378	(3,614)	(14,677)	(99,096)	347	(116,769)	11,475	344,018
	₩589,318	43,378	(3,614)	(14,677)	(114,405)	(4,053)	(118,140)	12,669	390,476

(*1) Equity method is not applied to investments in associates and joint ventures with fully impaired capital. As a result, losses of ₩7,276 million under equity method have been accounted to loans during the current year.

(*2) Details of the impairment losses as of December 31, 2016 are as follows:

CGU	Recoverable amounts	Valuation of recoverable Method	Discount rate	Primary Assumption	Impairment loss	Reason for impairment
	In millions of Korean won					
ADA Oil LLP	1,169	Value in use	10.16%	Estimated production quantities based on reserve reports and long-term oil price forecast by major forecasting Institutions	1,371	Decrease in international oil prices, changes in reserves and others
Offshore International Group, Inc.	247,660	Value in use	9.91%	Estimated production quantities based on reserve reports and long-term oil price forecast by major forecasting Institutions	116,769	Decrease in international oil prices, changes in reserves and others

(*3) Include the effect of changes in exchange rates.

(ii) For the year ended December 31, 2015

Entity	Beginning balance	Acquisition	Disposals	Dividends received	Share of profit and loss of equity method(*1)	Changes in equity adjustments in equity method	Impair-ment losses(*2)	Other changes(*3)	Ending balance
	In millions of Korean won								
<Investment in associates>									
Kernhem B.V.	₩ 10,100	—	—	—	(19,245)	8,848	—	297	—
Oilhub Korea Yeosu Co. Ltd.	36,954	—	—	—	2,046	(2,407)	—	2,423	39,016
ADA Oil LLP	11,502	—	—	—	(13,802)	3,905	—	407	2,012
Parallel Petroleum LLC	40,170	—	—	—	(16,910)	—	—	2,056	25,316
	98,726	—	—	—	(47,911)	10,346	—	5,183	66,344
<Investment in joint ventures>									—
KNOC Inam Ltd.	—	—	—	—	—	—	—	—	—
KNOC Kamchatka Petroleum Ltd.	—	—	—	—	—	—	—	—	—
KC karpovsky B.V.	—	—	—	—	—	—	—	—	—
KNOC Bazian Ltd.	—	—	—	—	—	—	—	—	—
Dolphin Property Ltd.	243	—	(202)	—	(9)	(39)	—	7	—
KNOC Nigerian West Oil Company Ltd.	—	—	—	—	—	—	—	—	—
KNOC Nigerian East Oil Company Ltd.	—	—	—	—	—	—	—	—	—
KNOC Aral Ltd.	—	—	—	—	—	—	—	—	—
KNOC kamchatka Co. Ltd.	—	—	—	—	—	—	—	—	—
KC kazakh B.V.	—	—	—	—	(25,731)	25,731	—	—	—
Offshore International Group, Inc.	687,310	—	—	—	(59,781)	—	(243,106)	34,676	419,099
KNOC Ferghana Ltd.	—	—	—	—	—	—	—	—	—
KNOC Ferghana2 Ltd.	—	—	—	—	—	—	—	—	—
KADOC Ltd.	—	—	—	—	—	—	—	—	—
Korea Oil Terminal Co., Ltd.	1,267	1,776	—	—	—	—	—	147	3,190
Deep Basin Partnership	46,489	95,046	—	(1,723)	(92,551)	—	—	(4,886)	42,375
HKMS Partnership	25,202	38,310	—	(6,794)	6,078	—	—	(4,486)	58,310
	760,511	135,132	(202)	(8,517)	(171,994)	25,692	(243,106)	25,458	522,974
	₩859,237	135,132	(202)	(8,517)	(219,905)	36,038	(243,106)	30,641	589,318

(*1) Equity method is not applied to investments in associates and joint ventures with fully impaired capital. As a result, losses of ₩23,025 million under equity method have been accounted to loans during the prior year.

(*2) Details of the impairment losses as of December 31, 2015 are as follows:

CGU	Recoverable amounts	Valuation of recoverable Method	Discount rate	Primary Assumption	Impairment loss	Reason for impairment
				In millions of Korean won		
Offshore International Group, Inc.	419,099	Value in use	9.78%	Estimated production quantities based on reserve reports and long-term oil price forecast by major forecasting Institutions	(243,106)	Decrease in international oil prices

(*3) Include the effect of changes in exchange rates.

(c) The summaries of financial information of major associates and joint ventures for the years ended December 31, 2016 and 2015 are as follows:

(i) For the year ended December 31, 2016

	Total assets	Total liabilities	Revenue	Net income (loss)
	In millions of Korean won			
<Investment in associates>				
Kernhem B.V.	₩205,086	254,046	26,677	10,519
Oilhub Korea Yeosu Co., Ltd.	554,894	402,345	76,668	18,294
ADA Oil LLP	91,663	144,322	26,677	16,421
Parallel Petroleum LLC	434,850	287,412	64,642	(1,489)
<Investment in joint ventures>				
KNOC Bazian Ltd.	150,999	214,036	—	(6,222)
KNOC Nigerian West Oil Company Ltd.	165,396	245,955	—	(8,803)
KNOC Nigerian East Oil Company Ltd.	272,964	360,691	—	(11,634)
KNOC Aral Ltd.	41,665	41,888	—	(5)
KC kazakh B.V.	345,673	923,725	—	(372,521)
Offshore International Group, Inc.	927,459	364,896	134,620	(95,825)
KNOC Ferghana Ltd.	63,963	72,798	—	(1,811)
KNOC Ferghana2 Ltd.	22,549	24,942	—	(643)
KADOC Ltd.	313,136	356,662	—	(11,604)
Korea Oil Terminal Co., Ltd.	3,827	4,521	—	(1,281)
Deep Basin Partnership	188,384	149,455	32,593	(45,263)
HKMS Partnership	100,334	100,892	20,881	(673)

(ii) For the year ended December 31, 2015

	Total assets	Total liabilities	Revenue	Net income (loss)
	In millions of Korean won			
<Investment in associates>				
Kernhem B.V.	₩ 200,449	253,106	44,895	(82,410)
Oilhub Korea Yeosu Co. Ltd.	541,738	407,201	68,069	7,056
ADA Oil LLP	91,187	151,038	44,895	(104,216)
Parallel Petroleum LLC	729,487	314,315	113,060	(299,497)
<Investment in joint ventures>				
KNOC Bazian Ltd.	146,439	201,288	—	(8,772)
KNOC Nigerian West Oil Company Ltd.	160,765	230,001	—	(7,469)
KNOC Nigerian East Oil Company Ltd.	264,434	337,762	—	(6,010)
KNOC Aral Ltd.	40,412	40,623	—	(8)
KC kazakh B.V.	677,890	861,916	—	(172,242)
Offshore International Group, Inc.	1,006,631	364,284	174,994	(95,904)
KNOC Ferghana Ltd.	62,038	68,777	—	(1,559)
KNOC Ferghana2 Ltd.	21,345	23,017	—	(527)
KADOC Ltd.	310,978	341,470	—	(11,487)
Korea Oil Terminal Co., Ltd.	4,188	4,294	—	(1,575)
Deep Basin Partnership	198,269	157,031	26,742	(92,468)
HKMS Partnership	97,903	97,781	17,505	191

18. Property, Plant and Equipment

(a) Details of property, plant and equipment as of December 31, 2016 and 2015 are as follows:

(i) As of December 31, 2016

	Acquisition cost	Contributions for construction	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
	In millions of Korean won					
Land	₩ 550,989	—	—	—	—	550,989
Buildings	205,139	—	—	(34,578)	—	170,561
Structures	1,967,228	(131)	—	(666,848)	—	1,300,249
Machinery	642,104	(4,254)	(2)	(393,442)	—	244,406
Vessels	129,293	—	—	(76,110)	—	53,183
Vehicles	10,286	—	—	(7,232)	—	3,054
Tools & fixtures	67,361	—	—	(49,843)	(321)	17,197
Construction-in-progress	274,357	—	—	—	—	274,357
Others	49,321	—	—	(38,465)	(2,198)	8,658
Oil & gas properties	20,530,244	—	(5,802)	(9,952,803)	(3,019,365)	7,552,274
	₩24,426,322	(4,385)	(5,804)	(11,219,321)	(3,021,884)	10,174,928

(ii) As of December 31, 2015

	Acquisition cost	Contributions for construction	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
	In millions of Korean won					
Land	₩ 536,779	—	—	—	—	536,779
Buildings	199,318	—	—	(27,960)	—	171,358
Structures	1,924,339	(131)	—	(606,447)	—	1,317,761
Machinery	644,080	(4,453)	(2)	(362,219)	—	277,406
Vessels	124,580	—	—	(70,174)	—	54,406
Vehicles	8,744	—	—	(6,606)	—	2,138
Tools & fixtures	66,077	—	—	(41,087)	—	24,990
Construction-in-progress	90,877	—	—	—	—	90,877
Others	57,065	—	—	(34,518)	—	22,547
Oil & gas properties	21,285,931	—	(6,978)	(9,902,434)	(3,161,361)	8,215,158
	₩24,937,790	(4,584)	(6,980)	(11,051,445)	(3,161,361)	10,713,420

(b) Changes in property, plant and equipment for the years ended December 31, 2016 and 2015 are as follows:

(i) For the year ended December 31, 2016

	Beginning balance	Acquisitions	Disposals	Depreciation	Impairment losses	Reversal of impairment losses	Reclassifi-cations	Others(*)	Ending balance
	In millions of Korean won								
Land	₩ 536,779	28	(2,436)	—	—	—	—	16,618	550,989
Buildings	171,358	223	(310)	(5,836)	—	—	19	5,107	170,561
Structures	1,317,892	397	(8,141)	(48,418)	—	—	57	38,593	1,300,380
(Contributions to construction)	(131)	—	—	4	—	—	—	(4)	(131)
Machinery	281,861	2,427	(700)	(30,868)	—	—	183	(4,241)	248,662
(Contributions to construction)	(4,453)	—	—	325	—	—	—	(126)	(4,254)
(Government grants)	(2)	—	—	—	—	—	—	—	(2)
Vessels	54,406	800	—	(3,602)	—	—	—	1,579	53,183
Vehicles	2,138	1,650	(107)	(700)	—	—	27	46	3,054
Tools & fixtures	24,990	703	(6)	(7,981)	(315)	—	892	(1,086)	17,197
Construction-in-progress	90,877	184,006	—	—	—	—	(10,500)	9,974	274,357
Others	22,547	296	(18)	(5,259)	(2,147)	—	20	(6,781)	8,658
Oil & gas properties	8,222,136	547,853	(143,601)	(853,130)	(431,145)	400,959	38,678	(223,674)	7,558,076
(Government grants)	(6,978)	—	—	1,337	—	—	—	(161)	(5,802)
	₩10,713,420	738,383	(155,319)	(954,128)	(433,607)	400,959	29,376	(164,156)	10,174,928

(*) Include the effect of changes in exchange rates and others.

(ii) For the year ended December 31, 2015

	Beginning balance	Acquisitions	Disposals	Depreciation	Impairment losses	Reversal of impairment losses	Reclassifi- cations	Others(*)	Ending balance
	In millions of Korean won								
Land	₩ 503,119	450	(123)	—	—	—	—	33,333	536,779
Buildings	164,213	1,562	(91)	(5,718)	—	—	797	10,595	171,358
Structures	1,271,619	10,394	(69)	(46,701)	—	—	1	82,648	1,317,892
(Contributions to construction)	(127)	—	—	4	—	—	—	(8)	(131)
Machinery	273,115	21,591	(74)	(30,906)	—	—	293	17,842	281,861
(Contributions to construction)	(4,591)	—	—	316	—	—	—	(178)	(4,453)
(Government grants)	—	(2)	—	—	—	—	—	—	(2)
Vessels	44,540	9,926	—	(3,248)	—	—	—	3,188	54,406
Vehicles	2,727	425	(22)	(650)	—	—	2	(344)	2,138
Tools & fixtures	30,081	2,843	(90)	(8,108)	—	—	707	(443)	24,990
Construction-in-progress	61,962	38,966	—	—	—	—	(13,258)	3,207	90,877
Others	27,507	4,790	(1,879)	(5,927)	—	—	27	(1,971)	22,547
Oil & gas properties	11,455,935	1,202,836	(109,478)	(1,348,216)	(2,362,119)	21,287	(254,414)	(383,695)	8,222,136
(Government grants)	(8,117)	—	—	1,618	—	—	—	(479)	(6,978)
	₩13,821,983	1,293,781	(111,826)	(1,447,536)	(2,362,119)	21,287	(265,845)	(236,305)	10,713,420

(*) Include the effect of changes in exchange rates and others.

(c) Details of impairments recognized by segments for the years ended December 31, 2016 and 2015 are as follows:

(i) For the year ended December 31, 2016

	Oil and Gas(*1)
	In millions of Korean won
Generals	
Type of assets	Oil and gas properties
Subject to recognition of impairment losses	31 CGUs and individual assets
Valuation Method	Value in use
Assumptions	
Discount rate after tax(*2)	8.00~22.20%
Oil prices(*3)	International indices
Production quantities	Estimated production quantities based on reserve reports
Recoverable amounts	₩2,018,690
Impairment losses	431,145
Reason for impairment	Decrease in forecasted oil prices and others

(*1) The CGUs of the oil and gas segment are fields or wells.

(*2) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.

(*3) The oil prices are based on the long-term forecasts from globally recognized research institutions.

(ii) For the year ended December 31, 2015

	Oil and Gas(*1)
	In millions of Korean won
Generals	
Type of assets	Oil and gas properties
Subject to recognition of impairment losses	42 CGUs and individual assets
Valuation Method	Value in use
Assumptions	
Discount rate after tax(*2)	6.04~17.50%
Oil prices(*3)	International indices
Production quantities	Estimated production quantities based on reserve reports
Recoverable amounts	₩2,388,292
Impairment losses	2,362,119
Reason for impairment	Decrease in international oil prices and others

(*1) The CGUs of the oil and gas segment are fields or wells.

(*2) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.

(*3) The oil prices are based on the long-term forecasts from globally recognized research institutions.

(d) Details of reversal of impairment losses recognized by segments for the year ended December 31, 2016 are as follows:

	Oil and Gas(*1)
	In millions of Korean won
Generals	
Type of assets	Oil and gas properties
Subject to recognition of impairment losses	24 CGUs and individual assets
Valuation Method	Value in use, net fair value(*2)
Assumptions	
Discount rate after tax(*3)	8.00~12.00%
Oil prices(*4)	International indices
Production quantities	Estimated production quantities based on reserve reports
Reversal of impairment losses	₩400,959
Reason for reversal of impairment losses	Production period extension, decrease in operation cost, disposal contracts and others

(*1) The CGUs of the oil and gas segment are fields or wells.

(*2) Each individual asset in Canada has been measured at net fair value based on disposal contracts.

(*3) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.

(*4) The oil prices are based on the long-term forecasts from globally recognized research institutions.

(e) Reversal of impairment losses on oil and gas properties of ₩21,287 million were recognized in the United States for the year ended December 31, 2015.

19. Goodwill

(a) Details of goodwill as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Acquisition cost	₩1,172,204	1,310,758
Accumulated impairment losses	(927,875)	(1,009,450)
	₩ 244,329	301,308

(b) Changes in goodwill for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Beginning balance	₩301,308	857,049
Disposals	(10,253)	(8,034)
Impairment losses(*1)	(32,440)	(559,062)
Other changes(*2)	(14,286)	11,355
	₩244,329	301,308

(*1) The Group recognized an impairment loss on goodwill arising at the acquisition of Harvest Operations Corp. due to significant decrease in oil prices.

(*2) Include the effect of exchange rate changes and others.

(c) Changes in accumulated impairment losses for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Beginning balance	₩(1,009,450)	(450,392)
Impairment losses	(32,440)	(559,062)
Other changes(*)	114,015	4
	₩ (927,875)	(1,009,450)

(*) Include the effect of exchange rate changes.

(d) For the purpose of impairment testing, carrying amounts of goodwill allocated to Group's CGUs and groups of CGUs as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Oil and gas properties of Dana Petroleum Limited by country(*1)	₩125,912	147,671
Conventional oil and gas properties of Harvest Operations Corp(*2)	89,767	125,852
Altius Holdings Inc. (a subsidiary of KNOC Kaz B.V.)(*3)	28,650	27,785
	₩244,329	301,308

(*1) Dana Petroleum Limited's recoverable amount is estimated based on the value in use. The value in use is estimated from the cash inflows, which are discounted at 8% and 12% derived from the oil production in the long-term production plan indicated in the reserve reports and the long-term oil price forecasts by the research institutions. There is no impairment loss on goodwill recognized based on the value in use estimated for each CGU for the year ended December 31, 2016.

(*2) Harvest Operations Corp.'s recoverable amount is estimated based on the fair value less costs of disposal. The Group estimated the fair value less costs of disposal using the market approach valuation technique. The Group used the market multiples as the entity value of a set of comparable companies divided by their reserves and multiplied that multiples to the subsidiaries' reserves from the reserve reports. The Group recognized an impairment loss on goodwill of ₩32,440 million in the consolidated statements of comprehensive loss as other loss based on the fair value less costs of disposal for the year ended December 31, 2016.

(*3) Altius Holding Inc.'s recoverable amount is estimated based on the value in use. The value in use is estimated from the cash inflows, which are discounted at 10.12%, derived from the oil production in the long-term production plan indicated in the reserve reports and the long-term oil price forecasts by the research institutions. There is no impairment loss on goodwill recognized based on the value in use estimated for each CGU for the year ended December 31, 2016.

20. Intangible Assets Other Than Goodwill

(a) Details of intangible assets other than goodwill as of December 31, 2016 and 2015 are as follows:

(i) As of December 31, 2016

	Acquisition cost	Accumulated amortization	Accumulated impairment losses	Book value
		In millions of Korean won		
Exploration and evaluation assets	₩3,231,627	—	(2,485,343)	746,284
Software	35,584	(28,510)	—	7,074
Mining rights	4,447,746	(1,523,666)	(101,142)	2,822,938
Development cost	40,802	(32,453)	—	8,349
Land use right	253	(71)	—	182
Others	97,093	(1,278)	(93,242)	2,573
	₩7,853,105	(1,585,978)	(2,679,727)	3,587,400

(ii) As of December 31, 2015

	Acquisition cost	Accumulated amortization	Accumulated impairment losses	Book value
		In millions of Korean won		
Exploration and evaluation assets	₩3,680,199	—	(2,433,485)	1,246,714
Software	32,194	(24,133)	—	8,061
Mining rights	4,305,392	(1,334,857)	(80,690)	2,889,845
Development cost	35,727	(27,847)	—	7,880
Land use right	245	(64)	—	181
Others	94,158	(1,132)	(90,426)	2,600
	₩8,147,915	(1,388,033)	(2,604,601)	4,155,281

(b) Changes in intangible assets other than goodwill for the years ended December 31, 2016 and 2015 are as follows:

(i) For the year ended December 31, 2016

	Beginning balance	Acquisitions	Disposals	Amortization	Impairment losses(*1)	Reversal of impairment	Reclassifications	Others(*2)	Ending balance
	In millions of Korean won								
Exploration and Evaluation assets	₩1,246,714	41,844	(70,753)	—	(327,854)	—	(49,025)	(94,642)	746,284
Software	8,061	158	(781)	(3,482)	—	—	2,917	201	7,074
Mining rights	2,889,845	923	(9,569)	(144,746)	(17,178)	6,416	14,350	82,897	2,822,938
Development cost	7,880	1,425	—	(3,590)	—	—	2,380	254	8,349
Land use right	181	—	—	(6)	—	—	—	7	182
Others	2,600	5	—	(106)	—	—	—	74	2,573
	₩4,155,281	44,355	(81,103)	(151,930)	(345,032)	6,416	(29,378)	(11,209)	3,587,400

(*1) Include the write-off of ₩345,032 million, which have been recognized due to expiration of mining rights in Korea, relinquishment of explorations in Iraq and decrease in recoverable amount of mining right in relation to oil and gas properties. Also, gains on debt exemption of ₩148,863 million from loans and accrued interest based on Accounting for Energy and Resources have been recognized.

(*2) Include the effect of changes in exchange rates and others.

(ii) For the year ended December 31, 2015

	Beginning balance	Acquisitions	Disposals	Amortization	Impairment losses(*1)	Reclassifications	Others(*2)	Ending balance
	In millions of Korean won							
Exploration and evaluation assets	₩ 831,878	286,553	(8,468)	—	(163,423)	272,397	27,777	1,246,714
Software	10,965	653	—	(3,907)	—	122	228	8,061
Mining rights	2,997,127	5,516	(10)	(201,810)	(71,962)	(8,077)	169,061	2,889,845
Development cost	7,891	1,988	—	(3,906)	—	1,403	504	7,880
Land use right	176	—	—	(6)	—	—	11	181
Others	2,791	18	—	(152)	(35,416)	—	35,359	2,600
	₩3,850,828	294,728	(8,478)	(209,781)	(270,801)	265,845	232,940	4,155,281

(*1) Include the write-off of ₩270,801 million, which were recognized due to relinquishment of explorations in Europe and decrease in recoverable amount of mining right in relation to oil and gas properties.

(*2) Include the effect of changes in exchange rates and others.

21. Trade and Other Payables

Details of trade and other payables as of December 31, 2016 and 2015 are as follows:

	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Trade accounts payable	₩100,246	—	131,627	—
Other accounts payable	693,151	57,144	518,805	354,340
Accrued expenses	117,873	203,009	129,346	223,647
Deposit received	—	4,562	—	2,445
Others	62,084	28,719	71,561	6,283
	₩973,354	293,434	851,339	586,715

22. Borrowings and Bonds Payable

(a) Details of borrowings and bonds payable as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Current Liabilities		
Short-term borrowings	₩ 897,965	1,269,147
Current portion of long-term borrowings	245,325	—
Less: present discounted value	(160)	—
Current portion of bonds payable	2,023,507	2,072,378
Less: current portion of discount on bonds payable	(754)	(1,968)
	3,165,883	3,339,557
Non-current Liabilities		
Long-term borrowings	1,096,273	1,552,425
Less: present discounted value	(65)	(865)
Bonds payable	10,289,014	9,388,675
Less: discount on bonds payable	(39,459)	(30,964)
Add: premium on bonds payable	1,878	2,708
	11,347,641	10,911,979
	₩14,513,524	14,251,536

(b) Details of payment schedule as of December 31, 2016 and 2015 are as follows:

	December 31, 2016		December 31, 2015	
	Borrowings	Bonds Payable	Borrowings	Bonds Payable
	In millions of Korean won			
Within a year	₩1,143,290	2,023,507	1,269,147	2,072,378
1~5 years	834,074	5,903,971	1,128,567	6,473,715
More than 5 years	262,199	4,385,043	423,858	2,914,960
	₩2,239,563	12,312,521	2,821,572	11,461,053

(c) Details of short-term borrowings as of December 31, 2016 and 2015 are as follows:

Type	Financial Institutions	Interest rate (%)	Maturity	December 31, 2015	December 31, 2016
		In millions of Korean won			
Short- term borrowings in foreign currencies	Korea Development Bank	—	—	₩ —	35,160
	Sumitomo Mitsui Bank	—	—	—	35,160
	Shinhan Bank London	3M Libor+2.50	2017-12-31	38,842	18,126
	ING Bank	—	—	—	58,600
	ING Bank	—	—	—	93,760
	Mizuho Corporate Bank	—	—	—	140,640
	Development Bank of Singapore	—	—	—	48,943
	Bank of America	—	—	—	58,600
	CIBC and others	(*)	2017-04-30	798,698	780,158
	The Export-Import Bank of Korea	Libor+0.69	2017-06-24	60,425	—
				₩897,965	1,269,147

(*) Floating rate is applied to the borrowings according to the terms of contract. Also, the effective interest rate as of December 31, 2016 is 1.60%.

(d) Details of long-term borrowings as of December 31, 2016 and 2015 are as follows:

Type	Financial Institution	Interest rate (%)	Maturity	December 31, 2016 Amount	December 31, 2016 Equivalent to Korean won	December 31, 2015 Amount	December 31, 2015 Equivalent to Korean won
			In millions of Korean won and thousands of foreign currencies				
Long- term borrowings in foreign currencies	Development Bank of Singapore	3M Libor +0.60	2018-01-30	USD 50,000	60,425	USD 50,000	58,600
	Mizuho Corporate Bank	3M Libor +0.75	2017-04-05	USD 200,000	241,700	USD 200,000	234,400
	SAER(*)	Treasury 3Y -1.25	N/A	USD 110,260	133,249	USD 191,294	224,197
	SAER(*)	Treasury 3Y -2.25	N/A	USD 106,703	128,950	USD 170,359	199,661
	BNP Paribas and others	Libor, Nibor, Euribor +1.75~2.25	2018-12-31	USD 540,763	653,512	USD 618,071	724,380
	JP Morgan	Libor+0.80	2018-07-29	USD 10,000	12,085	—	—
	Bank of America	Libor+0.75	2018-10-05	USD 20,000	24,170	—	—
	Hyundai Heavy Industries, Hanhwa Corp	N/A	N/A	USD 52,692	63,678	USD 52,692	61,755
	Kernhem International B.V.	8.13	2019-12-04	USD 16,718	20,204	USD 16,718	19,593
	Shinhan Bank	3M Libor +2.50	2017-10-31	USD 3,000	3,625	USD 25,460	29,839
					1,341,598		1,552,425
Less: present value discount on current portion					(225)		(865)
					1,341,373		1,551,560
Less: current portion					(245,325)		—
Less: present value discount on current portion					160		—
					1,096,208		1,551,560

(*) SAER stands for Special Accounting for Energy and Resources. Loans from SAER included in borrowings have no specific maturity as they were borrowed under the condition that the Group is not obligated to make repayment of the principal and interest until the exploration is proven to be successful.

(e) Details of bonds payable as of December 31, 2016 and 2015 are as follows:

			December 31, 2016		December 31, 2015	
Type	Interest rate (%)	Maturity	Amount	Equivalent to Korean won	Amount	Equivalent to Korean won
		In millions of Korean won and thousands of foreign currencies				
Floating interest rate bonds payable	3M Libor+0.80	2018-06-07	USD 200,000	241,700	USD 200,000	234,400
	3M Libor+1.00	2018-06-07	USD 300,000	362,550	USD 300,000	351,600
	A3B+1.50	2018-07-03	AUD 55,000	47,963	AUD 55,000	46,921
	3M Libor+1.20	2018-07-18	USD 330,000	398,805	USD 330,000	386,760
	A3B+1.08	2019-10-08	AUD 225,000	196,211	AUD 225,000	191,947
	3M Libor+0.35	2017-11-10	USD 100,000	120,850	USD 100,000	117,200
	3M Libor+0.60	2018-01-16	USD 50,000	60,425	USD 50,000	58,600
	3M Libor+0.70	2018-02-02	USD 250,000	302,125	USD 250,000	293,000
	A3B + 1.28	2019-02-05	AUD 325,000	283,416	—	—
Fixed interest rate bonds payable	4.38	2021-02-08	HKD 500,000	77,915	HKD 500,000	75,605
	—	—	—	—	HKD 780,000	117,943
	—	—	—	—	SGD 100,000	82,809
	4.50	2021-03-04	HKD 390,000	60,774	HKD 390,000	58,972
	—	—	—	—	CHF 325,000	385,252
	—	—	—	—	EUR 100,000	128,053
	—	—	—	—	USD 1,000,000	1,172,000
	—	—	—	—	HKD 637,000	96,321
	—	—	—	—	KRW 90,000	90,000
	3.95	2022-02-10	HKD 390,000	60,774	HKD 390,000	58,972
	1.88	2017-03-08	CHF 300,000	354,399	CHF 300,000	355,616
	4.00	2022-03-28	EUR 50,000	63,380	EUR 50,000	64,027
	3.13	2017-04-03	USD 1,000,000	1,208,500	USD 1,000,000	1,172,000
	1.80	2018-01-22	HKD 400,000	62,332	HKD 400,000	60,484
	2.85	2023-01-24	HKD 400,000	62,332	HKD 400,000	60,484
	1.97	2018-01-29	USD 70,000	84,595	USD 70,000	82,040
	2.40	2023-02-04	EUR 37,000	46,901	EUR 37,000	47,380
	3.00	2025-06-24	EUR 60,000	76,056	EUR 60,000	76,832
	3.09	2023-07-03	EUR 50,000	63,380	EUR 50,000	64,027
	1.63	2018-11-29	CHF 240,000	283,519	CHF 240,000	284,493
	2.75	2019-01-23	USD 500,000	604,250	USD 500,000	586,000
	4.00	2024-01-23	USD 500,000	604,250	USD 500,000	586,000
	2.75	2019-01-23	USD 250,000	302,125	USD 250,000	293,000
	3.25	2024-07-10	USD 550,000	664,675	USD 550,000	644,600
	4.25	2019-10-08	AUD 125,000	109,006	AUD 125,000	106,638
	2.18	2020-01-29	HKD 310,000	48,307	HKD 310,000	46,875
	3.10	2027-01-21	USD 50,000	60,425	USD 50,000	58,600
	3.10	2027-01-21	USD 70,000	84,595	USD 70,000	82,040
	2.39	2020-01-28	USD 50,000	60,425	USD 50,000	58,600
	2.11	2020-03-16	KRW 100,000	100,000	KRW 100,000	100,000
	3.21	2030-03-19	USD 85,000	102,723	USD 85,000	99,620
	2.99	2025-03-19	USD 90,000	108,765	USD 90,000	105,480

Type	Interest rate (%)	Maturity	December 31, 2016 Amount	December 31, 2016 Equivalent to Korean won	December 31, 2015 Amount	December 31, 2015 Equivalent to Korean won
		In millions of Korean won and thousands of foreign currencies				
	1.99	2020-04-23	KRW 50,000	50,000	KRW 50,000	50,000
	2.82	2025-04-29	USD 65,000	78,553	USD 65,000	76,180
	3.02	2030-04-29	USD 60,000	72,510	USD 60,000	70,320
	2.03	2020-08-26	KRW 150,000	150,000	KRW 150,000	150,000
	3.25	2025-10-01	USD 600,000	725,100	USD 600,000	703,200
	3.22	2030-11-10	USD 100,000	120,850	USD 100,000	117,200
Fixed interest rate bonds payable	2.13	2021-04-14	USD 500,000	604,250	—	—
	2.63	2024-04-14	USD 500,000	604,250	—	—
	2.00	2021-10-24	USD 350,000	422,975	—	—
	2.50	2026-10-24	USD 650,000	785,525	—	—
	6.88	2017-10-01	USD 281,140	339,758	USD 494,124	579,113
	2.13	2018-05-14	USD 625,052	755,375	USD 626,151	733,849
	2.33	2021-04-14	USD 194,396	234,927	—	—
				12,312,521		11,461,053
Less: discount on bonds payable				(40,213)		(32,932)
Add: premium on bonds payable				1,878		2,708
				12,274,186		11,430,829
Less: current portion				(2,023,507)		(2,072,378)
Less: present value discount on current portion				754		1,968
				10,251,433		9,360,419

23. Employee Benefits

The Group sponsors defined contribution plans and defined benefit plans which are subject to the employees' option.

(a) Defined contribution pension plan

The Group operates a defined contribution plan ("DC plan") which is subject to the employees' option. Contributions to the DC plan are separately managed by the plan's administrator. When employees terminate their employment before the benefits have vested, the Group's obligation to make contribution to the plan decreases on a pro rata basis.

Details of expenses relating to defined contribution plans for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Cost of sales	₩ 934	729
Selling and administrative expenses	3,509	1,992
	₩4,443	2,721

Total expenses of ₩4,443 million and ₩2,721 million for the years ended December 31, 2016 and 2015, respectively are contributions paid by the Group based on the payment rate defined in Employee Benefits. No contributions remain unpaid as of December 31, 2016.

(b) Defined benefit pension plan

The latest actuarial calculation on both plan assets and defined benefit obligation was performed as of December 31, 2016. The Group uses the projected unit credit method to determine the present value of its defined benefit obligations and the related current service costs.

(i) The components of defined benefits liabilities as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Present value of defined benefit obligation from funded plans	₩ 82,997	73,921
Fair value of plan assets	(68,267)	(55,581)
Net liabilities incurred from defined benefit plans	₩ 14,730	18,340

(ii) Changes in the present value of defined benefit obligations for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Beginning balance	₩73,921	60,501
Current service cost	8,966	7,777
Interest cost	2,891	2,624
Remeasurement components	1,419	3,343
Actual payments	(3,682)	(842)
Effect of movement in exchange rates	(49)	—
Others	(469)	518
	₩82,997	73,921

(iii) Changes in the fair value of plan assets for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Beginning balance	₩55,581	46,469
Expected return on plan assets(*)	2,201	2,035
Remeasurement components	(900)	(150)
Benefit paid by the plan	(3,667)	(1,089)
Contributions paid into the plan	15,052	8,618
Administrative cost on plan assets	—	(302)
	₩68,267	55,581

(*) Actual return on plan assets for the years ended December 31, 2016 and 2015 are ₩1,301 million and ₩1,885 million, respectively.

(iv) Details of the fair value of plan assets as of December 31, 2016 and 2015 are as follows:

	Expected rate of return(*2)		Fair value of plan assets	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
			In millions of Korean won	
Others(*1)	3.96%	4.38%	₩68,267	55,581

(*1) Others are comprised of 62% of deposit and 38% of local and overseas securities as of December 31, 2016.

(*2) The expected rate of return is calculated based on the weighted average of expected rate of returns for each type of assets. The management evaluates the expected rate of returns based on the historical rate of return trends and the analysis of the predicted market during the period when the defined benefits liabilities exist.

(v) Principal actuarial assumptions as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
Discount rate	4.05%	3.96%
Expected rate of return on plan assets	3.96%	4.38%
Future salary growth	4.94%	5.42%

(vi) Details of expenses relating to defined benefit plans for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Current service cost	₩ 8,966	7,777
Interest cost	2,891	2,624
Expected return on plan assets	(2,201)	(2,035)
Transfer to other account	(326)	(214)
	₩ 9,330	8,152

Expenses described above are recognized as the following items in the financial statements.

	2016	2015
	In millions of Korean won	
Cost of sales	₩3,884	3,467
Selling and administrative expenses	5,446	4,685
Others	327	214
	₩9,657	8,366

(vii) Remeasurement components recognized in other comprehensive income for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Defined benefit obligations	₩(1,419)	(3,343)
Return on plan assets	(900)	(150)
Income tax effect	561	845
	₩(1,758)	(2,648)

24. Provisions

(a) Details of provisions as of December 31, 2016 and 2015 are as follows:

	December 31, 2016			December 31, 2015		
	Current	Non-current	Total	Current	Non-current	Total
	In millions of Korean won					
Decommissioning cost(*1)(*4)	₩ 14,294	2,015,943	2,030,237	384	2,245,637	2,246,021
Social Overhead Capital(*2)	133,175	—	133,175	183,306	—	183,306
Allowance for salaries	2,043	—	2,043	1,971	—	1,971
Provision for litigations(*3)	4,474	—	4,474	2,956	—	2,956
Others(*4)	1,955	14,853	16,808	787	1,983	2,770
	₩155,941	2,030,796	2,186,737	189,404	2,247,620	2,437,024

(*1) The Group recognized provisions for future dismantling, removing and restoring obligations of wells and related facilities. Most of the costs incur at or after the completion of production and the management recognized its best estimations as provisions.

(*2) The Group is committed to providing construction services with regards to the Kurdish regional government's Social Overhead Capital to obtain rights on certain exploratory areas (see Note 42 for further discussion). This commitment has been classified as a provision due to its uncertain timing of related cash outflows.

(*3) The Group recognized the estimated settlement amounts related to the claims with the Trinidad as of December 31, 2016 (see Note 42 for further discussion).

(*4) The reclassifications from non-current to current amounted to ₩11,733 million and ₩124,227 million for the years ended December 31, 2016 and 2015, respectively.

(b) Changes in provisions for the years ended December 31, 2016 and 2015 are as follows:

(i) For the year ended December 31, 2016

	Beginning balance	Provision	Accretion expenses	Transfer(*1)	Payment	Others(*2)	Ending Balance
	In millions of Korean won						
Decommissioning cost	₩2,246,021	28,094	93,005	(124,075)	(17,539)	(195,269)	2,030,237
Social Overhead Capital	183,306	—	1,598	—	(54,081)	2,352	133,175
Allowance for salaries	1,971	—	—	—	—	72	2,043
Provision for litigations	2,956	1,315	—	—	—	203	4,474
Others	2,770	9,339	1,225	—	(1,593)	5,067	16,808
	₩2,437,024	38,748	95,828	(124,075)	(73,213)	(187,575)	2,186,737

(*1) The Group transferred restoring obligations to contract party regarding disposal of an oil and gas property.

(*2) Include the effect of changes in exchange rates and others.

(ii) For the year ended December 31, 2015

	Beginning balance	Provision	Accretion expenses	Reversal	Transfer(*1)	Payment	Others(*2)	Ending Balance
	In millions of Korean won							
Decommissioning cost	₩2,357,786	10,726	108,327	—	(157,340)	(73,592)	114	2,246,021
Social Overhead Capital	359,114	—	11,271	—	—	(199,449)	12,370	183,306
Allowance for salaries	2,428	—	—	—	—	—	(457)	1,971
Provision for litigations	61,184	—	—	(25,131)	—	(34,441)	1,344	2,956
Others	1,030	—	1,914	—	—	(997)	823	2,770
	₩2,781,542	10,726	121,512	(25,131)	(157,340)	(308,479)	14,194	2,437,024

(*1) The Group transferred restoring obligations to contract party regarding disposal of an oil and gas property.

(*2) Include the effect of changes in exchange rates and others.

25. Current Non-Financial Liabilities

Details of current non-financial liabilities as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Advance received	₩ 8,289	37,407
Unearned revenue	30,867	44,092
Withholdings	45,947	45,842
	₩85,103	127,341

26. Share Capital

The Group's total share capital is invested solely by the Korean government in accordance with the Korea National Oil Corporation Act and the authorized share capital is ₩13 trillion as of December 31, 2016. The changes in share capital for the year ended December 31, 2016 are as follows:

	Description	Amount
	In millions of Korean won	
Beginning balance		₩10,207,846
2016-02-17	Contribution for oil stockpiling business	34,618
2016-04-07	Contribution for oil field development	30,000
2016-05-20	Contribution for oil stockpiling business	36,817
2016-08-23	Contribution for oil stockpiling business	15,091
2016-09-09	Contribution for oil stockpiling business	5,300
2016-11-11	Contribution for oil stockpiling business	17,180
		₩10,346,852

27. Accumulated Deficit

(a) Details of accumulated deficit as December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Undisposed accumulated deficit	₩(7,633,552)	(6,539,889)

(b) Changes in accumulated deficit for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Beginning balance	₩(6,539,889)	(2,177,312)
Net loss for the year attributed to owner of the Company	(1,091,917)	(4,359,918)
Changes in equity method retained earnings	12	(11)
Remeasurement components of defined benefits plan	(1,758)	(2,648)
	₩(7,633,552)	(6,539,889)

(c) Changes in remeasurement components for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Beginning balance	₩(19,910)	(17,262)
Changes during the current year	(2,319)	(3,493)
Income tax effect	561	845
	₩(21,668)	(19,910)

28. Separate Statements of Disposition of Accumulated deficit

Separate statements of disposition of accumulated deficit for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
I. Undisposed Deficit		
Undisposed accumulated deficit carried over from prior years	₩(5,845,728)	(888,677)
Net loss	(733,773)	(4,954,403)
Remeasurement components	(1,758)	(2,648)
II. Undisposed deficit to be carried forward to the subsequent year	₩(6,581,259)	(5,845,728)

These statements of disposition of accumulated deficit were based on the separate financial statements of the parent company.

29. Other Components of Equity

(a) Details of other components of equity as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Other capital surpluses(*)	₩ 24,954	24,954
Accumulated other comprehensive loss	(339,409)	(191,362)
	₩(314,455)	(166,408)

(*) All other capital surpluses are gains from assets contributed.

(b) Changes in accumulated other comprehensive loss for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Gains on available-for-sale financial instruments	₩ 76,185	78,664
Equity adjustments in equity method	18,560	22,625
Exchange difference on translation of foreign operations	(497,774)	(357,238)
Gains on valuation of derivative instruments	63,620	64,587
	₩(339,409)	(191,362)

30. Revenue

Details of revenues except for other income, other profit and financial income for the years ended December 31, 2016 and 2015 are as follows:

	2016			2015		
	Domestic	Overseas	Total	Domestic	Overseas	Total
	In millions of Korean won					
Sales of goods and finished goods	₩ 85,605	2,180,883	2,266,488	219,706	2,950,858	3,170,564
Revenues from services provided	26,088	96,857	122,945	20,678	167,280	187,958
Interest income	1,274	—	1,274	1,473	—	1,473
Income on government grants	4,954	—	4,954	4,132	—	4,132
Others	2,232	32,505	34,737	2,730	66,314	69,044
	₩120,153	2,310,245	2,430,398	248,719	3,184,452	3,433,171

31. Other Income and Expenses

(a) Details of other income for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Reversal of other provisions(*1)	₩ 2,996	25,131
Reversal of bad debt allowance	671	2,426
Gains on exemption of debts(*2)	220,473	99,149
Compensation and indemnity	11	198
Rental income	338	409
Other income from overseas fields	7,677	7,347
Others	3,507	18,773
	₩235,673	153,433

(*1) The Company received partial amount back that it had paid on the loss in the first trial against Hanhwa Corp. as a result of the second trial and recognized it as reversal of other provisions (see Note 42).

(*2) Gains on exemption of debts are recognized for principals and accrued interests from SAER in relation to the explorations which turn out to be unsuccessful.

(b) Details of other expenses for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Interest costs on provision for decommissioning	₩ 93,005	108,327
Other bad debt expense	14,521	172,122
Donations	1,501	3,145
Losses on valuation of supplies	269	699
Other expenses from overseas fields	44	416
Others	9,909	14,458
	₩119,249	299,167

32. Other Profit and Loss

Details of other profit and loss for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Gains on disposal of property, plant and equipment	₩ 55,943	149,665
Gains on disposal of intangible assets other than goodwill	483	1,915
Gains on transactions of derivatives	—	8,931
Gains on valuation of derivatives	—	418
Reversal of impairment losses on property, plant and equipment	400,959	21,287
Reversal of impairment losses on intangible assets other than goodwill	6,416	—
Gains on foreign currency translation	21,467	25,305
Gains on foreign currency transactions	55,276	37,206
Other gains	9,930	5,848
Losses on disposal of property, plant and equipment	(9,045)	(8,676)
Losses on disposal of intangible assets other than goodwill	(66,326)	(22)
Losses on transactions of derivatives	(1,423)	(3,913)
Losses on valuation of derivatives	(3,164)	(1,202)
Impairment losses on property, plant and equipment	(433,607)	(2,362,119)
Impairment losses on intangible assets(*)	(377,472)	(829,863)
Losses on foreign currency translation	(26,710)	(66,018)
Losses on foreign currency transactions	(54,431)	(43,876)
Other losses	(2,135)	(9,855)
	₩(423,839)	(3,074,969)

(*) Impairment losses on intangible assets of ₩340,532 million due to expiration of mining right and relinquishment of exploration and others have been recognized in 2016, In connection with the relinquishment, gains on debt exemption of ₩148,863 million from loans and accrued interest based on Accounting for Energy and Resources have been recognized in other income and expense (see Note 31(a)).

33. Finance Income

(a) Details of finance income for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Interest income	₩ 37,816	39,094
Dividend income	24	3,863
Gains on disposal of financial assets	26,232	—
Gains on transaction of derivatives financial instruments	738	—
Gains on repayment of financial liabilities	17,234	—
Gains on foreign currency translation	60,054	43,991
Gains on foreign currency transaction	40,759	8,086
	₩182,857	95,034

(b) Interest income included in finance income for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Cash and cash equivalents	₩ 6,154	5,961
Loans and receivables	31,662	33,133
	₩37,816	39,094

34. Finance Costs

(a) Details of finance costs for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Interest expenses	₩424,598	415,090
Losses on transaction of derivatives financial instruments	5,749	—
Impairment losses on available-for-sale financial instruments	45,577	450,370
Losses on foreign currency translation	205,690	477,839
Losses on foreign currency transactions	13,940	11,139
Other financial costs	32,224	45,619
	₩727,778	1,400,057

(b) Interest expenses included in finance costs for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Short-term borrowings	₩ 29,868	31,278
Long-term borrowings	40,354	37,852
Bonds payable	362,087	352,521
Derivative liabilities	14,607	14,973
Other financial liabilities	5,362	11,482
	452,278	448,106
Less: capitalized costs of borrowings	(27,680)	(33,016)
	₩424,598	415,090

The annual weighted average costs of capital of the borrowings are 3.87%, 8.30% and 4.34~4.42% for the years ended December 31, 2016 and 2015, respectively.

35. Income Tax Benefit

(a) The components of income tax benefit for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Current income tax	₩ 76,264	45,390
Deferred tax directly charged to equity	(230)	(47,676)
Changes in deferred taxes arising from temporary differences	(359,170)	(1,000,847)
Adjustment for prior periods	69,009	31,456
Income tax benefit	₩(214,127)	(971,677)

(b) Reconciliations of expected income tax benefit computed by applying the statutory income tax rate to loss before income tax to the actual income tax benefit for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Loss before income tax	₩(1,332,974)	(5,471,944)
Benefits computed at the statutory rate(*)	(322,580)	(1,324,210)
Adjustments		
Adjustments to prior year tax return	685	(34,098)
Non-taxable income	(13,274)	(279)
Non-deductible expenses	1,532	157,593
Temporary differences not recognized in deferred tax assets	155,827	442,989
Effect from tax deduction and reduction	(16,898)	(46,667)
Effect from temporary differences not recognized in prior years	(28,554)	30,649
Differences in tax rates in overseas entities	(1,206)	(295,243)
Effect of changes in tax rates	10,341	97,589
Income tax benefit	₩ (214,127)	(971,677)
Effective tax benefit rate	16.06%	17.76%

(*) The applicable statutory tax rate for the years ended December 31, 2016 and 2015 is 24.2%, which is the Korea statutory corporate income tax rate where the Company is domiciled.

(c) Income tax recognized as accumulated other comprehensive income for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Available-for-sale financial assets	₩ 791	(38,643)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting	(1,582)	(1,130)
Remeasurement components	561	845
Equity adjustments arising from investments in equity-method investees	—	(8,748)
	₩ (230)	(47,676)

(d) Changes in deferred income tax assets (liabilities) recognized in the consolidated statements of financial position for the years ended December 31, 2016 and 2015 are as follows:

(i) For the year ended December 31, 2016

	Beginning balance	Amounts recognized in profit or loss	Amounts recognized in other comprehensive income	Others	Ending balance
	In millions of Korean won				
Deferred income tax on temporary differences					
Contributions for construction	₩ 1,109	(79)	—	31	1,061
Investment in associates and others	(34,737)	84,641	—	2,420	52,324
Financial guarantee liabilities	3,271	(727)	—	71	2,615
Allowance for doubtful accounts	170,159	21,942	—	6,207	198,308
Available-for-sale financial instruments	74,604	11,030	791	2,812	89,237
Intangible assets	112,938	1,673	—	3,587	118,198
Accrued expense	57,146	(7,719)	—	1,461	50,888
Asset retirement obligation	39,058	1,543	—	1,280	41,881
Property, plant and equipment	20,396	81,062	—	3,988	105,446
Land	(61,756)	(6,073)	—	(2,177)	(70,006)
Loss on valuation of derivatives	(9,376)	—	1,196	(242)	(8,422)
Employee benefits	1,223	(4,506)	561	(124)	(2,846)
Others	(37,263)	(42,097)	—	(2,901)	(82,261)
Deferred assets of subsidiaries	605,344	32,575	—	20,200	658,119
Differences in fair value and book value from business combination and others	(281,015)	127,674	—	(3,471)	(156,812)
Deferred tax liabilities of subsidiaries	(186,671)	58,461	(2,778)	(3,510)	(134,498)
	₩ 474,430	359,400	(230)	29,632	863,232
Deferred tax assets	₩ 942,116				1,154,542
Deferred tax liabilities	₩(467,686)				(291,310)

Temporary differences not recognized in deferred tax assets, tax loss carryforwards and tax deduction are ₩10,890,377 million as of December 31, 2016.

(ii) For the year ended December 31, 2015

	Beginning balance	Amounts recognized in profit or loss	Amounts recognized in other comprehensive income	Others	Ending balance
	In millions of Korean won				
Deferred income tax on temporary differences					
Contributions for construction	₩ 1,141	(104)	—	72	1,109
Investment in associates and others	113,313	(141,429)	(8,748)	2,127	(34,737)
Financial guarantee liabilities	2,866	207	—	198	3,271
Allowance for doubtful accounts	118,046	42,765	—	9,348	170,159
Available-for-sale financial instruments	15,283	94,935	(38,643)	3,029	74,604
Intangible assets	22,339	27,845	—	2,477	52,661
Impairment losses for intangible assets	50,118	6,604	—	3,555	60,277
Accrued expense	49,753	3,956	—	3,437	57,146
Asset retirement obligation	35,964	687	—	2,407	39,058
Property, plant and equipment	12,065	7,272	—	1,059	20,396
Land	(68,672)	11,067	—	(4,151)	(61,756)
Loss on valuation of derivatives	(4,724)	—	(4,190)	(462)	(9,376)
Employee benefits	(152)	490	845	40	1,223
Others	(6,095)	(29,699)	—	(1,469)	(37,263)
Deferred assets of subsidiaries	561,930	5,983	—	37,431	605,344
Differences in fair value and book value from business combination and others	(768,484)	519,757	—	(32,288)	(281,015)
Deferred tax liabilities of subsidiaries	(662,016)	498,187	3,060	(25,902)	(186,671)
	₩ (527,325)	1,048,523	(47,676)	908	474,430
Deferred tax assets	₩ 903,176				942,116
Deferred tax liabilities	₩(1,430,501)				(467,686)

36. Expenses Classified by Nature

(a) Expenses classified by nature for the year ended December 31, 2016 are as follows:

	Changes in inventories	Selling and administrative expenses	Cost of sales	Total
		In millions of Korean won		
Changes in inventories — merchandise	₩54,103	—	—	54,103
Changes in inventories — finished goods	(520)	—	—	(520)
Changes in inventories — other inventories	4,330	—	—	4,330
Purchases of inventories	—	—	375,640	375,640
Raw materials used	—	—	6,564	6,564
Salaries	—	97,904	133,466	231,370
Severance and retirement benefits	—	8,955	4,818	13,773
Other employee benefits	—	11,599	8,017	19,616
Insurance	—	3,390	26,354	29,744
Depreciation	—	18,904	934,785	953,689
Amortization	—	7,023	144,907	151,930
Bad debt expenses	—	429	—	429
Commissions and fees	—	19,216	49,424	68,640
Advertising	—	160	10	170
Education and training	—	3,730	851	4,581
Vehicle maintenance	—	1,584	663	2,247
Books and printing	—	801	17	818
Business development	—	111	41	152
Rent	—	8,272	57,460	65,732
Communications	—	1,075	6,453	7,528
Transport	—	29,631	165,793	195,424
Taxes and dues	—	3,029	38,165	41,194
Supplies	—	1,352	2,467	3,819
Utilities	—	1,294	43,531	44,825
Repairs	—	7,941	145,933	153,874
Research and development	—	253	856	1,109
Travel	—	1,883	630	2,513
Clothing expenses	—	12	81	93
Investigation and analysis	—	—	152	152
Association fee	—	163	9	172
Sales promotion	—	57	1,119	1,176
Rental tax	—	25,839	—	25,839
Others	—	6,185	204,316	210,501
	₩57,913	260,792	2,352,522	2,671,227

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(b) Expenses classified by nature for the year ended December 31, 2015 are as follows:

	Changes in inventories	Selling and administrative expenses	Cost of sales	Total
		In millions of Korean won		
Changes in inventories — merchandise	₩(50,558)	—	—	(50,558)
Changes in inventories — finished goods	33,470	—	—	33,470
Changes in inventories — other inventories	(384)	—	—	(384)
Purchases of inventories	—	—	660,037	660,037
Raw materials used	—	—	13,662	13,662
Salaries	—	112,299	116,668	228,967
Severance and retirement benefits	—	6,677	4,196	10,873
Other employee benefits	—	19,806	10,717	30,523
Insurance	—	4,783	33,571	38,354
Depreciation	—	19,518	1,428,018	1,447,536
Amortization	—	7,745	202,036	209,781
Bad debt expenses	—	4,311	—	4,311
Commissions and fees	—	30,261	73,657	103,918
Advertising	—	1,084	393	1,477
Education and training	—	6,741	12,878	19,619
Vehicle maintenance	—	1,962	539	2,501
Books and printing	—	1,014	31	1,045
Business development	—	284	92	376
Rent	—	10,191	64,195	74,386
Communications	—	1,742	814	2,556
Transport	—	37,318	99,378	136,696
Taxes and dues	—	3,543	93,226	96,769
Supplies	—	1,662	3,733	5,395
Utilities	—	1,508	66,718	68,226
Repairs	—	8,490	178,137	186,627
Research and development	—	1,942	1,992	3,934
Travel	—	2,887	1,141	4,028
Clothing expenses	—	12	175	187
Investigation and analysis	—	5	888	893
Association fee	—	771	18	789
Sales promotion	—	259	836	1,095
Rental tax	—	61,832	—	61,832
Others	—	6,130	473,233	479,363
	₩(17,472)	354,777	3,540,979	3,878,284

37. Categories of financial instruments

(a) Details of current financial assets by category as of December 31, 2016 and 2015 are as follows:

(i) As of December 31, 2016

	Loans and receivables	Hedging Financial assets	Total
	In millions of Korean won		
Cash and cash equivalents	₩ 812,651	—	812,651
Short-term financial instruments	2,032	—	2,032
Derivative assets	—	949	949
Others	16,026	—	16,026
Trade and other receivables	567,212	—	567,212
	₩1,397,921	949	1,398,870

(ii) As of December 31, 2015

	Loans and receivables	Hedging Financial assets	Total
	In millions of Korean won		
Cash and cash equivalents	₩ 783,981	—	783,981
Short-term financial instruments	2,000	—	2,000
Derivative assets	—	1,326	1,326
Others	14,066	—	14,066
Trade and other receivables	712,719	—	712,719
	₩1,512,766	1,326	1,514,092

The fair values of the financial assets listed above measured at amortized costs do not significantly differ from their book values.

(b) Details of non-current financial assets by category as of December 31, 2016 and 2015 are as follows:

(i) As of December 31, 2016

	Loans and receivables	Available-for-sale financial instruments	Hedging financial assets	Total
	In millions of Korean won			
Available-for-sale financial instruments	₩ —	269,278	—	269,278
Loans	601,075	—	—	601,075
Long-term financial instruments	5,083	—	—	5,083
Derivative assets	—	—	9,011	9,011
Trade and other receivables	118,664	—	—	118,664
	₩724,822	269,278	9,011	1,003,111

(ii) As of December 31, 2015

	Loans and receivables	Available-for-sale financial instruments	Hedging financial assets	Total
	In millions of Korean won			
Available-for-sale financial instruments	₩ —	355,733	—	355,733
Loans	500,578	—	—	500,578
Long-term financial instruments	4,661	—	—	4,661
Derivative assets	—	—	4,239	4,239
Trade and other receivables	104,606	—	—	104,606
	₩609,845	355,733	4,239	969,817

The fair values of the financial assets listed above measured at amortized costs do not significantly differ from their book values.

(c) Details of current financial liabilities by category as of December 31, 2016 and 2015 are as follows:

(i) As of December 31, 2016

	Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
	In millions of Korean won		
Short-term borrowings	₩ 897,965	—	897,965
Current portion of long-term borrowings	245,165	—	245,165
Bonds payable	2,022,753	—	2,022,753
Derivative liabilities	—	42,572	42,572
Trade and other payables	973,354	—	973,354
	₩4,139,237	42,572	4,181,809

(ii) As of December 31, 2015

	Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
	In millions of Korean won		
Short-term borrowings	₩1,269,147	—	1,269,147
Bonds payable	2,070,410	—	2,070,410
Derivative liabilities	—	100,436	100,436
Trade and other payables	851,339	—	851,339
	₩4,190,896	100,436	4,291,332

The fair values of the financial liabilities listed above measured at amortized costs do not significantly differ from their book values.

(d) Details of non-current financial liabilities by category as of December 31, 2016 and 2015 are as follows:

(i) As of December 31, 2016

	Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
	In millions of Korean won		
Long-term borrowings	₩ 1,096,208	—	1,096,208
Bonds payable	10,251,433	—	10,251,433
Derivative liabilities	—	147,831	147,831
Trade and other payables	293,434	—	293,434
	₩11,641,075	147,831	11,788,906

(ii) As of December 31, 2015

	Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
	In millions of Korean won		
Long-term borrowings	₩ 1,551,560	—	1,551,560
Bonds payable	9,360,419	—	9,360,419
Derivative liabilities	—	133,680	133,680
Trade and other payables	586,715	—	586,715
	₩11,498,694	133,680	11,632,374

The fair values of the financial liabilities listed above measured at amortized costs do not significantly differ from their book values.

(e) Net gains or losses by financial instruments for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Loans and receivables:		
Interest income	₩ 37,816	39,094
Gain (loss) on foreign currency transactions, net	5,185	(656)
Gain (loss) on foreign currency translation, net	7,562	(138,989)
Available-for-sale financial investments:		
Dividend income	24	3,863
Gain on disposal	26,232	—
Impairment loss	(45,577)	(450,370)
Other comprehensive income (loss), net of tax	(2,479)	178,153
Hedge financial assets:		
Loss on transaction, net	(84)	—
Loss on foreign currency transactions, net	(661)	—
Gain (loss) on foreign currency translation, net	(3,882)	2,959
Other comprehensive income (loss), net of tax	6,467	(5,668)
Other financial liabilities with amortized cost:		
Interest cost	(424,598)	(415,090)
Gain (loss) on foreign currency transactions, net	13,962	(2,397)
Loss on foreign currency translations, net	(114,909)	(204,195)
Gain on repayment of financial liabilities	17,234	—
Other financial cost	(32,224)	(45,619)
Hedge financial liabilities:		
Loss on transactions, net	(4,927)	—
Gain on foreign currency transactions, net	8,333	—
Loss on foreign currency translation, net	(34,407)	(93,623)
Other comprehensive income (loss), net of tax	(7,434)	14,508
	₩(548,367)	(1,118,030)

38. Netting Agreements

(a) Offsetting of financial assets and financial liabilities

As of December 31, 2016 and 2015, financial assets and financial liabilities subject to offsetting, enforceable master netting arrangements and similar agreements are as follows:

(i) As of December 31, 2016

Type of assets	Gross amounts recognized as financial instruments	Gross amounts of recognized financial instruments set off in the statement of financial position	Net amounts of financial instruments presented in the statement of financial position	Related amounts not set off in the statement of financial position: Financial instruments	Related amounts not set off in the statement of financial position: Collateral received or pledged	Net Amounts
	In millions of Korean won					
Financial assets						
Derivatives(*)	₩ 9,960	—	9,960	(9,960)	—	—
Financial liabilities						
Derivatives(*)	190,403	—	190,403	(9,960)	—	180,443

(*) Some of derivative contracts are made under International Swaps and Derivatives Association (ISDA) master netting agreements. In general, under such agreements the amounts owed by each counter party on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. In certain circumstances (i.e. when a default occurs), all standing transactions under the agreement are terminated, the termination value is assessed and only a single amount is payable in settlement of all transactions.

(ii) As of December 31, 2015

Type of assets	Gross amounts recognized as financial instruments	Gross amounts of recognized financial instruments set off in the statement of financial position	Net amounts of financial instruments presented in the statement of financial position	Related amounts not set off in the statement of financial position: Financial instruments	Related amounts not set off in the statement of financial position: Collateral received or pledged	Net Amounts
	In millions of Korean won					
Financial assets						
Derivatives(*)	₩ 5,565	—	5,565	(5,565)	—	—
Financial liabilities						
Derivatives(*)	234,116	—	234,116	(5,565)	—	228,551

(*) Some of derivative contracts are made under International Swaps and Derivatives Association (ISDA) master netting agreements. In general, under such agreements the amounts owed by each counter party on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. In certain circumstances (i.e. when a default occurs), all standing transactions under the agreement are terminated, the termination value is assessed and only a single amount is payable in settlement of all transactions.

39. Risk Management

(a) Capital management

The primary objective of the Group's capital management is to ensure that it maintains a strong credit rating and capital ratios in order to support its business and maximize the owners' value. The Group manages its capital structure and makes adjustments to it in light of changes in economic conditions. To maintain the sound capital structure, the Group may adjust the dividend payment to the owner, reduce share capital, issue new shares, raise funds from bond offerings and dispose the Group's non-core assets. No changes were made in the objectives, policies or processes for managing capital for the year ended December 31, 2016.

The Group's debt-to-equity ratio as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Total borrowings and debt instruments	₩14,513,524	14,251,536
Cash and cash equivalents	(812,651)	(783,981)
Net borrowings and debt securities	13,700,873	13,467,555
Total equity	₩ 3,508,732	4,195,594
Net borrowings and debt securities-to-equity ratio	390.48%	320.99%

(b) Financial risk management

The Group is exposed to various risks related to its financial instruments such as market risk (currency risk, interest rate risk and price risk) and credit risk.

(i) Risk management structure

The board of directors is responsible for implementing and monitoring the Group's risk management structure and the management regularly updates the policies for each risk and confirms the validity of the policies. The purpose of the risk management policies is to identify the risks that could potentially affect the Group's financial results and reduce, to an acceptable level, avoid or eliminate those risks. The policies are reviewed regularly to reflect the current market conditions and the Group's activities. The Group makes constant efforts to improve the policies by monitoring on real time basis and with support from the outside experts. The audit committee oversees the Group's compliance to the risk management policies and procedures and reviews the efficiency of the structure.

(ii) Credit risk

Credit risk is the risk of financial loss to the Group if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the Group's receivables from customers, investment securities, derivatives and financial guarantee contracts.

Credit risk also arises from transactions with financial institutions, and such transactions include transactions of cash and cash equivalents, various deposits, and financial instruments such as derivative contracts. The Group manages its exposure to this credit risk by only entering into transactions with banks that have high international credit ratings. The Group implements a credit risk management policy under which the Group only transacts business with counterparties that have a certain level of credit rate evaluated based on financial condition, historical experience, and other factors.

Book values of the financial assets and guarantee amounts by the contract represent the maximum amounts exposed to the credit risk. Details of the Group's level of maximum exposure to credit risk as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Cash and cash equivalents	₩ 812,651	783,981
Derivatives assets	9,960	5,565
Loans and receivables(*)	1,310,092	1,338,630
Financial guarantee contracts	38,961	—

(*) Comprised of loans, account receivables, non-trade receivables and others.

Details of maturities for loans and receivables and their impaired amounts as of December 31, 2016 and 2015 are as follows:

	December 31, 2016		December 31, 2015	
	Balance	Impaired	Balance	Impaired
	In millions of Korean won			
Not past due	₩1,951,467	(731,090)	1,962,374	(696,248)
0 ~ 30 days	8,167	—	20,876	—
31 ~ 60 days	13,892	—	12,979	—
More than 61 days	68,583	(927)	40,359	(1,709)
	₩2,042,109	(732,017)	2,036,588	(697,957)

Details of changes in allowance for impairment of loans and receivables for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Beginning balance	₩697,957	471,322
Impairment	14,950	176,434
Reversal of impairment loss	(671)	(2,426)
Write-off	(588)	(2,443)
Others(*)	20,369	55,070
Ending balance	₩732,017	697,957

(*) Include the effect of changes in exchange rates.

Aging of past due but not impaired financial assets as of December 31, 2016 and 2015 are as follows:

① As of December 31, 2016

	Book value	Less than 6 months	6~12 Months	1~2 years	2~5 years	More than 5 years
	In millions of Korean won					
Loans and receivables	₩89,715	21,757	89	66,694	1,146	29

② As of December 31, 2015

	Book value	Less than 6 months	6~12 Months	1~2 years	2~5 years	More than 5 years
	In millions of Korean won					
Loans and receivables	₩72,505	53,340	11,497	4,116	3,552	—

(iii) Market risk

① Crude oil price risk

Crude oil price risk is the risk that the profit or cash flows will fluctuate due to changes in the international market prices of crude oil. With all other variables held constant, the changes in Group's profit before tax for the years ended December 31, 2016 and 2015 from crude oil price fluctuations are as follows:

	2016		2015	
	Increase by 10%	**Decrease by 10%**	**Increase by 10%**	**Decrease by 10%**
	In millions of Korean won			
Increase (decrease) of profit before tax	₩139,823	(139,823)	201,111	(201,111)

② Interest rate risk

The Group is exposed to interest rate risk due to its borrowings with floating interest rates. Assuming a 100 basis points increase or decrease in interest rates as of December 31, 2016 the Group's total equity and its profit or loss will also increase or decrease. The Group mitigates risks from fluctuation in interest rate through derivative contracts.

Except for the effect of derivative transactions, this analysis considers the Group's total exposed risks associated with the fluctuation in interest rate. This analysis assumes that all other variables are held constant and the same method is applied as the method used in the prior periods. The details of increase or decrease in the total equity and profit or loss are as follows:

	2016		2015	
	Increase by 1%	**Decrease by 1%**	**Increase by 1%**	**Decrease by 1%**
	In millions of Korean won			
Increase (decrease) of profit before tax	₩(37,262)	37,262	(35,911)	35,911

③ Foreign currency risk

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the 'functional currency'). The Group is exposed to currency risk from the sales, purchases and borrowings not in United States dollar. The Group reduces currency risk from fluctuations in foreign exchange rates by carrying out derivative contracts.

Without considering the effect of the derivatives aforementioned, the Group's exposures to foreign currency risk as of December 31, 2016 and 2015 are as follows:

	Currency unit	December 31, 2016 Foreign currencies	December 31, 2016 Equivalent to Korean won	December 31, 2015 Foreign currencies	December 31, 2015 Equivalent to Korean won
		In thousands of foreign currencies and millions of Korean won			
Financial assets					
denominated in foreign currencies	KRW	254,691	254,691	471,629	471,629
Financial liabilities					
denominated in foreign currencies	KRW	331,915	331,915	433,223	433,223
	EUR	197,000	249,718	297,000	380,317
	SGD	235	196	100,939	83,587
	HKD	2,390,000	372,434	3,807,000	575,656
	CHF	540,000	637,918	865,000	1,025,362
	JPY	—	—	3,551	35
	AUD	730,000	636,597	405,092	345,584
	GBP	3	4	59	102
	AED	195	64	—	—
			2,228,846		2,843,866

The exchange rates applied for the years ended and as of December 31, 2016 and 2015 are as follows:

	Average rates 2016	Average rates 2015	Reporting date spot rate December 31, 2016	Reporting date spot rate December 31, 2015
	In US dollar per one foreign currency			
KRW	0.0009	0.0008	0.0008	0.0008
EUR	1.1058	1.1092	1.0489	1.0926
SGD	0.7242	0.7273	0.6906	0.7065
HKD	0.1288	0.1289	0.1289	0.1290
CHF	1.0145	1.0389	0.9775	1.0114
JPY	—	0.0082	—	0.0082
AUD	0.7439	0.7511	0.7216	0.7279
GBP	1.3547	1.5287	1.2248	1.4811
AED	0.2723	—	0.2723	—

The Company and its subsidiaries use various functional currencies depending on their primary economic environment in which the entities operate. A sensitivity analysis below indicates the effect on the Group's profit before tax from the fluctuations in each function currency exchange rate. As of December 31, 2016 and 2015 the effect of a 5% increase or decrease in each functional currency exchange rate on profit before tax assuming all other variables held constant is as follows:

		2016 Increase by 5%	2016 Decrease by 5%	2015 Increase by 5%	2015 Decrease by 5%
		In millions of Korean won			
Increase (decrease) of profit before tax	KRW	₩ (3,861)	3,861	1,920	(1,920)
	HKD	(18,622)	18,622	(28,783)	28,783
	CHF	(31,896)	31,896	(51,268)	51,268
	EUR	(12,388)	12,388	(19,754)	19,754
	AUD	(31,830)	31,830	(17,280)	17,279
	Others	(30)	30	51	(51)

(iv) Liquidity risk

The details of contractual maturities of financial liabilities and other contractual obligations as of December 31, 2016 are as follows:

	Book value	Contractual cash flows(*1)	Less than 1 year	1 ~ 2 years	2 ~ 5 years	More than 5 years(*2)
			In millions of Korean won			
Short-term borrowings	₩ 897,965	904,214	904,214	—	—	—
Bonds payable	12,274,186	13,890,158	2,331,493	2,838,996	3,818,369	4,901,300
Long-term borrowings	1,341,373	1,399,290	274,008	776,777	22,628	325,877
Trade and other payables	1,266,788	1,266,788	973,355	23,837	51,136	218,460
Derivatives liabilities	190,403	190,403	42,572	30,931	68,601	48,299
Financial guarantee contracts(*3)	—	38,961	38,961	—	—	—
	₩15,970,715	17,689,814	4,564,603	3,670,541	3,960,734	5,493,936

(*1) Contractual cash flows include the estimated interest payments but exclude the effects of offsetting contracts.

(*2) Loans from Special Accounting for Energy and Resources (“SAER”) included in borrowings have no specific maturity as entities were borrowed under the condition that the Group is not obligated to make repayment of the principal and interest until the exploration is proven to be successful.

(*3) Financial guarantee is allocated at the earliest period that the maximum amount could be requested.

The Group had a working capital (current assets minus current liabilities) deficit of ₩2,823,479 million as of December 31, 2016. The Group’s management currently anticipates that expected future capital contributions from the Government and the cash flows that the Group generates from its operations, together with its existing cash and cash equivalents and credit sources, will be sufficient to meet its currently anticipated needs for working capital, capital expenditures and business expansion throughout the foreseeable future.

(v) Other price risk

Other price risk is the risk that the fair value or cash flows of financial instruments will fluctuate because of changes in market prices other than interest rate risk and foreign currency risk. The Group’s marketable available-for-sale equity securities are exposed to market price risk arising from the fluctuation in the price of the securities. However, the Group’s management believes that the effect of the fluctuation in the price of the securities on the financial statements is not significant.

(c) Fair value measurement

(i) Fair value and book value of financial assets and liabilities as of December 31, 2016 and 2015 are as follows:

	December 31, 2016		December 31, 2015	
	Book value	Fair value	Book value	Fair value
	In millions of Korean won			
Assets recognized at fair value				
Available-for-sale financial assets	₩268,353	268,353	330,549	330,549
Currency swap	8,803	8,803	4,495	4,495
Interest rate swap	1,157	1,157	637	637
Other derivatives	—	—	433	433
Investments in associates and joint ventures(*)	96,358	96,358	100,685	100,685
	374,671	374,671	436,799	436,799
Liabilities recognized at fair value				
Currency forwards	—	—	6,141	6,141
Currency swap	190,403	190,403	227,975	227,975
	190,403	190,403	234,116	234,116

(*) The investments in joint ventures for Deep Basin Partnership and HKMS Partnership held by the Group are measured at the fair value at each financial statement date using the hypothetical liquidation book value method to estimate the Group's interests in the net assets of the joint ventures.

The fair values of the financial assets and liabilities measured at amortized costs do not significantly differ from their book values.

(ii) Fair value hierarchy

The following table provides an analysis of financial instruments that are measured subsequent to initial recognition at fair value, classified as Level 1, 2, or 3, based on the degree to which the fair value is observable.

Level 1: Unadjusted quoted prices in active markets for identical assets or liabilities;

Level 2: Inputs other than quoted prices that are observable for the asset or liability either directly or indirectly; and

Level 3: Inputs that are not based on observable market data.

Fair values of financial instruments by hierarchy level as of December 31, 2016 are as follows:

Type	December 31, 2016			
	Level 1	Level 2	Level 3	Total
	In millions of Korean won			
Financial assets at fair value				
Available-for-sale financial assets	₩247,576	—	20,777	268,353
Investments in associates and joint ventures	—	—	96,358	96,358
Derivative assets	—	9,960	—	9,960
	247,576	9,960	117,135	374,671
Financial liabilities at fair value				
Derivative liabilities	—	190,403	—	190,403

40. Related Parties

(a) The Group's major related parties as of December 31, 2016 are as follows:

Type	Related parties
Associates	Oilhub Korea Yeosu Co., Ltd.
	Kernhem B.V.
	ADA Oil LLP
	Parallel Petroleum LLC
Joint ventures	KNOC Inam Ltd.
	KNOC Kamchatka Petroleum Ltd.
	KC Karpovsky B.V.
	KNOC Bazian Ltd.
	KNOC Nigerian West Oil Company Ltd.
	KNOC Nigerian East Oil Company Ltd.
	KNOC Aral Ltd.
	KNOC kamchatka Co. Ltd.
	KC kazakh B.V.
	Offshore International Group, Inc.
	KNOC Ferghana Ltd.
	KNOC Ferghana2 Ltd.(*)
	KADOC Ltd.
	Korea Oil Terminal Co., Ltd.
	Deep Basin Partnership
	HKMS Partnership

(*) The entity has relinquished its exploration during the current year.

(b) Significant transactions with related parties for the years ended December 31, 2016 and 2015 are as follows:

	Transaction	Sales and others 2016	Sales and others 2015	Purchases and others 2016	Purchases and others 2015
		In millions of Korean won			
Oilhub Korea Yeosu Co., Ltd.	Revenues from rental services	₩ 1,495	1,447	—	—
	Expenses from rental services	—	—	16,472	17,147
Kernhem B.V.	Interest on loans	1,585	1,038	—	—
ADA Oil LLP	Interest on loans	366	296	—	—
	Revenues from services	1,425	3,129	—	—
	Expenses from services	—	—	—	33
Parallel Petroleum LLC	Interest on loans	172	196	—	—
KNOC Nigerian West Oil Company Ltd.	Interest on loans	1,886	1,877	—	—
KNOC Nigerian East Oil Company Ltd.	Interest on loans	2,104	4,778	—	—
KNOC kamchatka Co. Ltd.	Other bad debt expenses	—	—	186	414
KC kazakh B.V.	Reversal of allowances for bad debts	609	—	—	—
	Other bad debt expenses	—	—	456	197,200
Offshore International Group, Inc.	Interest on loans	2,467	—	—	—
KNOC Ferghana Ltd.	Reversal of allowances for bad debts	—	2,414	—	—
KNOC Ferghana2 Ltd.	Other bad debt expenses	—	—	13,424	—
KADOC Ltd.	Interest on loans	5,749	3,838	—	—
Deep Basin Partnership	Other expenses	—	—	1,163	496
HKMS Partnership	Other expenses	—	—	186	79
		₩17,858	19,013	31,887	215,369

(c) The outstanding receivables and payables, except for the loans, arising from the transactions with related parties as of December 31, 2016 and 2015 are as follows:

	Transaction	Receivables 2016	Receivables 2015	Payables 2016	Payables 2015
		In millions of Korean won			
Oilhub Korea Yeosu Co., Ltd.	Other account payables	₩ —	—	1,205	1,614
Kernhem B.V.	Accrued interest	9,154	7,277	—	—
ADA Oil LLP	Accrued interest	2,319	1,880	—	—
	Other receivables	1	—	—	—
	Account payables	—	—	—	21
	Other payables	—	—	—	170
KNOC Nigerian West Oil Company Ltd.	Accrued interest	20,908	22,155	—	—
KNOC Nigerian East Oil Company Ltd.	Accrued interest	23,216	25,390	—	—
KADOC Ltd.	Accrued interest	15,792	9,508	—	—
Offshore International Group, Inc.	Accrued interest	141	—	—	—
Deep Basin Partnership	Account payables	—	—	12,713	11,896
HKMS Partnership	Account payables	—	—	1,864	938
		₩71,531	66,210	15,782	14,639

(d) The loans to related parties as of December 31, 2016 and 2015 are as follows:

	December 31, 2016	December 31, 2015
	In millions of Korean won	
Associates		
Kernhem B.V.	₩ 41,989	39,280
ADA Oil LLP	11,998	11,635
Parallel Petroleum LLC	6,213	5,852
	60,200	56,767
Joint ventures		
KNOC Nigerian West Oil Company Ltd.	31,239	26,172
KNOC Nigerian East Oil Company Ltd.	34,928	28,506
KNOC Ferghana2 Ltd.	—	13,332
Offshore International Group, Inc.	68,280	—
KADOC Ltd.	185,739	163,814
	320,186	231,824
	₩380,386	288,591

The Group provided associates with additional loans of ₩92,288 million and received ₩734 million as the repayment of loans. Also, the Group recognized other bad debt expenses, net of ₩13,457 million, provision for loans of ₩7,276 million due to equity method valuation and an increase in provision for loans due to the effect of changes in exchange rates amounting to ₩20,974 million.

(e) There are no borrowings from the related parties as of December 31, 2016 and 2015.

(f) As of December 31, 2016, the Group does not provide any guarantees to the related parties.

(g) As of December 31, 2016, the Group is not provided with any guarantees from the related parties.

(h) The Company entered into a USD 70 million loan agreement available to December 31, 2017 with Offshore International Group Inc., an investment in joint venture. At December 31, 2016, Offshore International Group Inc. had ₩68,280 million drawn under the loan agreement.

(i) The Company entered into Commercial Storage Agreement with Oilhub Korea Yeosu Co., Ltd., its subsidiary, and leased storage with a volume of 240,000cbm per year. The agreement is terminated on March 31, 2021.

(j) The compensation to the key management personnel of the Group for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Salaries	₩518	584
Severance and retirement benefits	45	48
	₩563	632

41. Additional Cash Flow Statement Information

(a) Non-Cash Transactions

Significant non-cash investment and finance transactions excluded from statements of cash flows for the years ended December 31, 2016 and 2015 are as follows:

	2016	2015
	In millions of Korean won	
Bonds payable transferred to current portion	₩1,954,941	2,025,843
Long-term borrowings transferred to current portion	261,647	545,732
Construction in progress transferred to other accounts	10,599	13,258
Non-current liabilities transferred to current portion	11,733	124,227

42. Contingencies and Commitments

(a) Details of the Group's significant pending litigations as of December 31, 2016 are as follows:

In millions of Korean won and thousands of foreign currencies

Plaintiff	Defendant	Description	Amount	Process
The Company	Nigerian government and etc.	Claiming the validity of the exploration right in OPL 321 and 323(*1)	—	In third trial
Trinidad	Harvest Operations Corp.	Claiming compensation for monetary damages from termination of rig usage(*2)	CAD 15,649	In first trial
Hanhwa Corp.	The Company	Claiming refunds of the premium paid to the Group acquire interests in Yemen 4 oil field(*3)	KRW 5,979	In third trial
Hyundai Heavy Industries	The Company	Claiming refunds of the acquisition costs and premium paid to the Group acquire interests in Yemen 4 oil field(*4)	KRW 40,816	In second trial

(*1) In January 2009, the Company was notified by the President of the Federal Republic of Nigeria about the voidance of the allocation of OPL 321 and 323. The Nigerian Federal High Court granted a judgment in favor of the Company in August 2009. This judgment has been appealed by the Nigerian Government and in April 2012, the appeal was allowed by the Nigerian Court of Appeals setting aside the Nigerian Federal High Court's judgment. The Company filed an appeal at the Supreme Court of Nigeria against the judgment of the Nigerian Court of Appeals. The book value of the related assets is ₩110,291 million but the Company did not recognize a provision as the Company believes that the favorable outcome of the litigation is more likely than not.

(*2) The management of Harvest Operations Corp. has estimated the settlement costs to be CAD 5 million and recognized a provision for the estimated settlement.

(*3) The Company paid all claim amounts in February 2015 based on the loss of the first trial and a second trial is in the process by appealing to the decision as of December 31, 2016.

(*4) The Company paid partial claim amounts in July 2015 based on the loss of the first trial and a second trial is in the process by appealing to the decision as of December 31, 2016.

Also, the Company is in the process of litigation with Dr. Owolabi claiming compensation for cooperation of acquiring Nigerian mining rights. Except for the case of Harvest Operations Corp., the Group does not believe it has a present obligation and has not recognized any provisions for these lawsuits as of December 31, 2016.

In addtion, the Company is acting as an agent, a defendant, for the government in pending lawsuits against SK Energy Co., Ltd and others claiming the revocation of clawback of refund on oil import levies.

(b) The Group has provided loan guarantees to non-related parties as of December 31, 2016 and 2015 as follows:

Description of guarantee	Guaranteed Party	Effective Date	Guarantee period	December 31, 2016	December 31, 2015
			In thousands of US dollar		
Payment guarantee for Parallel business	Samsung C&T Corporation and others	2014-07-10	Until loans fully repaid	8,459	8,459
		2016-06-20		23,780	—

(c) As of December 31, 2016, the Group has received guarantees provided by non-related parties for the Group's obligations and indebtedness as follows:

Provider	Description	Contractual currency amount	Description of guarantee
		In thousands of US dollar	
Sumitomo Mitsui Bank	Guarantee for payment in foreign currency	300,000	Guarantee for the principle and interests of bonds payable

(d) The Company, in relation to the acquisition of Dana Petroleum Limited's equity interest, has provided a guarantee for any potential environmental and bodily damages during the exploration and production activities by Dana Petroleum Norway AS to the Norwegian government.

(e) In 2007 and 2008, the Company and Korean Consortium entered into an agreement (Production Sharing Contract) for the exploration and production of oil fields located in Iraq, with the Kurdish regional government ("KRG"), in accordance with the local Kurdish oil exploration laws. In 2008, the Iraqi federal government announced that such agreement in the region without obtaining proper approval from the federal government would be invalid to the Company and other participating companies in the region. The Company was advised by legal consultants in the UK and in Iraq that there is no legal basis on the alleged nullity of the agreement by the Iraqi government.

(f) In 2009, the Company entered into an exclusive agreement with the Kurdish regional government ("KRG") to obtain rights on five exploratory areas. In consideration of obtaining these rights, the Company committed to pay USD 1.9 billion of construction services for the government's Social Overhead Capital (SOC).

However, the agreement was amended twice until 2012. The Company's rights on three exploratory areas, including Qush Tappa, were terminated and the Company's USD 1.9 billion commitment was reduced to USD 1.175 billion. In addition, the quantity of return-guaranteed crude oil was reduced.

The Company recorded mining rights in relation to this agreement and the carrying amount as of December 31, 2016 is ₩1,393,517 million. In addition, the Company recorded a current provision in relation to this agreement and the carrying amounts as of December 31, 2016 are ₩133,175 million which represent that the Company's estimated obligation of expected payments for KRG's SOC construction.

(g) The Company is in the process of arranging the liquidation of KNOC Yemen Ltd. with YICOM, an acquirer. According to the arrangement, the Company may have a possibility of settlement, of which the amount cannot be estimated.

(h) As of December 31, 2016, other significant commitments and contingencies of the Company's subsidiaries are as follows:

(i) Harvest Operations Corp. ("Harvest") and its subsidiaries

The Company provided a payment guarantee on senior notes issued by Harvest, its subsidiary in June 2016 for the principal amount of USD 196 million and their corresponding interest. The payment guarantee is effective until the maturity date (April 14, 2021) of the bonds.

The Company provided a payment guarantee on senior notes issued by Harvest, its subsidiary in May 2013 for the principal amount of USD 630 million and their corresponding interest. The payment guarantee is effective until the maturity date (May 14, 2018) of the bonds.

Harvest entered into a credit facility maturing on April 30, 2017 for CAD 1.0 billion with the Canadian Imperial Bank of Commerce and other financial institutions.

(ii) Dana Petroleum Limited ("Dana") and its subsidiaries

Dana entered into credit facilities agreements in a form of syndicated loan for up to USD 1.0 billion. Dana has drawn borrowings amounting to USD 541 million as of December 31, 2016. In relation to the credit facilities, certain financial ratios and cash flows are required to be in compliance with debt covenants and its oil and certain gas properties have been pledged as collateral.

In January 2016, the Company approved an additional USD 300 million subordinated loan facility with a total amount of USD 600 million and the facility is available to December 31, 2018. It is undrawn as of December 31, 2016.

The Company provided a performance guarantee of GBP 58 million to Hess Corporation and others for the expenses that will incur for restoration of the sites, decommissioning, dismantling and removal of the facilities and structures. Also, the Company provided a performance guarantee of NOK 235 million (limit: NOK 1,597 million) to ExxonMobile E&P Norway AS for transferring restoring obligation.

(iii) ANKOR E&P Holdings Corp. ("ANKOR") and its subsidiaries

The Company provided a payment guarantee for ANKOR, its subsidiary, in relation to the borrowings from The Expert-Import Bank of Korea and others up to the limit of USD 108 million.

The Company provided a performance guarantee of USD 127 million to Chubb Limited and others for the future restoration of oil and gas sites held by ANKOR.

(iv) JB Patriot Investment Type Private Investment Limited Liability Company, non-controlling interest of KNOC Eagle Ford Corporation entered into an agreement of acquiring redeemable preferred shares with KNOC Eagle Ford Corporation and KNOC EF Star LLC, its subsidiary. The Company entered into the cash deficiency support agreement with KNOC Eagle Ford Corporation. In the case of a breach of covenants, JB Patriot Investment Type Private Investment Limited Liability Company is entitled to exercise a drag along right to require the KNOC Eagle Ford Corporation to sell the entire common shares held by KNOC Eagle Ford Corporation together with the preferred shares. Also, the Group holds the right to pay preferred shares and distributions on the preferred shares.

(i) As of December 31, 2016, the Company's significant commitments with the financial institutions are as follows:

Detail of contract	Financial institutions	Credit line amount	Executed amount
		In thousands of US dollar	
Trade finance	Deutsche Bank	400,000	—
	Development Bank of Singapore(*)	300,000	—
	Korea Development Bank	250,000	—
	Bank of America(*)	210,000	—
	ING Bank(*)	200,000	—
	Hongkong and Shanghai Banking Corporation(*)	100,000	—
	Standard Chartered bank(*)	150,000	—
	The Export-Import Bank of Korea	300,000	—
		1,910,000	—
Financial loans	BNP Paribas	400,000	—
	Development Bank of Singapore(*)	300,000	—
	Mizuho Bank	200,000	—
	Bank of America(*)	210,000	—
	ING Bank(*)	200,000	—
	Hongkong and Shanghai Banking Corporation(*)	100,000	—
	Credit Agricole	100,000	—
	Bank of Tokyo-Mitsubishi UFJ	50,000	—
	Standard Chartered Bank(*)	150,000	—
	The Export-Import Bank of Korea	700,000	—
	Woori Bank	33,099	—
		2,443,099	—

(*) A portion of or all of lines of credit for trade finance and financial loans have been integrated and the integrated line of credit is USD 960 million.

43. Subsequent events

(a) The board of directors of the Company determined to dispose of its building and land and lease them back. The Company entered into a disposal contract and lease contract simultaneously and received proceeds from disposal.

(b) The board of directors of the Company determined to provide a payment guarantee to Harvest Operations Corp. on CAD 1 billion loans plus accrued interest.

44. Uncertainty of deterioration in operating condition of oil market

Imbalance between supply and demand continues to drive low oil prices in the international crude oil market and oil prices are less likely to bounce back in a short period of time. Low oil prices has continuously led to deterioration of Group's profitability and financial soundness.

The Group is carrying forward a scheme to improve the profitability and financial soundness against the unstable oil market. There is a significant uncertainty with respect to the Group's future business results depending on the recovery of oil prices.

Independent Auditors’ Report

The Board of Directors and Shareholder
Korea National Oil Corporation:

We have audited the accompanying consolidated financial statements of Korea National Oil Corporation and its subsidiaries (the “Group”) which comprise the consolidated statements of financial position as at December 31, 2015 and 2014, the consolidated statements of comprehensive loss, changes in equity and cash flows for the years then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

Management’s Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Korean International Financial Reporting Standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors’ Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with Korean Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the entity’s preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity’s internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2015 and 2014 and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with Korean International Financial Reporting Standards.

Emphasis of matters

We draw attention to the followings: Without qualifying our opinion, we draw attention to Note 49 to the consolidated financial statements which states that the global oil market is confronted with excessive supplies due to an increase in both conventional crude oil and shale oil production from oil producing countries. Continued abundant supplies on the oil market has led to a significant drop in oil prices and as a result, the profitability and financial soundness for the Group has deteriorated. There is a significant uncertainty with respect to the Group's future business results depending on the fluctuation of oil prices. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

KPMG Samjong Accounting Corp.

KPMG Samjong Accounting Corp.
Seoul, Korea
February 29, 2016

This report is effective as of February 29, 2016, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that the above audit report has not been updated to reflect the impact of such subsequent events or circumstances, if any.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Financial Position
As of December 31, 2015 and 2014

	Note	2015	2014
		In thousands of Korean won	
Assets			
Cash and cash equivalents	7,8,40	₩ 783,981,021	506,448,753
Current financial assets	9,13,14,40	17,392,394	14,585,590
Trade and other receivables	10,40	712,718,723	941,156,630
Inventories	15	179,822,226	151,679,512
Current income tax assets	36	14,747,350	70,919,103
Current non-financial assets	16,38	130,930,261	257,292,034
Current assets		1,839,591,975	1,942,081,622
Non-current financial assets	9,11,12,13,40	865,211,148	1,136,788,538
Long-term trade and other receivables	10, 40	104,605,655	93,838,391
Property, plant and equipment	18	10,713,420,144	13,821,982,615
Goodwill	19	301,307,768	857,048,504
Intangible assets other than goodwill	20	4,155,280,657	3,850,828,416
Investments in associates and joint ventures	17	589,317,994	859,236,636
Deferred tax assets	36	942,115,987	903,175,901
Non-current non-financial assets	16	3,694,313,733	3,424,305,829
Non-current assets		21,365,573,086	24,947,204,830
Total assets		₩23,205,165,061	26,889,286,452
Liabilities			
Trade and other payables	21,40	₩ 851,339,393	1,417,940,562
Current financial liabilities	9,22,40	3,439,993,178	1,260,897,165
Current income tax liabilities	36	35,473,187	125,838,115
Current non-financial liabilities	26,38	127,341,266	131,270,984
Current provisions	25	189,404,474	258,469,204
Current liabilities		4,643,551,498	3,194,416,030
Long-term trade and other payables	21,40	586,714,571	452,705,928
Non-current financial liabilities	9.22,23,40	11,045,660,174	10,904,889,881
Employee benefits	24	18,339,702	14,031,961
Deferred tax liabilities	36	467,685,882	1,430,501,146
Non-current provisions	25	2,247,619,669	2,523,072,751
Non-current liabilities		14,366,019,998	15,325,201,667
Total liabilities		19,009,571,496	18,519,617,697
Equity			
Share capital	27	10,207,845,780	10,091,919,780
Accumulated deficit	28,29	(6,539,888,833)	(2,177,312,124)
Other components of equity	30	(166,408,433)	(357,504,008)
Equity attributable to the owner of the Company		3,501,548,514	7,557,103,648
Non-controlling interests		694,045,051	812,565,107
Total equity		4,195,593,565	8,369,668,755
Total equity and liabilities		₩23,205,165,061	26,889,286,452

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Comprehensive Loss
For the years ended December 31, 2015 and 2014

	Note	2015	2014
		In thousands of Korean won	
Continuing Operations			
Revenue	6,31	₩ 3,433,170,643	4,358,117,749
Cost of sales	6,39	3,523,506,626	3,439,873,292
Gross profit (loss)		(90,335,983)	918,244,457
Selling and administrative expenses	6,39	354,777,155	445,378,189
Operating profit (loss)		(445,113,138)	472,866,268
Other non-operating income	6,32	153,432,566	139,468,540
Other non-operating expenses	6,32	(299,166,643)	(266,860,119)
Other loss, net	6,33	(3,074,968,748)	(1,719,940,535)
Finance income	6,34	95,034,497	79,958,384
Finance costs	6,35	(1,400,056,840)	(621,038,153)
Loss on investments in associates and joint ventures, net	17,45	(501,105,498)	(41,575,496)
Loss before income tax		(5,471,943,804)	(1,957,121,111)
Income tax benefit	36	(971,677,358)	(684,335,163)
Loss from continuing operations		(4,500,266,446)	(1,272,785,948)
Discontinued operations			
Loss from discontinued operations, net of tax	37	—	(338,346,504)
Loss for the year		₩(4,500,266,446)	(1,611,132,452)
Other comprehensive income (loss)			
Items that will never be reclassified to profit or loss			
Actuarial losses on defined benefit plans		₩ (2,648,007)	(18,343,252)
Retained earnings adjustments in equity method, net of tax		(10,770)	(3,907)
Items that are or may be reclassified to profit or loss			
Net change in the unrealized fair value of available-for-sale financial assets, net of tax	11	—	(156,201,012)
Net change in fair value of available-for-sale financial assets reclassified to profit or loss, net of tax	11	178,152,527	3,683,344
Equity adjustments arising from investments in equity-method investees, net of tax		36,148,732	(5,478,246)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	9	8,840,411	20,170,210
Foreign currency translation differences		1,365,992	(146,772,486)
Other comprehensive income (loss) for the year, net of tax		221,848,885	(302,945,349)
Total comprehensive loss for the year		₩(4,278,417,561)	(1,914,077,801)
Loss attributable to:			
Owners of the Company		₩(4,359,917,932)	(1,602,523,025)
Non-controlling interests		(140,348,514)	(8,609,427)
Loss for the year		₩(4,500,266,446)	(1,611,132,452)
Total comprehensive income (loss) attributable to:			
Owners of the Company		₩(4,171,481,134)	(1,923,933,773)
Non-controlling interests		(106,936,427)	9,855,972
Total comprehensive loss for the year		₩(4,278,417,561)	(1,914,077,801)

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Changes in Equity
For the years ended December 31, 2015 and 2014

	Attributable to owners of the Company					
	Share capital	Accumulated deficit	Other components of equity	Subtotal	Non-controlling interests	Total equity
	In thousands of Korean won					
Balance at January 1, 2014	₩10,030,492,780	(513,370,001)	(54,440,419)	9,462,682,360	821,199,849	10,283,882,209
Total comprehensive loss for the year						
Loss for the year	—	(1,602,523,025)	—	(1,602,523,025)	(8,609,427)	(1,611,132,452)
Items that will not be reclassified subsequently to profit or loss						
Defined benefit plan actuarial losses, net of tax	—	(18,343,252)	—	(18,343,252)	—	(18,343,252)
Retained earnings adjustments in equity method	—	(3,907)	—	(3,907)	—	(3,907)
Items that may be reclassified subsequently to profit or loss						
Net change in the unrealized fair value of available-for-sale financial investments, net of tax	—	—	(156,201,012)	(156,201,012)	—	(156,201,012)
Net change in fair value of available-for-sale financial assets reclassified to profit or loss, net of tax	—	—	3,683,344	3,683,344	—	3,683,344
Equity adjustments arising from investments in equity-method investees, net of tax	—	—	(5,478,246)	(5,478,246)	—	(5,478,246)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	—	—	20,170,210	20,170,210	—	20,170,210
Exchange differences on translation of foreign operations	—	—	(165,237,885)	(165,237,885)	18,465,399	(146,772,486)
Total comprehensive income (loss) for the year	—	(1,620,870,184)	(303,063,589)	(1,923,933,773)	9,855,972	(1,914,077,801)
Transactions with owners of the Company, recognized directly in equity						
Issuance of share capital	61,427,000	—	—	61,427,000	—	61,427,000
Dividends	—	(43,071,939)	—	(43,071,939)	(27,747,883)	(70,819,822)
Changes in ownership interests in subsidiaries	—	—	—	—	9,257,169	9,257,169
Total transactions with owners of the Company	61,427,000	(43,071,939)	—	18,355,061	(18,490,714)	(135,653)
Balance at December 31, 2014	₩10,091,919,780	(2,177,312,124)	(357,504,008)	7,557,103,648	812,565,107	8,369,668,755

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Changes in Equity — (Continued)
For the years ended December 31, 2015 and 2014

	Attributable to owners of the Company					
	Share capital	Accumulated deficit	Other components of equity	Subtotal	Non-controlling interests	Total equity
	In thousands of Korean won					
Balance at January 1, 2015	₩10,091,919,780	(2,177,312,124)	(357,504,008)	7,557,103,648	812,565,107	8,369,668,755
Total comprehensive loss for the year						
Loss for the year	—	(4,359,917,932)	—	(4,359,917,932)	(140,348,514)	(4,500,266,446)
Items that will not be reclassified subsequently to profit or loss						
Defined benefit plan actuarial losses, net of tax	—	(2,648,007)	—	(2,648,007)	—	(2,648,007)
Retained earnings adjustments in equity method	—	(10,770)	—	(10,770)	—	(10,770)
Items that may be reclassified subsequently to profit or loss						
Net change in fair value of available-for-sale financial assets reclassified to profit or loss, net of tax	—	—	178,152,527	178,152,527	—	178,152,527
Equity adjustments arising from investments in equity-method investees, net of tax	—	—	36,148,732	36,148,732	—	36,148,732
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	—	—	8,840,411	8,840,411	—	8,840,411
Exchange differences on translation of foreign operations	—	—	(32,046,095)	(32,046,095)	33,412,087	1,365,992
Total comprehensive income (loss) for the year	—	(4,362,576,709)	191,095,575	(4,171,481,134)	(106,936,427)	(4,278,417,561)
Transactions with owners of the Company, recognized directly in equity						
Issuance of share capital	115,926,000	—	—	115,926,000	—	115,926,000
Dividends	—	—	—	—	(11,314,900)	(11,314,900)
Changes in ownership interests in subsidiaries	—	—	—	—	(268,729)	(268,729)
Total transactions with owners of the Company	115,926,000	—	—	115,926,000	(11,583,629)	104,342,371
Balance at December 31, 2015	₩10,207,845,780	(6,539,888,833)	(166,408,433)	3,501,548,514	694,045,051	4,195,593,565

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Cash Flows
For the years ended December 31, 2015 and 2014

	2015	2014
	In thousands of Korean won	
Cash flows from operating activities		
Loss for the year	₩(4,500,266,446)	(1,611,132,452)
Adjustment for:		
Net pension plan costs	8,365,674	11,694,258
Depreciation of property, plant and equipment	1,447,536,332	1,492,743,482
Amortization of intangible assets other than goodwill	209,780,647	262,608,618
Bad debt expense	4,311,473	(569,684)
Reversal of other provisions	(25,130,584)	—
Reversal of bad debt allowance	(2,425,878)	—
Gains on exemption of debts	(99,149,440)	(96,533,646)
Interest costs on the provision for decommissioning	108,326,934	167,601,802
Other bad debt expense	172,122,399	69,485,634
Gains on disposal of property, plant and equipment	(149,664,545)	(377,791,284)
Gains on disposal of intangible assets other than goodwill	(1,915,055)	(1,703,639)
Gains on valuation of derivatives (other profit or loss)	(418,347)	(774,415)
Reversal of impairment loss on property, plant and equipment	(21,286,571)	—
Gains on foreign currency translation (other profit or loss)	(25,304,795)	(7,899,235)
Losses on disposal of property, plant and equipment	8,676,197	14,375,586
Losses on disposal of intangible assets other than goodwill	22,327	41,987,066
Losses on valuation of derivatives (other profit or loss)	1,202,085	774,410
Impairment on property, plant and equipment	2,362,118,964	946,552,254
impairment and write-off of intangible assets other than goodwill	270,800,807	825,979,042
Impairment on goodwill	559,062,022	457,038,443
Losses on foreign currency translation (other profit or loss)	66,018,497	29,551,178
Income tax benefit	(971,677,358)	(596,451,641)
Interest income	(39,094,156)	(34,635,404)
Dividends income	(3,863,078)	(4,807,355)
Gains on disposal of available-for-sale financial investments	—	(2,893,891)
Gains on foreign currency translation (finance income)	(43,991,160)	(11,534,554)
Interest expense	415,090,185	394,660,817
Impairment loss on available-for-sale financial assets	450,369,625	—
Losses on valuation of derivatives (finance cost)	—	2,020,344
Losses on foreign currency translation (finance cost)	477,838,822	148,902,648
Other finance costs (Interest expense)	45,619,089	52,288,703
Share of loss (profit) in associates and joint ventures, net	242,929,626	42,586,212
Impairment loss on investments in associates and joint ventures	243,106,016	—
Losses on disposal of investments in associates and joint ventures	—	2,354,683
Gains on disposal of investments in associates and joint ventures	(142,205)	(3,365,399)
Loss on disposal of discontinued operation	—	54,024,188
Losses on disposal of investments in subsidiaries	15,212,061	—
	5,724,446,610	3,878,269,221
Changes in:		
Inventories	(25,842,027)	37,843,325
Trade and other receivables	148,238,225	(24,877,240)
Other receivables relating to operating activities	(34,081,768)	156,645,636
Trade and other payables	(430,387,548)	158,988,915
Other payables relating to operating activities	43,540,130	(142,258,780)
Defined benefit liability	(839,461)	(39,773,830)
Provisions	(272,996,881)	(271,721,154)
Cash generated from operating activities	651,810,834	2,141,983,641
Dividend received	3,863,078	5,333,965
Interest paid	(404,641,038)	(490,825,700)
Interest received	8,755,126	38,612,528
Income tax paid	(28,409,845)	(152,692,239)
Net cash provided by operating activities	₩ 231,378,155	1,542,412,195

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Cash Flows — (Continued)
For the years ended December 31, 2015 and 2014

	2015	2014
	In thousands of Korean won	
Cash flows from investing activities:		
Disposal of investments in associates and joint ventures	₩ 202,060	5,543,479
Acquisition of investments in associates and joint ventures	(75,663,794)	(79,058,447)
Proceeds from disposal of property, plant and equipment	33,154,586	850,642,949
Acquisition of property, plant and equipment	(1,228,755,724)	(2,452,102,662)
Proceeds from disposal of assets held for sale	66,895,439	52,330,382
Proceeds from disposal of intangible assets other than goodwill	1,852,328	8,654,840
Acquisition of intangible assets other than goodwill	(278,819,780)	(359,830,574)
Proceeds from government grants	1,686	—
Proceeds from disposal of goodwill	—	25,449,576
Acquisition of non-current non-financial assets	(44,597,715)	(95,970,934)
Proceeds from disposal of short-term trading financial assets	—	15,724,991
Acquisition of available-for-sale financial investments	—	(11,750,343)
Proceeds from disposal of available-for-sale financial investments	—	9,671,986
Increase in long-term and short-term financial assets	(2,014,653)	—
Decrease in long-term and short-term financial assets	2,591,163	89,306,976
Increase in leasehold deposits provided	(3,075,419)	(39,081,824)
Decrease in leasehold deposits provided	1,359,325	17,782,167
Collection of short-term and long-term loans	(117,607,431)	(133,001,119)
Decrease in short-term and long-term loans	11,782,950	32,909,405
Increase in leasehold deposits received	3,932,880	1,868,583
Decrease in leasehold deposits received	(3,343,820)	(3,529)
Net cash inflow (outflow) from change in scope of consolidation	(32,431,240)	35,827,797
Net cash used in investing activities	(1,664,537,159)	(2,025,086,301)
Cash flow from financing activities		
Proceeds from increase in share capital	115,926,000	61,427,000
Proceeds from short-term borrowings	900,796,997	263,596,573
Repayments of short-term borrowings	(665,734,462)	(220,502,771)
Repayments of current portion of long-term liabilities	—	(219,617,413)
Proceeds from issue of bond payables	2,003,432,759	2,310,012,129
Repayments of bond payables	(1,074,915,500)	(2,415,168,194)
Proceeds from long-term borrowings	462,525,937	459,184,671
Repayments of long-term borrowings	(28,777,650)	(160,073,731)
Dividends paid	(11,314,900)	(70,819,822)
Net cash inflow (outflow) from partial disposition of interest in subsidiaries	(268,729)	9,257,169
Net cash provided by financing activities	1,701,670,452	17,295,611
Net increase (decrease) in cash and cash equivalents before net effect of foreign exchange differences	268,511,448	(465,378,495)
Effect of exchange rate fluctuations on cash held	13,178,313	7,852,501
Increase (decrease) in cash and cash equivalents	281,689,761	(457,525,994)
Cash and cash equivalents at January 1	508,505,823	966,031,817
Cash and cash equivalents at December 31 before deduction of government grants	790,195,584	508,505,823
Government grants	(6,214,563)	(2,057,070)
Cash and cash equivalents at December 31 after deduction of government grants	₩ 783,981,021	506,448,753

See accompanying notes to the consolidated financial statements.

Notes to the Consolidated Financial Statements
For the years ended December 31, 2015 and 2014

1. Reporting Entity

(a) Description of the controlling company

Korea National Oil Corporation (the "Company" or the "Parent Company") was incorporated on March 3, 1979 to engage in the development of oil fields, distribution of crude oil, maintenance of petroleum reserve stock and improvement of the petroleum distribution infrastructure under the Korea National Oil Corporation Act. The Company's head office is located at 305, Jongga-Ro, Jung-Gu, Ulsan in Korea. The Company also has 8 petroleum stockpile sites, 1 domestic gas field management office, 7 overseas offices in Vietnam and other countries and overseas subsidiaries and affiliates in the United States and other countries.

As of December 31, 2015, the Company's share capital is ₩10,207,846 million, which is wholly owned by the government of the Republic of Korea.

The consolidated financial statements comprise the Company and its subsidiaries (together referred to as the "Group" and individually as "Group entities") and the Group's interests in associates and joint ventures.

The list of subsidiaries as of December 31, 2015 and 2014 is disclosed in Note 5.

2. Basis of Preparation

(a) Statement of compliance

The consolidated financial statements have been prepared in accordance with Korean International Financial Reporting Standards ("K-IFRS"), as prescribed in the Act on External Audits of Corporations in the Republic of Korea.

The consolidated financial statements were authorized for issue by the Board of Directors on March 4, 2016.

(b) Basis of measurement

The consolidated financial statements have been prepared on the historical cost basis, except for the following material items in the statement of financial position:

- derivative financial instruments are measured at fair value
- financial instruments at fair value through profit or loss are measured at fair value
- available-for-sale financial assets are measured at fair value
- investments in associates and joint venture are measured at fair value
- liabilities for defined benefit plans are recognized at the net of the total present value of defined benefit obligations less the fair value of plan assets

(c) Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the 'functional currency'). The accompanying consolidated financial statements are prepared in the Group's functional currency, the United States dollar, and presented in Korean won, the Group's presentation currency, for the financial reporting purposes in accordance with K-IFRS 1021, 'The Effects of Changes in Foreign Exchange Rates'. The Group is required to present its financial statements in Korean won in accordance with regulations in Korea.

Assets and liabilities for each statement of financial position presented (i.e. including comparatives) were translated at the closing rate at the date of that statement of financial position, income and expenses for each statement presenting profit or loss and other comprehensive income (i.e. including comparatives) were translated at the average exchange rates of the period and all resulting exchange differences were recognized in other comprehensive income.

(d) Use of estimates and judgments

The preparation of the consolidated financial statements in conformity with K-IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimates are revised and in any future periods affected.

(i) Assumptions and estimation uncertainties

Information about assumptions and estimation uncertainties that have a significant risk of resulting in a material adjustment within the next financial year are included in the following notes

Note 18: Property, Plant and Equipment — estimation of factors for depreciation and recoverable amount

Note 19: Goodwill — main assumptions for recoverable amounts

Note 20: Intangible assets other than goodwill — main assumptions for recoverable amounts

Note 24: Employee Benefits — main actuarial assumptions

Note 25 and 46: Provisions and Contingencies — assumptions for possibility of cash outflows and their amounts

Note 36: Income tax benefit — possibility of realization of deferred tax assets

(ii) Measurement of fair value

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities. The Group has an established control framework with respect to the measurement of fair values. This includes a valuation team that has overall responsibility for overseeing all significant fair value measurements, including Level 3 fair values, and reports directly to the CFO.

The valuation team regularly reviews significant unobservable inputs and valuation adjustments. If third party information, such as broker quotes or pricing services, is used to measure fair values, then the valuation team assesses the evidence obtained from the third parties to support the conclusion that such valuations meet the requirements of K-IFRS, including the level in the fair value hierarchy in which such valuations should be classified.

When measuring the fair value of an asset or a liability, the Group uses market observable data as far as possible. Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows.

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or a liability fall into different levels of the fair value hierarchy, then the fair value measurement is categorized in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

Information about the assumptions made in measuring fair values is included in the following notes:

Note 40 — Categories of financial instruments

3. Changes in Accounting Policies

Except for the changes below, the Group has consistently applied the accounting policies set out in note 4 to all periods presented in these consolidated financial statements. The Group has adopted the following new standards and amendments to standards with a date of initial application of January 1, 2015.

(a) K-IFRS No. 1019, 'Employee Benefits'

K-IFRS No. 1019, 'Employee Benefits', introduced a practical expedient for companies that operate defined benefit plans and when contributions are made by employees or third parties. According to the amendments, the Company is permitted to recognize those contributions as a reduction of the service cost in the period in which the related service is rendered, instead of forecast future contributions from employees or third parties and attribute them to periods or service as negative benefits.

(b) Impact of changes in accounting policies.

Management believes the impact of the amendments on the Group's consolidated financial statements is not significant, and the Group did not retrospectively apply the new standards and amendments to standards stated above.

4. Significant Accounting Policies

The significant accounting policies applied by the Group in preparation of its consolidated financial statements are included below. The accounting policies set out below have been applied consistently to all periods presented in these consolidated financial statements, except for changes in accounting policies as explained in note 3.

Certain comparative amounts in the statement of financial position have been reclassified or re-represented to facilitate the comparison of the current year and the prior year.

(a) Basis of consolidation

(i) Non-controlling interests

Non-controlling interests are measured at their proportionate share of the acquiree's identifiable net assets at the date of acquisition. Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

(ii) Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

(iii) Loss of control

When the Group loses control over a subsidiary, it derecognizes the assets and liabilities of the subsidiary, and any related NCI and other components of equity. Any resulting gain or loss is recognized in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

(iv) Interests in equity-accounted investees

The Group's interests in equity-accounted investees comprise interests in associates and a joint venture. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies. A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities.

Interests in associates and the joint venture are accounted for using the equity method. They are initially recognized at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and OCI of equity-accounted investees, until the date on which significant influence or joint control ceases.

(v) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealized income and expenses arising from intra-group transactions, are eliminated. Unrealized gains arising from transactions with equity-accounted investees are eliminated against the investment to the extent of the Group's interest in the investee. Unrealized losses are eliminated in the same way as unrealized gains, but only to the extent that there is no evidence of impairment.

(b) Discontinued operations

A discontinued operation is a component of the Group's business, the operations and cash flows of which can be clearly distinguished from the rest of the Group and which:

- represents a separate major line of business or geographical area of operations;
- is part of a single coordinated plan to dispose of a separate major line of business or geographic area of operations; or
- is a subsidiary acquired exclusively with a view to resale.

Classification as a discontinued operation occurs at the earlier of disposal or when the operation meets the criteria to be classified as held for sale.

When an operation is classified as a discontinued operation, the comparative consolidated statement of profit or loss and OCI is re-presented as if the operation had been discontinued from the start of the comparative period.

(c) Cash and cash equivalents

Cash and cash equivalents comprise cash on hand, demand deposits, and short-term investments in highly liquid securities that are readily convertible to known amounts of cash with maturities of three months or less from the acquisition date and which are subject to an insignificant risk of changes in value. Equity investments are excluded from cash and cash equivalents unless they are, in substance, cash equivalents, for example in the case of preferred shares when it has a short maturity with a specified redemption date.

(d) Inventories

Inventories are measured at the lower of cost and net realizable value. The cost of inventories is based on the moving-weighted average method, and includes expenditures for acquiring the inventories, production or conversion costs and other costs incurred in bringing them to their existing location and condition. Net realizable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and selling expenses.

The amount of any write-down of inventories to net realizable value and all losses of inventories are recognized as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realizable value, are recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

(e) Non-derivative financial assets

The Group recognizes and measures non-derivative financial assets by the following four categories: financial assets at fair value through profit or loss, held-to-maturity investments, loans and receivables and available-for-sale financial assets. The Group recognizes financial assets in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the instrument.

Upon initial recognition, non-derivative financial assets are measured at their fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the asset's acquisition or issuance.

(i) Financial assets at fair value through profit or loss

A financial asset is classified as financial assets are classified at fair value through profit or loss if it is held for trading or is designated as such upon initial recognition. Upon initial recognition, transaction costs are recognized in profit or loss when incurred. Financial assets at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss.

(ii) Held-to-maturity investments

A non-derivative financial asset with a fixed or determinable payment and fixed maturity, for which the Group has the positive intention and ability to hold to maturity, are classified as held-to-maturity investments. Subsequent to initial recognition, held-to-maturity investments are measured at amortized cost using the effective interest method.

(iii) Loans and receivables

Loans and receivables are financial assets with fixed or determinable payments that are not quoted in an active market. Subsequent to initial recognition, loans and receivables are measured at amortized cost using the effective interest method except for loans and receivables of which the effect of discounting is immaterial.

(iv) Available-for-sale financial assets

Available-for-sale financial assets are those non-derivative financial assets that are designated as available-for-sale or are not classified as financial assets at fair value through profit or loss, held-to-maturity investments or loans and receivables. Subsequent to initial recognition, they are measured at fair value, which changes in fair value, net of any tax effect, recorded in other comprehensive income in equity. Investments in equity instruments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured and derivatives that are linked to and must be settled by delivery of such unquoted equity instruments are measured at cost.

(v) De-recognition of financial assets

The Group derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows on the financial asset in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in transferred financial assets that is created or retained by the Group is recognized as a separate asset or liability.

If the Group retains substantially all the risks and rewards of ownership of the transferred financial assets, the Group continues to recognize the transferred financial assets and recognizes financial liabilities for the consideration received.

(vi) Offsetting between financial assets and financial liabilities

Financial assets and financial liabilities are offset and the net amount is presented in the consolidated statement of financial position only when the Group currently has a legally enforceable right to offset the recognized amounts, and there is the intention to settle on a net basis or to realize the asset and settle the liability simultaneously.

(f) Derivative financial instruments, including hedge accounting

Derivatives are initially recognized at fair value. Subsequent to initial recognition, derivatives are measured at fair value, and changes therein are accounted for as described below.

(i) Hedge accounting

The Group holds forward exchange contracts, interest rate swaps, currency swaps and other derivative contracts to manage interest rate risk and foreign exchange risk. The Group designated derivatives as hedging instruments to hedge the risk of changes in the fair value of assets, liabilities or firm commitments (a fair value hedge) and foreign currency risk of highly probable forecasted transactions or firm commitments (a cash flow hedge).

On initial designation of the hedge, the Group formally documents the relationship between the hedging instrument(s) and hedged item(s), including the risk management objectives and strategy in undertaking the hedge transaction, together with the methods that will be used to assess the effectiveness of the hedging relationship.

Fair value hedge

Changes in the fair value of a derivative hedging instrument designated as a fair value hedge are recognized in gain or loss. The gain or loss from remeasuring the hedging instrument at fair value for a derivative hedging instrument and the gain or loss on the hedged item attributable to the hedged risk are recognized in profit or loss in the same line item of the consolidated statement of comprehensive income.

The Group discontinues fair value hedge accounting if the hedging instrument expires or is sold, terminated or exercised, or if the hedge no longer meets the criteria for hedge accounting. Any adjustment arising from gain or loss on the hedged item attributable to the hedged risk is amortized to profit or loss from the date the hedge accounting is discontinued.

Cash flow hedge

When a derivative is designated to hedge the variability in cash flows attributable to a particular risk associated with a recognized asset or liability or a highly probable forecasted transaction that could affect profit or loss, the effective portion of changes in the fair value of the derivative is recognized in other comprehensive income, net of tax, and presented in the hedging reserve in equity. Any ineffective portion of changes in the fair value of the derivative is recognized immediately in profit or loss.

If the hedging instrument no longer meets the criteria for hedge accounting, expires or is sold, terminated, exercised, or the designation is revoked, then hedge accounting is discontinued prospectively. The cumulative gain or loss on the hedging instrument that has been recognized in other comprehensive income is reclassified to profit or loss in the periods during which the forecasted transaction occurs. If the forecasted transaction is no longer expected to occur, then the balance in other comprehensive income is recognized immediately in profit or loss.

(ii) Separable embedded derivatives

Embedded derivatives are separated from the host contract and accounted for separately only if the following criteria have been met:

① The economic characteristics and risks of the embedded derivative are not closely related to those of the host contract;
② A separate instrument with the same terms as the embedded derivative would meet the definition of a derivative; and
③ The hybrid instrument is not measured at fair value with changes in fair value recognized in profit or loss.

Changes in the fair value of separable embedded derivatives are recognized immediately in profit or loss.

(iii) Other derivative financial instruments

Changes in the fair value of other derivative financial instrument not designated as a hedging instrument are recognized immediately in profit or loss.

(g) Impairment of financial assets

A financial asset not carried at fair value through profit or loss is assessed at each reporting date to determine whether there is objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that a loss event has occurred after the initial recognition of the asset, and that the loss event had a negative effect on the estimated future cash flows of that asset that can be estimated reliably. However, losses expected as a result of future events, regardless of likelihood, are not recognized.

If there is objective evidence that financial instruments are impaired, impairment losses are measured and recognized. In addition, for an investment in an equity security, a significant or prolonged decline in its fair value below its cost is objective evidence of impairment.

(i) Financial assets measured at amortized cost

An impairment loss in respect of a financial asset measured at amortized cost is calculated as the difference between its carrying amount and the present value of its estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognized in profit or loss and reflected in an allowance account. When the Group considers that there are no realistic prospects of recovery of the asset, the relevant amounts are written off. If the amount of impairment loss subsequently decreases and the decrease can be related objectively to an event occurring after the impairment was recognized, then the previously recognized impairment loss is reversed through profit or loss either directly or by adjusting an allowance account.

(ii) Financial assets carried at cost

If there is objective evidence that an impairment loss has occurred on an unquoted equity instrument that is not carried at fair value because its fair value cannot be reliably measured, or on a derivative asset that is linked to and must be settled by delivery of such an unquoted equity instrument, the amount of the impairment loss is measured as the difference between the carrying amount of the financial asset and the present value of estimated future cash flows discounted at the current market rate of return for a similar financial asset. Such impairment losses shall not be reversed.

(iii) Available-for-sale financial assets

When a decline in the fair value of an available-for-sale financial asset has been recognized in other comprehensive income and there is objective evidence that the asset is impaired, the cumulative loss that had been recognized in other comprehensive income shall be reclassified from equity to profit or loss as a reclassification adjustment even though the financial asset has not been derecognized. Impairment losses recognized in profit or loss for an investment in an equity instrument classified as available-for-sale shall not be reversed through profit or loss. If, in a subsequent period, the fair value of a debt instrument classified as available-for-sale increases and the increase can be objectively related to an event occurring after the impairment loss was recognized in profit or loss, the impairment loss shall be reversed, with the amount of the reversal recognized in profit or loss.

(h) Property, plant and equipment

Property, plant and equipment are initially measured at cost and after initial recognition, are carried at cost less accumulated depreciation and accumulated impairment losses. The cost of property, plant and equipment includes expenditures arising directly from the construction or acquisition of the asset, any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management and the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

The following costs are capitalized as oil and gas properties.

- the costs incurred in development stage for constructing facilities and drilling wells for production
- the costs of acquiring production areas or fields with proved reserves
- the construction costs and other expenditures for initiating production
- the estimated costs for decommissioning

Additionally, the Group depreciates the acquisition costs of oil and gas properties which are aggregated on an area-by-area basis or field-by-field basis. For the costs of oil and gas properties which are aggregated on an area-by-area basis, the Group depreciates the acquisition costs using proved reserves as the total estimated production when applying the unit-of-production depreciation method. For the costs of oil and gas properties which are aggregated on a field-by-field basis, the Group depreciates the acquisition costs using proved developed reserves as the total estimated production when applying the unit-of-production depreciation method.

Costs related to undeveloped oil and gas properties are not immediately included in the depletable pool of developed assets but are transferred to the depletable pool as the reserves become proved (for area-by-area basis) or developed (for field-by-filed basis) through drilling activities.

Subsequent costs are recognized in the carrying amount of property, plant and equipment at cost or, if appropriate, as separate items if it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of the replaced part is derecognized. The costs of the day-to-day servicing are recognized in profit or loss as incurred.

Property, plant and equipment, except for land and oil and gas properties, are depreciated on a straight-line basis over estimated useful lives that appropriately reflect the pattern in which the asset's future economic benefits are expected to be consumed.

	Useful lives (years)
Buildings	20 ~ 40 years
Structures	20 ~ 40 years
Machinery	5 ~ 20 years
Vessels	20 years
Tools and fixtures	5 years
Vehicles	5 years

Gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment and are recognized in profit or loss. Depreciation methods, useful lives and residual values are reviewed at the end of each reporting date and adjusted, if appropriate. The change is accounted for as a change in an accounting estimate.

(i) Intangible assets

Intangible assets with finite useful lives acquired separately are carried at cost. Intangible assets acquired in a business combination are initially recognized at their fair value at the acquisition date (which is regarded as their cost). Subsequent to initial recognition, intangible assets acquired in a business combination are reported at cost less accumulated amortization and accumulated impairment losses.

Prior to acquiring the legal rights to explore an area, all costs related to exploration and evaluation of an area are charged directly to the statement of comprehensive loss. Once the legal rights to explore are acquired, all costs associated with acquisition of exploration rights, geological, geophysical and geographical research, drilling costs and evaluation of technical and commercial viability of economic production are capitalized as exploration and evaluation assets. All such costs are subject to review for impairment when facts and circumstances suggest that the carrying amount of the assets exceeds their recoverable amount. When technical feasibility and commercial viability are established, the relevant expenditure is transferred to oil and gas properties after impairment is assessed and any resulting impairment loss is recognized. If no potentially commercial petroleum is discovered from exploration drilling, the relating exploration and evaluation assets are written off through the statement of comprehensive loss.

The useful lives of intangible assets are assessed as either finite or indefinite. Intangible assets with finite lives are amortized over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. The amortization period and the amortization method for intangible assets with a finite useful lives are reviewed at least each financial year end. Changes in the expected useful life or the expected pattern of consumption of future economic benefits embodied in the asset is accounted for by changing the amortization period or method, as appropriate, and are treated as changes in accounting estimates. The amortization expense on intangible assets with finite lives is recognized in the statement of comprehensive income in the expense category consistent with the function of the intangible asset.

Intangible assets with indefinite useful lives such as membership are not amortized, but are tested for impairment annually. Intangible assets with definite useful lives are amortized on a straight-line basis over estimated useful lives of 5 to 20 years.

Gains or losses arising from derecognition of an intangible asset, measured as the difference between the net disposal proceeds and the carrying amount of the asset, and are recognized in income or loss when the asset is derecognized.

(j) Oil stockpiles

The Group stockpiles crude oil and petroleum products to stabilize domestic demand and market prices and classifies those assets as oil stockpiles (non-current non-financial assets) of which the cost is determined using the moving-average method. The Group performs annual impairment test for oil stockpiles.

(k) Borrowing costs

The Group capitalizes borrowing costs directly attributable to the acquisition, construction or production of a qualifying asset as part of the cost of that asset. Other borrowing costs are recognized in expense as incurred. A qualifying asset is an asset that requires a substantial period of time to get ready for its intended use or sale. Financial assets and inventories that are manufactured or otherwise produced over a short period of time are not qualifying assets. Assets that are ready for their intended use or sale when acquired are not qualifying assets.

To the extent that the Group borrows funds specifically for the purpose of obtaining a qualifying asset, the Group determines the amount of borrowing costs eligible for capitalization as the actual borrowing costs incurred on that borrowing during the period less any investment income on the temporary investment of those borrowings. To the extent that the Group borrows funds generally and uses them for the purpose of obtaining a qualifying asset, the Group shall determine the amount of borrowing costs eligible for capitalization by applying a capitalization rate to the expenditures on that asset. The capitalization rate shall be the weighted average of the borrowing costs applicable to the borrowings of the Group that are outstanding during the period, other than borrowings made specifically for the purpose of obtaining a qualifying asset. The amount of borrowing costs that the Group capitalizes during a period shall not exceed the amount of borrowing costs incurred during that period.

(l) Impairment of non-financial assets

The carrying amounts of the Group's non-financial assets, other than assets arising from employee benefits, inventories, deferred tax assets and non-current assets held for sale, are reviewed at the end of the reporting period to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Intangible assets that have indefinite useful lives or that are not yet available for use, irrespective of whether there is any indication of impairment, are tested for impairment annually by comparing their recoverable amount to their carrying amount.

For impairment testing, assets are grouped together into the smallest group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets ("CGUs"). The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. The value in use is estimated by applying a pre-tax discount rate that reflect current market assessments of the time value of money and the risks specific to the asset or CGU for which estimated future cash flows have not been adjusted, to the estimated future cash flows expected to be generated by the asset or CGU.

An impairment loss is recognized in profit or loss if the carrying amount of an asset or a CGU exceeds its recoverable amount.

(m) Non-current assets held for sale

Non-current assets, or disposal groups comprising assets and liabilities, that are expected to be recovered primarily through sale rather than through continuing use, are classified as held for sale. In order to be classified as held for sale, the asset (or disposal group) must be available for immediate sale in its present condition and its sale must be highly probable. The assets or disposal group that are classified as non-current assets held for sale are measured at the lower of their carrying amount and fair value less cost to sell.

The Group recognizes an impairment loss for any initial or subsequent write-down of an asset (or disposal group) to fair value less costs to sell, and a gain for any subsequent increase in fair value less costs to sell, up to the cumulative impairment loss previously recognized in accordance with K-IFRS No. 1036, 'Impairment of Assets'.

A non-current asset that is classified as held for sale or part of a disposal group classified as held for sale is not depreciated (or amortized).

(n) Non-derivative financial liabilities

The Group classifies non-derivative financial liabilities into financial liabilities at fair value through profit or loss or other financial liabilities in accordance with the substance of the contractual arrangement and the definitions of financial liabilities. The Group recognizes financial liabilities in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the financial liability.

(i) Financial assets at fair value through profit or loss

Financial liabilities at fair value through profit or loss include financial liabilities held for trading or designated as such upon initial recognition. Subsequent to initial recognition, financial liabilities at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss. Upon initial recognition, transaction costs that are directly attributable to the acquisition are recognized in profit or loss as incurred.

(ii) Other financial liabilities

Non-derivative financial liabilities other than financial liabilities at fair value through profit or loss are classified as other financial liabilities. At the date of initial recognition, other financial liabilities are measured at fair value minus transaction costs that are directly attributable to the acquisition. Subsequent to initial recognition, other financial liabilities are measured at amortized cost using the effective interest method.

The Group derecognizes a financial liability from the consolidated statement of financial position when it is extinguished (i.e. when the obligation specified in the contract is discharged, cancelled or expires).

(o) Employee benefits

(i) Short-term employee benefits

Short-term employee benefits are employee benefits that are due to be settled within 12 months after the end of the period in which the employees render the related service. When an employee has rendered service to the Group during an accounting period, the Group recognizes the undiscounted amount of short-term employee benefits expected to be paid in exchange for that service.

(ii) Retirement benefits: defined contribution plans

When an employee has rendered service to the Group during a period, the Group recognizes the contribution payable to a defined contribution plan in exchange for that service as a liability (accrued expense), after deducting any contribution already paid. If the contribution already paid exceeds the contribution due for service before the end of the reporting period, the Group recognizes that excess as an asset (prepaid expense) to the extent that the prepayment will lead to a reduction in future payments or a cash refund.

(iii) Retirement benefits: defined benefit plans

A defined benefit plan is a post-employment benefit plan other than a defined contribution plan. The Group's net obligation in respect of defined benefit plans is calculated by estimating the amount of future benefit that employees have earned in return for their service in the current and prior periods; that benefit is discounted to determine its present value. The fair value of plan assets is deducted. The calculation is performed annually by an independent actuary using the projected unit credit method.

The discount rate is the yield at the reporting date on high-quality corporate bonds that have maturity dates approximating the terms of the Group's obligations and that are denominated in the same currency in which the benefits are expected to be paid. The Group recognizes all actuarial gains and losses arising from actuarial assumption changes and experiential adjustments in other comprehensive income when incurred.

Re-measurements of net defined benefit liabilities, which comprise actuarial gains and losses, the return on plan assets (excluding interest) and the effect of the asset ceiling (if any, excluding interest), are recognized immediately in other comprehensive income. The Group determines the net interest expense (income) on the net defined benefit liability (asset) for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period to the then-net defined benefit liability (asset), taking into account any changes in the net defined benefit liability (asset) during the period as a result of contributions and benefit payments, net interest expense and other expenses related to defined benefit plans are recognized in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss in curtailment is recognized immediately in profit or loss. The Group recognizes gains and losses on the settlement of a defined benefit plan when the settlement occurs.

(p) Provisions

Provisions are recognized when the Group has a present legal or constructive obligation as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation.

The risks and uncertainties that inevitably surround many events and circumstances are taken into account in reaching the best estimate of a provision. Where the effect of the time value of money is material, provisions are determined at the present value of the expected future cash flows.

Where some or all of the expenditures required to settle a provision are expected to be reimbursed by another party, the reimbursement shall be recognized when, and only when, it is virtually certain that reimbursement will be received if the entity settles the obligation. The reimbursement shall be treated as a separate asset.

Provisions are reviewed at the end of each reporting period and adjusted to reflect the current best estimates. If it is no longer probable that an outflow of resources embodying economic benefits will be required to settle the obligation, the provision is reversed.

When there is a legal or contractual obligation for dismantling, removing facilities and restoring sites on which they are located to their original condition at the end of the useful lives of the facilities, the present value of the estimated future restoration costs are capitalized at the acquisition date as additions to the cost of oil and gas properties and are accounted for as a provision. The Group subsequently depreciates the restoration costs using the unit-of-production method and the difference between estimated restoration costs and their present value is charged to current operations by applying the effective-interest-rate method.

(q) Foreign currencies

Transactions in foreign currencies are translated to the respective functional currencies of Group entities at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are retranslated to the functional currency using the reporting date's exchange rate. Non-monetary assets and liabilities denominated in foreign currencies that are measured at fair value are retranslated to the functional currency at the exchange rate at the date that the fair value was determined. Non-monetary assets and liabilities denominated in foreign currencies that are measured in terms of historical cost in a foreign currency are translated using the exchange rate at the dates of the transactions.

Foreign currency differences arising on retranslation are recognized in profit or loss, except for differences arising on the retranslation of available-for-sale equity instruments, a financial liability designated as a hedge of the net investment in a foreign operation, or qualifying cash flow hedges, which are recognized in other comprehensive income. When gains or losses on non-monetary items are recognized in other comprehensive income, exchange components of those gains or losses are recognized in other comprehensive income. Conversely, when gains or losses on non-monetary items are recognized in profit or loss, exchange components of those gains or losses are recognized in profit or loss.

(r) Revenue

Revenue from sale of goods, rendering of services or use of the Group assets is measured at the fair value of the consideration received or receivable, net of returns, trade discounts and volume rebates. When two or more revenue generating activities or deliverables are sold under a single arrangement, each deliverable that is considered to be a separate unit of account is accounted for separately. The allocation of consideration from a revenue arrangement to its separate units of account is based on the relative fair values of each unit.

(i) Sales of goods

Revenue from the sale of goods in the ordinary course of activities is measured at the fair value of the consideration received or receivable, trade discounts and volume rebates. Revenue is recognized when persuasive evidence exists, usually in the form of an executed sales agreement, that the significant risks and rewards of ownership have been transferred to the buyer, recovery of the consideration is probable, the associated costs can be estimated reliably, there is no continuing management involvement with the goods, and the amount of revenue can be measured reliably. The appropriate timing for transfer of risks and rewards varies depending on the individual terms and conditions of the sales contract. For international sales, this timing depends on the type of international commercial terms of the contract.

The Group recognizes revenue from the sales of product from a production area, only when the Group invests in the production area as a joint operation not as a joint venture. In addition, for the Group's joint operations, the Group capitalizes costs related to the production area as the oil and gas properties even if the Group is a non-operator.

(ii) Sales of other services

Revenue from services rendered is recognized in profit or loss in proportion to the stage of completion of the transaction at the reporting date. The stage of completion is assessed by reference to surveys of work performed or services performed to date as a percentage of total services to be performed or the proportion that costs incurred to date bear to the estimated total costs of the transaction or other methods that reliably measures the services performed.

(s) Income taxes

Income tax expense comprises current and deferred tax. Current tax and deferred tax are recognized in profit or loss except to the extent that it relates to a business combination, or items recognized directly in equity or in other comprehensive income.

(i) Current tax

Current tax is the expected tax payable or receivable on the taxable profit or loss for the year, using tax rates enacted or substantively enacted at the end of the reporting period and any adjustment to tax payable in respect of previous years. The taxable profit is different from the accounting profit for the period since the taxable profit is calculated excluding the temporary differences, which will be taxable or deductible in determining taxable profit (tax loss) of future periods, and non-taxable or non-deductible items from the accounting profit.

(ii) Deferred tax

The measurement of deferred tax liabilities and deferred tax assets reflects the tax consequences that would follow from the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities. The Group recognizes a deferred tax liability for all taxable temporary differences associated with investments in subsidiaries, associates, and interests in joint ventures, except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. In addition, the Group recognizes a deferred tax asset for all deductible temporary differences to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

The carrying amount of a deferred tax asset is reviewed at the end of each reporting period and reduces the carrying amount to the extent that it is no longer probable that sufficient taxable profit will be available to allow the benefit of part or all of that deferred tax asset to be utilized.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply to the period when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period.

Deferred tax assets and liabilities are offset only if there is a legally enforceable right to offset the related current tax liabilities and assets, and they relate to income taxes levied by the same tax authority and they intend to settle current tax liabilities and assets on a net basis.

(t) New standards and interpretations not yet adopted

The following amendments to existing standards have been published and are mandatory for the Group for annual period beginning after January 1, 2015, and the Group has not early adopted them.

Management believes the impact of the amendments on the Group’s consolidated financial statements is not significant.

(i) K-IFRS No. 1109 'Financial Instrument'

Amendments to K-IFRS No. 1109, 'Financial Instruments' specify classification and measurement of financial instruments and change the credit loss mode into an expected credit loss model from an incurred credit loss model. Additionally, the amendments were aimed to align accounting more closely with risk management and expanded the types of eligible hedged item, hedging instrument, and hedged risk under new hedge accounting model. These amendments are effective for annual periods beginning on or after January 1, 2018.

(ii) K-IFRS No. 1115, 'Revenue from Contracts with Customers'

K-IFRS No. 1115, published in January 2016, establishes a comprehensive framework for determining whether, how much and when revenue is recognized. It replaces existing revenue recognition guidance, including K-IFRS No. 1018, 'Revenue', K-IFRS No. 1011, 'Construction Contracts' and K-IFRS No. 2113, 'Customer Loyalty Programmes'. K-IFRS No. 1115 is effective for annual reporting periods beginning on or after January 1, 2018, with early adoption permitted.

(iii) K-IFRS No. 1001, 'Presentation of financial statements'

Information that should be included in, excluded from, or aggregated with other information in the financial statements is clarified by the application of materiality. The other comprehensive income section shall present line items for the amounts for the period of the share of the other comprehensive income of associates and joint ventures accounted for using the equity method, separated into the share of items that will or will not be reclassified subsequently to profit or loss. These amendments are effective for annual periods beginning on or after January 1, 2016.

(iv) K-IFRS No. 1016, 'Property, Plant and Equipment' and K-IFRS No. 1038, 'Intangible Assets'

Amendments to K-IFRS No.1016, 'Property, Plant and Equipment' specify that the use of revenue-based methods to calculate the depreciation of an asset is not appropriate. These amendments are effective for annual periods beginning on or after January 1, 2016. Amendments to K-IFRS No. 1038, 'Intangible Assets' introduce a rebuttable presumption that the use of revenue-based amortization methods for intangible assets is inappropriate. This presumption can be rebutted only when revenue and the consumption of the economic benefits of the intangible asset are highly correlated, or when the intangible asset is expressed as a measure of revenue. These amendments are effective for annual periods beginning on or after January 1, 2016.

(v) K-IFRS No. 1111, 'Joint Arrangement'

Amendments to K-IFRS No. 1111, 'Joint Arrangement' require an investor to apply the principles of business combination accounting when it acquires an interest in a joint operation that constitutes a business as defined in K-IFRS No. 1103, 'Business Combinations'. These amendments are effective for annual periods beginning on or after January 1, 2016.

5. Subsidiaries

(a) The list of subsidiaries directly owned by the Company as of December 31, 2015 and 2014 are as follows:

Subsidiary name	Principal activity	Country of incorporation	Ownership (%) December 31, 2015	Ownership (%) December 31, 2014
ANKOR E&P Holdings Corp.	Exploration and production ("E&P")	United States	100.00	100.00
Dana Petroleum Limited	E&P	United Kingdom	100.00	100.00
KNOC Eagle Ford Corporation	E&P	United States	100.00	100.00
Harvest Operations Corp.	E&P	Canada	100.00	100.00
KNOC Kaz B.V.(*1)	Holding Company	Netherlands	100.00	100.00
KNOC Exploracao e Producao de Petro do Brasil Ltda	E&P	Brazil	100.00	100.00
KNOC NEMONE Ltd.	E&P	Indonesia	100.00	100.00
KNOC NEMTWO Ltd.	E&P	Indonesia	100.00	100.00
KNOC Sumatra Ltd.	E&P	Indonesia	100.00	100.00
KNOC Yemen Ltd.	E&P	Yemen	60.00	60.00
KNOC Trading Singapore Pte. Ltd.	Trading and Marketing	Singapore	100.00	100.00
KNOC Trading Corporation(*2)	Trading and Marketing	United States	100.00	100.00

(*1) Bakmura LLP, a subsidiary of KNOC Kaz B.V. was liquidated during the year ended December 31, 2015.

(*2) In February 2014, the Group acquired 100% of KNOC Trading Corporation from North Atlantic Refining Limited, which was a subsidiary of Harvest Operations Corp. North Atlantic Refining Limited was disposed of during the year ended December 31, 2014 and excluded from consolidation scope.

(b) Financial information of subsidiaries

(i) Financial information of subsidiaries as of and for the year ended December 31, 2015 is as follows:

Company	Assets	Liabilities	Revenue	Net profit (loss)
	In millions of Korean won			
ANKOR E&P Holdings Corp.	₩ 851,343	665,501	106,866	(391,870)
Dana Petroleum Limited (*1)	4,434,559	3,015,914	949,938	(585,049)
KNOC Eagle Ford Corporation	2,897,685	777,948	473,821	(63,649)
Harvest Operations Corp.	3,318,620	3,549,937	409,117	(1,625,831)
KNOC Kaz B.V.(*1)	1,084,204	613,086	222,836	(290,991)
KNOC Exploracao e Producao de Petro do Brasil Ltda	17	558	—	(214)
KNOC NEMONE Ltd.(*2)	—	—	—	46,293
KNOC NEMTWO Ltd.(*2)	—	—	—	41,264
KNOC Sumatra Ltd.	898	—	—	(633)
KNOC Yemen Ltd.	72	161,488	—	(61,254)
KNOC Trading Singapore Pte. Ltd.	332	39	588	112
KNOC Trading Corporation	1,846	10	1,442	303

(*1) The amounts presented are after reflecting the difference between the fair value and the book value that arose during the business combination.

(*2) As of December 31, 2015, they are on the process of liquidation and recognized gains on exemption of loans related to Accounting for Energy and Resources as they proved an exploration failure.

(ii) Financial information of subsidiaries as of and for the year ended December 31, 2014 is as follows:

Company	Assets	Liabilities	Revenue	Net profit (loss)
	In millions of Korean won			
ANKOR E&P Holdings Corp.	₩1,235,190	680,210	220,177	(93,466)
Dana Petroleum Limited (*)	5,836,302	3,970,789	1,184,384	(609,807)
KNOC Eagle Ford Corporation	2,836,393	775,501	689,707	27,757
Harvest Operations Corp.	4,844,729	3,366,532	855,036	(434,218)
KNOC Kaz B.V.(*)	1,513,170	619,469	365,721	(35,101)
KNOC Exploracao e Producao de Petro do Brasil Ltda	23	477	—	(105)
KNOC NEMONE Ltd.	90	45,061	—	(4,618)
KNOC NEMTWO Ltd.	111	40,197	—	(3,915)
KNOC Sumatra Ltd.	1,892	435	—	9,775
KNOC Yemen Ltd.	25,132	117,015	—	(17,597)
KNOC Trading Singapore Pte. Ltd.	185	4	459	50
KNOC Trading Corporation	1,486	58	1,643	315

(*) The amounts presented are after reflecting the difference between the fair value and the book value that arose during the business combination.

(iii) The financial information of the subsidiaries that are related to the Group's non-controlling interests as of December 31, 2015 is as follows:

Company	Ankor Energy LLC	KOA Energy LP(*)	Eagle Ford MS LLC and Eagle Ford Energy LLC
	In millions of Korean won		
Non-controlling interest	20%	98%	20%
Non-current assets	₩ —	163,370	2,749,571
Current assets	14,617	14,450	118,116
Non-current liabilities	—	(22,764)	(53,101)
Current liabilities	(14,585)	(1,009)	(11,706)
Net assets	32	154,047	2,802,880
Book value of the non-controlling interests	—	(151,437)	570,943
Revenue	—	29,343	577,809
Net income	—	(75,513)	(35,863)
Total comprehensive loss	—	(75,513)	(35,863)
Net loss distributed to non-controlling interests	—	(74,233)	(7,173)
Total comprehensive loss distributed to non-controlling interests	—	(74,233)	(7,173)

(*) According to an agreement committed by stakeholders, ANKOR E&P Holdings Corp. has a substantial control power.

(iv) The financial information of the subsidiaries that are related to the Group's non-controlling interests as of December 31, 2014 is as follows:

Company	Ankor Energy LLC	KOA Energy LP	Eagle Ford MS LLC and Eagle Ford Energy LLC
	In millions of Korean won		
Non-controlling interest	20%	98%	20%
Non-current assets	₩ —	222,058	2,618,601
Current assets	4,483	27,792	192,524
Non-current liabilities	—	(28,999)	(33,100)
Current liabilities	(4,457)	(6,266)	(41,349)
Net assets	26	214,585	2,736,676
Book value of the non-controlling interests	5	210,293	546,470
Revenue	—	61,976	758,042
Net income (loss)	—	(3,109)	61,400
Total comprehensive income (loss)	—	(3,109)	61,400
Net income (loss) distributed to non-controlling interests	—	(3,056)	12,280
Total comprehensive income (loss) distributed to non-controlling interests	—	(3,056)	12,280

6. Segment and Other Information

(a) For management purposes, the Group is organized into business units based on their goods and services the Group's operating segments are 1) oil and gas, 2) petroleum distribution, 3) oil stockpiling, 4) financing, 5) drillship chartering and 6) others.

Segments	Goods and services	Location of business
Oil and gas	Exploration, development and production of domestic and overseas resources and purchases and sales of crude oil	Domestic and overseas
Petroleum distribution	The whole sale gasoline and gas oil distribution business	Domestic
Refinery(*)	Refining of crude oil and sales of the refined petroleum products	Overseas
Oil stockpiling	Import and export of crude oil and petroleum products; lending and sales of oil stockpiles; management, operation and lending of oil stockpiling facilities	Domestic
Financing	Financing for companies engaged in energy and natural resources energy and natural resources development activities	Domestic
Drillship chartering	Drillship chartering business	Domestic and overseas
Others	Oil information services, other research services, etc.	Domestic and overseas

(*) The refinery segment is classified as a discontinued operation due to its disposal in November 2014 as described in Note 37.

(b) Segment results for the year

(i) For the year ended December 31, 2015

	Oil and gas	Petroleum distribution	Oil stockpiling	Finan-cing	Drillship chartering	Others	Continuing operations total	Recon-ciling items(*)	Group total
	In millions of Korean won								
Revenue	₩2,507,390	663,175	122,363	1,473	65,595	73,175	3,433,171	—	3,433,171
Cost of sales	2,686,702	619,209	178,620	—	32,863	6,113	3,523,507	—	3,523,507
Gross profit (loss)	(179,312)	43,966	(56,257)	1,473	32,732	67,062	(90,336)	—	(90,336)
Selling and administrative expenses	275,511	—	—	674	—	—	276,185	78,592	354,777
Reportable segment operating profit (loss)	(454,823)	43,966	(56,257)	799	32,732	67,062	(366,521)	(78,592)	(445,113)
Other income							153,433	—	153,433
Other expenses							299,167	—	299,167
Other loss, net							(3,074,969)	—	(3,074,969)
Finance income							95,034	—	95,034
Finance costs							1,400,057	—	1,400,057
Loss on investments in associates and joint ventures, net							(501,105)	—	(501,105)
Loss before income tax	₩						(5,393,352)	(78,592)	(5,471,944)
Depreciation and amortization	₩1,562,353	—	77,180	—	3,676	13	1,643,222	14,095	1,657,317
Impairment loss of property, plant and equipment	2,362,119	—	—	—	—	—	2,362,119	—	2,362,119
Reversing an impairment loss of property, plant and equipment	(21,287)	—	—	—	—	—	(21,287)	—	(21,287)
Impairment loss of intangible assets other than goodwill	270,801	—	—	—	—	—	270,801	—	270,801
Impairment loss of goodwill	559,062	—	—	—	—	—	559,062	—	559,062

(*) Primarily consists of headquarter salaries, training costs, service fees and other corporate related costs, including depreciation and amortization, that are not allocated to the segments.

(ii) For the year ended December 31, 2014

	Oil and gas	Petroleum distribution	Oil stockpiling	Finan-cing	Drillship chartering	Others	Recon-ciling items(*)	Continuing operations total	Refinery (discontinued operation)	Group total
	In millions of Korean won									
Revenue	₩3,817,016	222,459	147,768	2,128	96,931	71,815	—	4,358,117	3,275,081	7,633,198
Cost of sales	3,013,841	213,776	175,564	—	32,388	4,304	—	3,439,873	3,313,801	6,753,674
Gross profit (loss)	803,175	8,683	(27,796)	2,128	64,543	67,511	—	918,244	(38,720)	879,524
Selling and administrative expenses	363,966	—	—	1,102	—	—	80,310	445,378	6,183	451,561
Reportable segment operating profit (loss)	439,209	8,683	(27,796)	1,026	64,543	67,511	(80,310)	472,866	(44,903)	427,963
Other income								139,469	—	139,469
Other expenses								266,860	—	266,860
Other loss, net								(1,719,941)	(170,817)	(1,890,758)
Finance income								79,958	20,696	100,654
Finance costs								621,038	1,415	622,453
Loss on investments in associates and joint ventures, net								(41,575)	—	(41,575)
Loss before income tax	₩							(1,957,121)	(196,439)	(2,153,560)
Depreciation and amortization	₩1,658,232	—	74,180	—	2,846	—	7,866	1,743,124	12,228	1,755,352
Impairment loss of property, plant and equipment	775,546	—	—	—	—	—	—	775,546	171,006	946,552
Impairment loss of intangible assets other than goodwill	825,979	—	—	—	—	—	—	825,979	—	825,979
Impairment loss of goodwill	457,038	—	—	—	—	—	—	457,038	—	457,038

(*) Primarily consists of headquarter salaries, training costs, service fees and other corporate related costs, including depreciation and amortization, that are not allocated to the segments.

(c) Segment assets and liabilities

(i) As of December 31, 2015

	Oil and gas	Petroleum distribution	Oil stockpiling	Financing	Drillship chartering	Reconciling items(*2)	Group total
	In millions of Korean won						
Assets	₩16,347,461	172,422	5,884,322	2,454	71,668	—	22,478,327
Adjustments:							
Headquarters' land, buildings, tools & fixtures	—	—	—	—	—	217,463	217,463
Headquarters' software and memberships	—	—	—	—	—	13,950	13,950
Headquarters' loans to employees	—	—	—	—	—	96,665	96,665
Headquarters' deferred tax assets	—	—	—	—	—	336,772	336,772
Headquarters' interest rate swaps	—	—	—	—	—	5,132	5,132
Headquarters' financial assets and etc.	—	—	—	—	—	56,857	56,857
	₩16,347,461	172,422	5,884,322	2,454	71,668	726,839	23,205,165
Liabilities	₩18,402,867	116,959	70,913	—	7,192	—	18,597,931
Adjustments:							
Headquarters' derivative liabilities	—	—	—	—	—	227,975	227,975
Headquarters' financial liabilities	—	—	—	—	—	183,665	183,665
	₩18,402,867	116,959	70,913	—	7,192	411,640	19,009,571
Investments in associate and others(*1)	₩ 835,703	42,206	—	—	—	—	877,909
Acquisitions of property, plant and equipment	1,214,806	—	65,825	—	9,926	3,226	1,293,783
Acquisitions of intangible assets other than goodwill	292,150	—	—	—	—	2,578	294,728

(*1) Investments in associates and others consist of investment in associates and joint ventures and loans to related parties.

(*2) Primarily consists of loans for employees, deferred tax assets and others which are not allocated to the reportable segments.

(ii) As of December 31, 2014

	Oil and gas	Petroleum distribution	Oil stockpiling	Financing	Drillship chartering	Reconciling items(*2)	Group total
	In millions of Korean won						
Assets	₩20,256,787	82,789	5,388,078	3,668	66,863	—	25,798,185
Adjustments:							
Headquarters' land, buildings, tools & fixtures	—	—	—	—	—	297,544	297,544
Headquarters' software and memberships	—	—	—	—	—	14,550	14,550
Headquarters' loans to employees	—	—	—	—	—	89,305	89,305
Headquarters' deferred tax assets	—	—	—	—	—	339,226	339,226
Headquarters' interest rate swaps	—	—	—	—	—	7,634	7,634
Headquarters' financial assets and etc.	—	—	—	—	—	342,842	342,842
	₩20,256,787	82,789	5,388,078	3,668	66,863	1,091,101	26,889,286
Liabilities	₩17,870,654	100,457	41,751	—	9,625	—	18,022,487
Adjustments:							
Headquarters' derivative liabilities	—	—	—	—	—	259,008	259,008
Headquarters' financial liabilities	—	—	—	—	—	238,123	238,123
	₩17,870,654	100,457	41,751	—	9,625	497,131	18,519,618
Investments in associates and others(*1)	₩ 1,177,722	38,220	—	—	—	—	1,215,942
Acquisitions of property, plant and equipment	2,373,935	—	93,747	—	6,061	64,107	2,537,850
Acquisitions of intangible assets other than goodwill	377,704	—	—	—	—	3,681	381,385

(*1) Investments in associates and others consist of investment in associates and joint ventures and loans to related parties.

(*2) Primarily consists of loans for employees, deferred tax assets and others which are not allocated to the reportable segments.

(d) Information about geographical areas

(i) Revenue by geographic area for the years ended December 31, 2015 and 2014 is as follows:

	2015	2014
	In millions of Korean won	
Domestic	₩1,268,562	1,040,992
Canada	409,117	855,036
United Kingdom	949,938	1,184,384
United States	582,130	911,526
Kazakhstan	222,836	365,721
Others	588	459
Continuing operation	3,433,171	4,358,118
Discontinued operation (Refinery)	—	3,275,082
	₩3,433,171	7,633,200

In presenting information about geographical areas, segment revenue is based on the geographical location of the Group's entities which recorded the related revenue.

(ii) Non-current assets by geographic area as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Domestic(*)	₩ 5,185,708	5,469,565
Canada	2,619,428	4,351,286
United Kingdom	3,869,798	4,902,800
United States	3,292,984	3,435,186
Kazakhstan	2,312,039	2,589,822
Iraq	1,573,416	1,428,984
Yemen	4,318	4,411
Peru	54,849	68,086
Libya	61,376	81,113
Vietnam	454,796	469,438
Others	24,929	12,711
	₩19,453,641	22,813,402

(*) The goodwill that cannot be allocated to an individual country amounting to ₩28,023 million and ₩429,976 million as of December 31, 2015 and 2014, respectively is included in domestic.

Non-current assets by geographic area include property, plant and equipment, goodwill, intangible assets other than goodwill, investments in associates and joint ventures, and non-financial assets.

(e) Information about main customers

There is no customer whose revenue represents more than 10% of the Group's total revenue.

7. Cash and Cash Equivalents

Cash and cash equivalents in the statement of cash flows include cash and bank deposit and exclude bank overdrafts. Cash and cash equivalents in the consolidated statements of cash flows for the years ended December 31, 2015 and 2014 are comprised of the following items in the consolidated statements of financial position.

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Cash in hands	₩ 330	1,138
Other on demand deposits	175,453	199,862
Short-term deposits classified as cash equivalents	332,117	9,142
Short-term investments classified as cash equivalents	276,081	296,508
	783,981	506,650
Cash and cash equivalents included in non-current assets classified as held for sale	—	(201)
	₩783,981	506,449

8. Restricted Cash and Cash Equivalents

Restricted deposits as of December 31, 2015 and 2014 are as follows:

	December 31, 2015		December 31, 2014	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Asset retirement obligation	₩ —	2,282	—	2,015
Deposits for foreign workers	—	11	—	17
Compensations for fishermen	2,000	—	356	—
	₩2,000	2,293	356	2,032

9. Derivatives

(a) Derivatives as of December 31, 2015 and 2014 are as follows:

	December 31, 2015		December 31, 2014	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Derivative assets				
Currency swap	₩ 893	3,602	—	3,938
Interest rate swap	—	637	—	3,696
Other derivatives	433	—	1,801	—
	₩ 1,326	4,239	1,801	7,634
Derivative liabilities				
Currency forwards	₩ 6,141	—	1,974	—
Currency swap	94,295	133,680	—	145,378
Other derivatives	—	—	1,129	—
	₩100,436	133,680	3,103	145,378

(b) Details of currency swap as of December 31, 2015 are as follows:

Type	Counter party	Maturity	Contract amount				Contract interest rate per annum	
			Currency	Sell	Currency	Buy	Sell	Buy
			In millions of Korean won and thousands of foreign currencies					
	Barclays	2021-02-08	HKD	500,000	USD	64,185	4.38%	5.03%
	BNP	2016-02-15	HKD	780,000	USD	100,135	3.40%	3.69%
	BNP	2016-02-16	SGD	100,000	USD	78,431	3.15%	4.14%
	BNP	2021-03-04	HKD	390,000	USD	50,081	4.50%	5.20%
	HSBC	2016-05-12	CHF	125,000	USD	140,213	2.64%	3.74%
	UBS	2016-05-12	CHF	200,000	USD	224,341	2.64%	3.74%
	UBS	2016-05-25	EUR	100,000	USD	142,850	3.95%	3.43%
	Barclays	2016-12-22	HKD	637,000	USD	81,869	3.20%	3.45%
	Barclays	2022-02-10	HKD	390,000	USD	50,282	3.95%	4.45%
	UBS	2017-03-08	CHF	100,000	USD	109,733	1.88%	3.34%
	Barclays	2017-03-08	CHF	200,000	USD	219,467	1.88%	3.34%
	UBS	2022-03-28	EUR	50,000	USD	65,075	4.00%	4.55%
Cash flow hedge	HSBC	2016-12-26	KRW	90,000	USD	80,524	3.89%	2.93%
	HSBC	2023-01-24	HKD	400,000	USD	51,600	2.85%	3.17%
	HSBC	2018-01-22	HKD	400,000	USD	51,600	1.80%	1.98%
	DBS	2023-02-04	EUR	37,000	USD	49,765	2.40%	3.19%
	Barclays	2025-06-24	EUR	60,000	USD	80,070	3.00%	4.06%
	Barclays	2023-07-03	EUR	50,000	USD	65,670	3.09%	4.31%
	HSBC	2018-07-03	AUD	55,000	USD	51,260	4.33%	3.05%
	HSBC	2018-11-29	CHF	200,000	USD	210,970	1.63%	3.16%
	BNP	2018-11-29	CHF	40,000	USD	42,194	1.63%	3.17%
	HSBC	2019-10-08	AUD	125,000	USD	109,563	4.25%	0.99%
	HSBC	2019-10-08	AUD	75,000	USD	65,738	3.78%	1.06%
	ANZ	2019-10-08	AUD	150,000	USD	131,475	3.78%	1.01%
	SC	2020-01-29	HKD	310,000	USD	39,985	2.18%	2.42%
	HSBC	2020-08-26	KRW	150,000	USD	125,565	2.03%	2.41%

(c) Details of interest rate swap contracts as of December 31, 2015 are as follows:

Type	Counterparty	Terms	Contract amount	Contract interest rate per annum	
				Sell	Buy
			In thousands of US dollar		
Cash flow hedge	Barclays	2013-06-07~ 2018-06-07	300,000	3M Libor+100bp	2.18%
	Barclays	2013-06-07~ 2018-06-07	200,000	3M Libor+80bp	1.98%

(d) Details of currency forward as of December 31, 2015 are as follows:

Type	Counter party	Contract date	Maturity	Contract amount Currency	Sell	Currency	Buy	Contract rate of exchange (USD/GBP)
			In thousands of foreign currencies					
Cash flow hedge	ING	2015-10-29	2016-03-08	USD	15,260	GBP	10,000	1.5260
	SCOTIA	2015-10-29	2016-04-08	USD	15,258	GBP	10,000	1.5258
	CBA	2015-10-29	2016-05-09	USD	15,258	GBP	10,000	1.5258
	DNB	2015-10-29	2016-06-08	USD	15,259	GBP	10,000	1.5259
	CIBC	2015-10-29	2016-07-08	USD	15,260	GBP	10,000	1.5260
	DNB	2015-11-06	2016-07-25	USD	15,179	GBP	10,000	1.5179
	ING	2015-11-06	2016-08-08	USD	15,175	GBP	10,000	1.5175
	SCOTIA	2015-11-06	2016-08-25	USD	15,176	GBP	10,000	1.5176
	SCOTIA	2015-11-06	2016-09-08	USD	15,170	GBP	10,000	1.5170
	CBA	2015-11-06	2016-10-11	USD	15,180	GBP	10,000	1.5180

(e) Gains and losses on valuation and transaction of derivatives for the years ended December 31, 2015 and 2014 are as follows:

	Net income effects of valuations		Net income effects of transactions		Other comprehensive income (loss)(*)	
	2015	2014	2015	2014	2015	2014
	In millions Korean of won					
Currency forwards	₩ —	—	—	—	(3,059)	—
Currency swap	—	—	—	841	15,540	21,308
Interest rate swap	—	—	—	—	(2,417)	(2,354)
Other derivatives	(784)	(2,020)	5,017	—	(1,224)	1,216
	₩(784)	(2,020)	5,017	841	8,840	20,170

(*) Changes in accumulated other comprehensive income (loss) are net of tax effect amounting to ₩1,130 million and ₩6,241 million for the years ended December 31, 2015 and 2014, respectively.

10. Trade and Other Receivables

Details of trade and other receivables as of December 31, 2015 and 2014 are as follows:

	December 31, 2015			December 31, 2014		
	Gross amounts	Allowance for doubtful accounts	Book value	Gross amounts	Allowance for doubtful accounts	Book value
	In millions of Korean won					
Current						
Trade accounts receivable	₩305,958	(1,709)	304,249	434,308	(2,107)	432,201
Other receivables	408,470	—	408,470	508,956	—	508,956
	714,428	(1,709)	712,719	943,264	(2,107)	941,157
Non-current						
Trade accounts receivable	2,456	—	2,456	5,119	—	5,119
Other receivables	102,150	—	102,150	88,719	—	88,719
	104,606	—	104,606	93,838	—	93,838
	₩819,034	(1,709)	817,325	1,037,102	(2,107)	1,034,995

11. Available-for-sale Financial Instruments

(a) Details of available-for-sale financial instruments as of December 31, 2015 and 2014 are as follows:

	Ownership interest(%)	Carrying amount December 31, 2015	Carrying amount December 31, 2014	Fair value December 31, 2015	Fair value December 31, 2014
		In millions of Korean won			
Non-marketable					
Yemen LNG Company Limited(*1)	1.06	₩ 96,049	90,082	96,049	90,082
PETRO ONADO S.A.(*2)	5.64	19,230	18,036	19,230	18,036
Micronic Korea(*1)(*2)	16.70	897	841	897	841
Troika Resource Investment PEF	14.47	28,689	44,542	28,689	44,542
Global Dynasty Natural Resource PEF(*2)	15.00	5,057	4,743	5,057	4,743
Marketable					
EP Energy	12.82	160,554	358,921	160,554	358,921
Faroe Petroleum plc	18.00	45,257	49,730	45,257	49,730
		₩355,733	566,895	355,733	566,895

(*1) The dividend income associated with Yemen LNG Company Limited and others for the year ended December 31, 2015 is ₩3,863 million.

(*2) The carrying amounts of non-marketable securities without a quoted price in an active market and a reliable fair value measurement held by the Group that were measured at cost as of December 31, 2015 and 2014 are ₩25,184 million and ₩23,620 million, respectively.

(b) Changes in available-for-sale financial instruments for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Beginning balance	₩ 566,895	641,902
Acquisition	—	11,750
Disposals	—	(11,663)
Reclassification adjustments(*1)	216,796	(188,688)
Valuation adjustments(*1)	—	4,859
Impairment losses(*2)	(450,370)	—
Other changes(*3)	—	89,070
Effect of movements in exchange rates	22,412	19,665
	₩ 355,733	566,895

(*1) Amounts are presented without the tax effect amounting to (-)₩38,643 million in 2015 and ₩31,311 million in 2014, which have been recognized directly in equity.

(*2) The Group recognized impairment losses on the EP Energy, Faroe Petroleum plc, Troika Resource Investment PEF amounting to ₩364,636 million, ₩58,984 million, and ₩26,750 million, respectively.

(*3) The Group decided not to participate in a new issuance of stocks of Faroe Petroleum plc in 2014. The Group's ownership interest of Faroe Petroleum plc had decreased from 22.63% to 18% and the classification of those securities was changed to available-for-sale financial instruments from investments in associate.

12. Long-term Loans

Details of long-term loans as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Loans for tuitions(*1)	₩ 234	314
Loans for housing(*2)	97,587	88,983
Loans for vehicles(*3)	375	484
General loans	114,837	108,758
Loans to overseas fields operations	—	8
Loans to related parties(*4)	983,793	825,919
Allowance for doubtful accounts	(696,248)	(469,214)
	₩ 500,578	555,252

(*1) The Group provides employees who worked over a year with interest-free loans for their children's tuitions. The loans are repaid from their monthly wages.

(*2) The Group provides employees without housing with loans for housing at market interest rates. The loans are due 5~10 years and repaid by lump sum at maturity.

(*3) The Group provides overseas secondees who purchase or lease a vehicle with interest-free loans. The loans are due when the secondees return to Headquarters.

(*4) The Group provides KC Kazakh B.V. and 13 other related parties with loans at 2.25~9.00% interest rates. The maturities are due 5~25 years and the Group recognized related bad debt expenses of ₩172,122 million for the year ended December 31, 2015.

13. Financial Instruments

Details of financial Instruments as of December 31, 2015 and 2014 are as follows:

	December 31, 2015		December 31, 2014	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Term deposit	₩2,000	4,661	2,436	7,008

14. Other Financial Assets

Details of other financial assets as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	Current	Current
	In millions of Korean won	
Overseas field operations quick assets	₩14,066	10,349

15. Inventories

Details of inventories as of December 31, 2015 and 2014 are as follows:

	December 31, 2015			December 31, 2014		
	Acquisition cost	Provision for losses on valuation	Carrying amount	Acquisition cost	Provision for losses on valuation	Carrying amount
	In millions of Korean won					
Raw materials	₩ 5,409	(584)	4,825	6,251	(776)	5,475
Merchandises	68,436	—	68,436	15,070	—	15,070
Work-in-progress	126	—	126	228	—	228
Finished goods	16,893	—	16,893	48,359	—	48,359
Supplies	87,390	—	87,390	81,487	—	81,487
Goods in-transit	2,152	—	2,152	1,061	—	1,061
	₩180,406	(584)	179,822	152,456	(776)	151,680

The reversal of the losses on the valuation of inventories recognized to cost of sales for the year ended December 31, 2015 is ₩192 million, and the losses on the valuation of inventories recognized to cost of sales for the year ended December 31, 2014 is ₩186 million.

16. Non-Financial Assets

Details of non-financial assets as of December 31, 2015 and 2014 are as follows:

	December 31, 2015		December 31, 2014	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Advance payments	₩ 86,062	—	115,182	—
Prepaid expenses	44,868	9,465	79,898	11,671
Oil stockpiles	—	3,684,849	—	3,412,635
	₩130,930	3,694,314	195,080	3,424,306

17. Investments in Associates and Joint Ventures

(a) Details of investments in associates and joint ventures as of December 31, 2015 and 2014 are as follows:

(i) As of December 31, 2015

Entity	Principal activity	Country	Equity interest (%)	Acquisition cost	Book value
		In millions of Korean won			
<Investments in associates>					
Kernhem B.V.(*3)	Exploration and Production("E&P")	Netherlands	36.67	₩ 11,975	—
Oilhub Korea Yeosu Co. Ltd.	Storing of oil	Korea	29.00	39,622	39,016
ADA Oil LLP(*1)	E&P	Kazakhstan	12.50	20,569	2,012
Parallel Petroleum LLC(*2)	E&P	United States	10.00	44,965	25,316
				117,131	66,344
<Investments in joint ventures>					
KNOC Inam Ltd.(*3)	Exploration	Malaysia	40.00	—	—
KNOC Kamchatka Petroleum Ltd.(*3)(*5)	Exploration	Cyprus	55.00	1	—
KC karpovsky B.V.(*3)	Exploration	Netherlands	35.00	11	—
KNOC Bazian Ltd.(*3)(*5)	Exploration	Malaysia	66.72	—	—
Dolphin Property Ltd.(*4)	Lease	Nigeria	—	—	—
KNOC Nigerian West Oil Company Ltd.(*3)(*5)	Exploration	Nigeria	75.00	70	—
KNOC Nigerian East Oil Company Ltd.(*3)(*5)	Exploration	Nigeria	75.00	70	—
KNOC Aral Ltd.(*3)(*5)	Exploration	Malaysia	51.00	—	—
KNOC kamchatka Co. Ltd.(*3)	Exploration	Cyprus	50.00	7,965	—
KC kazakh B.V.(*3)	Exploration	Netherlands	35.00	265	—
Offshore International Group, Inc.	E&P	United States	50.00	748,015	419,099
KNOC Ferghana Ltd.(*3)	Exploration	Malaysia	50.00	1	—
KNOC Ferghana2 Ltd.(*3)(*5)	Exploration	Malaysia	65.00	—	—
KADOC Ltd.(*3)(*5)	Exploration	Malaysia	75.00	1	—
Korea Oil Terminal Co., Ltd.(*5)	Storing of oil	Korea	82.26	3,190	3,190
Deep Basin Partnership(*5)	E&P	Canada	81.71	156,829	42,375
HKMS Partnership(*5)	Gas processing plant operation	Canada	69.93	68,012	58,310
				984,430	522,974
				₩1,101,561	589,318

(*1) Classified to an investment in associate as the Group's associate, Kernhem B.V. holds 75% of the equity interest and by effective equity interest, the Group has the ability to exercise significant influence over the entity.

(*2) Classified to an investment in associate as the Group can designate one director in its board of directors.

Despite the percentage of ownership is below 20%, the Group has the ability to exercise significant influence over the entity.

(*3) Carrying amounts are less than ₩1 million.

(*4) Liquidated for the year ended December 31, 2015.

(*5) Despite the percentage of ownership of over 50%, the investment is classified to an investment in joint ventures the Group is unable to exercise control over investees solely.

(ii) As of December 31, 2014

Entity	Principal activity	Country	Equity interest (%)	Acquisition Cost	Book value
		In millions of Korean won			
<Investments in associates>					
Kernhem B.V.	Exploration and Production(“E&P”)	Netherlands	36.67	₩ 11,231	10,100
Oilhub Korea Yeosu Co. Ltd.	Storing of oil	Korea	29.00	37,160	36,954
ADA Oil LLP(*1)	E&P	Kazakhstan	12.50	19,291	11,502
Parallel Petroleum LLC(*2)	E&P	United States	10.00	42,172	40,170
				109,854	98,726
<Investments in joint ventures>					
KNOC Inam Ltd.(*3)	Exploration	Malaysia	40.00	—	—
KNOC Kamchatka Petroleum Ltd.(*3)(*4)	Exploration	Cyprus	55.00	1	—
KC karpovsky B.V.(*3)	Exploration	Netherlands	35.00	10	—
KNOC Bazian Ltd.(*3)(*4)	Exploration	Malaysia	66.72	—	—
Dolphin Property Ltd.(*4)	Lease	Nigeria	75.00	66	243
KNOC Nigerian West Oil Company Ltd.(*3)(*4)	Exploration	Nigeria	75.00	66	—
KNOC Nigerian East Oil Company Ltd.(*3)(*4)	Exploration	Nigeria	75.00	66	—
KNOC Aral Ltd.(*3)(*4)	Exploration	Malaysia	51.00	—	—
KNOC kamchatka Co. Ltd.(*3)	Exploration	Cyprus	50.00	7,471	—
KC kazakh B.V.(*3)	Exploration	Netherlands	35.00	249	—
Offshore International Group, Inc.	E&P	United States	50.00	701,551	687,310
KNOC Ferghana Ltd.(*3)	Exploration	Malaysia	50.00	1	—
KNOC Ferghana2 Ltd.(*3)(*4)	Exploration	Malaysia	65.00	—	—
KADOC Ltd.(*3)(*4)	Exploration	Malaysia	75.00	1	—
Korea Oil Terminal Co., Ltd.(*4)	Storing of oil	Korea	51.00	1,267	1,267
Deep Basin Partnership(*4)	Exploration	Canada	77.81	54,753	46,489
HKMS Partnership(*4)	Gas processing plant operation	Canada	53.76	26,570	25,202
				792,072	760,511
				₩901,926	859,237

(*1) Classified to an investment in associate as the Group’s associate, Kernhem B.V., holds 75% of the equity interest and by effective equity interest, the Group has the ability to exercise significant influence over the entity.

(*2) Classified to an investment in associate as the Group can designate one director in its board of directors. Despite the percentage of ownership is below 20%, the Group has the ability to exercise significant influence over the entity.

(*3) Carrying amounts are less than ₩1 million.

(*4) Despite the percentage of ownership of over 50%, the investment is classified to an investment in joint ventures as the Group is unable to exercise control over investees solely.

(b) Changes in carrying value of investments in associates and joint ventures for the years ended December 31, 2015 and 2014 are as follows:

(i) For the year ended December 31, 2015

Entity	Beginning balance	Acquisition	Disposals	Dividends received	Share of profit and loss of equity method (*1)	Changes in equity adjustments in equity method	Impair-ment losses (*2)	Other changes (*3)	Ending balance
					In millions of Korean won				
<Investment in associates>									
Kernhem B.V.(*4)	₩ 10,100	—	—	—	(19,245)	8,848	—	297	—
Oilhub Korea Yeosu Co. Ltd.	36,954	—	—	—	2,046	(2,407)	—	2,423	39,016
ADA Oil LLP	11,502	—	—	—	(13,802)	3,905	—	407	2,012
Parallel Petroleum LLC	40,170	—	—	—	(16,910)	—	—	2,056	25,316
	98,726	—	—	—	(47,911)	10,346	—	5,183	66,344
<Investment in joint ventures>									—
KNOC Inam Ltd.(*4)	—	—	—	—	—	—	—	—	—
KNOC Kamchatka Petroleum Ltd.(*4)	—	—	—	—	—	—	—	—	—
KC karpovsky B.V.(*4)	—	—	—	—	—	—	—	—	—
KNOC Bazian Ltd.(*4)	—	—	—	—	—	—	—	—	—
Dolphin Property Ltd.	243	—	(202)	—	(9)	(39)	—	7	—
KNOC Nigerian West Oil Company Ltd.(*4)	—	—	—	—	—	—	—	—	—
KNOC Nigerian East Oil Company Ltd.(*4)	—	—	—	—	—	—	—	—	—
KNOC Aral Ltd.(*4)	—	—	—	—	—	—	—	—	—
KNOC kamchatka Co. Ltd.(*4)	—	—	—	—	—	—	—	—	—
KC kazakh B.V.(*4)	—	—	—	—	(25,731)	25,731	—	—	—
Offshore International Group, Inc.	687,310	—	—	—	(59,781)	—	(243,106)	34,676	419,099
KNOC Ferghana Ltd.(*4)	—	—	—	—	—	—	—	—	—
KNOC Ferghana2 Ltd.(*4)	—	—	—	—	—	—	—	—	—
KADOC Ltd.(*4)	—	—	—	—	—	—	—	—	—
Korea Oil Terminal Co., Ltd.	1,267	1,776	—	—	—	—	—	147	3,190
Deep Basin Partnership	46,489	95,046	—	(1,723)	(92,551)	—	—	(4,886)	42,375
HKMS Partnership	25,202	38,310	—	(6,794)	6,078	—	—	(4,486)	58,310
	760,511	135,132	(202)	(8,517)	(171,994)	25,692	(243,106)	25,458	522,974
	₩859,237	135,132	(202)	(8,517)	(219,905)	36,038	(243,106)	30,641	589,318

(*1) Equity method is not applied to Investments in Associates and Joint Ventures with fully impaired capital. As a result, losses of ₩23,025 million under equity method have been accounted to loans during the current year.

(*2) Impairment losses have been recognized on investment in OIG based on the estimation by value in use calculation.

(*3) Include the effect of changes in exchange rates.

(*4) Carrying amounts are less than ₩1 million.

(ii) For the year ended December 31, 2014

Entity	Beginning balance	Acquisition	Disposals	Dividends received	Share of profit and loss of equity method(*1)	Changes in equity adjustments in equity method	Other changes (*2)	Ending balance
					In millions of Korean won			
<Investment in associates>								
Kernhem B.V.	₩ 12,632	—	—	—	(125)	(2,804)	397	10,100
Oilhub Korea Yeosu Co. Ltd.	38,775	—	—	—	(1,740)	(1,547)	1,466	36,954
ADA Oil LLP	12,382	—	—	—	(2)	(1,335)	457	11,502
Faroe Petroleum plc	135,205	—	(132,162)	—	(2,662)	—	(381)	—
Parallel Petroleum LLC	46,529	—	—	(527)	(7,421)	—	1,589	40,170
	245,523	—	(132,162)	(527)	(11,950)	(5,686)	3,528	98,726
<Investment in joint ventures>								
KNOC Inam Ltd.(*3)	—	—	—	—	—	—	—	—
KNOC Kamchatka Petroleum Ltd.(*3)	—	—	—	—	—	—	—	—
KC karpovsky B.V.(*3)	—	—	—	—	—	—	—	—
KNOC Bazian Ltd.(*3)	—	—	—	—	—	—	—	—
Dolphin Property Ltd.	—	—	—	—	132	101	10	243
KNOC Nigerian West Oil Company Ltd.(*3)	—	—	—	—	—	—	—	—
KNOC Nigerian East Oil Company Ltd.(*3)	—	—	—	—	—	—	—	—
KNOC Aral Ltd.(*3)	—	—	—	—	—	—	—	—
KNOC kamchatka Co. Ltd.(*3)	—	—	—	—	—	—	—	—
KC kazakh B.V.(*3)	—	—	—	—	—	—	—	—
Offshore International Group, Inc.	672,783	—	(14)	—	(12,883)	—	27,424	687,310
KNOC Ferghana Ltd.(*3)	—	—	—	—	—	—	—	—
KNOC Ferghana2 Ltd.(*3)	—	—	—	—	—	—	—	—
KNOC Samsung Lantian Oil Development Co., Ltd.	6,459	—	(6,447)	—	—	—	(12)	—
KADOC Ltd.(*3)	—	—	—	—	—	—	—	—
Korea Oil Terminal Co., Ltd.	—	1,214	—	—	—	—	53	1,267
Deep Basin Partnership	—	52,463	—	(2,213)	(4,488)	—	727	46,489
HKMS Partnership	—	25,459	—	—	(32)	—	(225)	25,202
	679,242	79,136	(6,461)	(2,213)	(17,271)	101	27,977	760,511
	₩924,765	79,136	(138,623)	(2,740)	(29,221)	(5,585)	31,505	859,237

(*1) Equity method is not applied to Investments in Associates and Joint Ventures with fully impaired capital. As a result, losses of ₩13,365 million under equity method have been accounted to loans during the prior year.

(*2) Include the effect of changes in exchange rates.

(*3) Carrying amounts are less than ₩1 million.

(c) The summaries of financial information of major associates and joint ventures for the years ended December 31, 2015 and 2014 are as follows:

(i) For the year ended December 31, 2015

	Total assets	Total liabilities	Revenue	Net income (loss)
	In millions of Korean won			
<Investment in associates>				
Kernhem B.V.	₩ 200,449	253,106	44,895	(82,410)
Oilhub Korea Yeosu Co. Ltd.	541,738	407,201	68,069	7,056
ADA Oil LLP	91,187	151,038	44,895	(104,216)
Parallel Petroleum LLC	729,487	314,315	113,060	(299,497)
<Investment in joint ventures>				
KNOC Bazian Ltd.	146,439	201,288	—	(8,772)
KNOC Nigerian West Oil Company Ltd.	160,765	230,001	—	(7,469)
KNOC Nigerian East Oil Company Ltd.	264,434	337,762	—	(6,010)
KNOC Aral Ltd.	40,412	40,623	—	(8)
KC kazakh B.V.	677,890	861,916	—	(172,242)
Offshore International Group, Inc.	1,006,631	364,284	174,994	(95,904)
KNOC Ferghana Ltd.	62,038	68,777	—	(1,559)
KNOC Ferghana2 Ltd.	21,345	23,017	—	(527)
KADOC Ltd.	310,978	341,470	—	(11,487)
Korea Oil Terminal Co., Ltd.	4,188	4,294	—	(1,575)
Deep Basin Partnership	198,269	157,031	26,742	(92,468)
HKMS Partnership	97,903	97,781	17,505	191

(ii) For the year ended December 31, 2014

	Total assets	Total liabilities	Revenue	Net income (loss)
	In millions of Korean won			
<Investment in associates>				
Kernhem B.V.	₩ 236,028	228,797	101,795	1,328
Oilhub Korea Yeosu Co. Ltd.	553,185	425,759	49,427	(5,999)
ADA Oil LLP	148,842	134,082	101,795	6,335
Parallel Petroleum LLC	638,274	293,687	139,913	(79,899)
<Investment in joint ventures>				
KNOC Bazian Ltd.	141,801	184,723	—	(3,035)
Dolphin Property Ltd.	328	4	—	1,076
KNOC Nigerian West Oil Company Ltd.	150,644	208,323	—	(6,295)
KNOC Nigerian East Oil Company Ltd.	247,785	310,719	—	(7,141)
KNOC Aral Ltd.	37,910	38,099	—	—
KC kazakh B.V.	625,173	702,563	—	(28,750)
Offshore International Group, Inc.	1,137,593	441,979	373,879	10,374
KNOC Ferghana Ltd.	61,195	66,001	—	(1,417)
KNOC Ferghana2 Ltd.	18,947	20,002	—	(437)
KADOC Ltd.	178,114	195,553	—	(2,788)
Korea Oil Terminal Co., Ltd.	1,791	59	5	(669)
Deep Basin Partnership	211,974	166,670	11,525	(4,489)
HKMS Partnership	70,798	70,865	—	(68)

18. Property, Plant and Equipment

(a) Details of property, plant and equipment as of December 31, 2015 and 2014 are as follows:

(i) As of December 31, 2015

	Acquisition cost	Contributions for construction	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
	In millions of Korean won					
Land	₩ 536,779	—	—	—	—	536,779
Buildings	199,318	—	—	(27,960)	—	171,358
Structures	1,924,339	(131)	—	(606,447)	—	1,317,761
Machinery	644,080	(4,453)	(2)	(362,219)	—	277,406
Vessels	124,580	—	—	(70,174)	—	54,406
Vehicles	8,744	—	—	(6,606)	—	2,138
Tools & fixtures	66,077	—	—	(41,087)	—	24,990
Construction-in-progress	90,877	—	—	—	—	90,877
Others	57,065	—	—	(34,518)	—	22,547
Oil & gas properties	21,285,931	—	(6,978)	(9,902,434)	(3,161,361)	8,215,158
	₩24,937,790	(4,584)	(6,980)	(11,051,445)	(3,161,361)	10,713,420

(ii) As of December 31, 2014

	Acquisition cost	Contributions for construction	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
	In millions of Korean won					
Land	₩ 503,119	—	—	—	—	503,119
Buildings	185,121	—	—	(20,908)	—	164,213
Structures	1,794,803	(127)	—	(523,184)	—	1,271,492
Machinery	584,474	(4,591)	—	(311,359)	—	268,524
Vessels	107,199	—	—	(62,659)	—	44,540
Vehicles	9,096	—	—	(6,369)	—	2,727
Tools & fixtures	73,890	—	—	(43,809)	—	30,081
Construction-in-progress	61,962	—	—	—	—	61,962
Others	57,265	—	—	(29,758)	—	27,507
Oil & gas properties	21,078,753	—	(8,117)	(8,533,610)	(1,089,208)	11,447,818
	₩24,455,682	(4,718)	(8,117)	(9,531,656)	(1,089,208)	13,821,983

(b) Changes in property, plant and equipment for the years ended December 31, 2015 and 2014 are as follows:

(i) For the year ended December 31, 2015

	Beginning balance	Acquisitions	Disposals	Depreciation	Impairment losses	Reversal of impairment losses	Reclassifi-cations	Others(*)	Ending balance
	In millions of Korean won								
Land	₩ 503,119	450	(123)	—	—	—	—	33,333	536,779
Buildings	164,213	1,562	(91)	(5,718)	—	—	797	10,595	171,358
Structures	1,271,619	10,394	(69)	(46,701)	—	—	1	82,648	1,317,892
(Contributions to construction)	(127)	—	—	4	—	—	—	(8)	(131)
Machinery	273,115	21,591	(74)	(30,906)	—	—	293	17,842	281,861
(Contributions to construction)	(4,591)	—	—	316	—	—	—	(178)	(4,453)
(Government grants)	—	(2)	—	—	—	—	—	—	(2)
Vessels	44,540	9,926	—	(3,248)	—	—	—	3,188	54,406
Vehicles	2,727	425	(22)	(650)	—	—	2	(344)	2,138
Tools & fixtures	30,081	2,843	(90)	(8,108)	—	—	707	(443)	24,990
Construction-in-progress	61,962	38,966	—	—	—	—	(13,258)	3,207	90,877
Others	27,507	4,790	(1,879)	(5,927)	—	—	27	(1,971)	22,547
Oil & gas properties	11,455,935	1,202,836	(109,478)	(1,348,216)	(2,362,119)	21,287	(254,414)	(383,695)	8,222,136
(Government grants)	(8,117)	—	—	1,618	—	—	—	(479)	(6,978)
	₩13,821,983	1,293,781	(111,826)	(1,447,536)	(2,362,119)	21,287	(265,845)	(236,305)	10,713,420

(*) Include the effect of changes in exchange rates and others.

(ii) For the year ended December 31, 2014

	Beginning balance	Acquisitions	Disposals	Depreciation(*1)	Impairment losses(*2)	Reclassifi-cations	Others(*3)	Ending balance
	In millions of Korean won							
Land	₩ 662,805	20,571	(174,735)	—	(9,764)	(15,770)	20,012	503,119
Buildings	71,653	48,223	(5,829)	(3,868)	(9,444)	56,568	6,910	164,213
Structures	1,374,410	45,719	(7,249)	(55,059)	(149,677)	11,249	52,226	1,271,619
(Contributions to construction)	(125)	—	—	3	—	—	(5)	(127)
Machinery	256,400	16,866	(4,477)	(29,386)	—	23,500	10,212	273,115
(Contributions to construction)	(4,703)	—	—	295	—	—	(183)	(4,591)
Vessels	41,192	5,934	—	(2,637)	(1,771)	—	1,822	44,540
Vehicles	3,386	550	(11)	(869)	(233)	(137)	41	2,727
Tools & fixtures	11,026	22,218	(8)	(5,403)	(99)	1,887	460	30,081
Construction-in-progress	173,969	59,529	(1,200)	—	—	(170,094)	(242)	61,962
Others	15,978	9,343	(59)	(6,655)	(18)	371	8,547	27,507
Oil & gas properties	12,190,447	2,308,896	(300,185)	(1,391,024)	(775,546)	(469,469)	(107,184)	11,455,935
(Government grants)	(9,952)	—	—	2,155	—	—	(320)	(8,117)
	₩14,786,486	2,537,849	(493,753)	(1,492,448)	(946,552)	(561,895)	(7,704)	13,821,983

(*1) Includes depreciation related to the discontinued operation amounting to ₩12,228 million.

(*2) Includes impairment losses related to the discontinued operation amounting to ₩171,006 million.

(*3) Include the effect of changes in exchange rates and others.

(c) Details of impairments recognized by segments for the year ended December 31, 2015.

	Oil and Gas(*1)
	In millions of Korean won
Generals	
Type of assets	Oil and gas properties
Subject to recognition of impairment losses	42 CGUs and individual assets
Valuation Method	Value in use
Assumptions	
Discount rate after tax(*2)	6.04~17.5%
Oil prices(*3)	International indices
Production quantities	Estimated production quantities based on reserve reports
Recoverable amounts	₩2,388,292
Impairment losses	2,362,119
Reason for impairment	Decrease in international oil prices

(*1) The CGUs of the oil and gas segment are fields or wells.

(*2) Weighted average cost of capital reflecting its own risk of CGU.

(*3) The oil prices are based on the long-term forecasts from globally recognized research institutions.

(d) Details of impairments recognized by segments for the year ended December 31, 2014.

	Oil and Gas(*1)	Refinery
	In millions of Korean won	
Generals		
Type of assets	Oil and gas properties	General assets
Subject to recognition of impairment losses	21 CGUs and individual assets	Assets held for sale
Valuation Method	Value in use	Fair value less costs to sell
Assumptions		
Discount rate after tax(*2)	6.0~17.2%	N/A
Oil prices(*3)	International indices	N/A
Production quantities	Estimated production quantities based on reserve reports	N/A
Recoverable amounts	₩813,634	—
Impairment losses(*4)	775,546	171,006
Reason for impairment	Decrease in international oil prices	Decrease in disposable value

(*1) The CGUs of the oil and gas segment are fields or wells.

(*2) Weighted average cost of capital reflecting its own risk of CGU.

(*3) The oil prices are based on the long-term forecasts from globally recognized research institutions.

(*4) The Group recognized impairment losses of the lands, buildings, structures, vessels, vehicles, tools & fixtures and others of the refinery segment amounting to ₩9,764 million, ₩9,444 million, ₩149,677 million, ₩1,771 million, ₩233 million, ₩99 million, and ₩18 million, respectively.

19. Goodwill

(a) Details of goodwill as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Acquisition cost	₩ 1,310,758	1,307,441
Accumulated impairment losses	(1,009,450)	(450,392)
	₩ 301,308	857,049

(b) Changes in goodwill for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Beginning balance	₩ 857,049	1,406,616
Disposals	(8,034)	(25,450)
Impairment(*1)	(559,062)	(457,038)
Other changes(*2)	11,355	(67,079)
	₩ 301,308	857,049

(*1) The Group recognized an impairment loss due to significant decrease in oil prices for goodwill recognized from the acquisition of Harvest Operations Corp. and Dana Petroleum Limited.

(*2) Include the effect of exchange rate changes and others.

(c) Changes in impairment loss for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Beginning balance	₩ (450,392)	—
Impairment	(559,062)	(457,038)
Other changes(*)	4	6,646
	₩(1,009,450)	(450,392)

(*) Include the effect of exchange rate changes.

(d) For the purpose of impairment testing, goodwill is allocated to individually operating entities determined to be CGUs. The goodwill amounts as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Dana Petroleum Limited operating entities	₩147,671	475,073
Harvest Operations Corp. operating entities	125,852	334,201
Altius Holdings Inc. (a subsidiary of KNOC Kaz B.V.)	27,785	47,775
	₩301,308	857,049

(e) Details of recoverable amounts of CGU are as follows:

	Recoverable amounts	Valuation Method	Discount rate	Primary Assumption	Impairment losses	Reason for impairment
			In millions of Korean won			
Dana Petroleum Limited	₩1,261,852	Value in use or Net fair value	6.52% ~ 11.54%	Estimated production quantities based on reserve reports, etc.	386,234	Decrease in international oil prices
Harvest Operations Corp.	1,023,229				172,828	
Altius Holdings Inc.	(*)				—	

(*) As a result of impairment test, no impairment loss has occurred and therefore, recoverable amounts are not shown.

20. Intangible Assets Other Than Goodwill

(a) Details of intangible assets other than goodwill as of December 31, 2015 and 2014 are as follows:

(i) As of December 31, 2015

	Acquisition cost	Accumulated amortization	Accumulated impairment losses	Book value
		In millions of Korean won		
Exploration and evaluation assets	₩3,680,199	—	(2,433,485)	1,246,714
Software	32,194	(24,133)	—	8,061
Mining rights	4,305,392	(1,334,857)	(80,690)	2,889,845
Development cost	35,727	(27,847)	—	7,880
Land use right	245	(64)	—	181
Others	94,158	(1,132)	(90,426)	2,600
	₩8,147,915	(1,388,033)	(2,604,601)	4,155,281

(ii) As of December 31, 2014

	Acquisition cost	Accumulated amortization	Accumulated impairment losses	Book value
		In millions of Korean won		
Exploration and evaluation assets	₩3,067,512	—	(2,235,634)	831,878
Software	30,382	(19,417)	—	10,965
Mining rights	4,120,953	(1,082,023)	(41,803)	2,997,127
Development cost	30,213	(22,322)	—	7,891
Land use right	230	(54)	—	176
Others	54,072	(877)	(50,404)	2,791
	₩7,303,362	(1,124,693)	(2,327,841)	3,850,828

(b) Changes in intangible assets other than goodwill for the years ended December 31, 2015 and 2014 are as follows:

(i) For the year ended December 31, 2015

	Beginning balance	Acquisitions	Disposals	Amortization	Impairment losses(*1)	Reclassifications	Others(*2)	Ending balance
				In millions of Korean won				
Exploration and evaluation assets	₩ 831,878	286,553	(8,468)	—	(163,423)	272,397	27,777	1,246,714
Software	10,965	653	—	(3,907)	—	122	228	8,061
Mining rights	2,997,127	5,516	(10)	(201,810)	(71,962)	(8,077)	169,061	2,889,845
Development cost	7,891	1,988	—	(3,906)	—	1,403	504	7,880
Land use right	176	—	—	(6)	—	—	11	181
Others	2,791	18	—	(152)	(35,416)	—	35,359	2,600
	₩3,850,828	294,728	(8,478)	(209,781)	(270,801)	265,845	232,940	4,155,281

(*1) Includes the write-off of ₩270,801 million, which were recognized due to relinquishment of explorations in Europe and decrease in recoverable amount of mining right in relation to oil and gas properties.

(*2) Include the effect of changes in exchange rates and others.

(ii) For the year ended December 31, 2014

	Beginning balance	Acquisitions	Disposals	Amortization	Impairment losses(*1)	Reclassifications	Others(*2)	Ending balance
				In millions of Korean won				
Exploration and evaluation assets	₩1,237,058	371,257	(48,938)	—	(775,318)	—	47,819	831,878
Software	10,874	3,328	—	(3,872)	—	365	270	10,965
Mining rights	2,640,041	6,235	—	(255,367)	(20,626)	501,185	125,659	2,997,127
Development cost	10,296	345	—	(3,199)	—	139	310	7,891
Land use right	174	—	—	(6)	—	—	8	176
Others	32,806	220	—	(165)	(30,035)	—	(35)	2,791
	₩3,931,249	381,385	(48,938)	(262,609)	(825,979)	501,689	174,031	3,850,828

(*1) Includes the write-off of ₩825,979 million, which are recognized due to failure to find reserves (dry hole cost) in Europe, expired mining rights in Africa and others.

(*2) Include the effect of changes in exchange rates and others.

21. Trade and Other Payables

Details of trade and other payables as of December 31, 2015 and 2014 are as follows:

	December 31, 2015		December 31, 2014	
	Current	Non-current	Current	Non-current
	In millions of Korean won			
Trade accounts payable	₩131,627	—	391,680	—
Other accounts payable	518,805	354,340	841,694	248,710
Accrued expenses	129,346	223,647	112,605	198,019
Deposit received	—	2,445	—	3,964
Others	71,561	6,283	71,962	2,013
	₩851,339	586,715	1,417,941	452,706

22. Borrowings and Bonds Payable

(a) Details of borrowing and bonds payable as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Current Liabilities		
Short-term borrowings	₩ 1,269,147	214,360
Current bonds payable	2,072,378	1,044,240
Less: present value discount on current portion	(1,968)	(806)
	3,339,557	1,257,794
Non-current Liabilities		
Long-term borrowings	1,552,425	1,895,649
Less: present discounted value	(865)	(1,247)
Bonds payable	9,388,675	8,897,095
Less: discount on bonds payable	(30,964)	(36,238)
Add: premium on bonds payable	2,708	3,345
	10,911,979	10,758,604
	₩14,251,536	12,016,398

(b) Details of payment schedule as of December 31, 2015 and 2014 are as follows:

	December 31, 2015		December 31, 2014	
	Borrowings	Bonds Payable	Borrowings	Bonds Payable
	In millions of Korean won			
Within a year	₩1,269,147	2,072,378	214,360	1,044,240
1~5 years	1,128,567	6,473,715	1,454,481	7,241,585
More than 5 years	423,858	2,914,960	441,168	1,655,510
	₩2,821,572	11,461,053	2,110,009	9,941,335

(c) Details of short-term borrowings as of December 31, 2015 and 2014 are as follows:

Type	Financial Institutions	Interest rate (%)	Maturity	December 31, 2015	December 31, 2014
		In millions of Korean won			
Short- term borrowings in foreign currencies	DBS	—	—	₩ —	54,960
	KDB	—	—	—	54,960
	KDB	Libor+0.7	2016-04-20	35,160	32,976
	Sumitomo Mitsui Bank	Libor+0.7	2016-07-21	35,160	32,976
	Shinhan Bank London	3M Libor+2.5	2016-12-31	18,126	5,512
	Bank of America	—	—	—	32,976
	ING	3M Libor+0.33	2016-03-29	58,600	—
	ING	3M Libor+0.33	2016-03-23	93,760	—
	MIZUHO	1M Libor+0.30	2016-02-05	140,640	—
	DBS	0.85	2016-04-29	48,943	—
	Bank of America	Libor+0.75	2016-12-26	58,600	—
	CIBC etc.(*1)	(*2)	2017-04-30	780,158	—
				₩1,269,147	214,360

(*1) It has been classified to current liabilities by failing to meet the terms of borrowing contract. On the other hand, Harvest Operations Corp. has obtained a formal waiver of the covenant with the lenders until maturity date, April 2017.

(*2) Floating rate is applied to the borrowings according to the terms of contract. Also, the effective interest rate as of December 31, 2015 is 1.71%.

(d) Details of long-term borrowings as of December 31, 2015 and 2014 are as follows:

				December 31, 2015		December 31, 2014	
Type	**Financial Institution**	**Interest rate (%)**	**Maturity**	**Amount**	**Equivalent to Korean won**	**Amount**	**Equivalent to Korean won**
				In millions of Korean won and thousands of foreign currencies			
Long- term borrowings in foreign currencies	DBS	3M Libor +0.60	2018-01-30	USD 50,000	58,600	—	—
	Mizuho	3M Libor +0.75	2017-04-05	USD 200,000	234,400	USD 200,000	219,840
	SAER(*)	Treasury 3Y -1.25	N/A	USD 191,294	224,197	USD 197,349	216,927
	SAER(*)	Treasury 3Y -2.25	N/A	USD 170,359	199,661	USD 204,004	224,241
	BNP Paribas and others	Libor, Nibor, Euribor +1.75~2.25	2018-12-31	USD 618,071	724,380	USD 530,002	582,578
	CIBC and others	—	—	—	—	CAD 617,569	584,542
	Hyundai Heavy Industries, Hanhwa Corp	N/A	N/A(*)	USD 52,692	61,755	USD 20,640	22,688
	Kernhem International B.V.	8.125	2019-12-04	USD 16,718	19,593	USD 16,718	18,376
	Shinhan Bank	3M Libor +2.50	2017-10-31	USD 25,460	29,839	USD 24,070	26,457
					1,552,425		1,895,649
Less: present value discount on current portion					(865)		(1,247)
					1,551,560		1,894,402

(*) SAER stands for Special Accounting for Energy and Resources. Loans from SAER included in borrowings have no specific maturity as they were borrowed under the condition that the Group is not obligated to make repayment of the principal and interest until the exploration is proven to be successful.

(e) Details of bonds payable as of December 31, 2015 and 2014 are as follows:

Type	Interest rate (%)	Maturity	December 31, 2015 Amount	December 31, 2015 Equivalent to Korean won	December 31, 2014 Amount	December 31, 2014 Equivalent to Korean won
		In millions of Korean won and thousands of foreign currencies				
Floating interest rate bonds payable	3M Libor+0.80	2018-06-07	USD 200,000	234,400	USD 200,000	219,840
	3M Libor+1.00	2018-06-07	USD 300,000	351,600	USD 300,000	329,760
	A3B+1.50	2018-07-03	AUD 55,000	46,921	AUD 55,000	49,450
	3M Libor+1.20	2018-07-18	USD 330,000	386,760	USD 330,000	362,736
	—	—	—	—	USD 250,000	274,800
	A3B+1.08	2019-10-08	AUD 225,000	191,947	AUD 225,000	202,295
	3M Libor+0.35	2017-11-10	USD 100,000	117,200	USD 100,000	109,920
	3M Libor+0.60	2018-01-16	USD 50,000	58,600	—	—
	3M Libor+0.70	2018-02-02	USD 250,000	293,000	—	—
Fixed interest rate bonds payable	—	—	—	—	USD 700,000	769,440
	4.38	2021-02-08	HKD 500,000	75,605	HKD 500,000	70,850
	3.40	2016-02-15	HKD 780,000	117,943	HKD 780,000	110,526
	3.15	2016-02-16	SGD 100,000	82,809	SGD 100,000	83,175
	4.50	2021-03-04	HKD 390,000	58,972	HKD 390,000	55,263
	2.63	2016-05-12	CHF 325,000	385,252	CHF 325,000	361,215
	3.95	2016-05-25	EUR 100,000	128,053	EUR 100,000	133,652
	4.00	2016-10-27	USD 1,000,000	1,172,000	USD 1,000,000	1,099,200
	3.20	2016-12-22	HKD 637,000	96,321	HKD 637,000	90,263
	3.89	2016-12-26	KRW 90,000	90,000	KRW 90,000	90,000
	3.95	2022-02-10	HKD 390,000	58,972	HKD 390,000	55,263
	1.88	2017-03-08	CHF 300,000	355,616	CHF 300,000	333,429
	4.00	2022-03-28	EUR 50,000	64,027	EUR 50,000	66,826
	3.13	2017-04-03	USD 1,000,000	1,172,000	USD 1,000,000	1,099,200
	1.80	2018-01-22	HKD 400,000	60,484	HKD 400,000	56,680
	2.85	2023-01-24	HKD 400,000	60,484	HKD 400,000	56,680
	1.97	2018-01-29	USD 70,000	82,040	USD 70,000	76,944
	2.40	2023-02-04	EUR 37,000	47,380	EUR 37,000	49,451
	3.00	2025-06-24	EUR 60,000	76,832	EUR 60,000	80,191
	3.09	2023-07-03	EUR 50,000	64,027	EUR 50,000	66,826
	1.63	2018-11-29	CHF 240,000	284,493	CHF 240,000	266,743
	2.75	2019-01-23	USD 500,000	586,000	USD 500,000	549,600
	4.00	2024-01-23	USD 500,000	586,000	USD 500,000	549,600
	2.75	2019-01-23	USD 250,000	293,000	USD 250,000	274,800
	3.25	2024-07-10	USD 550,000	644,600	USD 550,000	604,560
	4.25	2019-10-08	AUD 125,000	106,638	AUD 125,000	112,387
	2.18	2020-01-29	HKD 310,000	46,875	—	—
	3.10	2027-01-21	USD 50,000	58,600	—	—
	3.10	2027-01-21	USD 70,000	82,040	—	—
	2.39	2020-01-28	USD 50,000	58,600	—	—
	2.11	2020-03-16	KRW 100,000	100,000	—	—
	3.21	2030-03-19	USD 85,000	99,620	—	—

Type	Interest rate (%)	Maturity	December 31, 2015 Amount	December 31, 2015 Equivalent to Korean won	December 31, 2014 Amount	December 31, 2014 Equivalent to Korean won
		In millions of Korean won and thousands of foreign currencies				
	2.99	2025-03-19	USD 90,000	105,480	—	—
	1.99	2020-04-23	KRW 50,000	50,000	—	—
	2.82	2025-04-29	USD 65,000	76,180	—	—
	3.02	2030-04-29	USD 60,000	70,320	—	—
	2.03	2020-08-26	KRW 150,000	150,000	—	—
	3.25	2025-10-01	USD 600,000	703,200	—	—
	3.22	2030-11-10	USD 100,000	117,200	—	—
Fixed interest rate bonds payable . . .	6.88	2017-10-01	USD 494,124	579,113	USD 492,558	541,420
	2.13	2018-05-14	USD 626,151	733,849	USD 626,228	688,350
				11,461,053		9,941,335
Less: discount on bonds payable				(32,932)		(37,044)
Add: premium on bonds payable				2,708		3,345
				11,430,829		9,907,636
Less: current portion				(2,072,378)		(1,044,240)
Less: present value discount on current portion				1,968		806
				9,360,419		8,864,202

23. Other financial Liabilities

Other financial liabilities as of December 31, 2014 are as follows:

	December 31, 2014 Non-current
	In millions of Korean won
Asset-Backed Securities	₩544
Financial guarantee	364
	₩908

24. Employee Benefits

The Group sponsors defined contribution plans and defined benefit plans which are subject to the employees’ option.

(a) Defined contribution pension plan

The Group operates a defined contribution plan (“DC plan”) which is subject to the employees’ option. Contributions to the DC plan are separately managed by the plan’s administrator. When employees terminate their employment before the benefits have vested, the Group’s obligation to make contribution to the plan decreases on a pro rata basis.

Details of expenses relating to defined contribution plans for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Cost of sales	₩ 729	697
Selling and administrative expenses	1,992	—
	₩2,721	697

Total expenses of ₩2,721 million and ₩697 million for the years ended December 31, 2015 and 2014, respectively are contributions paid by the Group based on the payment rate defined in Employee Benefits. No contributions remain unpaid as of December 31, 2015.

(b) Defined benefit pension plan

The latest actuarial calculation on both plan assets and defined benefit obligation was performed as of December 31, 2015. The Group uses the projected unit credit method to determine the present value of its defined benefit obligations and the related current service costs.

(i) The components of defined benefits liabilities as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Present value of defined benefit obligation from funded plans	₩ 73,921	60,501
Fair value of plan assets	(55,581)	(46,469)
Net liabilities incurred from defined benefit plans	₩ 18,340	14,032

(ii) Changes in the present value of defined benefit obligations for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Beginning balance	₩60,501	162,126
Current service cost	7,777	11,554
Interest cost	2,624	7,059
Remeasurement components	3,343	25,560
Actual payments	(842)	(39,779)
Effect of movement in exchange rates	—	(4,248)
Decrease upon disposal of subsidiary(*)	—	(101,771)
Others	518	—
	₩73,921	60,501

(*) Related to the disposal of a subsidiary as disclosed in note 37.

(iii) Changes in the fair value of plan assets for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Beginning balance	₩46,469	155,374
Expected return on plan assets	2,035	6,471
Actuarial gains (losses)	(150)	1,736
Benefit paid by the plan	(1,089)	(39,779)
Contributions paid into the plan	8,618	18,527
Administrative cost on plan assets	(302)	—
Effect of movement in exchange rates	—	(3,614)
Decrease upon disposal of subsidiary	—	(92,246)
	₩55,581	46,469

(iv) Details of the fair value of plan assets as of December 31, 2015 and 2014 are as follows:

	Expected rate of return(*2)		Fair value of plan assets	
	December 31, 2015	December 31, 2014	December 31, 2015	December 31, 2014
		In millions of Korean won		
Others(*1)	4.38%	5.35%	₩55,581	46,469

(*1) Others are comprised of GCI, MIS, retirement insurance and transfer from national pension.

(*2) The expected rate of return is calculated based on the weighted average of expected rate of returns for each type of assets. The management evaluates the expected rate of returns based on the historical rate of return trends and the analysis of the predicted market during the period when the defined benefits liabilities exist.

(v) Principal actuarial assumption as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
Discount rate	3.96%	4.38%
Expected rate of return on plan assets	4.38%	5.35%
Future salary growth	5.42%	5.42%

(vi) Details of expenses relating to defined benefit plans for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Current service cost	₩ 7,777	11,554
Interest cost	2,624	7,059
Expected return on plan assets	(2,035)	(6,471)
Transfer to other account	(214)	(385)
Other	—	(448)
	₩ 8,152	11,309

Expenses described above are recognized as the following items in the financial statements.

	2015	2014
	In millions of Korean won	
Cost of sales	₩3,467	2,571
Selling and administrative expenses	4,685	5,842
Others	214	385
Loss from discontinued operation	—	2,896
	₩8,366	11,694

(vii) Remeasurement components recognized in other comprehensive income for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Actuarial losses	₩(3,343)	(25,560)
Return on plan assets	(150)	1,736
	₩(3,493)	(23,824)

In addition, the amounts recognized for the year ended December 31, 2015 are included in retained earnings. The actuarial gains and losses amounting to ₩2,648 million (net of deferred tax amounting to ₩845 million) and ₩18,343 million (net of deferred tax amounting to ₩5,481 million) have been recognized as other comprehensive loss for the years ended December 31, 2015 and 2014, respectively.

25. Provisions

(a) Details of provisions as of December 31, 2015 and 2014 are as follows:

	2015			2014		
	Current	Non-current	Total	Current	Non-current	Total
	In millions of Korean won					
Decommissioning cost(*1)(*4)	₩ 384	2,245,637	2,246,021	2,937	2,354,849	2,357,786
Social Overhead Capital(*2)(*4)	183,306	—	183,306	249,791	109,323	359,114
Allowance for salaries	1,971	—	1,971	2,428	—	2,428
Provision for litigations(*3)	2,956	—	2,956	3,313	57,871	61,184
Others	787	1,983	2,770	—	1,030	1,030
	₩189,404	2,247,620	2,437,024	258,469	2,523,073	2,781,542

(*1) The Group recognized provisions for future dismantling, removing and restoring obligations of wells and related facilities. Most of the costs incur at or after the completion of production and the management recognized its best estimations as provisions.

(*2) The Group is committed to providing construction services with regards to the Kurdish regional government's Social Overhead Capital to obtain rights on certain exploratory areas (see note 46 for further discussion). This commitment has been classified as a provision due to its uncertain timing of related cash outflows.

(*3) The Group derecognized provisions as the Group lost in the first trial with the legal claims against Hanhwa Corp. and Hyundai Heavy industries for the period of 2015 and paid accordingly. The Group also recognized the estimated settlement amounts related to the claims with the Trindad.

(*4) The reclassifications from non-current to current amounted to ₩124,227 million and ₩189,284 million for the years ended December 31, 2015 and 2014, respectively.

(b) Changes in provisions for the years ended December 31, 2015 and 2014 are as follows:

(i) For the year ended December 31, 2015

	Beginning balance	Provision	Accretion expenses	Reversal	Transfer(*1)	Payment	Others(*2)	Ending Balance
	In millions of Korean won							
Decommissioning cost	₩2,357,786	10,726	108,327	—	(157,340)	(73,592)	114	2,246,021
Social Overhead Capital	359,114	—	11,271	—	—	(199,449)	12,370	183,306
Allowance for salaries	2,428	—	—	—	—	—	(457)	1,971
Provision for litigations	61,184	—	—	(25,131)	—	(34,441)	1,344	2,956
Others	1,030	—	1,914	—	—	(997)	823	2,770
	₩2,781,542	10,726	121,512	(25,131)	(157,340)	(308,479)	14,194	2,437,024

(*1) The Group transferred restoring obligations to contract party regarding disposal of an oil and gas property.

(*2) Include the effect of changes in exchange rates and others.

(ii) For the year ended December 31, 2014

	Beginning balance	Provision	Accretion expenses	Payment	Others(*)	Ending Balance
	In millions of Korean won					
Decommissioning cost	₩2,276,237	29,548	112,151	(115,575)	55,425	2,357,786
Social Overhead Capital	546,567	905	16,637	(220,668)	15,673	359,114
Allowance for salaries	—	—	2,326	—	102	2,428
Provision for litigations	3,468	—	55,451	—	2,265	61,184
Others	1,888	—	—	(16)	(842)	1,030
	₩2,828,160	30,453	186,565	(336,259)	72,623	2,781,542

(*) Include the effect of changes in exchange rates and others.

26. Current Non-Financial Liabilities

Details of current non-financial liabilities as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Advance received	₩ 37,407	15,204
Unearned revenue	44,092	26,016
Withholdings	45,842	41,741
	₩127,341	82,961

27. Share Capital

The Group's total share capital is invested solely by the Korean government in accordance with the Korea National Oil Corporation Act and the authorized share capital is ₩13 trillion as of December 31, 2015. The changes in share capital for the year ended December 31, 2015 are as follows:

	Description	Amount
	In millions of Korean won	
Beginning balance		₩10,091,920
2015. 02. 27	Contribution for oil stockpiling business	14,732
2015. 06. 24	Contribution for oil stockpiling business	16,705
2015. 09. 22	Contribution for oil stockpiling business	13,054
2015. 10. 28	Contribution for oil stockpiling business	14,435
2015. 12. 28	Contribution for oil field development	57,000
		₩10,207,846

28. Accumulated Deficit

(a) Details of accumulated deficit as December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Legal reserve(*1)	₩ —	929,848
Reserve for business expansion(*2)	—	895,310
Undisposed accumulated deficit	(6,539,889)	(4,002,470)
Accumulated deficit	₩(6,539,889)	(2,177,312)

(*1) In accordance with the Commercial Act in the Republic of Korea, an amount equal to at least 10% of cash dividends is required to be appropriated as a legal reserve until the reserve equals 50% of share capital. The legal reserve cannot be used as a source for cash dividends and may only be used to offset an accumulated deficit. Total amount was used to offset an accumulated deficit during the current year.

(*2) The Korea National Oil Corporation Act requires the Company to appropriate, from retained earnings, an amount equal to at least 20% of net income for each accounting period as a reserve for business expansion until the reserve equals share capital after having appropriated retained earnings for the legal reserve. This reserve cannot be used as a source for cash dividends and may only be used to offset an accumulated deficit. Total amount was used to offset an accumulated deficit during the current year.

(b) Changes in accumulated deficit for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Beginning balance	₩(2,177,312)	(513,370)
Net loss for the year attributed to owner of the Company	(4,359,918)	(1,602,523)
Dividends	—	(43,072)
Changes in equity method retained earnings	(11)	(4)
Remeasurement components of defined benefits plan	(2,648)	(18,343)
Accumulated deficit	₩(6,539,889)	(2,177,312)

(c) Changes in remeasurement components for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Beginning balance	₩(17,262)	1,081
Changes during the current year	(3,493)	(23,824)
Income tax effect	845	5,481
	₩(19,910)	(17,262)

29. Separate Statement of Disposition of Accumulated deficit

Separate statements of disposition of accumulated deficit for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
I. Undisposed Deficit		
Undisposed accumulated deficit carried over from prior years	₩ (888,677)	—
Net loss	(4,954,403)	(2,700,907)
Remeasurement components	(2,648)	(12,928)
	(5,845,728)	(2,713,835)
II. Disposal of undisposed deficit		
Transfer from legal reserves	—	929,848
Transfer from other reserves	—	895,310
	—	1,825,158
III. Undisposed deficit to be carried forward to the subsequent year	₩(5,845,728)	(888,677)

These statements of disposition of accumulated deficit were based on the separate financial statements of the parent company.

30. Other Components of Equity

(a) Details of other components of equity as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Other capital surpluses(*)	₩ 24,954	24,954
Accumulated other comprehensive loss	(191,362)	(382,458)
	₩(166,408)	(357,504)

(*) All other capital surpluses are gains from assets contributed.

(b) Changes in accumulated other comprehensive loss for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Gains(losses) on available-for-sale financial instruments — Reclassification adjustment	₩ 78,664	(99,489)
Equity adjustments in equity method	22,625	(13,523)
Exchange difference on translation of foreign operations	(357,238)	(325,192)
Gains on valuation of derivative instruments	64,587	55,746
	₩(191,362)	(382,458)

31. Revenue

Details of revenues from continuing operations except for other profit, financial income for the years ended December 31, 2015 and 2014 are as follows:

	2015			2014		
	Domestic	Overseas	Total	Domestic	Overseas	Total
	In millions of Korean won					
Sales of goods and finished goods	₩219,706	2,950,858	3,170,564	397,570	3,641,906	4,039,476
Revenues from services provided	20,678	167,280	187,958	33,707	210,992	244,699
Interest income	1,473	—	1,473	2,128	—	2,128
Income on government grants	4,132	—	4,132	3,326	—	3,326
Others	2,730	66,314	69,044	1,534	66,955	68,489
	₩248,719	3,184,452	3,433,171	438,265	3,919,853	4,358,118

32. Other Income and Expenses

(a) Details of other income for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Reversal of other provisions	₩ 25,131	—
Reversal of bad debt allowance	2,426	—
Gains on exemption of debt	99,149	96,534
Compensation and indemnity	198	38
Rental income	409	171
Other income from overseas fields	7,347	23,633
Others	18,773	19,093
	₩153,433	139,469

(b) Details of other expenses for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Interest costs on the provision for decommissioning	₩108,327	167,602
Other bad debt expense	172,122	69,486
Donations	3,145	2,725
Losses on valuation of supplies	699	2,060
Other expenses from overseas fields	416	6,011
Others	14,458	18,976
	₩299,167	266,860

33. Other Profit and Loss

Details of other profit and loss for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Gains on disposal of property, plant and equipment	₩ 149,665	377,791
Gains on disposal of intangible assets other than goodwill	1,915	1,703
Gains on transactions of derivatives	8,931	—
Gains on valuation of derivatives	418	774
Reversal of Impairment losses on property, plant and equipment	21,287	—
Gains on foreign currency translation	25,305	7,899
Gains on foreign currency transactions	37,206	63,193
Other gains	5,848	51,058
Losses on disposal of property, plant and equipment	(8,676)	(14,376)
Losses on disposal of intangible assets other than goodwill	(22)	(41,987)
Losses on transactions of derivatives	(3,913)	—
Losses on valuation of derivatives	(1,202)	(774)
Impairment losses on property, plant and equipment	(2,362,119)	(775,546)
Impairment losses and write-off of intangible assets	(829,863)	(1,283,017)
Losses on foreign currency translation	(66,018)	(29,551)
Losses on foreign currency transactions	(43,876)	(55,465)
Other losses	(9,855)	(21,643)
	₩(3,074,969)	(1,719,941)

34. Finance Income

(a) Details of finance income for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Interest income	₩39,094	34,635
Dividend income	3,863	4,807
Gains on disposal of financial assets	—	2,894
Gains on transaction of derivatives financial instruments	—	926
Gains on foreign currency translation	43,991	11,535
Gains on foreign currency transaction	8,086	25,161
	₩95,034	79,958

(b) Interest income included in finance income for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Cash and cash equivalents	₩ 5,961	13,660
Loans and receivables	33,133	20,975
	₩39,094	34,635

35. Finance Costs

(a) Details of finance costs for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Interest expenses	₩ 415,090	394,661
Losses on valuation of derivatives financial instruments	—	2,020
Losses on transaction of derivatives financial instruments	—	85
Impairment losses on available- for-sale financial instruments	450,370	—
Losses on foreign currency translation	477,839	148,903
Losses on foreign currency transaction	11,139	23,080
Other financial costs	45,619	52,289
	₩1,400,057	621,038

(b) Interest expenses included in finance costs for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Short-term borrowings	₩ 31,278	2,489
Long-term borrowings	37,852	51,828
Bonds payable	352,521	332,761
Derivative liabilities	14,973	22,426
Other financial liabilities	11,482	16,981
	448,106	426,485
Less: capitalized costs of borrowing	(33,016)	(31,824)
	₩415,090	394,661

The annual weighted average costs of capital of the borrowings are 4.34~4.42% and 3.25~4.73% for the years ended December 31, 2015 and 2014, respectively.

36. Income Tax Benefit

(a) The components of income tax benefit for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Current income tax	₩ 45,390	275,487
Deferred tax directly charged to equity	(47,676)	30,571
Changes in deferred taxes arising from temporary differences	(1,000,847)	(1,091,145)
Adjustment for prior periods	31,456	100,752
Income tax benefit	₩ (971,677)	(684,335)

(b) Reconciliations of expected income tax benefit computed by applying the statutory income tax rate to loss before income taxes to the actual income tax benefit for the years ended December 31, 2015 and 2014 are as followings:

	2015	2014
	In millions of Korean won	
Loss before income tax	₩(5,471,944)	(1,957,121)
Benefits computed at the statutory rate(*)	(1,324,210)	(473,623)
Adjustments		
Adjustments to prior year tax return	(34,098)	2,644
Non-taxable income	(279)	(22,944)
Non-deductible expenses	157,593	46,103
Temporary differences not recognized in deferred tax assets	442,989	(28,664)
Effect from tax deduction and reduction	(46,667)	(4,335)
Effect from temporary differences not recognized in prior years	30,649	(19,791)
Differences in tax rates in overseas entities	(295,243)	(196,066)
Effect of changes in tax rates	97,589	12,341
Income tax benefit	₩ (971,677)	(684,335)
Effective tax benefit rate	17.76%	34.97%

(*) The applicable statutory tax rate for the years ended December 31, 2015 and 2014 is 24.2%, which is the Korea statutory corporate income tax rate where the Company is domiciled.

(c) Income tax recognized as accumulated other comprehensive income for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Available-for-sale financial assets — Reclassification adjustment	₩(38,643)	31,311
Net change in the unrealized fair value of derivatives using cash flow hedge accounting	(1,130)	(6,241)
Remeasurement components	845	5,481
Equity adjustments arising from investments in equity-method investees	(8,748)	20
	₩(47,676)	30,571

(d) Changes in deferred income tax assets (liabilities) recognized in the consolidated statements of financial position for the years ended December 31, 2015 and 2014 are as follows:

(i) For the year ended December 31, 2015

	Beginning balance	Amounts recognized in profit or loss	Amounts recognized in other comprehensive income	Others	Ending balance
	In millions of Korean won				
Deferred income tax on temporary differences					
Contributions for construction	₩ 1,141	(104)	—	72	1,109
Investment in associates and others	113,313	(141,429)	(8,748)	2,127	(34,737)
Financial guarantee liabilities	2,866	207	—	198	3,271
Allowance for doubtful accounts	118,046	42,765	—	9,348	170,159
Available-for-sale financial instruments	15,283	94,935	(38,643)	3,029	74,604
Intangible assets	22,339	27,845	—	2,477	52,661
Impairment losses for intangible assets	50,118	6,604	—	3,555	60,277
Accrued expense	49,753	3,956	—	3,437	57,146
Asset retirement obligation	35,964	687	—	2,407	39,058
Property, plant and equipment	12,065	7,272	—	1,059	20,396
Land	(68,672)	11,067	—	(4,151)	(61,756)
Loss on valuation of derivatives	(4,724)	—	(4,190)	(462)	(9,376)
Employee benefits	(152)	490	845	40	1,223
Others	(6,095)	(29,699)	—	(1,469)	(37,263)
Deferred assets of subsidiaries	561,930	5,983	—	37,431	605,344
Differences in fair value and book value from business combination and others	(768,484)	519,757	—	(32,288)	(281,015)
Deferred tax liabilities of subsidiaries	(662,016)	498,187	3,060	(25,902)	(186,671)
	₩ (527,325)	1,048,523	(47,676)	908	474,430
Deferred tax assets	₩ 903,176				942,116
Deferred tax liabilities	₩(1,430,501)				(467,686)

Temporary differences not recognized in deferred tax assets, tax loss carryforwards and tax deduction are ₩1,410,271 million as of December 31, 2015.

(ii) For the year ended December 31, 2014

	Beginning balance	Amounts recognized in profit or loss	Amounts recognized in other comprehensive income	Others	Ending balance
	In millions of Korean won				
Deferred income tax on temporary differences					
Contributions for construction	₩ 1,168	(72)	—	45	1,141
Investment in associates and others	59,498	49,192	—	4,623	113,313
Financial guarantee liabilities	3,568	(815)	—	113	2,866
Allowance for doubtful accounts	92,950	20,341	—	4,755	118,046
Available-for-sale financial instruments	(14,312)	(2,384)	31,311	668	15,283
Intangible assets	23,022	(1,572)	—	889	22,339
Impairment losses for intangible assets	37,990	10,106	—	2,022	50,118
Accrued expense	47,159	606	—	1,988	49,753
Asset retirement obligation	29,422	5,096	—	1,446	35,964
Property, plant and equipment	4,548	7,021	—	496	12,065
Land	(100,408)	34,411	—	(2,675)	(68,672)
Gain (loss) on valuation of derivatives	1,565	(37)	(6,051)	(201)	(4,724)
Employee benefits	(2,228)	(2,049)	4,127	(2)	(152)
Others	(8,508)	2,653	—	(240)	(6,095)
Deferred assets of subsidiaries	183,344	472,165	1,184	(94,763)	561,930
Differences in fair value and book value from business combination and others	(947,844)	209,638	—	(30,278)	(768,484)
Deferred tax liabilities of subsidiaries	(892,358)	256,274	—	(25,932)	(662,016)
	₩(1,481,424)	1,060,574	30,571	(137,046)	(527,325)
Deferred tax assets	₩ 354,969				903,176
Deferred tax liabilities	₩(1,836,393)				(1,430,501)

37. Discontinued Operations

The refinery segment had been reclassified to a discontinued operation as North Atlantic Refining Limited, which was the refinery segment, was disposed of in November 2014. There is no segment classified as a discontinued operation in current year.

(a) Results of discontinued operation for the year ended December 31, 2014 are as follows:

	2014
	In millions of Korean won
Profit	₩ 3,295,968
Loss(*)	(3,492,407)
Loss before income tax	(196,439)
Income tax expense	(87,884)
Loss after tax	(284,323)
Loss on disposal of discontinued operation	(54,024)
Loss from discontinued operation	₩ (338,347)

(*) Impairments on property, plant, and equipment for the year ended December 31, 2014 is ₩171,006 million.

(b) Cash flow from (used in) discontinued operation for the years ended December 2014 are as follows:

	2014
	In millions of Korean won
Net cash used in operating activities	₩ (60,752)
Net cash used in investing activities	(30,330)
Net cash from financing activities	123,172
Effect of foreign exchange translation	(954)
Net cash from discontinued operation	₩ 31,136

(c) Carrying value of assets and liabilities upon disposal and cash flows related to the disposal for the year ended 2014 is as follows:

	2014
	In millions of Korean won
Inventories	₩ 94,616
Trade and other receivables	33,038
Other assets	2,068
Cash and cash equivalents	30,862
Trade and other payables	(54,969)
Provisions	(16,258)
Other liabilities	(10,864)
Net assets and liabilities	78,493
Consideration received, in cash	66,690
Cash and cash equivalents disposed	(30,862)
Net cash inflow	₩ 35,828

38. Non-current Assets and Liabilities Held For Sale

Assets and liabilities held for sale for the year ended December 31, 2014 is as follows. Also there is no assets classified in assets and liabilities held for sale for the year ended December 31, 2015.

	2014			
	KNOC NEMONE Ltd.(*1)	KNOC NEMTWO Ltd.(*1)	Disposal of Land and others(*2)	Total
	In millions of Korean won			
Cash and cash equivalents	₩ 90	110	—	200
Property, plant and equipment	—	—	62,012	62,012
Assets held for sale	90	110	62,012	62,212
Account payables and other payables	17	17	—	34
Non-current financial liabilities	26,549	21,727	—	48,276
Liabilities held for sale	₩26,566	21,744	—	48,310

(*1) KNOC NEMONE Ltd. and KNOC NEMTWO Ltd., the Group's subsidiaries, have resolved and proceeded to discontinue their operations in 2009 and received approval to close the areas from the government of Indonesia in 2011. KNOC NEMONE Ltd. completed its tax investigation as of December 31, 2014 and KNOC NEMTWO Ltd. completed its tax investigation in November 2013. It is expected to complete their liquidations in 2016.

(*2) Disposal of KNOC headquarter building and related assets was approved by the board of directors in April 2012. After its relocation to Ulsan, the Group entered into a sales contract of the properties on November 20, 2014. The sale was completed on November 30, 2015

39. Expenses Classified by Nature

(a) Expenses classified by nature for the year ended December 31, 2015 are as follows:

	Changes in inventories	Selling and administrative expenses	Cost of sales	Total
		In millions of Korean won		
Changes in inventories — merchandise	₩(50,558)	—	—	(50,558)
Changes in inventories — finished goods	33,470	—	—	33,470
Changes in inventories — other inventories	(384)	—	—	(384)
Purchases of inventories	—	—	660,037	660,037
Raw materials used	—	—	13,662	13,662
Salaries	—	112,299	116,668	228,967
Severance and retirement benefits	—	6,677	4,196	10,873
Other employee benefits	—	19,806	10,717	30,523
Insurance	—	4,783	33,571	38,354
Depreciation	—	19,518	1,428,018	1,447,536
Amortization	—	7,745	202,036	209,781
Bad debt expenses	—	4,311	—	4,311
Commissions and fees	—	30,261	73,657	103,918
Advertising	—	1,084	393	1,477
Education and training	—	6,741	12,878	19,619
Vehicle maintenance	—	1,962	539	2,501
Books and printing	—	1,014	31	1,045
Business development	—	284	92	376
Rent	—	10,191	64,195	74,386
Communications	—	1,742	814	2,556
Transport	—	—	99,378	99,378
Taxes and dues	—	3,543	93,226	96,769
Supplies	—	1,662	3,733	5,395
Utilities	—	1,508	66,718	68,226
Repairs	—	8,490	178,137	186,627
Research and development	—	1,942	1,992	3,934
Travel	—	2,887	1,141	4,028
Clothing expenses	—	12	175	187
Investigation and analysis	—	5	888	893
Association fee	—	771	18	789
Sales promotion	—	259	836	1,095
Sales commission	—	99,150	—	99,150
Others	—	6,130	473,233	479,363
	₩(17,472)	354,777	3,540,979	3,878,284

(b) Expenses classified by nature for the year ended December 31, 2014 are as follows:

	Changes in inventories	Selling and administrative expenses	Cost of sales	Total
	In millions of Korean won			
Changes in inventories — merchandise	₩ (926)	—	—	(926)
Changes in inventories — finished goods	50,017	—	—	50,017
Changes in inventories — other inventories	(6,839)	—	—	(6,839)
Purchases of inventories	—	—	211,270	211,270
Raw materials used	—	—	9,857	9,857
Salaries	—	124,172	119,759	243,931
Severance and retirement benefits	—	5,842	3,268	9,110
Other employee benefits	—	21,832	8,404	30,236
Insurance	—	5,070	40,828	45,898
Depreciation	—	12,970	1,467,545	1,480,515
Amortization	—	7,018	255,591	262,609
Bad debt expenses	—	570	—	570
Commissions and fees	—	57,724	81,407	139,131
Advertising	—	1,873	534	2,407
Education and training	—	5,786	16,883	22,669
Vehicle maintenance	—	1,658	260	1,918
Books and printing	—	1,138	30	1,168
Business development	—	431	99	530
Rent	—	11,489	57,941	69,430
Communications	—	1,701	1,074	2,775
Transport	—	—	106,175	106,175
Taxes and dues	—	4,347	111,424	115,771
Supplies	—	2,877	3,812	6,689
Utilities	—	809	71,381	72,190
Repairs	—	8,690	258,066	266,756
Research and development	—	7,523	2,452	9,975
Travel	—	4,341	1,374	5,715
Clothing expenses	—	381	226	607
Investigation and analysis	—	9	1,119	1,128
Association fee	—	873	16	889
Sales promotion	—	339	995	1,334
Sales commission	—	136,059	—	136,059
Others	—	19,856	565,831	585,687
	₩42,252	445,378	3,397,621	3,885,251

40. Categories of financial instruments

(a) Details of current financial assets by category as of December 31, 2015 and 2014 are as follows:

(i) As of December 31, 2015

	Loans and receivables	Hedging Financial assets	Total
	In millions of Korean won		
Cash and cash equivalents	₩ 783,981	—	783,981
Short-term financial instruments	2,000	—	2,000
Derivative assets	—	1,326	1,326
Others	14,066	—	14,066
Trade and other receivables	712,719	—	712,719
	₩1,512,766	1,326	1,514,092

(ii) As of December 31, 2014

	Loans and receivables	Hedging Financial assets	Total
	In millions of Korean won		
Cash and cash equivalents	₩ 506,449	—	506,449
Short-term financial instruments	2,436	—	2,436
Derivative assets	—	1,801	1,801
Others	10,349	—	10,349
Trade and other receivables	941,157	—	941,157
	₩1,460,391	1,801	1,462,192

The fair values of the financial assets listed above measured at amortized costs do not significantly differ from their book values.

(b) Details of non-current financial assets by category as of December 31, 2015 and 2014 are as follows:

(i) As of December 31, 2015

	Loans and receivables	Available-for-sale financial instruments	Hedging financial assets	Total
	In millions of Korean won			
Available-for-sale financial instruments	₩ —	355,733	—	355,733
Loans	500,578	—	—	500,578
Long-term financial instruments	4,661	—	—	4,661
Derivative assets	—	—	4,239	4,239
Trade and other receivables	104,606	—	—	104,606
	₩609,845	355,733	4,239	969,817

(ii) As of December 31, 2014

	Loans and receivables	Available-for-sale financial instruments	Hedging financial assets	Total
	In millions of Korean won			
Available-for-sale financial instruments	₩ —	566,895	—	566,895
Loans	555,252	—	—	555,252
Long-term financial instruments	7,008	—	—	7,008
Derivative assets	—	—	7,634	7,634
Trade and other receivables	93,838	—	—	93,838
	₩656,098	566,895	7,634	1,230,627

The fair values of the financial assets listed above measured at amortized costs do not significantly differ from their book values.

(c) Details of current financial liabilities by category as of December 31, 2015 and 2014 are as follows:

(i) As of December 31, 2015

	Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
	In millions of Korean won		
Short-term borrowings	₩1,269,147	—	1,269,147
Bonds payable	2,070,410	—	2,070,410
Derivative liabilities	—	100,436	100,436
Trade and other payables	851,339	—	851,339
	₩4,190,896	100,436	4,291,332

(ii) As of December 31, 2014

	Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
	In millions of Korean won		
Short-term borrowings	₩ 214,360	—	214,360
Bonds payable	1,043,434	—	1,043,434
Derivative liabilities	—	3,103	3,103
Trade and other payables	1,417,941	—	1,417,941
	₩2,675,735	3,103	2,678,838

The fair values of the financial liabilities listed above measured at amortized costs do not significantly differ from their book values.

(d) Details of non-current financial liabilities by category as of December 31, 2015 and 2014 are as follows:

(i) As of December 31, 2015

	Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
	In millions of Korean won		
Long-term borrowings	₩ 1,551,560	—	1,551,560
Bonds payable	9,360,419	—	9,360,419
Derivative liabilities	—	133,680	133,680
Trade and other payables	586,715	—	586,715
	₩11,498,694	133,680	11,632,374

(ii) As of December 31, 2014

	Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
	In millions of Korean won		
Long-term borrowings	₩ 1,894,402	—	1,894,402
Bonds payable	8,864,202	—	8,864,202
Derivative liabilities	—	145,378	145,378
Others	908	—	908
Trade and other payables	452,706	—	452,706
	₩11,212,218	145,378	11,357,596

The fair values of the financial liabilities listed above measured at amortized costs do not significantly differ from their book values.

(e) Net gains or losses by financial instruments for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Financial assets at fair value through profit or loss:		
Loss on valuation, net	₩ —	(1,346)
Loans and receivables:		
Interest income	39,094	34,635
Gain (loss) on foreign currency transactions, net	(656)	2,081
Loss on foreign currency translation, net	(138,989)	(34,151)
Available-for-sale financial investments:		
Dividend income	3,863	4,807
Gain on disposal	—	2,894
Impairment loss	(450,370)	—
Other comprehensive income (loss), net of tax	178,153	(152,518)
Hedge financial assets:		
Loss on transaction	—	(54)
Gain (loss) on foreign currency translation, net	2,959	(12,264)
Other comprehensive income (loss), net of tax	(5,668)	1,216
Financial liabilities at fair value through profit or loss (derivatives):		
Loss on valuation, net	—	(674)
Other financial liabilities with amortized cost:		
Interest cost	(415,090)	(394,661)
Loss on foreign currency transactions, net	(2,397)	—
Gain (loss) on foreign currency translations, net	(204,195)	87,987
Other financial cost	(45,619)	(52,289)
Hedge financial liabilities:		
Gain on transactions	—	895
Loss on foreign currency translation, net	(93,623)	(178,939)
Other comprehensive income, net of tax	14,508	18,954
	₩(1,118,030)	(673,427)

41. Netting Agreements

(a) Offsetting of financial assets and financial liabilities

As of December 31, 2015 and 2014, financial assets and financial liabilities subject to offsetting, enforceable master netting arrangements and similar agreements are as follows:

(i) As of December 31, 2015

Type of assets	Gross amounts recognized as financial instruments	Gross amounts of recognized financial instruments set off in the statement of financial position	Net amounts of financial instruments presented in the statement of financial position	Related amounts not set off in the statement of financial position		Net Amounts
				Financial instruments	Collateral received or pledged	
			In millions of Korean won			
Financial assets						
Derivatives(*)	₩ 5,565	—	5,565	(5,565)	—	—
Financial liabilities						
Derivatives(*)	234,116	—	234,116	(5,565)	—	228,551

(*) Some of derivative contracts are made under International Swaps and Derivatives Association (ISDA) master netting agreements. In general, under such agreements the amounts owed by each counter party on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. In certain circumstances (i.e. when a default occurs), all standing transactions under the agreement are terminated, the termination value is assessed and only a single amount is payable in settlement of all transactions.

(ii) As of December 31, 2014

Type of assets	Gross amounts recognized as financial instruments	Gross amounts of recognized financial instruments set off in the statement of financial position	Net amounts of financial instruments presented in the statement of financial position	Related amounts not set off in the statement of financial position		Net Amounts
				Financial instruments	Collateral received or pledged	
			In millions of Korean won			
Financial assets						
Derivatives(*)	₩ 9,435	—	9,435	(7,634)	—	1,801
Financial liabilities						
Derivatives(*)	148,481	—	148,481	(7,634)	—	140,847

(*) Some of derivative contracts are made under International Swaps and Derivatives Association (ISDA) master netting agreements. In general, under such agreements the amounts owed by each counter party on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. In certain circumstances (i.e. when a default occurs), all standing transactions under the agreement are terminated, the termination value is assessed and only a single amount is payable in settlement of all transactions.

42. Risk Management

(a) Capital management

The primary objective of the Group's capital management is to ensure that it maintains a strong credit rating and capital ratios in order to support its business and maximize the owners' value. The Group manages its capital structure and makes adjustments to it in light of changes in economic conditions. To maintain the sound capital structure, the Group may adjust the dividend payment to the owner, reduce share capital, issue new shares, raise funds from bond offerings and dispose Group's non-core assets. No changes were made in the objectives, policies or processes for managing capital for the year ended December 31, 2015.

The Group's debt-to-equity ratio as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Total borrowings and debt instruments	₩14,251,536	12,016,398
Cash and cash equivalents	(783,981)	(506,449)
Net borrowings and debt securities	13,467,555	11,509,949
Total equity	₩ 4,195,594	8,369,669
Net borrowings and debt securities-to-equity ratio	320.99%	137.52%

(b) Financial risk management

The Group is exposed to various risks related to its financial instruments such as market risk (currency risk, interest rate risk and price risk) and credit risk.

(i) Risk management structure

The board of directors is responsible for implementing and monitoring the Group's risk management structure and the management regularly updates the policies for each risk and confirms the validity of the policies. The purpose of the risk management policies is to identify the risks that could potentially affect the Group's financial results and reduce, to an acceptable level, avoid or eliminate those risks. The policies are reviewed regularly to reflect the current market conditions and the Group's activities. The Group makes constant efforts to improve the policies by monitoring on real time basis and with support from the outside experts. The audit committee oversees the Group's compliance to the risk management policies and procedures and reviews the efficiency of the structure.

(ii) Credit risk

Credit risk is the risk of financial loss to the Group if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the Group's receivables from customers, investment securities, derivatives and financial guarantee contracts.

Credit risk also arises from transactions with financial institutions, and such transactions include transactions of cash and cash equivalents, various deposits, and financial instruments such as derivative contracts. The Group manages its exposure to this credit risk by only entering into transactions with banks that have high international credit ratings. The Group implements a credit risk management policy under which the Group only transacts business with counterparties that have a certain level of credit rate evaluated based on financial condition, historical experience, and other factors.

Book values of the financial assets and guarantee amounts by the contract represent the maximum amounts exposed to the credit risk. Details of the Group's level of maximum exposure to credit risk as of December 31, 2015 and 2014 are as follows:

	December 31, 2015	December 31, 2014
	In millions of Korean won	
Cash and cash equivalents	₩ 783,981	506,449
Derivatives assets	5,565	9,435
Available-for-sale financial instruments	355,733	566,895
Loans and receivables(*)	1,338,630	1,610,039
Financial guarantee contracts	—	68,215

(*) Comprised of loans, account receivables and non-trade receivables.

Details of maturities for loans and receivables and their impaired amounts as of December 31, 2015 and 2014 are as follows:

	December 31, 2015		December 31, 2014	
	Balance	Impairment	Balance	Impairment
	In millions of Korean won			
Not past due	₩1,962,374	(696,248)	1,915,383	(469,215)
0 ~ 30 days	20,876	—	115,417	—
31 ~ 60 days	12,979	—	13,703	—
More than 61 days	40,359	(1,709)	36,858	(2,107)
	₩2,036,588	(697,957)	2,081,361	(471,322)

Details of changes in allowance for impairment of loans and receivables for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Beginning balance	₩471,322	394,447
Impairment	176,434	70,055
Reversal of impairment loss	(2,426)	—
Write-off	(2,443)	(24,411)
Others(*)	55,070	31,231
Ending balance	₩697,957	471,322

(*) Include the effect of changes in exchange rates.

Aging of past due but not impaired financial assets as of December 31, 2015 and 2014 are as follows:

① As of December 31, 2015

	Book value	Less than 6 months	6~12 Months	1~2 years	2~5 years	More than 5 years
	In millions of Korean won					
Loans and receivables	₩72,505	53,340	11,497	4,116	3,552	—

② As of December 31, 2014

	Book value	Less than 6 months	6~12 Months	1~2 years	2~5 years	More than 5 years
	In millions of Korean won					
Loans and receivables	₩163,871	128,868	20,107	14,896	—	—

(iii) Market risk

① Crude oil price risk

Crude oil price risk is the risk that the profit or cash flows will fluctuate due to changes in the international market prices of crude oil. With all other variables held constant, the changes in Group's profit before tax for the years ended December 31, 2015 and 2014 from crude oil price fluctuations are as follows:

	2015		2014	
	Increase by 10%	Decrease by 10%	Increase by 10%	Decrease by 10%
	In millions of Korean won			
Increase (decrease) of profit before tax	₩201,111	(201,111)	320,030	(320,030)

② Interest rate risk

The Group is exposed to interest rate risk due to its borrowings with floating interest rates. Assuming a 100 basis points increase or decrease in interest rates as of December 31, 2015 the Group's total equity and its profit or loss will also increase or decrease.

Except for the effect of derivative transactions, this analysis considers the Group's total exposed risks associated with the fluctuation in interest rate. This analysis assumes that all other variables are held constant and the same method is applied as the method used in the prior periods. The details of increase or decrease in the total equity and profit or loss are as follows:

	For the year ended December 31, 2015		For the year ended December 31, 2014	
	Increase by 1%	Decrease by 1%	Increase by 1%	Decrease by 1%
	In millions of Korean won			
Increase (decrease) of profit before tax	₩(35,911)	35,911	(32,354)	32,354

③ Foreign currency risk

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the 'functional currency'). The Group is exposed to currency risk from the sales, purchases and borrowings not in United States dollar. The Group reduces currency risk from fluctuations in foreign exchange rates by carrying out interest swap and currency swap transactions.

Without considering the effect of the derivatives aforementioned, the Group's exposures to foreign currency risk as of December 31, 2015 and 2014 are as follows:

		December 31, 2015		December 31, 2014	
	Currency unit	Foreign currencies	Equivalent to Korean won	Foreign currencies	Equivalent to Korean won
		In thousands of foreign currencies and millions of Korean won			
Financial assets					
denominated in foreign currencies	KRW	471,629	₩ 471,629	438,015	₩ 438,015
Financial liabilities					
denominated in foreign currencies	KRW	433,223	433,223	120,254	120,254
	EUR	297,000	380,317	297,001	396,947
	SGD	100,939	83,587	100,537	83,622
	HKD	3,807,000	575,656	3,497,000	495,525
	CHF	865,000	1,025,362	865,000	961,387
	JPY	3,551	35	13,500,000	124,219
	AUD	405,092	345,584	55,000	49,450
	GBP	59	102	16	27
			2,843,866		2,231,431

The exchange rates applied for the years ended and as of December 31, 2015 and 2014 are as follows:

	Average exchange rates		Ending exchange rates	
	December 31, 2015	December 31, 2014	December 31, 2015	December 31, 2014
	In US dollar per one foreign currency			
KRW	0.0008	0.0009	0.0008	0.0009
EUR	1.1092	1.3281	1.0926	1.2159
SGD	0.7273	0.7890	0.7065	0.7566
HKD	0.1289	0.1289	0.1290	0.1289
CHF	1.0389	1.0932	1.0114	1.0111
JPY	0.0082	0.0094	0.0082	0.0083
AUD	0.7511	0.9013	0.7279	0.8179
GBP	1.5287	1.6480	1.4811	1.5561
CAD	—	0.9058	—	0.8611

The Company and its subsidiaries use various functional currencies depending on their primary economic environment in which the entities operate. A sensitivity analysis below indicates the effect on the Group's profit before tax from the fluctuations in each function currency exchange rate. As of December 31, 2015 and 2014 the effect of a 5% increase or decrease in each functional currency exchange rate on profit before tax assuming all other variables held constant is as follows:

		2015		2014	
		Increase by 5%	Decrease by 5%	Increase by 5%	Decrease by 5%
		In millions of Korean won			
Increase (decrease) of profit before tax	KRW	₩ 1,920	(1,920)	15,888	(15,888)
	HKD	(28,783)	28,783	(24,776)	24,776
	CHF	(51,268)	51,268	(48,069)	48,069
	EUR	(19,754)	19,754	(19,119)	19,119
	Others	(17,229)	17,229	(9,645)	9,645

(iv) Liquidity risk

The details of contractual maturities of financial liabilities and other contractual obligations as of December 31, 2015 are as follows:

	Book value	Contractual cash flows(*1)	Less than 1 year	1 ~ 2 years	2 ~ 5 years	More than 5 years(*2)
			In millions of Korean won			
Short-term borrowings	₩ 1,269,147	1,284,662	1,284,662	—	—	—
Bonds payable	11,430,829	12,818,504	2,397,048	2,454,375	4,509,951	3,457,130
Long-term borrowings	1,551,560	1,843,858	49,406	373,461	892,441	528,550
Trade and other payables	1,438,054	1,438,054	851,339	285,621	50,123	250,971
Derivatives liabilities	234,116	234,116	100,436	32,181	54,148	47,351
	₩15,923,706	17,619,194	4,682,891	3,145,638	5,506,663	4,284,002

(*1) Contractual cash flows include the estimated interest payments but exclude the effects of offsetting contracts.

(*2) Loans from Special Accounting for Energy and Resources (“SAER”) included in borrowings have no specific maturity as they were borrowed under the condition that the Group is not obligated to make repayment of the principal and interest until the exploration is proven to be successful.

The Group had a working capital (current assets minus current liabilities) deficit of ₩2,803,960 million as of December 31, 2015. The Group’s management currently anticipates that the net proceeds from the sale of non-core assets, expected future capital contributions from the Government and the cash flows that the Group generates from its operations, together with its existing cash and cash equivalents and credit sources, will be sufficient to meet its currently anticipated needs for working capital, capital expenditures and business expansion throughout the foreseeable future.

(v) Other price risk

Other price risk is the risk that the fair value or cash flows of financial instruments will fluctuate because of changes in market prices other than interest rate risk and foreign currency risk. The Group’s marketable available-for-sale equity securities are exposed to market price risk arising from the fluctuation in the price of the securities. However, the Group’s management believes that the effect of the fluctuation in the price of the securities on the financial statements is not significant.

(c) Fair value measurement

(i) Fair value and book value of financial assets and liabilities as of December 31, 2015 and 2014 are as follows:

Type	December 31, 2015		December 31, 2014	
	Book value	Fair value	Book value	Fair value
	In millions of Korean won			
Assets recognized at fair value				
Available-for-sale financial assets	₩330,549	330,549	543,275	543,275
Currency swap	4,495	4,495	3,938	3,938
Interest rate swap	637	637	3,696	3,696
Other derivatives	433	433	1,801	1,801
Investments in associates and joint ventures(*)	100,685	100,685	71,691	71,691
	436,799	436,799	624,401	624,401
Liabilities recognized at fair value				
Interest rate swap	6,141	6,141	1,974	1,974
Currency swap	227,975	227,975	145,378	145,378
Other derivative liabilities	—	—	1,129	1,129
	234,116	234,116	148,481	148,481

(*) The investments in joint ventures for Deep Basin Partnership and HKMS Partnership held by the Group are measured at the fair value at each financial statement date using the hypothetical liquidation book value method to estimate the Group's interests in the net assets of the joint ventures.

The fair values of the financial assets and liabilities measured at amortized costs do not significantly differ from their book values.

(ii) Fair value hierarchy

Fair values of financial instruments by hierarchy level as of December 31, 2015 are as follows:

Type	December 31, 2015			
	Level 1	Level 2	Level 3	Total
	In millions of Korean won			
Financial assets at fair value				
Available-for-sale financial assets	₩205,812	—	124,737	330,549
Investments in associates and joint ventures	—	—	100,685	100,685
Derivative assets	—	5,565	—	5,565
	205,812	5,565	225,422	436,799
Financial liabilities at fair value				
Derivative liabilities	—	234,116	—	234,116

43. Related Parties

(a) The Group's major related parties as of December 31, 2015 are as follows:

Type	Related party
Associates	Oilhub Korea Yeosu Co., Ltd.
	Kernhem B.V.
	ADA Oil LLP
	Parallel Petroleum LLC
Joint ventures	KNOC Inam Ltd.
	KNOC Kamchatka Petroleum Ltd.
	KC Karpovsky B.V.
	KNOC Bazian Ltd.
	Dolphin Property Ltd.(*)
	KNOC Nigerian West Oil Company Ltd.
	KNOC Nigerian East Oil Company Ltd.
	KNOC Aral Ltd.
	KNOC Kamchatka Co. Ltd.
	KC Kazakh B.V.
	Offshore International Group, Inc.
	KNOC Ferghana Ltd.
	KNOC Ferghana2 Ltd.
	KADOC Ltd.
	Korea Oil Terminal Co., Ltd.
	Deep Basin Partnership
	HKMS Partnership

(*) Liquidated during the current year.

(b) Significant transactions with related parties for the years ended December 31, 2015 and 2014 are as follows:

	Transaction	Sales and others 2015	Sales and others 2014	Purchases and others 2015	Purchases and others 2014
		In millions of Korean won			
Oilhub Korea Yeosu Co., Ltd.	Revenues from rental services	₩ 1,447	1,347	17,147	12,756
Kernhem B.V.	Interest on loans	1,038	1,587	—	—
ADA Oil LLP	Interest on loans	296	263	—	—
	Revenues from services	3,129	3,120	—	—
	Expenses from services	—	—	33	—
Parallel Petroleum LLC	Interest on loans	196	—	—	—
KC karpovsky B.V.	Other bad debt expenses	—	—	—	2,864
KNOC Bazian Ltd.	Other bad debt expenses	—	—	—	66,621
KNOC Nigerian West Oil Company Ltd.	Interest on loans	1,877	2,297	—	—
KNOC Nigerian East Oil Company Ltd.	Interest on loans	4,778	2,594	—	—
KNOC kamchatka Co. Ltd.	Other bad debt expenses	—	—	414	—
KC kazakh B.V.	Interest on loans	—	579	—	—
	Other bad debt expenses	—	—	197,200	—
Offshore International Group, Inc.	Interest on loans	—	202	—	—
KNOC Ferghana Ltd.	Reversal of allowances for bad debts	2,414	—	—	—
KADOC Ltd.	Interest on loans	3,838	2,164	—	—
Deep Basin Partnership	Other expense	—	—	496	—
HKMS Partnership	Other expense	—	—	79	—
		₩19,013	14,153	215,369	82,241

(c) The outstanding receivables and payables, except for the loans, arising from the transactions with related parties as of December 31, 2015 and 2014 are as follows:

	Transaction	Receivables 2015	Receivables 2014	Payables 2015	Payables 2014
		In millions of Korean won			
Oilhub Korea Yeosu Co., Ltd.	Other account payables	₩ —	—	1,614	—
Kernhem B.V.	Accrued interest	7,277	5,816	—	—
ADA Oil LLP	Accrued interest	1,880	1,476	—	—
	Account receivables	—	56	—	—
	Account payables	—	—	21	—
	Other payables	—	—	170	—
Parallel Petroleum LLC	Accrued interest	—	134	—	—
KNOC Nigerian West Oil Company Ltd.	Accrued interest	22,155	18,955	—	—
KNOC Nigerian East Oil Company Ltd.	Accrued interest	25,390	19,171	—	—
KC kazakh B.V.	Accrued interest	—	2,106	—	—
KADOC Ltd.	Accrued interest	9,508	5,189		—
Deep Basin Partnership	Account payables	—	—	11,896	—
HKMS Partnership	Account payables	—	—	938	—
		₩66,210	52,903	14,639	—

(d) The loans to related parties as of December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Associates		
Kernhem B.V.	₩ 39,280	48,082
ADA Oil LLP	11,635	10,913
Parallel Petroleum LLC	5,852	—
	56,767	58,995
Joint ventures		
KNOC Kamchatka Co. Ltd.	—	83
KNOC Nigerian West Oil Company Ltd.	26,172	24,277
KNOC Nigerian East Oil Company Ltd.	28,506	29,137
KC kazakh B.V.	—	133,723
KNOC Ferghana2 Ltd.	13,332	12,061
KADOC Ltd.	163,814	98,430
	231,824	297,711
	₩288,591	356,706

The Group provided associates with additional loans of ₩102,022 million and received ₩2,414 million as the repayment of loans. Also, the Group recognized other bad debt expenses of ₩165,403 million, provision for loans of ₩22,772 million due to equity method valuation and an increase in provision for loans due to the effect of changes in exchange rates amounting to ₩20,454 million.

(e) As of December 31, 2015, the Group has not provided the guarantees to related parties.

(f) The compensation to the key management personnel of the Group for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Salaries	₩584	840
Severance and retirement benefits	48	45
	₩632	885

44. Additional Cash Flow Statement Information

(a) Non-Cash Transactions

Significant non-cash investment and finance transactions excluded from statements of cash flows for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Bonds payable transferred to current portion	₩2,025,843	1,043,434
Long-term borrowings transferred to current portion	545,732	—
Construction in progress transferred to other accounts	13,258	170,094
Non-current liabilities transferred to current portion	124,227	189,284

45. Disposal of affiliates

Bakmura LLP, a subsidiary of the Kaz B.V. was liquidated for the year ended December 31, 2015. Also, the North Atlantic Refining Limited, a subsidiary of Harvest Operations Corp. was disposed of for the year ended December 31, 2014.

(1) Fair value of amount received is as follows:

	2015	2014
	In millions of Korean won	
Amount received	₩—	66,690

(2) Assets and liabilities of affiliates when the Group loses control over a subsidiary are as follows:

	2015	2014
	In millions of Korean won	
Inventories	₩ —	94,616
Accounts receivable	1,842	33,038
Other assets	—	2,068
Cash and cash equivalents	—	30,862
Trade and Other Payables	(347)	(54,969)
Provisions	—	(16,258)
Other liabilities	—	(10,864)
Total	₩1,495	78,493

(3) Details of other gain and loss on disposal of affiliates for the years ended December 31, 2015 and 2014 are as follows:

	2015	2014
	In millions of Korean won	
Fair value of amount received	₩ —	66,690
Book value of net assets disposed	(1,495)	(78,493)
Accumulated exchange differences regarding subsidiary's assets reclassified from equity.	—	(42,126)
Exchange differences	52	(94)
Loss on disposal(*)	(1,443)	(54,023)

(*) Loss on disposal of subsidiaries is ₩13,769 million in regards to additional payment for disposal on North Atlantic Refining Limited occurred in the prior year.

46. Contingencies and Commitments

(a) Details of the Group's significant pending litigations as of December 31, 2015 are as follows:

Plaintiff	Defendant	Description	Amount	Process
KNOC	Nigerian government and etc.	Claiming the validity of the exploration right in OPL 321 and 323(*1)	—	In third trial
AAA, DR.Owolabi	KNOC	Claiming compensation for cooperation in the process of acquiring Nigerian mining rights(*2)	USD 100,000	In first trial
Trinidad	Harvest Operations Corp.	Claiming compensation for monetary damages from termination of rig usage(*3)	CAD 15,649	In first trial
Hanhwa Corp.	KNOC	Claiming refunds of the premium paid to the Group acquire interests in Yemen 4 oil field(*4)	KRW 5,979	In second trial
Hyundai Heavy Industries	KNOC	Claiming refunds of the acquisition costs and premium paid to the Group acquire interests in Yemen 4 oil field(*5)	KRW 17,938	In second trial

(*1) In January 2009, the Group was notified by the President of the Federal Republic of Nigeria about the voidance of the allocation of OPL 321 and 323. The Nigerian Federal High Court granted a judgment in favor of the Company in August 2009. This judgment has been appealed by the Nigerian Government and in April 2012, the appeal was allowed by the Nigerian Court of Appeals setting aside the Nigerian Federal High Court's judgment. The Company filed an appeal at the Supreme Court of Nigeria against the judgment of the Nigerian Court of Appeals. The book value of the related assets is ₩102,223 million but the Company did not recognize a provision as the Company believes that the favorable outcome of the litigation is more likely than not.

(*2) This litigation was instituted at the High Court of Lagos State alledging that the Company entered into a secretive remunerative agreement and paying the brokerage and other fees due to the plaintiffs for sponsoring its acquisitions of OPL 321 and OPL 323. The plaintiff claimed general damages for the plaintiff's loss of the business associated with the defendant's acquisition of the right to OPL 321 and OPL 323. The Company did not recognize a provision as the Company believes that it is more likely than not that its defenses against the suit will be successful.

(*3) The management of Harvest Operations Corp. has estimated the settlement costs to be CAD 3.5 million and recognized a provision for the estimated settlement.

(*4) The Company paid all claim amounts in February, 2015 based on the loss of the first trial and a second trial is in the process by appealing to the decision as of December 31, 2015.

(*5) The Company paid partial claim amounts in July, 2015 based on the loss of the first trial and a second trial is in the process by appealing to the decision as of December 31, 2015.

Except as noted above, the Group does not believe it has a present obligation and has not recognized any provisions for these lawsuits.

In addition, the Group is acting as an agent, a defendant, for the government in pending lawsuits against GS Caltex Corporation and others claiming the revocation of clawback of refund on oil import levies.

(b) The Group has provided loan guarantees to non-related parties as of December 31, 2015 and 2014 as follows:

Description of guarantee	Guaranteed Party	Effective Date	Guarantee period	December 31, 2015	December 31, 2014
			In thousands of US dollar		
Payment guarantee for Parallel business	Samsung C&T Oil Gas Parallel Corp.	2014-07-10	2014-07-10 ~ Loans fully repaid	USD 8,459	USD 8,459

(c) As of December 31, 2015 the Group has received guarantees provided by non-related parties for the Group's obligations and indebtedness as follows:

Provider	Description	Contractual currency amount	Equivalent to Korean won	Description of guarantee
		In millions of Korean won and thousands of foreign currencies		
BBVA Colombia	Performance guarantee	USD 11,683	13,692	Fulfillment and correct execution of the contractual obligations for Colombia CPO 2 and CPE 7
Bank of Tokyo Mitsubishi UFJ	Performance guarantee	USD 2,746	3,218	Bank guarantee on exploration operation expenses for Malaysia 2B
Sumitomo Mitsui Banking Corporation	Guarantee for payment in foreign currency	USD 200,000	234,400	Guarantee for the principle and interests of bonds payable
Sumitomo Mitsui Banking Corporation	Guarantee for payment in foreign currency	USD 100,000	117,200	Guarantee for the principle and interests of bonds payable

(d) The Company, in relation to the acquisition of Dana Petroleum Limited's equity interest, has provided a guarantee for any potential environmental and bodily damages during the exploration and production activities by Dana Petroleum Norway AS to the Norwegian government.

(e) In 2007 and 2008, the Company and Korean Consortium entered into an agreement (Production Sharing Contract) for the exploration and production of oil fields located in Iraq, with the Kurdish regional government

("KRG"), in accordance with the local Kurdish oil exploration laws. In 2008, the Iraqi federal government announced that such agreement in the region without obtaining proper approval from the federal government would be invalid to the Company and other participating companies in the region. The Company was advised by legal consultants in the UK and in Iraq that there is no legal basis on the alleged nullity of the agreement by the Iraqi government.

(f) In 2009, the Company entered into an exclusive agreement with the Kurdish regional government ("KRG") to obtain rights on five exploratory areas. In consideration of obtaining these rights, the Company committed to pay USD 1.9 billion of construction services for the government's Social Overhead Capital (SOC).

However, the agreement was amended twice until 2012. The Company's rights on three exploratory areas, including Qush Tappa, were terminated and the Company's USD 1.9 billion commitment was reduced to USD 825 million. In addition, the quantity of return-guaranteed crude oil was reduced.

The Company recorded mining rights in relation to this agreement and the carrying amount as of December 31, 2015 is ₩1,352,580 million. In addition, the Company recorded a current provision in relation to this agreement and the carrying amounts as of December 31, 2015 are ₩183,306 million which represent that the Company's estimated obligation of expected payments for KRG's SOC construction.

(g) The Company is in the process of arranging the liquidation of KNOC Yemen Ltd. with YICOM, an acquirer. According to the arrangement, the Company may have a possibility of settlement, of which the amount cannot be estimated.

(h) The Company and Ecopetrol, the joint venture counterparty, entered into a USD 70 million loan agreement with Offshore International Group Inc. respectively, an investment in joint venture, in February, 2016.

(i) As of December 31, 2015, other significant commitments and contingencies of the Company's subsidiaries are as follows:

(i) Harvest Operations Corp.("Harvest") and its subsidiaries

In October 2010, Harvest issued senior notes amount of USD 500 million (maturing: October 1, 2017). The senior notes are unconditionally guaranteed by all of Harvest's wholly-owned subsidiaries as the incurrence of additional secured indebtedness and dividend payments to the stockholder may be restricted in violation of the covenants associated with the notes.

The Company provided a payment guarantee on senior notes issued by Harvest its subsidiary, on May 2013 for the principal amount of USD 630 million and their corresponding interest. The payment guarantee is effective until the maturity date (May 14, 2018) of the notes.

Harvest entered into a credit facility maturing on April 30, 2017 for CAD 1.0 billion with the Canadian Imperial Bank of Commerce and other financial institutions. Harvest should comply with the required pre-defined financial ratios. However, at December 31, 2015, Harvest is not in compliance with this covenant. In February, Harvest has obtained a formal waiver of the covenant with the lending syndicate until maturity date (April, 2017).

(ii) Dana Petroleum Limited("Dana") and its subsidiaries

Dana entered into credit facilities agreements in a form of syndicated loan for up to USD 1.0 billion. The Company has drawn borrowings amounting to USD 618 million as of December 31, 2015. In relation to the credit facilities, certain financial ratios and cash flows are required to be in compliance with debt covenants and its oil and certain gas properties have been pledged as collateral. Dana is scheduled to have a meeting to deal with covenant waiver with financial institutions in March, 2016.

The Company agreed USD 300 million subordinated loan facility maturing on December 31, 2016 with Dana and the loan has been undrawn at December 31, 2015. In January, 2016, the Company approved an additional USD 300 million subordinated loan facility and changed the maturity date of the total of USD 600 million to December 31, 2018.

The Company provided a performance guarantee of USD 317 million to Dana for the expenses that will incur for restoration of the sites, decommissioning, dismantling and removal of the facilities and structures. A standby L/C open amount is approximately USD 22 million as of December 31, 2015.

(j) As of December 31, 2015, the Group's significant commitments with the financial institutions are as follows:

Detail of contract	Financial institutions	Contractual currency unit	Credit line amount	Executed amount
		In thousands of US dollar		
Trade finance	Deutsche Bank	USD	400,000	—
	DBS(*)	USD	300,000	41,760
	ING(*)	USD	200,000	—
	Hongkong and Shanghai Banking Corporation(*)	USD	100,000	—
	Korea Development Bank	USD	250,000	—
	Bank of America(*)	USD	90,000	—
			1,340,000	41,760
Financial loans	BNP Paribas	USD	500,000	—
	DBS(*)	USD	300,000	—
	Mizuho Bank	USD	200,000	120,000
	Bank of America(*)	USD	90,000	—
	ING(*)	USD	200,000	130,000
	Hongkong and Shanghai Banking Corporation(*)	USD	100,000	—
	Credit. Agricole	USD	100,000	—
	Bank of Tokyo-Mitsubishi UFJ	USD	50,000	—
			1,540,000	250,000

(*) A portion of or all of lines of credit for trade finance and financial loans have been integrated and the integrated line of credit is USD 690 million.

47. Business combination

(a) General information

Harvest Operations Corp., one of the Group's subsidiaries, acquired all of the issued and outstanding common shares of Hunt Oil Company of Canada, Inc. for the year ended December 31, 2015 which was a private oil and gas company with operations immediately offsetting the subsidiary's lands and production in Canada. The acquisition was accounted for as a business combination, and the acquired assets and liabilities were recognized as their provisional fair value. Details of the business combination occurred during the period are as follows:

	Main operation	Acquisition date	Acquired equity interest (%)	Consideration transferred
		In millions of Korean won		
Hunt Oil Company of Canada, Inc.	Oil and gas	2015-02-27	100.00	₩34,520

(b) Identifiable assets and liabilities

As of December 31, 2015, provisional fair values of assets and liabilities acquired by business combination as at the date of acquisition are as follows:

	Amount
	In millions of Korean won
Cash	₩ 2,089
Account receivables	581
Prepaid expenses	194
Property, plant and equipment	41,973
Exploration and evaluation assets	6,222
Deferred tax assets	747
Assets	₩ 51,806
Account payables	₩ (5,712)
Decommissioning liabilities	(2,989)
Deferred tax liabilities	(8,585)
Liabilities	₩(17,286)

(c) As of December 31, 2015, net cash outflow from business combination of current year is as follows:

	Amount
	In millions of Korean won and thousands of foreign currencies
Cash	₩34,520
Cash and cash equivalent received	(2,089)
	₩32,431

48. Date of Authorization for Issue

The Group’s financial statements as of and for the year ended December 31, 2015 will be authorized for issuance on March 4, 2016 at the board of directors’ meeting.

49. Uncertainty of deterioration in operating condition of oil market

The global oil market is confronted with excessive supplies due to an increase in both conventional crude oil and shale oil production from oil producing countries. Continued abundant supplies on the oil market has led to a significant drop in oil prices and as a result, the profitability and financial soundness for the Group has deteriorated as the Group’s major business is Exploration and Production which is highly exposed to fluctuation risk in oil prices.

The Group is carrying forward a scheme to improve the profitability and financial soundness against the unstable oil market. There is a significant uncertainty with respect to the Group’s future business results depending on the fluctuation of oil prices

THE ISSUER

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Contents

Independent Auditors' Report

Based on a report originally issued in Korean

The Board of Directors and Shareholder
Korea National Oil Corporation:

We have audited the accompanying consolidated financial statements of Korea National Oil Corporation and its subsidiaries (the "Group") which comprise the consolidated statements of financial position as of December 31, 2017 and 2016, the consolidated statements of comprehensive loss, changes in equity and cash flows for the years then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Korean International Financial Reporting Standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with Korean Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2017 and 2016 and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with Korean International Financial Reporting Standards.

Emphasis of matter

Without qualifying our opinion, we draw attention to the following:

(1) Uncertainty of Deterioration in Operating Condition of Oil Market

As described in Note 45, imbalance between supply and demand continues to drive low oil prices in the international crude oil market and oil prices are unlikely to increase in a short period of time. There is a significant uncertainty with respect to the Group's future business results depending on the recovery of oil prices. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

(2) Financial Statements Restatement

As described in Note 46, the audited consolidated financial statements have been restated in relations to the accounting change for disposal of headquarters building in Ulsan. We have audited the consolidated financial statements for the year ended December 31, 2017 and issued auditors' report as of February 28, 2018.

Accounting for sale-and-leaseback transaction of headquarters building has been changed from an operating lease to a finance lease. As a result, the Group's net asset decreased ₩55,536 million and loss for the year increased ₩58,616 million.

Other matters

The procedures and practices utilized in the Republic of Korea to audit such consolidated financial statements may differ from those generally accepted and applied in other countries.

We have audited the consolidated financial statements for the year ended December 31, 2017 and issued auditors' report as of February 28, 2018. As describe in emphasis of matter paragraph above, we have reissued the auditors' report as the consolidated financial statements for the year ended December 31, 2017 have been restated. Accordingly, the restated consolidated financial statements for the year ended December 31, 2017 of the Group are different from the consolidated financial statements which have been authorized to issue by the Board of Directors on February 28, 2018. We have performed further audit procedures to express an opinion on the restated consolidated financial statements for the year ended December 31, 2017.

As described above, the auditors' report issued on February 28, 2018 is no longer effective, and therefore, shall not be used in relation to the consolidated financial statements for the year ended December 31, 2017, as the consolidated financial statements for the year ended December 31, 2017 have been restated.

KPMG Samjong Accounting Corp.

Seoul, Korea
February 28, 2018 (Except for the items in note 46)
June 12, 2018 (The date of the end of audit procedures performed only for the corrected misstatements in note 46)

This report is effective as of June 12, 2018, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that the above audit report has not been updated to reflect the impact of such subsequent events or circumstances, if any.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Financial Position
As of December 31, 2017 and 2016

In thousands of Korean won	***Notes***		**2017**	**2016**
Assets				
Cash and cash equivalents	8,39,41	₩	791,075,068	812,651,226
Current financial assets	9,10,13,14,15,39,40,41		24,710,087	19,007,401
Trade and other receivables, net	11,39,41		556,269,282	567,212,371
Inventories, net	16		88,273,335	125,113,992
Current income tax assets			37,055,000	15,439,429
Current non-financial assets	18		117,277,633	69,817,482
Assets held for sale	6,17		3,471,555	-
Current assets			1,618,131,960	1,609,241,901
Non-current financial assets, net	9,10,12,13,14,39,40,41		622,446,995	884,446,230
Long-term trade and other receivables	11,39,41,46		97,767,935	118,664,070
Property, plant and equipment, net	20,46		9,023,670,970	10,174,928,224
Goodwill	21		147,854,169	244,328,694
Intangible assets other than goodwill, net	22		2,934,334,387	3,587,399,646
Investments in associates and joint ventures	19		281,259,417	390,475,565
Deferred tax assets	37,46		1,218,914,526	1,154,541,941
Non-current non-financial assets	18		3,547,621,284	3,903,169,409
Non-current assets			17,873,869,683	20,457,953,779
Total assets		₩	19,492,001,643	22,067,195,680

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Financial Position, Continued
As of December 31, 2017 and 2016

In thousands of Korean won	***Notes***		**2017**	**2016**
Liabilities				
Trade and other payables	23,39,41,43,46	₩	786,399,194	973,354,166
Current financial liabilities	10,24,39,40,41,43		3,252,096,536	3,208,454,829
Current income tax liabilities	46		9,459,405	9,868,339
Current non-financial liabilities	27,46		108,686,434	85,103,193
Current provisions	26		94,440,202	155,940,533
Current liabilities			4,251,081,771	4,432,721,060
Long-term trade and other payables	23,39,41,43,46		503,799,162	293,433,599
Non-current financial liabilities	10,24,39,40,41,43		10,096,071,773	11,495,471,823
Non-current non-financial liabilities	27,46		42,607,876	-
Employee benefits, net	25		8,293,543	14,730,311
Deferred tax liabilities	37		132,817,193	291,310,490
Non-current provisions	26		2,020,256,660	2,030,796,036
Non-current liabilities			12,803,846,207	14,125,742,259
Total liabilities		₩	17,054,927,978	18,558,463,319
Equity				
Share capital	28		10,434,864,780	10,346,851,780
Accumulated deficit	29,46		(8,463,172,816)	(7,633,552,073)
Other components of equity	31		(576,845,327)	(314,455,121)
Equity attributable to the owner of the Company			1,394,846,637	2,398,844,586
Non-controlling interests			1,042,227,028	1,109,887,775
Total equity		₩	2,437,073,665	3,508,732,361
Total equity and liabilities		₩	19,492,001,643	22,067,195,680

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Comprehensive Loss
For the years ended December 31, 2017 and 2016

In thousands of Korean won	***Notes***		**2017**	**2016 (Restated) (Note 7)**
Continuing Operations				
Revenue	6,32	₩	2,312,485,962	2,424,966,928
Cost of sales	6,38		1,850,289,885	2,397,156,177
Gross profit	6		462,196,077	27,810,751
Selling and administrative expenses	6,38,46		286,324,859	260,114,038
Operating profit (loss)	6		175,871,218	(232,303,287)
Other non-operating income	6,33		152,268,721	235,672,964
Other non-operating expenses	6,33		207,235,979	26,243,896
Other loss, net	6,34,46		(463,149,784)	(422,718,978)
Finance income	6,35,39,46		304,558,480	182,857,191
Finance costs	6,36,39,46		710,411,647	820,782,736
Loss on investments in associates and joint ventures, net	6,19		(127,487,447)	(239,808,380)
Loss before income tax	6		(875,586,438)	(1,323,327,122)
Income tax benefit	37,46		(194,163,332)	(211,684,112)
Loss from continuing operations			(681,423,106)	(1,111,643,010)
Discontinued operations				
Loss from discontinued operations, net of tax			(52,337,450)	(7,203,465)
Loss for the year		₩	(733,760,556)	(1,118,846,475)
Other comprehensive income (loss)				
Items that will never be reclassified subsequently to profit or loss				
Actuarial gains (losses) on defined benefit plans, net of tax	25,29		3,141,590	(1,758,211)
Retained earnings adjustments in equity method, net of tax			(48,043)	11,669
Items that are or may be reclassified subsequently to profit or loss				
Net change in the unrealized fair value of available-for-sale financial assets, net of tax	12,39		(5,920,445)	(2,478,854)
Net change in fair value of available-for-sale financial assets reclassified to profit or loss, net of tax	12,39		(58,177,009)	-
Equity adjustments arising from investments in equity-method investees, net of tax	19		5,278,959	(4,064,426)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	10,39		(48,425,006)	(967,374)
Net change in fair value of derivatives using cash flow hedge accounting reclassified to profit or loss, net of tax	10,39		1,093,830	-
Foreign currency translation differences for foreign operations			(285,311,995)	(103,397,053)
Other comprehensive loss for the year, net of tax			(388,368,119)	(112,654,249)
Total comprehensive loss for the year		₩	(1,122,128,675)	(1,231,500,724)
Income (loss) attributable to:				
Owners of the Company			(832,714,290)	(1,091,916,698)
Non-controlling interests			98,953,734	(26,929,777)
Loss for the year			(733,760,556)	(1,118,846,475)
Total comprehensive income (loss) attributable to:				
Owners of the Company			(1,092,010,949)	(1,241,709,928)
Non-controlling interests			(30,117,726)	10,209,204
Total comprehensive loss for the year		₩	(1,122,128,675)	(1,231,500,724)

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Changes in Equity

For the years ended December 31, 2017 and 2016

In thousands of Korean won		Attributable to owners of the Company					
		Share capital	Accumulated deficit	Other components of equity	Subtotal	Non-controlling interests	Total equity
Balance as of January 1, 2016	₩	10,207,845,780	(6,539,888,833)	(166,408,433)	3,501,548,514	694,045,051	4,195,593,565
Total comprehensive loss for the year							
Loss for the year		-	(1,091,916,698)	-	(1,091,916,698)	(26,929,777)	(1,118,846,475)
Items that will not be reclassified subsequently to profit or loss							
Actuarial losses on defined benefit plan, net of tax		-	(1,758,211)	-	(1,758,211)	-	(1,758,211)
Retained earnings adjustments in equity method, net of tax		-	11,669	-	11,669	-	11,669
Items that may be reclassified subsequently to profit or loss							
Net change in the unrealized fair value of available-for-sale financial assets, net of tax		-	-	(2,478,854)	(2,478,854)	-	(2,478,854)
Equity adjustments arising from investments in equity-method investees, net of tax		-	-	(4,064,426)	(4,064,426)	-	(4,064,426)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax		-	-	(967,374)	(967,374)	-	(967,374)
Foreign currency translation differences for foreign operations		-	-	(140,536,034)	(140,536,034)	37,138,981	(103,397,053)
Total comprehensive income (loss) for the year		-	(1,093,663,240)	(148,046,688)	(1,241,709,928)	10,209,204	(1,231,500,724)
Transactions with owners of the Company, recognized directly in equity							
Issuance of share capital		139,006,000	-	-	139,006,000	-	139,006,000
Dividends paid		-	-	-	-	(46,420,000)	(46,420,000)
Contribution by non-controlling interests		-	-	-	-	452,053,520	452,053,520
Total transactions with owners of the Company		139,006,000	-	-	139,006,000	405,633,520	544,639,520
Balance as of December 31, 2016	₩	10,346,851,780	(7,633,552,073)	(314,455,121)	2,398,844,586	1,109,887,775	3,508,732,361

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Changes in Equity, Continued
For the years ended December 31, 2017 and 2016

In thousands of Korean won		Attributable to owners of the Company					
		Share capital	Accumulated deficit	Other components of equity	Subtotal	Non-controlling interests	Total equity
Balance as of January 1, 2017	₩	10,346,851,780	(7,633,552,073)	(314,455,121)	2,398,844,586	1,109,887,775	3,508,732,361
Total comprehensive loss for the year							
Loss for the year		-	(832,714,290)	-	(832,714,290)	98,953,734	(733,760,556)
Items that will not be reclassified subsequently to profit or loss							
Defined benefit plan actuarial gains, net of tax		-	3,141,590	-	3,141,590	-	3,141,590
Retained earnings adjustments in equity method, net of tax		-	(48,043)	-	(48,043)	-	(48,043)
Items that may be reclassified subsequently to profit or loss							
Net change in the unrealized fair value of available-for-sale financial assets, net of tax		-	-	(5,920,445)	(5,920,445)	-	(5,920,445)
Net change in fair value of available-for-sale financial assets reclassified to profit or loss, net of tax		-	-	(58,177,009)	(58,177,009)	-	(58,177,009)
Equity adjustments arising from investments in equity-method investees, net of tax		-	-	5,278,959	5,278,959	-	5,278,959
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax		-	-	(48,425,006)	(48,425,006)	-	(48,425,006)
Net change in fair value of derivatives using cash flow hedge accounting reclassified to profit or loss, net of tax		-	-	1,093,830	1,093,830	-	1,093,830
Foreign currency translation differences for foreign operations		-	-	(156,240,535)	(156,240,535)	(129,071,460)	(285,311,995)
Total comprehensive loss for the year		-	(829,620,743)	(262,390,206)	(1,092,010,949)	(30,117,726)	(1,122,128,675)
Transactions with owners of the Company, recognized directly in equity							
Issuance of share capital		88,013,000	-	-	88,013,000	-	88,013,000
Dividends paid		-	-	-	-	(35,007,112)	(35,007,112)
Distribution to non-controlling interests		-	-	-	-	(2,535,909)	(2,535,909)
Total transactions with owners of the Company		88,013,000	-	-	88,013,000	(37,543,021)	50,469,979
Balance as of December 31, 2017	₩	10,434,864,780	(8,463,172,816)	(576,845,327)	1,394,846,637	1,042,227,028	2,437,073,665

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Cash Flows
For the years ended December 31, 2017 and 2016

In thousands of Korean won		**2017**	**2016**
Cash flows from operating activities			
Loss for the year	₩	(733,760,556)	(1,118,846,475)
Adjustment for:			
Severance and retirement benefits		10,013,447	9,656,685
Depreciation		806,411,988	953,689,274
Amortization of intangible assets other than goodwill		98,482,908	151,930,271
Bad debt expense		-	428,504
Reversal of other bad debt allowance		(7,937,647)	(670,562)
Gains on exemption of debts		(76,743,985)	(220,473,024)
Loss on cancellation of debt exemption		2,701,210	-
Non-operating income from overseas oil fields (other income)		(3,914,767)	(7,265,315)
Interest costs on provision for decommissioning		73,316,028	93,005,038
Other bad debt expense		180,185,957	14,521,334
Gains on disposal of property, plant and equipment		(2,130,079)	(55,943,249)
Gains on disposal of intangible assets other than goodwill		-	(483,491)
Reversal of impairment losses on property, plant and equipment		(163,644,901)	(400,959,457)
Reversal of impairment losses on intangible assets other than goodwill		-	(6,416,059)
Gains on foreign currency translation (other profit or loss)		(39,594,669)	(21,467,246)
Losses on disposal of property, plant and equipment		182,050	9,045,000
Losses on disposal of intangible assets other than goodwill		3,524,172	66,325,786
Losses on valuation of inventories		6,820,816	-
Losses on valuation of derivatives (other profit or loss)		-	3,164,396
Impairment losses on property, plant and equipment		363,206,306	433,606,570
Impairment losses on intangible assets other than goodwill		227,051,386	345,031,887
Impairment losses on goodwill		87,470,422	32,440,037
Losses on foreign currency translation (other profit or loss)		45,109,552	26,709,709
Income tax benefit		(199,940,426)	(214,127,410)
Interest income		(50,601,455)	(37,816,259)
Dividends income		(9,991)	(24,114)
Gains on disposal of available-for-sale financial investments		-	(26,232,279)
Gains on repayment of financial liabilities		(1,583,427)	(17,233,744)
Gains on transaction of derivatives (finance income)		(1,168,345)	(737,705)
Gains on foreign currency translation (finance income)		(143,659,143)	(60,053,861)
Interest expense		401,018,825	424,597,942
Impairment losses on available-for-sale financial assets		71,585,757	45,576,708
Losses on transaction of derivatives (finance cost)		11,604,928	5,748,906
Loss on valuation of derivatives (finance cost)		25,305,094	-
Losses on foreign currency translation (finance cost)		93,114,772	205,689,862
Other finance costs (interest expense)		26,610,339	32,224,499
Share of loss in associates and joint ventures		128,645,527	131,858,177
Share of gain in associates and joint ventures		(6,684,312)	(10,176,936)
Impairment losses on investments in associates and joint ventures		5,526,231	118,139,758
Gains on disposal of investments in associates and joint ventures		-	(12,620)
		1,970,274,568	2,023,297,012
Changes in:			
Inventories		21,542,265	43,869,162
Trade and other receivables		(84,476,210)	155,555,916
Other receivables from operating activities		(67,541,088)	48,398,420
Trade and other payables		89,645,401	(126,602,890)
Other payables from operating activities		17,104,940	(54,297,941)
Defined benefit liability		(4,700,902)	(3,682,234)
Provisions		(61,140,231)	(60,170,625)
		(89,565,825)	3,069,808

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES
Consolidated Statements of Cash Flows, Continued
For the years ended December 31, 2017 and 2016

In thousands of Korean won		2017	2016
Cash generated from operating activities	₩	1,146,948,187	907,520,345
Dividend received		24,242,702	14,700,343
Interest paid		(472,962,743)	(477,471,075)
Interest received		68,773,996	17,832,607
Income tax paid		(71,619,868)	(90,667,506)
Net cash provided by operating activities	₩	695,382,274	371,914,714
Cash flows from investing activities:			
Proceeds from disposal of investments in associates and joint ventures		-	3,626,880
Acquisition of investments in associates and joint ventures		(19,932,879)	(42,176,384)
Proceeds from disposal of property, plant and equipment		216,130,892	86,560,097
Acquisition of property, plant and equipment		(801,791,485)	(640,995,307)
Proceeds from disposal of intangible assets other than goodwill		11,920	5,725,944
Acquisition of intangible assets other than goodwill		(27,933,109)	(44,334,731)
Acquisition of non-current non-financial assets		(92,476,135)	(90,792,457)
Proceeds from disposal of available-for-sale financial investments		-	67,184,859
Acquisition of available-for-sale financial investments		(17,744)	-
Increase in long-term and short-term financial assets		(206,429,516)	-
Decrease in long-term and short-term financial assets		206,192,617	66,804
Increase in leasehold deposits provided		(21,506,145)	(18,364,281)
Decrease in leasehold deposits provided		1,066,154	16,059,739
Increase in short-term and long-term loans		(59,686,502)	(107,154,291)
Collection of short-term and long-term loans		23,259,743	10,576,677
Increase in leasehold deposits received		476,209	1,988,940
Decrease in leasehold deposits received		-	(29,786)
Net cash used in investing activities	₩	(782,635,980)	(752,057,297)
Cash flow from financing activities			
Proceeds from increase in share capital		88,013,000	139,006,000
Proceeds from short-term borrowings		152,272,880	698,772,900
Repayments of short-term borrowings		(801,762,951)	(1,149,502,996)
Proceeds from issue of bond payables		2,209,147,968	2,576,075,381
Repayments of bond payables		(1,946,543,420)	(2,165,791,933)
Proceeds from long-term borrowings		801,623,879	34,826,579
Repayments of long-term borrowings		(242,928,671)	(87,824,325)
Dividends paid		(35,007,112)	(46,420,000)
Repayments of finance lease liability		(7,855,845)	-
Net cash inflow from contribution by non-controlling interests		-	452,053,520
Net cash outflow due to other distribution to non-controlling interests		(2,535,909)	-
Net cash provided by financing activities	₩	214,423,819	451,195,126

See accompanying notes to the consolidated financial statements.

KOREA NATIONAL OIL CORPORATION AND SUBSIDIARIES

Consolidated Statements of Cash Flows, Continued

For the years ended December 31, 2017 and 2016

In thousands of Korean won		2017	2016
Net increase in cash and cash equivalents before net effect of foreign exchange differences	₩	127,170,113	71,052,543
Effect of exchange rate fluctuations on cash held		(152,866,817)	(44,431,621)
Net Increase (decrease) in cash and cash equivalents		(25,696,704)	26,620,922
Cash and cash equivalents as of January 1		816,816,506	790,195,584
Cash and cash equivalents as of December 31 before deduction of government grants		791,119,802	816,816,506
Government grants		(44,734)	(4,165,280)
Cash and cash equivalents as of December 31 after deduction of government grants	₩	791,075,068	812,651,226

See accompanying notes to the consolidated financial statements.

1. Reporting Entity

(a) Description of the controlling company

Korea National Oil Corporation (the "Company" or the "Parent Company") was incorporated on March 3, 1979 to engage in the development of oil fields, distribution of crude oil, maintenance of petroleum reserve stock and improvement of the petroleum distribution infrastructure under the Korea National Oil Corporation Act. The Company's head office is located at 305, Jongga-Ro, Jung-Gu, Ulsan in Korea. The Company also has 9 petroleum stockpile sites, 1 domestic gas field management office, 1 overseas office in Kazakhstan and overseas subsidiaries and affiliates in the United States and other countries.

As of December 31, 2017, the Company's share capital is ₩10,434,865 million, which is wholly owned by the government of the Republic of Korea.

The consolidated financial statements comprise the Company and its subsidiaries (together referred to as the "Group" and individually as "Group entities") and the Group's interests in associates and joint ventures.

The list of subsidiaries as of December 31, 2017 and 2016 is disclosed in Note 5.

2. Basis of Preparation

(a) Statement of compliance

The consolidated financial statements have been prepared in accordance with Korean International Financial Reporting Standards ("K-IFRS"), as prescribed in the Act on External Audits of Corporations in the Republic of Korea.

The consolidated financial statements were authorized for issue by the Board of Directors on June 12, 2018.

(b) Basis of measurement

The consolidated financial statements have been prepared on the historical cost basis, except for the following material items in the statement of financial position:

- ✓ derivative financial instruments are measured at fair value
- ✓ financial instruments at fair value through profit or loss are measured at fair value
- ✓ available-for-sale financial assets are measured at fair value
- ✓ investments in associates and joint venture are measured at fair value
- ✓ liabilities for defined benefit plans are recognized at the net of the total present value of defined benefit obligations less the fair value of plan assets

2. Basis of Preparation, Continued

(c) Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the 'functional currency'). The accompanying consolidated financial statements are prepared in the Group's functional currency, the United States dollar, and presented in Korean won, the Group's presentation currency, for the financial reporting purposes in accordance with K-IFRS No. 1021, 'The Effects of Changes in Foreign Exchange Rates'. The Group is required to present its financial statements in Korean won in accordance with regulations in Korea.

Assets and liabilities for each statement of financial position presented (i.e. including comparatives) were translated at the closing rate at the date of that statement of financial position, income and expenses for each statement presenting profit or loss and other comprehensive income (i.e. including comparatives) were translated at the average exchange rates of the period and all resulting exchange differences were recognized in other comprehensive income.

(d) Use of estimates and judgments

The preparation of the consolidated financial statements in conformity with K-IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimates are revised and in any future periods affected.

(i) Management's judgment
Information about critical judgments in applying accounting policies that have the most significant effect on the amounts recognized in the consolidated financial statements is included in the following notes

Note 19: Investments in Associates and Joint Ventures – classification of a joint arrangement

(ii) Assumptions and estimation uncertainties
Information about assumptions and estimation uncertainties that have a significant risk of resulting in a material adjustment within the next financial year are included in the following notes

Note 19: Investments in Associates and Joint Ventures – main assumptions for recoverable amounts
Note 20: Property, Plant and Equipment – estimation of factors for depreciation and recoverable amount
Note 21: Goodwill – main assumptions for recoverable amounts
Note 22: Intangible assets other than goodwill – main assumptions for recoverable amounts
Note 25: Employee Benefits – main actuarial assumptions
Note 26 and 44: Provisions and Contingencies – assumptions for possibility of cash outflows and their amounts
Note 37: Income tax benefit – possibility of realization of deferred tax assets

2. Basis of Preparation, Continued

(d) Use of estimates and judgments, continued

(iii) Measurement of fair value

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities. The Group has an established control framework with respect to the measurement of fair values. This includes a valuation team that has overall responsibility for overseeing all significant fair value measurements, including Level 3 fair values, and reports directly to the CFO.

The valuation team regularly reviews significant unobservable inputs and valuation adjustments. If third party information, such as broker quotes or pricing services, is used to measure fair values, then the valuation team assesses the evidence obtained from the third parties to support the conclusion that such valuations meet the requirements of K-IFRS, including the level in the fair value hierarchy in which such valuations should be classified.

When measuring the fair value of an asset or a liability, the Group uses market observable data as far as possible. Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows.

· Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
· Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
· Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or a liability fall into different levels of the fair value hierarchy, then the fair value measurement is categorized in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

Information about the assumptions made in measuring fair values is included in the following notes:

Note 39 – Categories of financial instruments
Note 41 – Risk Management

3. Changes in Accounting Policies

Except for the changes below, the Group has consistently applied the accounting policies set out in note 4 to all periods presented in these consolidated financial statements. The Group has adopted the following amendments to standards with a date of initial application of January 1, 2017.

(a) K-IFRS No. 1007 'Statement of Cash Flows'

Amendments to K-IFRS No. 1007, 'Statement of Cash Flows' require an entity to disclose changes from financing cash flows, changes arising from obtaining or losing control of subsidiaries or other businesses, the effect of changes in foreign exchange rates, changes in fair values and other changes in liabilities arising from financing activities. K-IFRS No. 1007 does not require the disclosure of comparative information of prior year. The related disclosures are included in note 43.

(b) K-IFRS No. 1012 'Income taxes'

Amendments to K-IFRS No. 1012, in the case of debt instruments evaluated with fair values, deferred tax accounting treatment is clarified, as the temporary difference is calculated from the difference between the carrying amount and taxable base amount of the debt liabilities, regardless of the expected recovery method. When reviewing the feasibility of deferred tax assets, if there is sufficient evidence that it is likely to recover some part of an entity's assets in excess of the carrying amount, the estimated amount of future taxable income would be included in the estimated future taxable income. In addition, future taxable income estimates are calculated as the amount before deducting the deductible (deduction) effect from deductible temporary differences.

(c) Impact of changes in accounting policies.

Management believes the impact of the amendments on the Group's consolidated financial statements is not significant, and the Group did not retrospectively apply the amendments to K-IFRS No. 1212 stated above.

4. Significant Accounting Policies

The significant accounting policies applied by the Group in preparation of its consolidated financial statements are included below. The accounting policies set out below have been applied consistently to all periods presented in these consolidated financial statements, except for changes in accounting policies as explained in note 3.

(a) Basis of consolidation

(i) Non-controlling interests

Non-controlling interests are measured at their proportionate share of the acquiree's identifiable net assets at the date of acquisition. Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

(ii) Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

(iii) Loss of control

When the Group loses control over a subsidiary, it derecognizes the assets and liabilities of the subsidiary, and any related NCI and other components of equity. Any resulting gain or loss is recognized in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

4. Significant Accounting Policies, Continued

(a) Basis of consolidation, continued

(iv) Interests in equity-accounted investees

The Group's interests in equity-accounted investees comprise interests in associates and a joint venture. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies. A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities.

Interests in associates and the joint venture are accounted for using the equity method. They are initially recognized at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and OCI of equity-accounted investees, until the date on which significant influence or joint control ceases.

(v) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealized income and expenses arising from intra-group transactions, are eliminated. Unrealized gains arising from transactions with equity-accounted investees are eliminated against the investment to the extent of the Group's interest in the investee. Unrealized losses are eliminated in the same way as unrealized gains, but only to the extent that there is no evidence of impairment.

(b) Discontinued operations

The Group classifies its business segment or subsidiary as discontinued operation when it disposes a separate line of business or a segment, meets the criteria for assets held for sale, or acquires a subsidiary for sole purpose of sale. The consolidated statements of comprehensive income should be restated as if the operations have been discontinued from the beginning of the comparative fiscal period.

(c) Cash and cash equivalents

Cash and cash equivalents comprise cash on hand, demand deposits, and short-term investments in highly liquid securities that are readily convertible to known amounts of cash with maturities of three months or less from the acquisition date and which are subject to an insignificant risk of changes in value. Equity investments are excluded from cash and cash equivalents unless they are, in substance, cash equivalents, for example in the case of preferred shares when it has a short maturity with a specified redemption date.

4. Significant Accounting Policies, Continued

(d) Inventories

Inventories are measured at the lower of cost and net realizable value. The cost of inventories is based on the moving-weighted average method, and includes expenditures for acquiring the inventories, production or conversion costs and other costs incurred in bringing them to their existing location and condition. Net realizable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and selling expenses.

The amount of any write-down of inventories to net realizable value and all losses of inventories are recognized as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realizable value, are recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

(e) Non-derivative financial assets

The Group recognizes and measures non-derivative financial assets by the following four categories: financial assets at fair value through profit or loss, held-to-maturity investments, loans and receivables and available-for-sale financial assets. The Group recognizes financial assets in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the instrument.

Upon initial recognition, non-derivative financial assets are measured at their fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the asset's acquisition or issuance.

(i) Financial assets at fair value through profit or loss

A financial asset is classified as financial assets are classified at fair value through profit or loss if it is held for trading or is designated as such upon initial recognition. Upon initial recognition, transaction costs are recognized in profit or loss when incurred. Financial assets at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss.

(ii) Held-to-maturity investments

A non-derivative financial asset with a fixed or determinable payment and fixed maturity, for which the Group has the positive intention and ability to hold to maturity, are classified as held-to-maturity investments. Subsequent to initial recognition, held-to-maturity investments are measured at amortized cost using the effective interest method.

(iii) Loans and receivables

Loans and receivables are financial assets with fixed or determinable payments that are not quoted in an active market. Subsequent to initial recognition, loans and receivables are measured at amortized cost using the effective interest method except for loans and receivables of which the effect of discounting is immaterial.

4. Significant Accounting Policies, Continued

(e) Non-derivative financial assets, continued

(iv) Available-for-sale financial assets

Available-for-sale financial assets are those non-derivative financial assets that are designated as available-for-sale or are not classified as financial assets at fair value through profit or loss, held-to-maturity investments or loans and receivables. Subsequent to initial recognition, they are measured at fair value, which changes in fair value, net of any tax effect, recorded in other comprehensive income in equity. Investments in equity instruments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured and derivatives that are linked to and must be settled by delivery of such unquoted equity instruments are measured at cost.

(v) De-recognition of financial assets

The Group derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows on the financial asset in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. Any interest in transferred financial assets that is created or retained by the Group is recognized as a separate asset or liability.

If the Group retains substantially all the risks and rewards of ownership of the transferred financial assets, the Group continues to recognize the transferred financial assets and recognizes financial liabilities for the consideration received.

(vi) Offsetting between financial assets and financial liabilities

Financial assets and financial liabilities are offset and the net amount is presented in the consolidated statement of financial position only when the Group currently has a legally enforceable right to offset the recognized amounts, and there is the intention to settle on a net basis or to realize the asset and settle the liability simultaneously.

4. Significant Accounting Policies, Continued

(f) Derivative financial instruments, including hedge accounting

Derivatives are initially recognized at fair value. Subsequent to initial recognition, derivatives are measured at fair value, and changes therein are accounted for as described below.

(i) Hedge accounting

The Group holds forward exchange contracts, interest rate swaps, currency swaps and other derivative contracts to manage interest rate risk and foreign exchange risk. The Group designated derivatives as hedging instruments to hedge the risk of changes in the fair value of assets, liabilities or firm commitments (a fair value hedge) and foreign currency risk of highly probable forecasted transactions or firm commitments (a cash flow hedge).

On initial designation of the hedge, the Group formally documents the relationship between the hedging instrument(s) and hedged item(s), including the risk management objectives and strategy in undertaking the hedge transaction, together with the methods that will be used to assess the effectiveness of the hedging relationship.

Fair value hedge
Changes in the fair value of a derivative hedging instrument designated as a fair value hedge are recognized in gain or loss. The gain or loss from remeasuring the hedging instrument at fair value for a derivative hedging instrument and the gain or loss on the hedged item attributable to the hedged risk are recognized in profit or loss in the same line item of the consolidated statement of comprehensive income.

The Group discontinues fair value hedge accounting if the hedging instrument expires or is sold, terminated or exercised, or if the hedge no longer meets the criteria for hedge accounting. Any adjustment arising from gain or loss on the hedged item attributable to the hedged risk is amortized to profit or loss from the date the hedge accounting is discontinued.

Cash flow hedge
When a derivative is designated to hedge the variability in cash flows attributable to a particular risk associated with a recognized asset or liability or a highly probable forecasted transaction that could affect profit or loss, the effective portion of changes in the fair value of the derivative is recognized in other comprehensive income, net of tax, and presented in the hedging reserve in equity. Any ineffective portion of changes in the fair value of the derivative is recognized immediately in profit or loss.

If the hedging instrument no longer meets the criteria for hedge accounting, expires or is sold, terminated, exercised, or the designation is revoked, then hedge accounting is discontinued prospectively. The cumulative gain or loss on the hedging instrument that has been recognized in other comprehensive income is reclassified to profit or loss in the periods during which the forecasted transaction occurs. If the forecasted transaction is no longer expected to occur, then the balance in other comprehensive income is recognized immediately in profit or loss.

4. Significant Accounting Policies, Continued

(f) Derivative financial instruments, including hedge accounting, continued

(ii) Separable embedded derivatives

Embedded derivatives are separated from the host contract and accounted for separately only if the following criteria have been met:

① The economic characteristics and risks of the embedded derivative are not closely related to those of the host contract;
② A separate instrument with the same terms as the embedded derivative would meet the definition of a derivative; and
③ The hybrid instrument is not measured at fair value with changes in fair value recognized in profit or loss.

Changes in the fair value of separable embedded derivatives are recognized immediately in profit or loss.

(iii) Other derivative financial instruments

Changes in the fair value of other derivative financial instrument not designated as a hedging instrument are recognized immediately in profit or loss.

(g) Impairment of financial assets

A financial asset not carried at fair value through profit or loss is assessed at each reporting date to determine whether there is objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that a loss event has occurred after the initial recognition of the asset, and that the loss event had a negative effect on the estimated future cash flows of that asset that can be estimated reliably. However, losses expected as a result of future events, regardless of likelihood, are not recognized.

If there is objective evidence that financial instruments are impaired, impairment losses are measured and recognized. In addition, for an investment in an equity security, a significant or prolonged decline in its fair value below its cost is objective evidence of impairment.

(i) Financial assets measured at amortized cost

An impairment loss in respect of a financial asset measured at amortized cost is calculated as the difference between its carrying amount and the present value of its estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognized in profit or loss and reflected in an allowance account. When the Group considers that there are no realistic prospects of recovery of the asset, the relevant amounts are written off. If the amount of impairment loss subsequently decreases and the decrease can be related objectively to an event occurring after the impairment was recognized, then the previously recognized impairment loss is reversed through profit or loss either directly or by adjusting an allowance account.

4. Significant Accounting Policies, Continued

(g) Impairment of financial assets, continued

(ii) Financial assets carried at cost

If there is objective evidence that an impairment loss has occurred on an unquoted equity instrument that is not carried at fair value because its fair value cannot be reliably measured, or on a derivative asset that is linked to and must be settled by delivery of such an unquoted equity instrument, the amount of the impairment loss is measured as the difference between the carrying amount of the financial asset and the present value of estimated future cash flows discounted at the current market rate of return for a similar financial asset. Such impairment losses shall not be reversed.

(iii) Available-for-sale financial assets

When a decline in the fair value of an available-for-sale financial asset has been recognized in other comprehensive income and there is objective evidence that the asset is impaired, the cumulative loss that had been recognized in other comprehensive income shall be reclassified from equity to profit or loss as a reclassification adjustment even though the financial asset has not been derecognized. Impairment losses recognized in profit or loss for an investment in an equity instrument classified as available-for-sale shall not be reversed through profit or loss. If, in a subsequent period, the fair value of a debt instrument classified as available-for-sale increases and the increase can be objectively related to an event occurring after the impairment loss was recognized in profit or loss, the impairment loss shall be reversed, with the amount of the reversal recognized in profit or loss.

(h) Property, plant and equipment

Property, plant and equipment are initially measured at cost and after initial recognition, are carried at cost less accumulated depreciation and accumulated impairment losses. The cost of property, plant and equipment includes expenditures arising directly from the construction or acquisition of the asset, any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management and the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

The following costs are capitalized as oil and gas properties.

- the costs incurred in development stage for constructing facilities and drilling wells for production
- the costs of acquiring production areas or fields with proved reserves
- the construction costs and other expenditures for initiating production
- the estimated costs for decommissioning

Additionally, the Group depreciates the acquisition costs of oil and gas properties which are aggregated on an area-by-area basis or field-by-field basis. For the costs of oil and gas properties which are aggregated on an area-by-area basis, the Group depreciates the acquisition costs using proved reserves as the total estimated production when applying the unit-of-production depreciation method. For the costs of oil and gas properties which are aggregated on a field-by-field basis, the Group depreciates the acquisition costs using proved developed reserves as the total estimated production when applying the unit-of-production depreciation method.

4. Significant Accounting Policies, Continued

(h) Property, plant and equipment, continued

Costs related to undeveloped oil and gas properties are not immediately included in the depletable pool of developed assets but are transferred to the depletable pool as the reserves become proved (for area-by-area basis) or developed (for field-by-filed basis) through drilling activities.

Subsequent costs are recognized in the carrying amount of property, plant and equipment at cost or, if appropriate, as separate items if it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of the replaced part is derecognized. The costs of the day-to-day servicing are recognized in profit or loss as incurred.

Property, plant and equipment, except for land and oil and gas properties, are depreciated on a straight-line basis over estimated useful lives that appropriately reflect the pattern in which the asset's future economic benefits are expected to be consumed.

	Useful lives (years)
Buildings	20 ~ 40 years
Structures	20 ~ 40 years
Machineries	5 ~ 20 years
Vessels	20 years
Tools and fixtures	5 years
Vehicles	5 years

Gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment and are recognized in profit or loss. Depreciation methods, useful lives and residual values are reviewed at the end of each reporting date and adjusted, if appropriate. The change is accounted for as a change in an accounting estimate.

(i) Intangible assets

Intangible assets with finite useful lives acquired separately are carried at cost. Intangible assets acquired in a business combination are initially recognized at their fair value at the acquisition date (which is regarded as their cost). Subsequent to initial recognition, intangible assets acquired in a business combination are reported at cost less accumulated amortization and accumulated impairment losses.

Prior to acquiring the legal rights to explore an area, all costs related to exploration and evaluation of an area are charged directly to the statement of comprehensive loss. Once the legal rights to explore are acquired, all costs associated with acquisition of exploration rights, geological, geophysical and geographical research, drilling costs and evaluation of technical and commercial viability of economic production are capitalized as exploration and evaluation assets. All such costs are subject to review for impairment when facts and circumstances suggest that the carrying amount of the assets exceeds their recoverable amount. When technical feasibility and commercial viability are established, the relevant expenditure is transferred to oil and gas properties after impairment is assessed and any resulting impairment loss is recognized. If no potentially commercial petroleum is discovered from exploration drilling, the relating exploration and evaluation assets are written off through the statement of comprehensive loss.

4. Significant Accounting Policies, Continued

(i) Intangible assets, continued

The useful lives of intangible assets are assessed as either finite or indefinite. Intangible assets with finite lives are amortized over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. The amortization period and the amortization method for intangible assets with a finite useful lives are reviewed at least each financial year end. Changes in the expected useful life or the expected pattern of consumption of future economic benefits embodied in the asset is accounted for by changing the amortization period or method, as appropriate, and are treated as changes in accounting estimates. The amortization expense on intangible assets with finite lives is recognized in the statement of comprehensive income in the expense category consistent with the function of the intangible asset.

Intangible assets with indefinite useful lives such as membership are not amortized, but are tested for impairment annually. Intangible assets with definite useful lives are amortized on a straight-line basis over estimated useful lives of 5 to 20 years.

Gains or losses arising from derecognition of an intangible asset, measured as the difference between the net disposal proceeds and the carrying amount of the asset, and are recognized in income or loss when the asset is derecognized.

(j) Oil stockpiles

The Group stockpiles crude oil and petroleum products to stabilize domestic demand and market prices and classifies those assets as oil stockpiles (non-current non-financial assets) of which the cost is determined using the moving-average method. The Group performs annual impairment test for oil stockpiles.

(k) Borrowing costs

The Group capitalizes borrowing costs directly attributable to the acquisition, construction or production of a qualifying asset as part of the cost of that asset. Other borrowing costs are recognized in expense as incurred. A qualifying asset is an asset that requires a substantial period of time to get ready for its intended use or sale. Financial assets and inventories that are manufactured or otherwise produced over a short period of time are not qualifying assets. Assets that are ready for their intended use or sale when acquired are not qualifying assets.

To the extent that the Group borrows funds specifically for the purpose of obtaining a qualifying asset, the Group determines the amount of borrowing costs eligible for capitalization as the actual borrowing costs incurred on that borrowing during the period less any investment income on the temporary investment of those borrowings. To the extent that the Group borrows funds generally and uses them for the purpose of obtaining a qualifying asset, the Group shall determine the amount of borrowing costs eligible for capitalization by applying a capitalization rate to the expenditures on that asset. The capitalization rate shall be the weighted average of the borrowing costs applicable to the borrowings of the Group that are outstanding during the period, other than borrowings made specifically for the purpose of obtaining a qualifying asset. The amount of borrowing costs that the Group capitalizes during a period shall not exceed the amount of borrowing costs incurred during that period.

4. Significant Accounting Policies, Continued

(l) Impairment of non-financial assets

The carrying amounts of the Group's non-financial assets, other than assets arising from employee benefits, inventories, deferred tax assets and non-current assets held for sale, are reviewed at the end of the reporting period to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Intangible assets that have indefinite useful lives or that are not yet available for use, irrespective of whether there is any indication of impairment, are tested for impairment annually by comparing their recoverable amount to their carrying amount.

For impairment testing, assets are grouped together into the smallest group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets ("CGUs"). The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. The value in use is estimated by applying a pre-tax discount rate that reflect current market assessments of the time value of money and the risks specific to the asset or CGU for which estimated future cash flows have not been adjusted, to the estimated future cash flows expected to be generated by the asset or CGU.

An impairment loss is recognized in profit or loss if the carrying amount of an asset or a CGU exceeds its recoverable amount.

(m) Lease

The Group classifies and accounts for leases as either a finance or operating lease, depending on the terms. Leases where the Group assumes substantially all of the risks and rewards of ownership are classified as finance leases. All other leases are classified as operating leases.

(i) Finance leases

At the commencement of the lease term, the Group recognizes as finance assets and finance liabilities in its consolidated statements of financial position, the lower amount of the fair value of the leased property and the present value of the minimum lease payments, each determined at the inception of the lease. Any initial direct costs are added to the amount recognized as an asset. Minimum lease payments are apportioned between the finance charge and the reduction of the outstanding liability. The finance charge is allocated to each period during the lease term so as to produce a constant periodic rate of interest on the remaining balance of the liability. Contingent rents are charged as expenses in the periods in which they are incurred.
The depreciable amount of a leased asset is allocated to each accounting period during the period of expected use on a systematic basis consistent with the depreciation policy the lessee adopts for depreciable assets that are owned. If there is no reasonable certainty that the lessee will obtain ownership by the end of the lease term, the asset is fully depreciated over the shorter of the lease term and its useful life. The Group reviews to determine whether the leased asset may be impaired.

(ii) Operating leases

Leases where the lessor retains a significant portion of the risks and rewards of ownership are classified as operating leases. Payments made under operating leases (net of any incentives received from the lessor) are recognized in profit or loss on a straight-line basis over the period of the lease.

4. Significant Accounting Policies, Continued

(m) Lease, continued

(iii) Determining whether an arrangement contains a lease

Determining whether an arrangement is, or contains, a lease shall be based on the substance of the arrangement and requires an assessment of whether fulfillment of the arrangement is dependent on the use of a specific asset or assets (the asset) and the arrangement conveys a right to use the asset.

At inception or reassessment of the arrangement, the Group separates payments and other consideration required by such an arrangement into those for the lease and those for other elements on the basis of their relative fair values. If the Group concludes for a financial lease that it is impracticable to separate the payments reliably, the Group recognizes an asset and a liability at an amount equal to the fair value of the underlying asset that was identified as the subject of the lease. Subsequently, the liability shall be reduced as payments are made and an imputed finance charge on the liability recognized using the purchaser's incremental borrowing rate of interest

(n) Non-current assets held for sale

Non-current assets, or disposal groups comprising assets and liabilities, that are expected to be recovered primarily through sale rather than through continuing use, are classified as held for sale. In order to be classified as held for sale, the asset (or disposal group) must be available for immediate sale in its present condition and its sale must be highly probable. The assets or disposal group that are classified as non-current assets held for sale are measured at the lower of their carrying amount and fair value less cost to sell.

The Group recognizes an impairment loss for any initial or subsequent write-down of an asset (or disposal group) to fair value less costs to sell, and a gain for any subsequent increase in fair value less costs to sell, up to the cumulative impairment loss previously recognized in accordance with K-IFRS No. 1036, 'Impairment of Assets'.

A non-current asset that is classified as held for sale or part of a disposal group classified as held for sale is not depreciated (or amortized).

4. Significant Accounting Policies, Continued

(o) Non-derivative financial liabilities

The Group classifies non-derivative financial liabilities into financial liabilities at fair value through profit or loss or other financial liabilities in accordance with the substance of the contractual arrangement and the definitions of financial liabilities. The Group recognizes financial liabilities in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the financial liability.

(i) Financial assets at fair value through profit or loss

Financial liabilities at fair value through profit or loss include financial liabilities held for trading or designated as such upon initial recognition. Subsequent to initial recognition, financial liabilities at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss. Upon initial recognition, transaction costs that are directly attributable to the acquisition are recognized in profit or loss as incurred.

(ii) Other financial liabilities

Non-derivative financial liabilities other than financial liabilities at fair value through profit or loss are classified as other financial liabilities. At the date of initial recognition, other financial liabilities are measured at fair value minus transaction costs that are directly attributable to the acquisition. Subsequent to initial recognition, other financial liabilities are measured at amortized cost using the effective interest method.

The Group derecognizes a financial liability from the consolidated statement of financial position when it is extinguished (i.e. when the obligation specified in the contract is discharged, cancelled or expires).

(p) Employee benefits

(i) Short-term employee benefits

Short-term employee benefits are employee benefits that are due to be settled within 12 months after the end of the period in which the employees render the related service. When an employee has rendered service to the Group during an accounting period, the Group recognizes the undiscounted amount of short-term employee benefits expected to be paid in exchange for that service.

(ii) Retirement benefits: defined contribution plans

When an employee has rendered service to the Group during a period, the Group recognizes the contribution payable to a defined contribution plan in exchange for that service as a liability (accrued expense), after deducting any contribution already paid. If the contribution already paid exceeds the contribution due for service before the end of the reporting period, the Group recognizes that excess as an asset (prepaid expense) to the extent that the prepayment will lead to a reduction in future payments or a cash refund.

4. Significant Accounting Policies, Continued

(p) Employee benefits, continued

(iii) Retirement benefits: defined benefit plans

A defined benefit plan is a post-employment benefit plan other than a defined contribution plan. The Group's net obligation in respect of defined benefit plans is calculated by estimating the amount of future benefit that employees have earned in return for their service in the current and prior periods; that benefit is discounted to determine its present value. The fair value of plan assets is deducted. The calculation is performed annually by an independent actuary using the projected unit credit method.

The discount rate is the yield at the reporting date on high-quality corporate bonds that have maturity dates approximating the terms of the Group's obligations and that are denominated in the same currency in which the benefits are expected to be paid. The Group recognizes all actuarial gains and losses arising from actuarial assumption changes and experiential adjustments in other comprehensive income when incurred.

Re-measurements of net defined benefit liabilities, which comprise actuarial gains and losses, the return on plan assets (excluding interest) and the effect of the asset ceiling (if any, excluding interest), are recognized immediately in other comprehensive income. The Group determines the net interest expense (income) on the net defined benefit liability (asset) for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period to the then-net defined benefit liability (asset), taking into account any changes in the net defined benefit liability (asset) during the period as a result of contributions and benefit payments, net interest expense and other expenses related to defined benefit plans are recognized in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss in curtailment is recognized immediately in profit or loss. The Group recognizes gains and losses on the settlement of a defined benefit plan when the settlement occurs.

4. Significant Accounting Policies, Continued

(q) Provisions

Provisions are recognized when the Group has a present legal or constructive obligation as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation.

The risks and uncertainties that inevitably surround many events and circumstances are taken into account in reaching the best estimate of a provision. Where the effect of the time value of money is material, provisions are determined at the present value of the expected future cash flows.

Where some or all of the expenditures required to settle a provision are expected to be reimbursed by another party, the reimbursement shall be recognized when, and only when, it is virtually certain that reimbursement will be received if the entity settles the obligation. The reimbursement shall be treated as a separate asset.

Provisions are reviewed at the end of each reporting period and adjusted to reflect the current best estimates. If it is no longer probable that an outflow of resources embodying economic benefits will be required to settle the obligation, the provision is reversed.

When there is a legal or contractual obligation for dismantling, removing facilities and restoring sites on which they are located to their original condition at the end of the useful lives of the facilities, the present value of the estimated future restoration costs are capitalized at the acquisition date as additions to the cost of oil and gas properties and are accounted for as a provision. The Group subsequently depreciates the restoration costs using the unit-of-production method and the difference between estimated restoration costs and their present value is charged to current operations by applying the effective-interest-rate method.

(r) Share capital

Common stock is classified as equity and the incremental costs arising directly attributable to the issuance of common stock less their tax effects are deducted from equity.

(s) Foreign currencies

Transactions in foreign currencies are translated to the respective functional currencies of Group entities at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are retranslated to the functional currency using the reporting date's exchange rate. Non-monetary assets and liabilities denominated in foreign currencies that are measured at fair value are retranslated to the functional currency at the exchange rate at the date that the fair value was determined. Non-monetary assets and liabilities denominated in foreign currencies that are measured in terms of historical cost in a foreign currency are translated using the exchange rate at the dates of the transactions.

Foreign currency differences arising on retranslation are recognized in profit or loss, except for differences arising on the retranslation of available-for-sale equity instruments, a financial liability designated as a hedge of the net investment in a foreign operation, or qualifying cash flow hedges, which are recognized in other comprehensive income. When gains or losses on non-monetary items are recognized in other comprehensive income, exchange components of those gains or losses are recognized in other comprehensive income. Conversely, when gains or losses on non-monetary items are recognized in profit or loss, exchange components of those gains or losses are recognized in profit or loss.

4. Significant Accounting Policies, Continued

(t) Revenue

Revenue from sale of goods, rendering of services or use of the Group assets is measured at the fair value of the consideration received or receivable, net of returns, trade discounts and volume rebates. When two or more revenue generating activities or deliverables are sold under a single arrangement, each deliverable that is considered to be a separate unit of account is accounted for separately. The allocation of consideration from a revenue arrangement to its separate units of account is based on the relative fair values of each unit.

(i) Sales of goods

Revenue from the sale of goods in the ordinary course of activities is measured at the fair value of the consideration received or receivable, trade discounts and volume rebates. Revenue is recognized when persuasive evidence exists, usually in the form of an executed sales agreement, that the significant risks and rewards of ownership have been transferred to the buyer, recovery of the consideration is probable, the associated costs can be estimated reliably, there is no continuing management involvement with the goods, and the amount of revenue can be measured reliably. The appropriate timing for transfer of risks and rewards varies depending on the individual terms and conditions of the sales contract. For international sales, this timing depends on the type of international commercial terms of the contract.

The Group recognizes revenue from the sales of product from a production area, only when the Group's investment in the production area is considered as a joint operation not as a joint venture. In addition, for the Group's joint operations, the Group capitalizes costs related to the production area as the oil and gas properties even if the Group is a non-operator.

(ii) Sales of other services

Revenue from services rendered is recognized in profit or loss in proportion to the stage of completion of the transaction at the reporting date. The stage of completion is assessed by reference to surveys of work performed or services performed to date as a percentage of total services to be performed or the proportion that costs incurred to date bear to the estimated total costs of the transaction or other methods that reliably measures the services performed.

(u) Finance income and finance costs

Finance income comprises interest income on funds invested (including available-for-sale financial assets), dividend income, gains on the disposal of available-for-sale financial assets and changes in the fair value of financial assets at fair value through profit or loss. Interest income is recognized as it accrues in profit or loss, using the effective interest rate method. Dividend income is recognized in profit or loss on the date that the Group's right to receive payment is established.

Finance costs comprise interest expense on borrowings and changes in the fair value of financial assets at fair value through profit or loss. Borrowing costs are recognized in profit or loss using the effective interest rate method.

4. Significant Accounting Policies, Continued

(u) Income taxes

Income tax expense comprises current and deferred tax. Current tax and deferred tax are recognized in profit or loss except to the extent that it relates to a business combination, or items recognized directly in equity or in other comprehensive income.

(i) Current tax

Current tax is the expected tax payable or receivable on the taxable profit or loss for the year, using tax rates enacted or substantively enacted at the end of the reporting period and any adjustment to tax payable in respect of previous years. The taxable profit is different from the accounting profit for the period since the taxable profit is calculated excluding the temporary differences, which will be taxable or deductible in determining taxable profit (tax loss) of future periods, and non-taxable or non-deductible items from the accounting profit.

(ii) Deferred tax

The measurement of deferred tax liabilities and deferred tax assets reflects the tax consequences that would follow from the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities. The Group recognizes a deferred tax liability for all taxable temporary differences associated with investments in subsidiaries, associates, and interests in joint ventures, except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. In addition, the Group recognizes a deferred tax asset for all deductible temporary differences to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

The carrying amount of a deferred tax asset is reviewed at the end of each reporting period and reduces the carrying amount to the extent that it is no longer probable that sufficient taxable profit will be available to allow the benefit of part or all of that deferred tax asset to be utilized.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply to the period when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period.

Deferred tax assets and liabilities are offset only if there is a legally enforceable right to offset the related current tax liabilities and assets, and they relate to income taxes levied by the same tax authority and they intend to settle current tax liabilities and assets on a net basis.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted

The following new standards have been published and are mandatory for the Group for annual period beginning after January 1, 2017 and the Group has not early adopted them.

(i) K-IFRS No. 1109 "Financial Instruments"

K-IFRS No. 1109 "Financial Instruments", issued on September 25, 2015, is effective for fiscal periods beginning after January 1, 2018, but may be adopted early. It replaces existing guidance in K-IFRS No. 1039 "Financial Instruments: Recognition and Measurement". The Group expects to apply K-IFRS No. 1109 for the fiscal period beginning January 1, 2018. The standard will generally be applied retrospectively with some exemptions allowing an entity not to restate the comparative information for prior periods in relation to classification and measurement (including impairment) changes.

When applying K-IFRS No. 1109, the classification of financial assets will be driven by the Group's business model for managing the financial assets and contractual terms of cash flow. To efficiently adopt K-IFRS No. 1109, it is generally necessary to prepare the analysis of the financial impact, accounting policies, accounting system, and system stabilization. The effect on the financial statements of the adoption of K-IFRS No. 1109 may differ not only based on the selection and judgment of accounting policies in accordance with the standard, but also on the financial instruments held by the Group and economic conditions during the fiscal period.

In order to assess the financial impact of the initial adoption of K-IFRS No. 1109, the Group has preliminarily analyzed the potential impact on the consolidated financial statements based on the available information as of December 31, 2017. The expected financial effects of the adoption of the standard are as follows. The Group expects to further analyze the impact on the consolidated financial statement with additional information in the future, and the result of the analysis of the impact on the financial statement may vary.

Classification and Measurement of Financial Assets
The following table shows the classification of financial assets measured subsequently at amortized cost, at fair value through other comprehensive income and at fair value through profit or loss. If a hybrid contract contains a host that is a financial asset, the classification of the hybrid contract shall be determined for the entire contract without separating the embedded derivative.

Business model	Contractual cash flows are solely payments of principal and interests	All other cases
To collect contractual cash flows	Amortized cost(*1)	Fair value through profit or loss(*2)
Both to collect contractual cash flows and sell financial assets	Fair value through other comprehensive income(*1)	
For trading, and others	Fair value through profit or loss	

(*1) The Group may irrevocably designate as at fair value through profit or loss to eliminate or significantly reduce an accounting mismatch.
(*2) The Group may irrevocably designate equity investments that is not held for trading as at fair value through other comprehensive income.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted, continued

(i) K-IFRS No. 1109 "Financial Instruments", continued

The requirements of K-IFRS No. 1109 to classify a financial instrument to be measured at amortized cost or fair value through other comprehensive income are more stringent than those of existing K-IFRS No. 1039. Therefore, the proportion of financial assets at fair value through profit or loss may increase upon the adoption of K-IFRS No. 1109 resulting in higher volatility in profit or loss. As of December 31, 2017, the Group owns available-for-sale financial assets of ₩90,807 million, and loans and receivables of ₩2,691,498 million.

According to K-IFRS No.1109, only debt instruments whose contractual cash flows solely represent payments of principal and interest on a given day and intended to receive contractual cash flow can be measured at amortized cost. The Group measures loans and receivables amounting to ₩2,691,498 million at amortized cost as of December 31, 2017.

As a result of analysis of the impact on the financial statements, most of the financial assets have contractual cash flows which solely consist of principal and interest, but loans and other receivables from associates and other related parties will be measured at fair value through profit or loss as they are not held for with the intent to receive contractual cash flows.

According to K-IFRS No. 1109, the Group may make an irrevocable election to present in other comprehensive income subsequent changes in the fair value of an investment in an equity instrument which is not held for trading at initial recognition. As of December 31 2017, the Group owns equity instruments classified as available-for-sale financial assets of ₩90,807 million, and corresponding unrealized gain on valuation of ₩58,177 million has been reclassified to profit or loss. As a result of analysis of the impact on the financial statements, financial assets will not have a material impact on the financial statements because the Group has a intent to designate long-term strategic purposed equity instruments, which accounts most of the available-for-sale equity instrument, to be measured at fair value through other comprehensive income.

Classification and Measurement of Financial Liabilities
Under K-IFRS No. 1039, all financial liabilities designated at fair value through profit or loss recognized their fair value movements in profit or loss. However, K-IFRS No. 1109 requires the amount of the change in the liability's fair value attributable to changes in the credit risk to be recognized in other comprehensive income. Amounts presented in other comprehensive income are not subsequently transferred to profit or loss. However, if the effects of changes in liability's credit risk recognized in other comprehensive income creates or enlarges an accounting mismatch, the entire fair value change is recognized in profit or loss.

The Group had financial liabilities of ₩14,638,367 million as of December 31, 2017, among which none is designated as liabilities measured at fair value through profit or loss. Therefore the Group expects the adoption of K-IFRS No. 1109 will not have a significant impact on the classification of financial liabilities.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted, continued

(i) K-IFRS No. 1109 "Financial Instruments", continued

Impairment: Financial Assets and Contract Assets
K-IFRS No. 1109 replaces the incurred loss model in the existing standard with a forward-looking expected credit loss model for debt instruments, lease receivables, contractual assets, loan commitments, and financial guarantee contracts.

Under K-IFRS No. 1109, impairment losses are likely to be recognized earlier than using the incurred loss model under the existing guidance in K-IFRS No. 1039 as loss allowances will be measured either 12-month or lifetime expected credit loss based on the extent of increase in credit risk.

If credit risk has increased significantly since the initial recognition, a loss allowance for lifetime expected credit loss is required to be measured at the end of every reporting period. If credit risk has not increased significantly since the initial recognition, a loss allowance is measured based on 12-month expected credit loss.

The Group owns debt instrument of ₩2,691,498 million (loans and receivables) measured at amortized cost, and recognizes ₩741,869 million of loss allowance for these assets as of December 31, 2017. The Group analyzed the impact on the financial statement by calculating loss allowance on an amount equivalent to the lifetime expected credit loss for trade receivables and contract assets with significant financing component. When analyzing the impact, the Group assumed that the credit risk has not significantly increased based on low credit risk as of December 31, 2017. As a result, the Group expects no significant effect on loss allowance upon adoption of K-IFRS No. 1109 as of January 1, 2018.

Hedge Accounting
K-IFRS No. 1109 maintains the mechanics of hedge accounting of existing K-IFRS No. 1039, but replaces the complex and rule-based requirements of K-IFRS No. 1039 to principle-based requirements emphasizing the hedging activities of an entity. The intensity of requirements for hedge accounting have been alleviated by broadening the qualifying criteria and hedged items, and removing quantitative standard (80~125%) for the effectiveness of hedge. Hedge accounting under K-IFRS No. 1109 can be applied to certain transactions which do not meet the requirements for hedge accounting under K-IFRS No. 1039, and thus the volatility of the profit or loss may be reduced.

As the Group applies hedge accounting, ₩1,094 million (after income tax effect) of the change in fair value of the financial instrument using cash flow hedge recognized in other comprehensive income was reclassified to profit or loss for the year ended December 31, 2017. As of December 31, 2017, the change in fair value of the financial instrument using cash flow hedge accumulated in other comprehensive income is (-)₩48,425 million.

The Group has not yet determined whether to apply the hedge accounting under the requirements of K-IFRS No. 1109 or existing requirements of K-IFRS No. 1039 at the time of initial application of K-IFRS No. 1109. As a result of analysis of the impact on the consolidated financial statement using hedge accounting under K-IFRS No. 1109, the Group expects it will not have a material impact on the consolidated financial statements.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted, continued

(ii) K-IFRS No. 1115 "Revenue from Contracts with Customers"

K-IFRS No. 1115 "Revenue from Contracts with Customers", issued on November 6, 2015, is effective for annual periods beginning on or after January 1, 2018, but may be adopted early. It replaces existing revenue recognition guidance, including K-IFRS No. 1018 "Revenue", K-IFRS No.1011 "Construction Contracts", K-IFRS No. 2031 "Revenue- Barter transactions involving advertising services", K-IFRS No. 2113 "Customer Loyalty Programs", K-IFRS No. 2115 "Agreements for the construction of real estate", and K-IFRS No. 2118 "Transfers of assets from customers". The Group intends to apply the modified retrospective approach which will recognize the cumulative impact of initially applying the revenue standard as of January 1, 2018, the date of initial application without restating prior year's financial statements and the Group also decided to apply the practical expedients as allowed by K-IFRS No. 1115 by applying the new standard only to those contracts that are not considered as completed contracts at the date of initial application.

Existing K-IFRS standards and interpretations including K-IFRS No. 1018 provide revenue recognition guidance by transaction types such as sales of goods, rendering of services, interest income, royalty income, dividend income and construction revenue; however, under the new standard, K-IFRS No. 1115, the five-step approach (Step 1: Identify the contract(s) with a customer, Step 2: Identify the performance obligations in the contract, Step 3: Determine the transaction price, Step 4: Allocate the transaction price to the performance obligations in the contract, Step 5: Recognize revenue when the entity satisfied a performance obligation) is applied for all types of contracts or agreements.

Based on the current circumstance and available information as of December 31, 2017, the Group has preliminary assessed the potential impact on the consolidated financial statements when applying K-IFRS No. 1115. The potential impact on the consolidated financial statements are as follows.

Considerations payable to a customer
In accordance with K-IFRS No. 1115, considerations payable to a customer should be deducted from the amount of revenue earned unless payment is made in relation to goods or service provided by the customer as a separable performance obligation. The Group has not been able to quantify the financial impact of considerations payable to customers, but consolidated revenues and selling and general administrative expenses are expected to decrease upon adoption of K-IFRS No. 1115.

Presentation and disclosures
The presentation and disclosure requirements of K-IFRS No. 1115 are more detailed than existing standards. Presentation requirements have significantly changed from current practice and disclosure requirements for consolidated financial statements have increased. Numerous disclosure requirements are newly added according to K-IFRS No. 1115 and the Group expects some portion of the disclosure requirements would have a significant effect. In addition, as required by K-IFRS No. 1115, the Group plans to disclose the performance obligations arising from contractual arrangements with the customers and the nature of the goods or services agreed to transfer.

4. Significant Accounting Policies, Continued

(v) New standards and interpretations not yet adopted, continued

(iii) K-IFRS No. 1116 "Leases"

K-IFRS No. 1116 "Leases" will replace K-IFRS No. 1017 "Leases" and K-IFRS No. 2104 "Determining whether an Arrangement contains a Lease". It is effective for annual periods beginning on or after January 1, 2019, with early adoption permitted for a company which has adopted K-IFRS No. 1115. As a lessee, the Group shall apply this standard using one of the following two methods; (a) retrospectively to each prior reporting period presented in accordance with K-IFRS No. 1008 "Accounting Policies, Changes in Accounting Estimates and Errors" but using the practical expedients for completed contracts- i.e. completed contracts as of the beginning of the earliest prior period presented are not restated; or (b) retrospectively with the cumulative effect of initially applying this standard recognized at the date of initial application. The Group is in process of revaluating the financial impacts arising from applying this standard.

5. Subsidiaries

(a) The list of subsidiaries directly owned by the Company as of December 31, 2017 and 2016 are as follows:

			Ownership (%)	
Subsidiary name	**Principal activity**	**Country of incorporation**	**December 31, 2017**	**December 31, 2016**
ANKOR E&P Holdings Corp.	Exploration and production ("E&P")	United States	100.00	100.00
Dana Petroleum Limited	E&P	United Kingdom	100.00	100.00
KNOC Eagle Ford Corporation(*)	E&P	United States	100.00	100.00
Harvest Operations Corp.	E&P	Canada	100.00	100.00
KNOC Kaz B.V.	E&P	Netherlands	100.00	100.00
KNOC Exploracao e Producao de Petro do Brasil Ltda	E&P	Brazil	100.00	100.00
KNOC NEMONE Ltd.	E&P	Indonesia	100.00	100.00
KNOC NEMTWO Ltd.	E&P	Indonesia	100.00	100.00
KNOC Sumatra Ltd.	E&P	Indonesia	100.00	100.00
KNOC Yemen Ltd.	E&P	Yemen	60.00	60.00
KNOC Trading Singapore Pte. Ltd.	Trading and Marketing	Singapore	100.00	100.00

(*) All shares of KNOC Trading Corporation owned by the Company have been contributed to KNOC Eagle Ford Corporation, a subsidiary of the Company for the year ended December 31, 2017.

5. Subsidiaries, Continued

(b) Financial information of subsidiaries

(i) Financial information of subsidiaries as of and for the year ended December 31, 2017 is as follows:

In millions of Korean won

Company		Assets	Liabilities	Revenue	Net profit (loss)
ANKOR E&P Holdings Corp.	₩	474,839	163,947	88,378	(76,997)
Dana Petroleum Limited(*1)		3,398,242	2,290,141	712,145	10,755
KNOC Eagle Ford Corporation		2,401,577	217,888	375,150	48,696
Harvest Operations Corp.		2,657,014	2,804,010	248,619	(246,056)
KNOC Kaz B.V.(*1)		844,974	570,320	196,132	(127,015)
KNOC Exploracao e Producao de Petro do Brasil Ltda(*2)		10	305	-	224
KNOC NEMONE Ltd.(*2)		-	-	-	-
KNOC NEMTWO Ltd.(*2)		-	-	-	-
KNOC Sumatra Ltd.		634	-	-	(165)
KNOC Yemen Ltd.(*2)		13	-	-	155,817
KNOC Trading Singapore Pte. Ltd.		407	6	409	88

(*1) The amounts presented are after reflecting the difference between the fair value and the book value that arose during the business combination.

(*2) Entities are in the process of liquidation as of December 31, 2017.

(ii) Financial information of subsidiaries as of and for the year ended December 31, 2016 is as follows:

In millions of Korean won

Company		Assets	Liabilities	Revenue	Net profit (loss)
ANKOR E&P Holdings Corp.	₩	628,065	191,894	78,864	(13,685)
Dana Petroleum Limited(*1)		3,734,592	2,574,927	684,022	(104,267)
KNOC Eagle Ford Corporation		2,700,100	246,346	347,601	(148,276)
Harvest Operations Corp.		3,019,766	2,926,659	251,932	(306,387)
KNOC Kaz B.V.(*1)		1,144,608	653,062	155,975	8,546
KNOC Exploracao e Producao de Petro do Brasil Ltda(*2)		21	595	-	95
KNOC NEMONE Ltd.(*2)		-	-	-	-
KNOC NEMTWO Ltd.(*2)		-	-	-	-
KNOC Sumatra Ltd.		891	-	-	(33)
KNOC Yemen Ltd.(*2)		15	166,517	-	(57)
KNOC Trading Singapore Pte. Ltd.		342	14	478	33
KNOC Trading Corporation		2,367	-	1,109	454

(*1) The amounts presented are after reflecting the difference between the fair value and the book value that arose during the business combination.

(*2) Entities are in the process of liquidation as of December 31, 2016.

5. Subsidiaries, Continued

(b) Financial information of subsidiaries, continued

(iii) The financial information of the subsidiaries that are related to the Group's non-controlling interests as of December 31, 2017 is as follows:

In millions of Korean won

Company		ANKOR Energy LLC	KOA Energy LP(*1)	Eagle Ford MS LLC and Eagle Ford Energy LLC	KNOC EF Star LLC(*2)
Non-controlling interests		20%	98%	20%	-
Non-current assets	₩	-	155,031	2,170,701	412,489
Current assets		457	26,984	136,441	30,442
Non-current liabilities		-	(20,485)	(31,395)	-
Current liabilities		(457)	(1,535)	(3,959)	(50)
Net assets		-	159,995	2,271,788	442,881
Book value of the non-controlling interests		-	157,283	454,358	412,489
Revenue		-	25,919	441,982	15,045
Net income (loss)		-	(15,895)	55,759	14,921
Total comprehensive income (loss)		-	(15,895)	55,759	-
Net income (loss) distributed to non-controlling interests		-	(15,626)	11,152	-
Total comprehensive income (loss) distributed to non-controlling interests		-	(15,626)	11,152	-

(*1) According to shareholders' agreement, ANKOR E&P Holdings Corp. holds a de facto control.
(*2) A non-controlling interest has no voting right as non-cumulative and non-participating redeemable preferred shares (see Note 44).

(iv) The financial information of the subsidiaries that are related to the Group's non-controlling interests as of December 31, 2016 is as follows:

In millions of Korean won

Company		ANKOR Energy LLC	KOA Energy LP(*1)	Eagle Ford MS LLC and Eagle Ford Energy LLC	KNOC EF Star LLC(*2)
Non-controlling interests		20%	98%	20%	-
Non-current assets	₩	-	164,940	2,547,764	465,273
Current assets		4,271	22,389	98,731	31,646
Non-current liabilities		-	(24,247)	(43,748)	-
Current liabilities		(4,238)	(658)	(4,595)	-
Net assets		33	162,424	2,598,152	496,919
Book value of the non-controlling interests		7	159,671	521,521	465,273
Revenue		-	22,658	440,363	1,363
Net income (loss)		-	3,437	(116,551)	1,377
Total comprehensive income (loss)		-	3,437	(116,551)	-
Net income (loss) distributed to non-controlling interests		-	3,378	(23,310)	-
Total comprehensive income (loss) distributed to non-controlling interests		-	3,378	(23,310)	-

(*1) According to shareholders' agreement, ANKOR E&P Holdings Corp. holds a de facto control.
(*2) A non-controlling interest has no voting right as non-cumulative and non-participating redeemable preferred shares (see Note 44).

6. Segment and Other Information

(a) For management purposes, the Group is organized into business units based on their goods and services. The Group's operating segments are 1) oil and gas, 2) petroleum distribution, 3) oil stockpiling, 4) financing, 5) drillship chartering and 6) others.

Segments	Goods and services	Location of business
Oil and gas	Exploration, development and production of domestic and overseas resources and sales of crude oil	Domestic and overseas
Petroleum distribution	Distribution business of gasoline and gas oil and oil trading	Domestic and overseas
Oil stockpiling	Purchase and lending of oil stockpiles, management, operation and lending of oil stockpiling facilities	Domestic
Financing (*)	Financing for companies engaged in energy and natural resources development activities	Domestic
Drillship chartering (*)	Drillship chartering business	Domestic and overseas
Others	Oil information services, other research services, etc.	Domestic and overseas

(*) Financing and drillship chartering segments have been classified as discontinued operations during the year ended December 31, 2017. (see Note 7)

6. Segment and Other Information, Continued

(b) Segment results for the year

(i) For the year ended December 31, 2017

In millions of Korean won		Oil and gas	Petroleum distribution	Oil stockpiling	Others	Reportable segment total	Reconciling items(*)	Subtotal for continuing operations	Financing (Dis-continued)	Drillship chartering (Dis-continued)	Group total
Revenue	₩	2,004,759	187,984	112,146	7,597	2,312,486	-	2,312,486	314	-	2,312,800
Cost of sales		1,495,275	179,369	171,824	3,822	1,850,290	-	1,850,290	-	9,132	1,859,422
Gross profit (loss)		509,484	8,615	(59,678)	3,775	462,196	-	462,196	314	(9,132)	453,378
Selling and administrative expenses		208,658	369	-	-	209,027	77,298	286,325	244	-	286,569
Reportable segment operating profit (loss)		300,826	8,246	(59,678)	3,775	253,169	(77,298)	175,871	70	(9,132)	166,809
Other income						152,269	-	152,269	-	-	152,269
Other expenses						(207,236)	-	(207,236)	-	-	(207,236)
Other loss, net						(463,150)	-	(463,150)	-	(49,053)	(512,203)
Finance income						304,558	-	304,558	-	-	304,558
Finance costs						(710,411)	-	(710,411)	-	-	(710,411)
Loss on investments in associates and joint ventures, net						(127,487)	-	(127,487)	-	-	(127,487)
Loss before income tax	₩					(798,288)	(77,298)	(875,586)	70	(58,185)	(933,701)
Depreciation and amortization	₩	812,180	10	75,282	10	887,482	13,452	900,934	-	3,961	904,895
Impairment loss on property, plant and equipment		320,267	-	-	-	320,267	-	320,267	-	42,940	363,207
Reversal of impairment loss on property, plant and equipment		163,645	-	-	-	163,645	-	163,645	-	-	163,645
Impairment loss on intangible assets other than goodwill		227,051	-	-	-	227,051	-	227,051	-	-	227,051
Impairment loss on goodwill		87,470	-	-	-	87,470	-	87,470	-	-	87,470

(*) Primarily consists of operating profit (loss) including depreciation and amortization that are not allocated to the segments.

6. Segment and Other Information, Continued

(b) Segment results for the year, continued

(ii) For the year ended December 31, 2016

In millions of Korean won		Oil and gas	Petroleum distribution	Oil stockpiling	Others	Reportable segment total	Reconciling items(*)	Subtotal for continuing operations	Financing (Discontinued)	Drillship chartering (Discontinued)	Group total
Revenue	₩	1,778,518	487,970	118,902	39,577	2,424,967	-	2,424,967	1,274	4,157	2,430,398
Cost of sales		1,777,258	448,353	168,175	3,370	2,397,156	-	2,397,156	-	13,279	2,410,435
Gross profit (loss)		1,260	39,617	(49,273)	36,207	27,811	-	27,811	1,274	(9,122)	19,963
Selling and administrative expenses		186,342	822	-	-	187,164	72,950	260,114	678	-	260,792
Reportable segment operating profit (loss)		(185,082)	38,795	(49,273)	36,207	(159,353)	(72,950)	(391,656)	596	(9,122)	(240,829)
Other income						235,673	-	235,673	-	-	235,673
Other expenses						(26,244)	-	(26,244)	-	-	(26,244)
Other loss, net						(422,719)	-	(422,719)	-	(1,120)	(423,839)
Finance income						182,857	-	182,857	-	-	182,857
Finance costs						(820,783)	-	(820,783)	-	-	(820,783)
Loss on investments in associates and joint ventures, net						(239,808)	-	(239,808)	-	-	(239,808)
Loss before income tax	₩					(1,250,377)	(72,950)	(1,323,327)	596	(10,242)	(1,332,973)
Depreciation and amortization	₩	1,009,329	2	78,876	34	1,088,241	13,863	1,102,104	-	3,515	1,105,619
Impairment loss on property, plant and equipment		433,607	-	-	-	433,607	-	433,607	-	-	433,607
Reversal of impairment loss on property, plant and equipment		400,959	-	-	-	400,959	-	400,959	-	-	400,959
Impairment loss on intangible assets other than goodwill		345,032	-	-	-	345,032	-	345,032	-	-	345,032
Reversal of impairment loss on intangible assets other than goodwill		6,416	-	-	-	6,416	-	6,416	-	-	6,416
Impairment loss on goodwill		32,440	-	-	-	32,440	-	32,440	-	-	32,440

(*) Primarily consists of operating profit (loss) including depreciation and amortization that are not allocated to the segments.

6. Segment and Other Information, Continued

(c) Segment assets and liabilities

(i) As of December 31, 2017

In millions of Korean won		Oil and gas	Petroleum distribution	Oil stockpiling	Reportable segment total	Recon-ciling items(*2)	Financing (Discontinued)	Drillship chartering (Discontinued) (*3)	Group total
Assets	₩	12,566,159	90,160	5,597,713	18,254,032	-	-	3,472	18,257,504
Adjustments:									
Headquarters' land, buildings, tools & fixtures		-	-	-	-	278,750	-	-	278,750
Headquarters' software and memberships		-	-	-	-	13,059	-	-	13,059
Headquarters' loans to employees		-	-	-	-	102,842	-	-	102,842
Headquarters' deferred tax assets		-	-	-	-	580,526	-	-	580,526
Headquarters' derivatives assets		-	-	-	-	48,379	-	-	48,379
Headquarters' financial assets and etc.		-	-	-	-	210,942	-	-	210,942
	₩	12,566,159	90,160	5,597,713	18,254,032	1,234,498	-	3,472	19,492,002
Liabilities	₩	16,466,614	95,249	80,331	16,642,194	-	-	-	16,642,194
Adjustments:									
Headquarters' derivative liabilities		-	-	-	-	82,712	-	-	82,712
Headquarters' financial liabilities		-	-	-	-	330,022	-	-	330,022
	₩	16,466,614	95,249	80,331	16,642,194	412,734	-	-	17,054,928
Investments in associates and others(*1)	₩	543,616	50,430	-	594,046	-	-	-	594,046
Acquisitions of property, plant and equipment		486,072	-	113,642	599,714	232,648	-	-	832,362
Acquisitions of intangible assets other than goodwill		27,223	-	-	27,223	1,624	-	-	28,847

(*1) Investments in associates and others consist of investments in associates and joint ventures and loans to related parties.
(*2) Primarily consists of loans for employees, deferred tax assets and others which are not allocated to the reportable segments
(*3) Assets in drillship chartering segment amounting to ₩3,472 million have been classified as assets held for sale.

6. Segment and Other Information, Continued

(c) Segment assets and liabilities, continued

(ii) As of December 31, 2016

In millions of Korean won		Oil and gas	Petroleum distribution	Oil stockpiling	Reportable segment total	Recon-ciling items(*2)	Financing (Discontinued)	Drillship chartering (Discontinued)	Group total
Assets	₩	14,691,648	90,209	6,166,901	20,948,758	-	176,881	53,677	21,179,316
Adjustments:									
Headquarters' land, buildings, tools & fixtures		-	-	-	-	237,332	-	-	237,332
Headquarters' software and memberships		-	-	-	-	16,186	-	-	16,186
Headquarters' loans to employees		-	-	-	-	100,315	-	-	100,315
Headquarters' deferred tax assets		-	-	-	-	496,423	-	-	496,423
Headquarters' derivatives assets		-	-	-	-	9,011	-	-	9,011
Headquarters' financial assets and etc.		-	-	-	-	28,613	-	-	28,613
	₩	14,691,648	90,209	6,166,901	20,948,758	887,880	176,881	53,677	22,067,196
Liabilities	₩	18,144,278	68,450	48,524	18,261,252	-	543	3,474	18,265,269
Adjustments:									
Headquarters' derivative liabilities		-	-	-	-	190,403	-	-	190,403
Headquarters' financial liabilities		-	-	-	-	102,791	-	-	102,791
	₩	18,144,278	68,450	48,524	18,261,252	293,194	543	3,474	18,558,463
Investments in associates and others(*1)	₩	726,622	44,239	-	770,861	-	-	-	770,861
Acquisitions of property, plant and equipment		550,426	-	187,158	737,584	-	-	800	738,384
Acquisitions of intangible assets other than goodwill		42,790	-	-	42,790	1,565	-	-	44,355

(*1) Investments in associates and others consist of investment in associates and joint ventures and loans to related parties.

(*2) Primarily consists of loans for employees, deferred tax assets and others which are not allocated to the reportable segments.

6. Segment and Other Information, Continued

(d) Information about geographical areas

(i) Revenue by geographic area for the years ended December 31, 2017 and 2016 is as follows:

In millions of Korean won		2017	2016
Domestic	₩	694,935	905,004
Canada		248,619	251,932
United Kingdom		712,145	684,022
United States		463,528	427,574
Kazakhstan		192,850	155,975
Others		409	460
Reportable segment operating revenue	₩	2,312,486	2,424,967
Financing (discontinued)		314	1,274
Drillship chartering (discontinued)		-	4,157
	₩	2,312,800	2,430,398

In presenting information about geographical areas, segment revenue is based on the geographical location of the Group's entities which recorded the related revenue.

(ii) Non-current assets by geographic area as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Domestic	₩	6,326,504	7,121,214
Canada		1,966,834	2,294,904
United Kingdom		2,994,323	3,367,853
United States		2,564,524	3,092,412
Kazakhstan		325,109	442,808
Iraq		1,333,008	1,507,801
Yemen		3,948	4,453
Peru		45,297	45,145
Libya		43,668	41,550
Vietnam		331,524	382,161
Others		1	-
	₩	15,934,740	18,300,301

Non-current assets by geographic area include property, plant and equipment, goodwill, intangible assets other than goodwill, investments in associates and joint ventures, and non-financial assets.

6. Segment and Other Information, Continued

(e) Information about main customers

No customer's revenue is more than 10% of consolidated revenue for the year ended December 31, 2017. Customers whose revenue is 10% or more of consolidated revenue for the year ended December 31, 2016 are Unipec Asia Co., Ltd. and BP P.L.C. amounting to ₩388,888 million and ₩328,239 million, respectively. Furthermore, revenues from these customers for the years ended December 31, 2017 and 2016 are related to petroleum distribution and oil stockpiling segments.

7. Discontinued Operations

During 2017, financing and drillship chartering segments, which were part of the Parent Company, are classified as discontinued operations as 1) the Parent Company transferred its responsibilities related to financing for companies engaged in energy and natural resources development activities to another government agency in 2017 and 2) management committed to a plan to sell the primary assets of drillship chartering segment. As a result, the comparative consolidated statement of comprehensive loss for the year ended December 31, 2016 has been restated to present discontinued operations separately from continuing operations.

(a) Details of profit and loss from discontinued operations are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won		**Financing**	**Drillship chartering**	**Total**
Revenue	₩	314	-	314
Expenses (*)		244	58,184	58,428
Income (loss) before income tax		70	(58,184)	(58,114)
Income tax expense (benefit)		17	(5,794)	(5,777)
Profit (loss) from discontinued operations	₩	53	(52,390)	(52,337)

(*) Impairment loss on property, plant and equipment in drillship chartering segment amounting to ₩ 42,940 million and loss from valuation of supplies amounting to ₩ 6,821 million are included.

(ii) For the year ended December 31, 2016

In millions of Korean won		**Financing**	**Drillship chartering**	**Total**
Revenue	₩	1,274	4,157	5,431
Expenses		678	14,399	15,077
Income (loss) before income tax		596	(10,242)	(9,646)
Income tax expense (benefit)		144	(2,587)	(2,443)
Profit (Loss) from discontinued operations	₩	452	(7,655)	(7,203)

7. Discontinued Operations, Continued

(b) Details of cash flows from discontinued operations are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won		Financing	Drillship chartering	Total
Cash flow from operating activities	₩	70	(4,462)	(4,392)

(ii) For the year ended December 31, 2016

In millions of Korean won		Financing	Drillship chartering	Total
Cash flow from operating activities	₩	596	(6,727)	(6,131)
Cash flow from investing activities		-	(800)	(800)
	₩	596	(7,527)	(6,931)

(c) The book value of assets related to discontinued operations amounting to ₩3,472 million is classified as assets held for sale. (see Note 17)

8. Cash and Cash Equivalents

Cash and cash equivalents in the consolidated statements of cash flows include cash and bank deposit and exclude government grants. Cash and cash equivalents in the consolidated statements of cash flows for the years ended December 31, 2017 and 2016 are comprised of the following items in the consolidated statements of financial position.

In millions of Korean won		December 31, 2017	December 31, 2016
Cash in hands	₩	100	375
Other on demand deposits		211,415	182,380
Short-term deposits classified as cash equivalents		312,706	464,398
Short-term investments classified as cash equivalents		266,899	169,663
		791,120	816,816
Government grants		(45)	(4,165)
	₩	791,075	812,651

9. Restricted Deposits

Details of restricted deposits as of December 31, 2017 and 2016 are as follows:

		December 31, 2017		December 31, 2016	
In millions of Korean won		Current	Non-current	Current	Non-current
Compensations for fishermen	₩	2,056	-	2,032	-
Asset retirement obligation		-	2,317	-	2,426
Deposits for foreign workers		-	4	-	5
	₩	2,056	2,321	2,032	2,431

10. Derivatives

(a) Details of derivatives as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Current	Non-current	Current	Non-current
Derivative assets					
Currency swaps	₩	-	44,269	949	7,854
Interest rate swaps		1,161	2,949	-	1,157
Currency forwards		2,596	-	-	-
Other derivatives		775	84	-	-
	₩	4,532	47,302	949	9,011
Derivative liabilities					
Currency swaps	₩	18,830	45,832	42,572	147,831
Other derivatives		74,682	2,397	-	-
	₩	93,512	48,229	42,572	147,831

10. Derivatives, Continued

(b) Details of currency swap contracts as of December 31, 2017 are as follows:

In millions of Korean won and thousands of foreign currencies

Type	Counter party	Maturity	Contract amount				Contract interest rate per annum (%)	
			Currency	Sell	Currency	Buy	Sell	Buy
Cash flow hedge	HSBC	2021-02-08	HKD	500,000	USD	64,185	4.38	5.03
	BNP	2021-03-04	HKD	390,000	USD	50,081	4.50	5.20
	HSBC	2022-02-10	HKD	390,000	USD	50,282	3.95	4.45
	BNP	2022-03-28	EUR	50,000	USD	65,075	4.00	4.55
	HSBC	2023-01-26	HKD	400,000	USD	51,600	2.85	3.17
	HSBC	2018-01-22	HKD	400,000	USD	51,600	1.80	1.98
	DBS	2023-02-04	EUR	37,000	USD	49,765	2.40	3.19
	HSBC	2025-06-24	EUR	60,000	USD	80,070	3.00	4.06
	HSBC	2023-07-03	EUR	50,000	USD	65,670	3.09	4.31
	HSBC	2018-07-03	AUD	55,000	USD	51,260	3.21	3.05
	HSBC	2018-11-29	CHF	200,000	USD	210,970	1.63	3.16
	BNP	2018-11-29	CHF	40,000	USD	42,194	1.63	3.17
	HSBC	2019-10-08	AUD	125,000	USD	109,563	4.25	2.11
	HSBC	2019-10-08	AUD	75,000	USD	65,738	2.79	2.18
	ANZ	2019-10-08	AUD	150,000	USD	131,475	2.79	2.14
	SC	2020-01-29	HKD	310,000	USD	39,985	2.18	2.42
	HSBC	2020-08-26	KRW	150,000	USD	125,565	2.03	2.41
	CITI	2019-02-05	AUD	325,000	USD	230,555	2.98	2.15
	HSBC	2018-01-18	CAD	95,000	USD	73,643	(*)	(*)
	CIBC	2018-01-18	CAD	95,000	USD	73,643	(*)	(*)

(*) The contracts are currency swap contracts for the principal amounts excluding interests.

10. Derivatives, Continued

(c) Details of interest rate swap contracts as of December 31, 2017 are as follows:

In thousands of US dollar

Type	Counterparty	Terms	Contract amount	Contract interest rate per annum(%)	
				Sell	Buy
Cash flow hedge	HSBC	2018-06-07	300,000	U3L+100bp	2.18
	HSBC	2018-06-07	200,000	U3L+80bp	1.98
	BOA	2020-03-27	500,000	U3L+60bp	2.46

(d) Details of the currency forward contracts as of December 31, 2017 are as follows:

In thousands of foreign currencies

Type	Counter party	Contract date	Maturity	Contract amount				Contract currency rate
				Currency	Sell	Currency	Buy	
Cash flow hedge	CBA	2017-06-09	2018-01-10	GBP	6,000	USD	7,661	1.2769
	CBA	2017-06-07	2018-01-31	GBP	2,000	USD	2,600	1.2998
	CBA	2017-06-09	2018-02-13	GBP	8,000	USD	10,232	1.2790
	CBA	2017-06-09	2018-03-13	GBP	14,000	USD	17,941	1.2815
	CBA	2017-06-09	2018-04-10	GBP	17,000	USD	21,789	1.2817
	CBA	2017-06-09	2018-05-10	GBP	16,000	USD	20,536	1.2835
	CBA	2017-06-09	2018-06-12	GBP	10,000	USD	12,849	1.2849
	CBA	2017-06-12	2018-02-13	USD	10,269	GBP	8,000	1.2836
	CBA	2017-06-12	2018-03-13	USD	10,278	GBP	8,000	1.2847
	CBA	2017-06-12	2018-04-10	USD	12,861	GBP	10,000	1.2861
	CBA	2017-06-12	2018-05-10	USD	12,873	GBP	10,000	1.2873
	CBA	2017-06-12	2018-06-12	USD	7,732	GBP	6,000	1.2887

10. Derivatives, Continued

(e) Details of other derivatives (crude oil swaps) as of December 31, 2017 are as follows:

In BBL, US dollar

Type	Counterparty	Terms	Contract amount	Exercise price
Cash flow hedge	BNP	2018-03-31	282,000	55.56
	SG	2018-06-30	226,000	55.19
	SG	2018-09-30	169,000	55.10
	SG	2018-12-31	113,000	55.10
	GS	2018-03-31	57,000	53.06
	GS	2018-06-30	57,000	53.06
	SG	2018-09-30	57,000	53.09
	SG	2018-12-31	57,000	53.09
	GS	2019-03-31	15,000	51.05
	GS	2019-03-31	15,000	52.10
	BNP	2018-12-31	465,000	56.05
	ING	2018-12-31	600,000	55.00
	CBA	2018-06-30	191,159	55.08
	ING	2018-06-30	310,000	55.10
	ING	2018-12-31	490,000	55.00
	SG	2018-12-31	490,956	55.01
	SG	2018-12-31	290,000	55.12
	ING	2018-12-31	390,000	55.27
	ING	2018-12-31	499,161	55.84
	DNB	2019-03-31	135,581	58.72
	DNB	2019-09-31	352,140	58.01
	GS	2018-03-31	1,095,000	3.24(*)
	GS	2018-03-31	256,000	3.16(*)
	GS	2018-12-31	438,000	3.11(*)
	SG	2018-03-31	441,000	3.15(*)
	SG	2018-12-31	586,000	3.12(*)
	SG	2019-03-31	193,000	2.90(*)
	SG	2019-03-31	166,000	2.97(*)
	SC	2019-03-31	142,000	2.91(*)
	SG	2019-03-31	72,000	51.59
	SG	2019-06-30	66,000	51.34
	SG	2019-09-30	33,000	51.07

(*) The contracts above are derivatives settled based on Henry Hub gas price with exercise prices determined in USD/MBTU.

10. Derivatives, Continued

(f) Details of other derivatives(zero cost collar options) as of December 31, 2017 are as follows:

In BBL, US dollar

Type	Counterparty	Terms	Contract amount	Exercise Price	
				Call	Put
Held for trading	GS	2018-03-31	56,000	56.46	53.00
	GS	2018-06-30	56,000	56.46	53.00
	GS	2018-09-30	56,000	56.46	53.00
	GS	2018-12-31	56,000	56.46	53.00
	BNP	2018-03-31	46,000	65.62	56.00
	BNP	2018-06-30	47,000	65.62	56.00
	BNP	2018-09-30	48,000	65.62	56.00
	BNP	2018-12-31	49,000	65.62	56.00
Cash flow hedge	SC	2018-03-31	169,000	59.60	51.50
	SC	2018-06-30	127,000	59.60	51.50
	SG	2018-09-30	84,000	59.21	51.50
	SG	2018-12-31	42,000	59.21	51.50
	BNP	2018-03-31	42,000	56.90	52.25
	BNP	2018-06-30	42,000	56.90	52.25
	SC	2018-09-30	42,000	58.15	52.25
	SC	2018-12-31	42,000	58.15	52.25
	CITI	2019-03-31	38,000	57.05	52.25
	CITI	2018-03-31	42,000	54.80	51.80
	CITI	2018-06-30	42,000	54.80	51.80
	BNP	2018-09-30	42,000	55.00	51.80
	BNP	2018-12-31	42,000	55.00	51.80
	GS	2019-03-31	38,000	55.30	51.80
	GS	2019-06-30	38,000	55.30	51.80
	BNP	2018-03-31	42,000	59.21	53.00
	BNP	2018-06-30	42,000	59.21	53.00
	BNP	2018-09-30	42,000	59.21	53.00
	BNP	2018-12-31	42,000	59.21	53.00
	GS	2019-03-31	38,000	63.50	53.00
	GS	2019-06-30	38,000	63.50	53.00
	GS	2019-09-30	38,000	63.50	53.00
	GS	2018-03-31	85,000	52.00	54.05
	GS	2018-06-30	68,000	52.00	53.75
	GS	2018-09-30	50,000	51.50	53.75
	SC	2018-12-31	32,000	51.50	53.60
	SC	2019-03-31	15,000	51.50	53.60
	GS	2018-03-31	17,000	51.50	52.75
	GS	2018-06-30	17,000	51.50	52.60
	SC	2018-09-30	16,000	51.00	52.40
	SC	2018-12-31	15,000	51.00	51.90

In BBL, US dollar

Type	Counterparty	Terms	Contract amount	Exercise Price	
				Call	Put
Cash flow hedge	GS	2018-03-31	17,000	51.50	53.05
	GS	2018-06-30	17,000	51.50	52.80
	GS	2018-09-30	17,000	51.00	52.50
	GS	2018-12-31	16,000	51.00	51.90
	GS	2019-06-30	30,000	51.90	54.65
	GS	2019-09-30	16,000	51.90	53.55
	CBA	2018-12-31	480,000	52.00	59.00
	DNB	2019-06-30	217,052	54.00	62.96
	DNB	2019-09-30	440,000	54.00	62.41
	GS	2019-03-31	26,000	53.15	51.50
	GS	2018-12-31	80,000	53.50	51.50
	SC	2018-03-31	198,000	54.40	51.50
	SC	2018-03-31	152,000	54.98	51.50
	SC	2018-09-30	119,000	53.76	51.50
	SC	2018-06-30	141,000	54.98	51.50
	SC	2018-06-30	159,000	54.20	51.50
	SG	2018-09-30	131,000	52.76	51.00
	SG	2018-12-31	120,000	53.30	51.00

(g) Gains and losses on valuation and transaction of derivatives for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		Net income effects of valuations		Net income effects of transactions		Other comprehensive income (loss) (*)	
		2017	2016	2017	2016	2017	2016
Currency swaps	₩	(10,749)	-	(11,605)	(5,011)	5,935	(1,330)
Interest rate swaps			-	-	-	2,468	363
Currency forwards			-	-	-	(4,444)	-
Other derivatives		(14,556)	(3,164)	(2,477)	(1,423)	(51,290)	-
	₩	(25,305)	(3,164)	(14,082)	(6,434)	(47,331)	(967)

(*) Changes in accumulated other comprehensive income (loss) are net of tax effect amounting to ₩15,308 million and (-)₩1,582 million for the years ended December 31, 2017 and 2016, respectively.

11. Trade and Other Receivables

Details of trade and other receivables as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017				December 31, 2016			
		Gross amounts	Allowance for doubtful accounts	Present value discount	Book value	Gross amounts	Allowance for doubtful accounts	Present value discount	Book value
Current									
Trade accounts receivable	₩	267,828	(693)	-	267,135	298,536	(1,400)	-	297,136
Other receivables		289,145	(11)	-	289,134	270,254	(172)	(6)	270,076
		556,973	(704)	-	556,269	568,790	(1,572)	(6)	567,212
Non-current									
Other receivables		115,807	-	(18,039)	97,768	118,664	-	-	118,664
	₩	672,780	(704)	(18,039)	654,037	687,454	(1,572)	(6)	685,876

12. Available-for-sale Financial Instruments

(a) Details of available-for-sale financial instruments as of December 31, 2017 and 2016 are as follows:

In millions of Korean won	Ownership interest(%)		Carrying amount December 31, 2017	Carrying amount December 31, 2016	Fair value December 31, 2017	Fair value December 31, 2016
Non-marketable						
Yemen LNG Company Limited	1.06	₩	4,669	13,613	4,669	13,613
PETRO ONADO S.A.	5.64		-	-	-	-
Micronic Korea(*1)(*2)	16.70		820	925	820	925
Troika Resource Investment PEF	14.47		3,244	3,666	3,244	3,666
Global Dynasty Natural Resource PEF	15.67		2,991	3,498	2,991	3,498
Marketable						
EP Energy	12.82		79,083	247,576	79,083	247,576
		₩	90,807	269,278	90,807	269,278

(*1) The dividend incomes associated with Micronic Korea are ₩10 million and ₩24 million for the years ended December 31, 2017 and 2016, respectively.

(*2) The carrying amounts of non-marketable securities without a quoted price in an active market or a reliable fair value measurement held by the Group that was measured at cost are ₩820 million and ₩925 million as of December 31, 2017 and 2016, respectively.

12. Available-for-sale Financial Instruments, Continued

(b) Changes in available-for-sale financial instruments for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	269,278	355,733
Acquisitions (Disposals)		18	(40,953)
Valuation adjustments(*1)		(84,561)	(3,270)
Impairment losses(*2)		(71,586)	(45,577)
Effect of movements in exchange rates		(22,342)	3,345
	₩	90,807	269,278

(*1) Amounts are presented without the tax effect amounting to ₩20,464 million and ₩791 million for the years ended December 31, 2017 and 2016 respectively, which have been recognized directly in equity.

(*2) The Group recognized impairment losses on EP Energy, Troika Resource Investment PEF and Global Dynasty Resource PEF amounting to ₩71,445 million, ₩7 million and ₩134 million, respectively, for the year ended December 31, 2017. The Group recognized impairment losses on PETRO ONADO S.A., Troika Resource Investment PEF and Global Dynasty Resource PEF amounting to ₩19,042 million, ₩24,887 million and ₩1,648 million, respectively, for the year ended December 31, 2016.

13. Loans

Details of loans as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017			December 31, 2016		
		Face value	Provision for loans	Carrying amount	Face value	Provision for loans	Carrying amount
Short term Loans							
Loans to related parties(*1)	₩	3,185	-	3,185	-	-	-
Long term Loans							
Loans to employee(*2)	₩	103,222	-	103,222	100,490	-	100,490
General loans		108,554	(45,098)	63,456	121,256	(1,057)	120,199
Loans to related parties(*1)		1,008,855	(696,068)	312,787	1,109,773	(729,387)	380,386
	₩	1,223,816	(741,166)	482,650	1,331,519	(730,444)	601,075

(*1) The Group provided KADOC Ltd. and 15 other related parties with loans at interest rates of 3.00~7.99%. The maturities are due in 2~23 years, and the Group recognized related bad debt expenses of ₩47,280 million and ₩4,760 million for the years ended December 31, 2017 and 2016 respectively; reversal of bad debt allowance of ₩7,934 million for the year ended December 31, 2017; and share of loss under equity method of ₩18,706 million and ₩7,276 million for the years ended December 31, 2017 and 2016, respectively. (see Note 42)

(*2) Loans to employee consist of loans for tuitions, housing and vehicles.

14. Financial Instruments

Details of financial Instruments as of December 31, 2017 and 2016 are as follows:

		December 31, 2017		December 31, 2016	
In millions of Korean won		Current	Non-current	Current	Non-current
Term deposit	₩	2,074	4,873	2,032	5,083

15. Other Financial Assets

Details of other current financial assets as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Overseas field operations quick assets	₩	14,919	16,026

16. Inventories

Details of inventories as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017			December 31, 2016		
		Acquisition cost	Provision for losses on valuation	Carrying amount	Acquisition cost	Provision for losses on valuation	Carrying amount
Raw materials(*1)	₩	3,113	(441)	2,672	5,173	(518)	4,655
Merchandises		8,842	-	8,842	14,227	-	14,227
Work-in-progress		71	-	71	200	-	200
Finished goods		7,738	-	7,738	17,961	-	17,961
Supplies(*2)		66,013	-	66,013	84,905	-	84,905
Goods in-transit		2,937	-	2,937	3,166	-	3,166
	₩	88,714	(441)	88,273	125,632	(518)	125,114

(*1) The reversal of the losses on the valuation of inventories recognized in cost of sales for the year ended December 31, 2017 is ₩77 million, and the reversal of the valuation of inventories recognized in cost of sales for the year ended December 31, 2016 is ₩66 million.

(*2) As drillship chartering segment has been classified as discontinued operations, loss on valuation has been recognized amounting to ₩6,821 million and carrying amount of supplies related to the vessels has been classified as assets held for sale. (see note 17)

17. Assets Held for Sale

In September 2017, management committed to a plan to sell the primary asset, Doo Sung (a vessel), within drillship chartering segment which was approved by the Board of Directors. A sales contract was entered into in 2017, but was terminated in February 2018 before execution of the contract. Management expects the assets will be sold in 2018. The assets held for sale are measured at the lower of their carrying amount and fair value less cost to sell based on an appraisal value, and the Group recognized the related impairment and other losses amounting to ₩49,761 million in 2017.

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Details of assets held for sale as of December 31, 2017 are as follows:

In millions of Korean won

		Acquisition Cost	Accumulated Depreciation	Accumulated Impairment loss	Carrying Amount
Vessels	₩	114,625	(70,925)	(40,228)	3,472
Tools and fixtures		4,629	(4,174)	(455)	-
Supplies		6,462	-	(6,462)	-
	₩	125,716	(75,099)	(47,145)	3,472

18. Non-Financial Assets

Details of non-financial assets as of December 31, 2017 and 2016 are as follows:

In millions of Korean won

		December 31, 2017		December 31, 2016	
		Current	Non-current	Current	Non-current
Advance payments	₩	98,531	-	42,620	-
Prepaid expenses		18,747	7,629	27,197	9,014
Oil stockpiles		-	3,539,992	-	3,894,155
	₩	117,278	3,547,621	69,817	3,903,169

19. Investments in Associates and Joint Ventures

(a) Details of investments in associates and joint ventures as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won

Entity	Principal activity	Country	Equity interest (%)		Acquisition cost	Book value
<Investments in associates>						
Kernhem B.V.	Exploration and Production("E&P")	Netherlands	36.67	₩	10,947	-
Oilhub Korea Yeosu Co., Ltd.	Storing of oil	Korea	29.00		36,221	50,430
ADA Oil LLP(*1)	E&P	Kazakhstan	12.50		18,803	-
Parallel Petroleum LLC(*2)	E&P	United States	10.00		41,106	-
					107,077	50,430
<Investments in joint ventures>						
KNOC Inam Ltd.	Exploration	Malaysia	40.00		-	-
KNOC Kamchatka Petroleum Ltd.(*3)	Exploration	Cyprus	55.00		1	-
KC karpovsky B.V.	Exploration	Netherlands	35.00		10	-
KNOC Bazian Ltd.(*3)	Exploration	Malaysia	66.72		-	-
KNOC Nigerian West Oil Company Ltd.(*3)	Exploration	Nigeria	75.00		64	-
KNOC Nigerian East Oil Company Ltd.(*3)	Exploration	Nigeria	75.00		64	-
KNOC Aral Ltd.(*3)	Exploration	Malaysia	51.00		-	-
Korea kamchatka Co., Ltd.	Exploration	Cyprus	50.00		7,282	-
KC kazakh B.V.	Exploration	Netherlands	35.00		243	-
Offshore International Group, Inc.	E&P	United States	50.00		680,471	182,782
KNOC Ferghana Ltd.	Exploration	Malaysia	50.00		1	-
KNOC Ferghana2 Ltd.(*3)	Exploration	Malaysia	65.00		-	-
KADOC Ltd.(*3)	E&P	Malaysia	75.00		1	-
Korea Oil Terminal Co., Ltd.(*3)	Storing of oil	Korea	82.26		3,965	-
Deep Basin Partnership(*3)	E&P	Canada	82.59		199,759	-
HKMS Partnership(*3)	Gas processing plant operation	Canada	70.47		63,667	48,047
					955,528	230,829
				₩	1,062,605	281,259

(*1) Classified as an investment in associate as the Group's associate, Kernhem B.V. holds 75% of the equity interest and by effective equity interest, the Group has the ability to exercise significant influence over the entity.

(*2) Classified as an investment in associate as the Group can designate one director in its board of directors. Despite the percentage of ownership is below 20%, the Group has the ability to exercise significant influence over the entity.

(*3) Despite the percentage of ownership of over 50%, the investment is classified as an investment in joint ventures as the Group is unable to exercise control over investees solely.

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19. Investments in Associates and Joint Ventures, Continued

(a) Details of investments in associates and joint ventures as of December 31, 2017 and 2016 are as follows, continued:

(ii) As of December 31, 2016

In millions of Korean won

Entity	Principal activity	Country	Equity interest (%)		Acquisition cost	Book value
<Investments in associates>						
Kernhem B.V.	Exploration and Production("E&P")	Netherlands	36.67	₩	12,348	-
Oilhub Korea Yeosu Co., Ltd.	Storing of oil	Korea	29.00		40,856	44,239
ADA Oil LLP(*1)	E&P	Kazakhstan	12.50		21,209	1,169
Parallel Petroleum LLC(*2)	E&P	United States	10.00		46,366	1,050
					120,779	46,458
<Investments in joint ventures>						
KNOC Inam Ltd.	Exploration	Malaysia	40.00		-	-
KNOC Kamchatka Petroleum Ltd.(*3)	Exploration	Cyprus	55.00		1	-
KC karpovsky B.V.	Exploration	Netherlands	35.00		11	-
KNOC Bazian Ltd.(*3)	Exploration	Malaysia	66.72		-	-
KNOC Nigerian West Oil Company Ltd.(*3)	Exploration	Nigeria	75.00		73	-
KNOC Nigerian East Oil Company Ltd.(*3)	Exploration	Nigeria	75.00		73	-
KNOC Aral Ltd.(*3)	Exploration	Malaysia	51.00		-	-
Korea kamchatka Co., Ltd.	Exploration	Cyprus	50.00		8,213	-
KC kazakh B.V.	Exploration	Netherlands	35.00		274	-
Offshore International Group, Inc.	E&P	United States	50.00		767,547	247,660
KNOC Ferghana Ltd.	Exploration	Malaysia	50.00		1	-
KNOC Ferghana2 Ltd.(*3)	Exploration	Malaysia	65.00		-	-
KADOC Ltd.(*3)	E&P	Malaysia	75.00		1	-
Korea Oil Terminal Co., Ltd.(*3)	Storing of oil	Korea	82.26		3,967	-
Deep Basin Partnership(*3)	E&P	Canada	82.32		205,296	40,217
HKMS Partnership(*3)	Gas processing plant operation	Canada	70.23		71,042	56,141
					1,056,499	344,018
				₩	1,177,278	390,476

(*1) Classified as an investment in associate as the Group's associate, Kernhem B.V. holds 75% of the equity interest and by effective equity interest, the Group has the ability to exercise significant influence over the entity.

(*2) Classified as an investment in associate as the Group can designate one director in its board of directors. Despite the percentage of ownership is below 20%, the Group has the ability to exercise significant influence over the entity.

(*3) Despite the percentage of ownership of over 50%, the investment is classified as an investment in joint ventures as the Group is unable to exercise control over investees solely.

19. Investments in Associates and Joint Ventures, Continued

(b) Changes in carrying value of investments in associates and joint ventures for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won

Entity	Beginning balance	Acquisition	Dividends received	Share of profit and loss of equity method (*1)	Changes in equity adjustments in equity method	Impair-ment losses (*2)	Other changes (*3)	Ending balance
<Investment in associates>								
Kernhem B.V.	₩ -	-	-	477	(477)	-	-	-
Oilhub Korea Yeosu Co. Ltd.	44,239	-	-	6,054	5,836	-	(5,699)	50,430
ADA Oil LLP	1,169	-	-	(1,083)	(11)	-	(75)	-
Parallel Petroleum LLC	1,050	-	-	(982)	-	-	(68)	-
	46,458	-	-	4,466	5,348	-	(5,842)	50,430
<Investment in joint ventures>								
KNOC Inam Ltd.	-	-	-	-	-	-	-	-
KNOC Kamchatka Petroleum Ltd.	-	-	-	-	-	-	-	-
KC karpovsky B.V.	-	-	-	-	-	-	-	-
KNOC Bazian Ltd.	-	-	-	-	-	-	-	-
KNOC Nigerian West Oil Company Ltd.	-	-	-	-	-	-	-	-
KNOC Nigerian East Oil Company Ltd.	-	-	-	-	-	-	-	-
KNOC Aral Ltd.	-	-	-	-	-	-	-	-
Korea kamchatka Co., Ltd.	-	-	-	-	-	-	-	-
KC kazakh B.V.	-	-	-	-	-	-	-	-
Offshore International Group, Inc.	247,660	-	-	(33,297)	-	(5,526)	(26,055)	182,782
KNOC Ferghana Ltd.	-	-	-	-	-	-	-	-
KNOC Ferghana2 Ltd.	-	-	-	-	-	-	-	-
KADOC Ltd.	-	-	-	-	-	-	-	-
Korea Oil Terminal Co., Ltd.	-	473	-	(404)	(69)	-	-	-
Deep Basin Partnership	40,217	18,738	(9,611)	(47,205)	-	-	(2,139)	-
HKMS Partnership	56,141	722	(14,934)	8,634	-	-	(2,516)	48,047
	344,018	19,933	(24,545)	(72,272)	(69)	(5,526)	(30,710)	230,829
	₩ 390,476	19,933	(24,545)	(67,806)	5,279	(5,526)	(36,552)	281,259

(*1) Equity method is not applied to investments in associates and joint ventures for which the investment balance has been reduced to zero. As a result, losses of ₩18,706 million under equity method have been accounted to loans for the year ended December 31, 2017. Loss under equity method amounting to ₩35,449 million related to Group's additional obligation on Deep Basin Partnership has been accounted for as provision.

(*2) Details of the impairment loss as of December 31, 2017 are as follows:

In millions of Korean won

CGU	Recoverable amounts	Valuation of recoverable Method	Discount rate	Primary Assumption	Impairment loss	Reason for impairment
Offshore International Group, Inc.	182,782	Value in use	8.28%	Estimated production quantities based on reserve reports and long-term oil price forecasts by major forecasting Institutions	(5,526)	Decrease in international oil prices, changes in reserves and others

(*3) Include the effect of changes in exchange rates.

19. Investments in Associates and Joint Ventures, Continued

(b) Changes in carrying value of investments in associates and joint ventures for the years ended December 31, 2017 and 2016 are as follows, continued:

(ii) For the year ended December 31, 2016

In millions of Korean won

Entity		Beginning balance	Acquisition	Disposals	Dividends received	Share of profit and loss of equity method (*1)	Changes in equity adjustments in equity method	Impair-ment losses (*2)	Other changes (*3)	Ending balance
<Investment in associates>										
Kernhem B.V.	₩	-	-	-	-	1,978	(1,978)	-	-	-
Oilhub Korea Yeosu Co. Ltd.		39,016	-	-	-	5,305	(1,456)	-	1,374	44,239
ADA Oil LLP		2,012	-	-	-	1,467	(966)	(1,371)	27	1,169
Parallel Petroleum LLC		25,316	-	-	-	(24,059)	-	-	(207)	1,050
		66,344	-	-	-	(15,309)	(4,400)	(1,371)	1,194	46,458
<Investment in joint ventures>										
KNOC Inam Ltd.		-	-	-	-	-	-	-	-	-
KNOC Kamchatka Petroleum Ltd.		-	-	-	-	-	-	-	-	-
KC karpovsky B.V.		-	-	-	-	-	-	-	-	-
KNOC Bazian Ltd.		-	-	-	-	-	-	-	-	-
KNOC Nigerian West Oil Company Ltd.		-	-	-	-	-	-	-	-	-
KNOC Nigerian East Oil Company Ltd.		-	-	-	-	-	-	-	-	-
KNOC Aral Ltd.		-	-	-	-	-	-	-	-	-
Korea kamchatka Co., Ltd.		-	-	-	-	-	-	-	-	-
KC kazakh B.V.		-	-	-	-	-	-	-	-	-
Offshore International Group, Inc.		419,099	-	(3,614)	-	(56,780)	-	(116,769)	5,724	247,660
KNOC Ferghana Ltd.		-	-	-	-	-	-	-	-	-
KNOC Ferghana2 Ltd.		-	-	-	-	-	-	-	-	-
KADOC Ltd.		-	-	-	-	-	-	-	-	-
Korea Oil Terminal Co., Ltd.		3,190	650	-	-	(4,156)	347	-	(31)	-
Deep Basin Partnership		42,375	41,852	-	(1,436)	(45,001)	-	-	2,427	40,217
HKMS Partnership		58,310	876	-	(13,241)	6,841	-	-	3,355	56,141
		522,974	43,378	(3,614)	(14,677)	(99,096)	347	(116,769)	11,475	344,018
	₩	589,318	43,378	(3,614)	(14,677)	(114,405)	(4,053)	(118,140)	12,669	390,476

(*1) Equity method is not applied to investments in associates and joint ventures with fully impaired capital. As a result, losses of ₩7,276 million under equity method have been accounted to loans for the year ended December 31, 2016.

(*2) Details of the impairment losses as of December 31, 2016 are as follows:

In millions of Korean won

CGU	Recoverable amounts	Valuation of recoverable Method	Discount rate	Primary Assumption	Impairment loss	Reason for impairment
ADA Oil LLP	1,169	Value in use	10.16%	Estimated production quantities based on reserve reports and long-term oil price forecasts by major forecasting Institutions	(1,371)	Decrease in international oil prices, changes in reserves and others
Offshore International Group, Inc.	247,660		9.91%		(116,769)	

(*3) Include the effect of changes in exchange rates.

19. Investments in Associates and Joint Ventures, Continued

(c) The summaries of financial information of major associates and joint ventures for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won		Total assets	Total liabilities	Revenue	Net income (loss)
<Investment in associates>					
Kernhem B.V.	₩	180,599	230,387	31,885	(5,435)
Oilhub Korea Yeosu Co., Ltd.		511,353	337,455	74,838	20,877
ADA Oil LLP		78,933	132,246	31,885	(6,911)
Parallel Petroleum LLC		367,166	258,795	7,118	(19,528)
<Investment in joint ventures>					
KNOC Nigerian West Oil Company Ltd.		147,185	227,588	-	(9,481)
KNOC Nigerian East Oil Company Ltd.		241,808	329,639	-	(10,614)
Offshore International Group, Inc.		771,078	335,429	144,109	(66,594)
KADOC Ltd.		355,192	405,489	-	(12,359)
Korea Oil Terminal Co., Ltd.		3,693	4,507	-	(721)
Deep Basin Partnership		99,629	135,074	44,474	(82,654)
HKMS Partnership		94,140	93,246	24,147	811

19. Investments in Associates and Joint Ventures, Continued

(c) The summaries of financial information of major associates and joint ventures for the years ended December 31, 2017 and 2016 are as follows, continued:

(ii) For the year ended December 31, 2016

In millions of Korean won		Total assets	Total liabilities	Revenue	Net income (loss)
<Investment in associates>					
Kernhem B.V.	₩	205,086	254,046	26,677	10,519
Oilhub Korea Yeosu Co., Ltd.		554,894	402,345	76,668	18,294
ADA Oil LLP		91,663	144,322	26,677	16,421
Parallel Petroleum LLC		434,850	287,412	64,642	(1,489)
<Investment in joint ventures>					
KNOC Bazian Ltd.		150,999	214,036	-	(6,222)
KNOC Nigerian West Oil Company Ltd.		165,396	245,955	-	(8,803)
KNOC Nigerian East Oil Company Ltd.		272,964	360,691	-	(11,634)
KNOC Aral Ltd.		41,665	41,888	-	(5)
KC kazakh B.V.		345,673	923,725	-	(372,521)
Offshore International Group, Inc.		927,459	364,896	134,620	(95,825)
KNOC Ferghana Ltd.		63,963	72,798	-	(1,811)
KNOC Ferghana2 Ltd.		22,549	24,942	-	(643)
KADOC Ltd.		313,136	356,662	-	(11,604)
Korea Oil Terminal Co., Ltd.		3,827	4,521	-	(1,281)
Deep Basin Partnership		188,384	149,455	32,593	(45,263)
HKMS Partnership		100,334	100,892	20,881	(673)

20. Property, Plant and Equipment

(a) Details of property, plant and equipment as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Acquisition cost	Contributions for construction	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
Land	₩	445,333	-	-	-	-	445,333
Buildings		70,223	-	-	(24,419)	-	45,804
Structures		1,786,554	(113)	-	(634,577)	-	1,151,864
Machinery		563,786	(3,471)	-	(371,523)	-	188,792
Vehicles		9,289	-	-	(7,106)	-	2,183
Tools & fixtures		56,501	-	-	(46,530)	(306)	9,665
Finance lease asset		220,420	-	-	(5,839)	-	214,581
Construction-in-progress		254,104	-	-	-	-	254,104
Others		53,412	-	-	(39,568)	(2,086)	11,758
Oil & gas properties		19,718,592	-	(3,969)	(10,076,816)	(2,938,220)	6,699,587
	₩	23,178,214	(3,584)	(3,969)	(11,206,378)	(2,940,612)	9,023,671

(ii) As of December 31, 2016

In millions of Korean won		Acquisition cost	Contributions for construction	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
Land	₩	550,989	-	-	-	-	550,989
Buildings		205,139	-	-	(34,578)	-	170,561
Structures		1,967,228	(131)	-	(666,848)	-	1,300,249
Machinery		642,104	(4,254)	(2)	(393,442)	-	244,406
Vessels		129,293	-	-	(76,110)	-	53,183
Vehicles		10,286	-	-	(7,232)	-	3,054
Tools & fixtures		67,361	-	-	(49,843)	(321)	17,197
Construction-in-progress		274,357	-	-	-	-	274,357
Others		49,321	-	-	(38,465)	(2,198)	8,658
Oil & gas properties		20,530,244	-	(5,802)	(9,952,803)	(3,019,365)	7,552,274
	₩	24,426,322	(4,385)	(5,804)	(11,219,321)	(3,021,884)	10,174,928

20. Property, Plant and Equipment, Continued

(b) Changes in property, plant and equipment for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won	Beginning balance	Acquisitions	Disposals (*2)	Depreciation	Impairment losses	Reversal of impairment losses	Reclassifi-cations	Others (*3)	Ending balance
Land	₩ 550,989	-	(45,542)	-	-	-	-	(60,114)	445,333
Buildings	170,561	974	(108,429)	(1,907)	-	-	(1,929)	(13,466)	45,804
Structures	1,300,380	67,644	(3,999)	(46,454)	-	-	(1,630)	(163,964)	1,151,977
(Contributions to construction)	(131)	-	-	4	-	-	-	14	(113)
Machinery	248,662	13,744	(19,839)	(27,467)	-	-	4,601	(27,438)	192,263
(Contributions to construction)	(4,254)	-	-	316	-	-	-	467	(3,471)
(Government grants)	(2)	-	2	-	-	-	-	-	-
Vessels(*1)	53,183	-	-	(3,641)	(42,460)	-	(3,664)	(3,418)	-
Vehicles	3,054	268	(36)	(866)	-	-	-	(237)	2,183
Tools & fixtures(*1)	17,197	708	(59)	(6,324)	(480)	-	90	(1,467)	9,665
Finance lease asset	-	232,648	-	(6,163)	-	-	-	(11,904)	214,581
Construction-in-progress	274,357	33,977	(45)	-	-	-	(29,008)	(25,177)	254,104
Others	8,658	857	(5)	(3,629)	-	-	38	5,839	11,758
Oil & gas properties	7,558,076	481,542	(432)	(711,533)	(320,267)	163,645	29,615	(497,090)	6,703,556
(Government grants)	(5,802)	-	-	1,240	-	-	-	593	(3,969)
	₩ 10,174,928	832,362	(178,384)	(806,424)	(363,207)	163,645	(1,887)	(797,362)	9,023,671

(*1) Impairment loss on vessels and tools & fixtures due to discontinued drillship chartering segment has been recognized during the year ended December 31, 2017. Details are as follows:

In millions of Korean won

	Characteristics of asset	Valuation method of recoverable amount	Recoverable amount	Discount rate after tax	Primary assumptions	Impairment losses	Cause of impairment
Drillship chartering	Vessels and tools & fixtures	Fair value less cost to sell	3,472	-	Appraisal value when scrapped	42,940	Discontinued operation

(*2) For the years ended December 31, 2017, the Group sold the headquarters' land, building, and fixtures and leased back. The contracted sale price is ₩220,000 million, and the Group holds a right to purchase corresponding assets within 5 years from the commencement date. The Group has accounted the sale-and-leaseback transaction above as finance lease, and deferred gain on disposal of property, plant and equipment amounting to ₩34,364 million and recognized over the lease term.

(*3) Include the effect of changes in exchange rates and others. (see Note 23)

20. Property, Plant and Equipment, Continued

(ii) For the year ended December 31, 2016

In millions of Korean won		Beginning balance	Acquisitions	Disposals	Depreciation	Impairment losses	Reversal of impairment losses	Reclassifi-cations	Others (*)	Ending balance
Land	₩	536,779	28	(2,436)	-	-	-	-	16,618	550,989
Buildings		171,358	223	(310)	(5,836)	-	-	19	5,107	170,561
Structures		1,317,892	397	(8,141)	(48,418)	-	-	57	38,593	1,300,380
(Contributions to construction)		(131)	-	-	4	-	-	-	(4)	(131)
Machinery		281,861	2,427	(700)	(30,868)	-	-	183	(4,241)	248,662
(Contributions to construction)		(4,453)	-	-	325	-	-	-	(126)	(4,254)
(Government grants)		(2)	-	-	-	-	-	-	-	(2)
Vessels		54,406	800	-	(3,602)	-	-	-	1,579	53,183
Vehicles		2,138	1,650	(107)	(700)	-	-	27	46	3,054
Tools & fixtures		24,990	703	(6)	(7,981)	(315)	-	892	(1,086)	17,197
Construction-in-progress		90,877	184,006	-	-	-	-	(10,500)	9,974	274,357
Others		22,547	296	(18)	(5,259)	(2,147)	-	20	(6,781)	8,658
Oil & gas properties		8,222,136	547,853	(143,601)	(853,130)	(431,145)	400,959	38,678	(223,674)	7,558,076
(Government grants)		(6,978)	-	-	1,337	-	-	-	(161)	(5,802)
	₩	10,713,420	738,383	(155,319)	(954,128)	(433,607)	400,959	29,376	(164,156)	10,174,928

(*) Include the effect of changes in exchange rates and others.

(c) Details of impairments recognized by segments for the years ended December 31, 2017 and 2016 are as follows :

(i) For the year ended December 31, 2017

In millions of Korean won		**Oil and Gas(*1)**
General information		
Type of assets		Oil and gas properties
Recognition of impairment losses		26 CGUs and individual assets
Valuation Method		Value in use, fair value less cost to sell(*2)
Assumptions		
Discount rate after tax(*3)		8.00~22.30%
Oil prices(*4)		International indices
Production quantities		Estimated production quantities based on reserve reports
Recoverable amounts	₩	658,155
Impairment losses		320,266
Reason for impairment		Decrease in forecasted oil prices and probable reserves

(*1) The CGUs of the oil and gas segment are fields or areas.
(*2) Each individual asset in Canada has been measured at fair value less cost to sell based on disposal contracts.
(*3) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.
(*4) The oil prices are based on the long-term forecasts from globally recognized research institutions.

20. Property, Plant and Equipment, Continued

(c) Details of impairments recognized by segments for the years ended December 31, 2017 and 2016 are as follows, continued :

(ii) For the year ended December 31, 2016

In millions of Korean won		**Oil and Gas(*1)**
General information		
Type of assets		Oil and gas properties
Recognition of impairment losses		31 CGUs and individual assets
Valuation Method		Value in use
Assumptions		
Discount rate after tax(*2)		8.00~22.20%
Oil prices(*3)		International indices
Production quantities		Estimated production quantities based on reserve reports
Recoverable amounts	₩	2,018,690
Impairment losses		431,145
Reason for impairment		Decrease in forecasted oil prices and others

(*1) The CGUs of the oil and gas segment are fields or wells.
(*2) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.
(*3) The oil prices are based on the long-term forecasts from globally recognized research institutions.

(d) Details of reversal of impairment losses recognized by segments for the year ended December 31, 2017 are as follows :

In millions of Korean won		**Oil and Gas(*1)**
General information		
Type of assets		Oil and gas properties
Recognition of reversal of impairment losses		10 CGUs and individual assets
Valuation Method		Value in use, fair value less cost to sell (*2)
Assumptions		
Discount rate after tax(*3)		8.50~20.30%
Oil prices(*4)		International indices
Production quantities		Estimated production quantities based on reserve reports
Reversal of impairment losses	₩	163,645
Reason for reversal of impairment losses		Increase in probable reserves and others

(*1) The CGUs of the oil and gas segment are fields or areas.
(*2) Each individual asset in Canada has been measured at fair value less cost to sell based on disposal contracts.
(*3) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.
(*4) The oil prices are based on the long-term forecasts from globally recognized research institutions.

20. Property, Plant and Equipment, Continued

(e) Details of reversal of impairment losses recognized by segments for the year ended December 31, 2016 are as follows :

In millions of Korean won		**Oil and Gas(*1)**
General information		
Type of assets		Oil and gas properties
Recognition of reversal of impairment losses		24 CGUs and individual assets
Valuation Method		Value in use, fair value less cost to sell (*2)
Assumptions		
Discount rate after tax(*3)		8.00~12.00%
Oil prices(*4)		International indices
Production quantities		Estimated production quantities based on reserve reports
Reversal of impairment losses	₩	400,959
Reason for reversal of impairment losses		Production period extension, decrease in operation cost, disposal contracts and others

(*1) The CGUs of the oil and gas segment are fields or wells.

(*2) Each individual asset in Canada has been measured at fair value less cost to sell based on disposal contracts.

(*3) Weighted average costs of capital reflecting its own risk of a CGU and an individual asset.

(*4) The oil prices are based on the long-term forecasts from globally recognized research institutions.

21. Goodwill

(a) Details of goodwill as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Acquisition cost	₩	1,131,748	1,172,204
Accumulated impairment losses		(983,894)	(927,875)
	₩	147,854	244,329

(b) Changes in goodwill for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	244,329	301,308
Disposals		-	(10,253)
Impairment losses (*1)		(87,470)	(32,440)
Other changes (*2)		(9,005)	(14,286)
	₩	147,854	244,329

(*1) The Group recognized an impairment loss on goodwill arising from the acquisition of Harvest Operations Corp. due to significant decrease in oil and gas prices.
(*2) Include the effect of exchange rate changes.

(c) Changes in accumulated impairment losses for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	(927,875)	(1,009,450)
Impairment losses		(87,470)	(32,440)
Other changes (*)		31,451	114,015
	₩	(983,894)	(927,875)

(*) Include the effect of exchange rate changes.

21. Goodwill, Continued

(d) For the purpose of impairment testing, carrying amounts of goodwill allocated to Group's CGUs and groups of CGUs as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Oil and gas properties segment			
Oil and gas properties of Dana Petroleum Limited by country (*1)	₩	122,454	125,912
Conventional oil and gas properties of Harvest Operations Corp. (*2)		-	89,767
Altius Holdings Inc. (a subsidiary of KNOC Kaz B.V.) (*3)		25,400	28,650
	₩	147,854	244,329

(*1) Dana Petroleum Limited's recoverable amount is estimated based on the value in use. The value in use is estimated from the cash inflows, which are discounted at 8% and 12% derived from the oil production in the long-term production plan indicated in the reserve reports and the long-term oil price forecasts by the research institutions. There is no impairment loss on goodwill recognized based on the value in use estimated for each CGU for the year ended December 31, 2017.

(*2) Harvest Operations Corp.'s recoverable amount is estimated based on the fair value less costs of disposal. The Group estimated the fair value less costs of disposal using the market approach valuation technique. The Group used the market multiples as the entity value of a set of comparable companies divided by their reserves and multiplied that multiples to the subsidiaries' reserves from the reserve reports. The Group recognized an impairment loss on goodwill of ₩87,470 million and ₩32,440 million in the consolidated statements of comprehensive loss as other loss based on the fair value less costs of disposal for the years ended December 31, 2017 and 2016 respectively.

(*3) Altius Holding Inc.'s recoverable amount is estimated based on the value in use. The value in use is estimated from the cash inflows, which are discounted at 9.28%, derived from the oil production in the long-term production plan indicated in the reserve reports and the long-term oil price forecasts by the research institutions. There is no impairment loss on goodwill recognized based on the value in use estimated for each CGU for the year ended December 31, 2017.

22. Intangible Assets Other Than Goodwill

(a) Details of intangible assets other than goodwill as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Acquisition cost	Accumulated amortization	Accumulated impairment losses	Book value
Exploration and evaluation assets	₩	3,085,261	-	(2,572,182)	513,079
Software		28,315	(23,782)	-	4,533
Mining rights		3,941,282	(1,438,868)	(95,095)	2,407,319
Development cost		38,070	(31,018)	-	7,052
Land use right		224	(70)	-	154
Others		85,870	(1,009)	(82,664)	2,197
	₩	7,179,022	(1,494,747)	(2,749,941)	2,934,334

(ii) As of December 31, 2016

In millions of Korean won		Acquisition cost	Accumulated amortization	Accumulated impairment losses	Book value
Exploration and evaluation assets	₩	3,231,627	-	(2,485,343)	746,284
Software		35,584	(28,510)	-	7,074
Mining rights		4,447,746	(1,523,666)	(101,142)	2,822,938
Development cost		40,802	(32,453)	-	8,349
Land use right		253	(71)	-	182
Others		97,093	(1,278)	(93,242)	2,573
	₩	7,853,105	(1,585,978)	(2,679,727)	3,587,400

22. Intangible Assets Other Than Goodwill, Continued

(b) Changes in intangible assets other than goodwill for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won

		Beginning balance	Acquisi-tions	Disposals	Amorti-zation	Impairment losses(*1)	Reclassifi-cations	Others (*2)	Ending balance
Exploration and evaluation assets	₩	746,284	27,171	(3,356)	-	(221,323)	(1,940)	(33,757)	513,079
Software		7,074	91	(4)	(2,657)	-	736	(707)	4,533
Mining rights		2,822,938	-	(8)	(93,346)	(5,728)	-	(316,537)	2,407,319
Development cost		8,349	1,573	-	(2,372)	-	429	(927)	7,052
Land use right		182	-	-	(6)	-	-	(22)	154
Others		2,573	13	-	(103)	-	-	(286)	2,197
	₩	3,587,400	28,848	(3,368)	(98,484)	(227,051)	(775)	(352,236)	2,934,334

(*1) Include the write-off of ₩227,051 million, which have been recognized due to relinquishment of explorations in continental shelf and decrease in estimated reserve amount of exploration in United Kingdom. Also, gains on debt exemption of ₩17,119 million from loans and accrued interest based on Accounting for Energy and Resources have been recognized.
(*2) Include the effect of changes in exchange rates and others.

(ii) For the year ended December 31, 2016

In millions of Korean won

		Beginning balance	Acquisi-tions	Disposals	Amorti-zation	Impairment losses(*1)	Reversal of impairment	Reclassifi-cations	Others (*2)	Ending balance
Exploration and evaluation assets	₩	1,246,714	41,844	(70,753)	-	(327,854)	-	(49,025)	(94,642)	746,284
Software		8,061	158	(781)	(3,482)	-	-	2,917	201	7,074
Mining rights		2,889,845	923	(9,569)	(144,746)	(17,178)	6,416	14,350	82,897	2,822,938
Development cost		7,880	1,425	-	(3,590)	-	-	2,380	254	8,349
Land use right		181	-	-	(6)	-	-	-	7	182
Others		2,600	5	-	(106)	-	-	-	74	2,573
	₩	4,155,281	44,355	(81,103)	(151,930)	(345,032)	6,416	(29,378)	(11,209)	3,587,400

(*1) Include the write-off of ₩345,032 million, which have been recognized due to expiration of mining rights in Korea, relinquishment of explorations in Iraq and decrease in recoverable amount of mining right in relation to oil and gas properties. Also, gains on debt exemption of ₩148,863 million from loans and accrued interest based on Accounting for Energy and Resources have been recognized.
(*2) Include the effect of changes in exchange rates and others.

23. Trade and Other Payables

(a) Details of trade and other payables as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Current	**Non-current**	**Current**	**Non-current**
Trade accounts payable	₩	140,950	-	100,246	-
Other accounts payable		502,444	46,474	693,151	57,144
Accrued expenses		98,358	196,583	117,873	203,009
Deposit received		-	4,480	-	4,546
Other deposits received		-	14	-	16
Finance lease liability		8,327	212,721	-	-
Other payables		36,320	43,527	62,084	28,719
	₩	786,399	503,799	973,354	293,434

(b) Details of finance lease liability are as follows:

(i) Lease Contract

As of January 31, 2018, the Group has entered in to a contract with KOCREF CR-REIT 36 to sell the headquarters building in Ulsan and lease back for use. The Group holds bargain purchase option which is exercisable after 5 years, and lease payments are renewed every 5 years. In compliance to the obligation to domicile in Ulsan under the legislation, the Group has accounted the contract for right to use the headquarters building as finance lease. Meanwhile, lessor holds the legal title of finance lease asset amounting to ₩214,581 million. (see Note 20)

(ii) Details of finance lease liability as of December 31, 2017 are as follows:

In millions of Korean won		**Minimum lease payments**	**Present value of minimum lease payment**
Within a year	₩	8,527	8,327
1~5 years		35,085	30,682
More than 5 years		482,577	182,039
	₩	526,189	221,048

(ii) Details of liquidity classification of finance lease liability as of December 31, 2017 are as follows:

In millions of Korean won		**As of December 31, 2017**
Current	₩	8,327
Non-current		212,721
	₩	221,048

24. Borrowings and Bonds Payable

(a) Details of borrowings and bonds payable as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Current Liabilities			
Short-term borrowings	₩	53,570	897,965
Current portion of long-term borrowings		782,304	245,325
Less: current portion of present discounted value		(4)	(160)
Current portion of bonds payable		2,324,147	2,023,507
Less: current portion of discount on bonds payable		(1,433)	(754)
		3,158,584	3,165,883
Non-current Liabilities			
Long-term borrowings		1,035,265	1,096,273
Less: present discounted value		(243)	(65)
Bonds payable		9,044,863	10,289,014
Less: discount on bonds payable		(32,899)	(39,459)
Add: premium on bonds payable		857	1,878
		10,047,843	11,347,641
	₩	13,206,427	14,513,524

(b) Details of payment schedule as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Borrowings	Bonds Payable	Borrowings	Bonds Payable
Within a year	₩	835,874	2,324,147	1,143,290	2,023,507
1~5 years		819,860	4,709,238	834,074	5,903,971
More than 5 years		215,405	4,335,625	262,199	4,385,043
	₩	1,871,139	11,369,010	2,239,563	12,312,521

24. Borrowings and Bonds Payable, Continued

(c) Details of short-term borrowings as of December 31, 2017 and 2016 are as follows:

In millions of Korean won

Type	Financial Institutions	Interest rate (%)	Maturity		December 31, 2017	December 31, 2016
				₩		
Short- term borrowings in foreign currencies	Shinhan Bank London	-	-		-	38,842
	CIBC and others	-	-		-	798,698
	The Export-Import Bank of Korea	-	-		-	60,425
	The Export-Import Bank of Korea	Libor+0.69	2018-06-26		53,570	-
				₩	53,570	897,965

(d) Details of long-term borrowings as of December 31, 2017 and 2016 are as follows:

In millions of Korean won and thousands of foreign currencies

				December 31, 2017		December 31, 2016	
Type	Financial Institution	Interest rate (%)	Maturity	Amount	Equivalent to Korean won	Amount	Equivalent to Korean won
Long- term borrowings in foreign currencies	Development Bank of Singapore	3M Libor+0.60	2018-01-30	USD 50,000	53,570	USD 50,000	60,425
	Mizuho Corporate Bank	3M Libor+0.75	2020-04-03	USD 200,000	214,280	USD 200,000	241,700
	SAER	Treasury 3Y -1.25	N/A(*1)	USD 95,939	102,788	USD 110,260	133,249
	SAER	Treasury 3Y -2.25	N/A(*1)	USD 105,111	112,616	USD 106,703	128,950
	BNP Paribas and others	Libor,Nibor, Euribor +1.75~2.25	2018-12-13	USD 660,170	707,306	USD 540,763	653,512
	CIBC and others	(*2)	2020-02-24	USD 150,983	161,764	-	-
	The Export Import Bank of Korea	2.27	2020-02-24	USD 397,522	425,905	-	-
	JP Morgan	Libor+0.80	2018-07-29	USD 10,000	10,714	USD 10,000	12,085
	Bank of America	Libor+0.75	2018-10-05	USD 10,000	10,714	USD 20,000	24,170
	Hyundai Heavy Industries, Hanhwa Corp	-	-	-	-	USD 52,692	63,678
	Kernhem International B.V.	8.13	2020-12-28	USD 16,718	17,912	USD 16,718	20,204
	Shinhan Bank	-	-	-	-	USD 3,000	3,625
					1,817,569		1,341,598
Less: present value discount					(247)		(225)
					1,817,322		1,341,373
Less: current portion					(782,304)		(245,325)
Less: current portion of present value discount					4		160
					1,035,022		1,096,208

(*1) SAER stands for Special Accounting for Energy and Resources. Loans from SAER included in borrowings have no specific maturity as they were borrowed under the condition that the Group is not obligated to make repayment of the principal and interest until the exploration is proven to be successful.

(*2) Interest rate on credit facility is subject to floating interest rate according to the contract terms, and effective interest rate for the year ended December 31, 2017 is approximately 2.215%.

24. Borrowings and Bonds Payable, Continued

(e) Details of bonds payable as of December 31, 2017 and 2016 are as follows:

In millions of Korean won and thousands of foreign currencies

Type	Interest rate (%)	Maturity	December 31, 2017 Amount	December 31, 2017 Equivalent to Korean won	December 31, 2016 Amount	December 31, 2016 Equivalent to Korean won
Floating interest rate bonds payable	3M Libor+0.80	2018-06-07	USD 200,000	214,280	USD 200,000	241,700
	3M Libor+1.00	2018-06-07	USD 300,000	321,420	USD 300,000	362,550
	A3B+1.50	2018-07-03	AUD 55,000	45,934	AUD 55,000	47,963
	3M Libor+1.20	2018-07-18	USD 330,000	353,562	USD 330,000	398,805
	A3B+1.08	2019-10-08	AUD 225,000	187,911	AUD 225,000	196,211
	-	-	-	-	USD 100,000	120,850
	3M Libor+0.60	2018-01-16	USD 50,000	53,570	USD 50,000	60,425
	3M Libor+0.70	2018-02-02	USD 250,000	267,850	USD 250,000	302,125
	A3B+1.28	2019-02-05	AUD 325,000	271,427	AUD 325,000	283,416
	3M Libor+0.60	2020-03-27	USD 500,000	535,700	-	-
Fixed interest rate bonds payable	4.38	2021-02-08	HKD 500,000	68,535	HKD 500,000	77,915
	4.50	2021-03-04	HKD 390,000	53,457	HKD 390,000	60,774
	3.95	2022-02-10	HKD 390,000	53,457	HKD 390,000	60,774
	-	-	-	-	CHF 300,000	354,399
	4.00	2022-03-28	EUR 50,000	63,963	EUR 50,000	63,380
	-	-	-	-	USD 1,000,000	1,208,500
	1.80	2018-01-22	HKD 400,000	54,828	HKD 400,000	62,332
	2.85	2023-01-24	HKD 400,000	54,828	HKD 400,000	62,332
	1.97	2018-01-29	USD 70,000	74,997	USD 70,000	84,595
	2.40	2023-02-04	EUR 37,000	47,332	EUR 37,000	46,901
	3.00	2025-06-24	EUR 60,000	76,755	EUR 60,000	76,056
	3.09	2023-07-03	EUR 50,000	63,963	EUR 50,000	63,380
	1.63	2018-11-29	CHF 240,000	262,733	CHF 240,000	283,519
	2.75	2019-01-23	USD 500,000	535,700	USD 500,000	604,250
	4.00	2024-01-23	USD 500,000	535,700	USD 500,000	604,250
	3.25	2024-07-10	USD 550,000	589,270	USD 550,000	664,675
	2.75	2019-01-23	USD 250,000	267,850	USD 250,000	302,125
	4.25	2019-10-08	AUD 125,000	104,395	AUD 125,000	109,006
	3.10	2027-01-21	USD 50,000	53,570	USD 50,000	60,425
	3.10	2027-01-21	USD 70,000	74,998	USD 70,000	84,595
	2.39	2020-01-28	USD 50,000	53,570	USD 50,000	60,425
	2.18	2020-01-29	HKD 310,000	42,492	HKD 310,000	48,307
	2.11	2020-03-16	KRW 100,000	100,000	KRW 100,000	100,000
	3.21	2030-03-19	USD 85,000	91,069	USD 85,000	102,723
	2.99	2025-03-19	USD 90,000	96,426	USD 90,000	108,765
	1.99	2020-04-23	KRW 50,000	50,000	KRW 50,000	50,000
	2.82	2025-04-29	USD 65,000	69,641	USD 65,000	78,553
	3.02	2030-04-29	USD 60,000	64,284	USD 60,000	72,510
	2.03	2020-08-26	KRW 150,000	150,000	KRW 150,000	150,000
	3.25	2025-10-01	USD 600,000	642,840	USD 600,000	725,100
	3.22	2030-11-10	USD 100,000	107,140	USD 100,000	120,850
	2.13	2021-04-14	USD 500,000	535,700	USD 500,000	604,250
	2.63	2024-04-14	USD 500,000	535,700	USD 500,000	604,250
	2.00	2021-10-24	USD 350,000	374,990	USD 350,000	422,975
	2.50	2026-10-24	USD 650,000	696,410	USD 650,000	785,525
	2.88	2022-03-27	USD 500,000	535,700	-	-
	3.38	2027-03-27	USD 500,000	535,700	-	-
	-	-	-	-	USD 281,140	339,758

24. Borrowings and Bonds Payable, Continued

(e) Details of bonds payable as of December 31, 2017 and 2016 are as follows, continued:

In millions of Korean won and thousands of foreign currencies

Type	Interest rate (%)	Maturity	December 31, 2017 Amount	December 31, 2017 Equivalent to Korean won	December 31, 2016 Amount	December 31, 2016 Equivalent to Korean won
Fixed interest rate bonds payable	2.13	2018-05-14	USD 629,964	674,972	USD 625,052	755,375
	2.33	2021-04-14	USD 195,678	209,659	USD 194,396	234,927
	3.00	2022-09-21	USD 480,409	514,732	-	-
				11,369,010		12,312,521
Less: discount on bonds payable				(34,332)		(40,213)
Add: premium on bonds payable				857		1,878
				11,335,535		12,274,186
Less: current portion				(2,324,147)		(2,023,507)
Less: current portion of present value discount				1,433		754
				9,012,821		10,251,433

25. Employee Benefits

The Group sponsors defined contribution plans and defined benefit plans which are subject to the employees' option.

(a) Defined contribution pension plan

The Group operates a defined contribution plan ("DC plan") which is subject to the employees' option. Contributions to the DC plan are separately managed by the plan's administrator. When employees terminate their employment before the benefits have vested, the Group's obligation to make contribution to the plan decreases on a pro rata basis.

Details of expenses relating to defined contribution plans for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Cost of sales	₩	1,057	934
Selling and administrative expenses		1,613	3,509
Profit (loss) from discontinued operations		64	-
	₩	2,734	4,443

Total expenses of ₩2,734 million and ₩4,443 million for the years ended December 31, 2017 and 2016, respectively are contributions paid by the Group based on the payment rate defined in employee benefits. No contributions remain unpaid as of December 31, 2017.

25. Employee Benefits, Continued

(b) Defined benefit pension plan

The latest actuarial calculation on both plan assets and defined benefit obligation was performed as of December 31, 2017. The Group uses the projected unit credit method to determine the present value of its defined benefit obligations and the related current service costs.

(i) The components of defined benefits liabilities as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Present value of defined benefit obligation from funded plans	₩	85,105	82,997
Fair value of plan assets		(76,811)	(68,267)
Net liabilities incurred from defined benefit plans	₩	8,294	14,730

(ii) Changes in the present value of defined benefit obligations for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	82,997	73,921
Current service cost		9,041	8,966
Interest cost		3,335	2,891
Remeasurement components		(5,509)	1,419
Actual payments		(4,759)	(3,682)
Effect of movement in exchange rates		-	(49)
Others		-	(469)
	₩	85,105	82,997

(iii) Changes in the fair value of plan assets for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	68,267	55,581
Expected return on plan assets(*)		2,765	2,201
Remeasurement components		(1,364)	(900)
Benefit paid by the plan		(4,759)	(3,667)
Contributions paid into the plan		11,902	15,052
	₩	76,811	68,267

(*) Actual returns on plan assets for the years ended December 31, 2017 and 2016 are ₩1,401 million and ₩1,301 million, respectively.

25. Employee Benefits, Continued

(b) Defined benefit pension plan, continued

(iv) Details of the fair value of plan assets as of December 31, 2017 and 2016 are as follows:

In millions of Korean won	Expected rate of return(*2)			Fair value of plan assets	
	December 31, 2017	December 31, 2016		December 31, 2017	December 31, 2016
Others(*1)	4.05%	3.96%	₩	76,812	68,267

(*1) Others are comprised of 79.34% of deposit and 20.66% of local and overseas securities as of December 31, 2017.
(*2) The expected rate of return is calculated based on the weighted average of expected rate of returns for each type of assets. The management evaluates the expected rate of returns based on the historical rate of return trends and the analysis of the predicted market during the period when the defined benefits liabilities exist.

(v) Principal actuarial assumptions as of December 31, 2017 and 2016 are as follows:

	December 31, 2017	December 31, 2016
Discount rate	4.31%	4.05%
Expected rate of return on plan assets	4.05%	3.96%
Future salary growth	4.99%	4.94%

(vi) Details of expenses relating to defined benefit plans for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Current service cost	₩	9,041	8,966
Interest cost		3,335	2,891
Expected return on plan assets		(2,765)	(2,201)
Transfer to other account		(294)	(326)
	₩	9,317	9,330

Expenses described above are recognized as the following items in the financial statements.

In millions of Korean won		2017	2016
Cost of sales	₩	2,884	3,227
Selling and administrative expenses		6,151	5,323
Others		294	326
Loss on discontinued operations		282	781
	₩	9,611	9,657

25. Employee Benefits, Continued

(b) Defined benefit pension plan, continued

(vii) Remeasurement components recognized in other comprehensive income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Defined benefit obligations	₩	5,509	(1,419)
Return on plan assets		(1,364)	(900)
Income tax effect		(1,003)	561
	₩	3,142	(1,758)

26. Provisions

(a) Details of provisions as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017			December 31, 2016		
		Current	Non-current	Total	Current	Non-current	Total
Decommissioning cost(*1)(*3)	₩	14,669	1,969,374	1,984,043	14,294	2,015,943	2,030,237
Social Overhead Capital(*2)		77,111	-	77,111	133,175	-	133,175
Allowance for salaries		667	-	667	2,043	-	2,043
Provision for litigations		-	-	-	4,474	-	4,474
Onerous contract		1,249	6,363	7,612	-	-	-
Others(*3)		744	44,520	45,264	1,955	14,853	16,808
	₩	94,440	2,020,257	2,114,697	155,941	2,030,796	2,186,737

(*1) The Group recognized provisions for future dismantling, removing and restoring obligations of wells and related facilities. Most of the costs incur at or after the completion of production and the management recognized its best estimations as provisions.

(*2) The Group is committed to providing construction services with regards to the Kurdish regional government's Social Overhead Capital to obtain rights on certain exploratory areas (see Note 44). This commitment has been classified as a provision due to its uncertain timing of related cash outflows.

(*3) The reclassifications from non-current to current amounted to ₩10,710 million and ₩11,733 million for the years ended December 31, 2017 and 2016, respectively.

26. Provisions, Continued

(b) Changes in provisions for the years ended December 31, 2017 and 2016 are as follows :

(i) For the year ended December 31, 2017

In millions of Korean won		Beginning balance	Provision	Accretion expenses	Transfer(*1)	Payment	Others(*2)	Ending Balance
Decommissioning cost	₩	2,030,237	9,124	73,316	(460)	(10,162)	(118,012)	1,984,043
Social Overhead Capital		133,175	-	1,131	-	(43,600)	(13,595)	77,111
Allowance for salaries		2,043	233	-	-	-	(1,609)	667
Provision for litigations		4,474	-	-	-	(6,643)	2,169	-
Onerous contract		-	-	923	-	(1,253)	7,942	7,612
Others(*3)		16,808	42,008	-	-	(924)	(12,628)	45,264
	₩	2,186,737	51,365	75,370	(460)	(62,582)	(135,733)	2,114,697

(*1) The Group transferred restoring obligations to contract party regarding disposal of an oil and gas property.
(*2) Include the effect of changes in exchange rates and others.
(*3) Additional obligation of Deep Basin Partnership to the Group amounting to ₩35,449 million has been accounted for as other provision.

(ii) For the year ended December 31, 2016

In millions of Korean won		Beginning balance	Provision	Accretion expenses	Transfer(*1)	Payment	Others(*2)	Ending Balance
Decommissioning cost	₩	2,246,021	28,094	93,005	(124,075)	(17,539)	(195,269)	2,030,237
Social Overhead Capital		183,306	-	1,598	-	(54,081)	2,352	133,175
Allowance for salaries		1,971	-	-	-	-	72	2,043
Provision for litigations		2,956	1,315	-	-	-	203	4,474
Others		2,770	9,339	1,225	-	(1,593)	5,067	16,808
	₩	2,437,024	38,748	95,828	(124,075)	(73,213)	(187,575)	2,186,737

(*1) The Group transferred restoring obligations to contract party regarding disposal of an oil and gas property.
(*2) Include the effect of changes in exchange rates and others.

27. Non-Financial Liabilities

Details of non-financial liabilities as of December 31, 2017 and 2016 are as follows:

In millions of Korean won

Type		December 31, 2017		December 31, 2016	
		Current	Non-current	Current	Non-current
Advance received	₩	13,866	-	8,289	-
Unearned revenue		25,207	9,123	30,867	-
Withholdings		68,303	-	45,947	-
Others (*)		1,310	33,485	-	-
	₩	108,686	42,608	85,103	-

(*) Deferred gain on disposal of property, plant and equipment in relation to the disposal of Ulsan headquarters building is included (current: ₩879 million, non-current: ₩33,485 million).

28. Share Capital

The Group's total share capital is invested solely by the Korean government in accordance with the Korea National Oil Corporation Act and the authorized share capital is ₩13 trillion as of December 31, 2017. The changes in share capital for the year ended December 31, 2017 are as follows:

In millions of Korean won	Description		Amount
Beginning balance		₩	10,346,852
2017-04-05	Contribution for oil stockpiling business		23,000
2017-04-27	Contribution for oil field development		22,300
2017-06-30	Contribution for oil stockpiling business		23,000
2017-12-26	Contribution for oil stockpiling business		19,713
Ending balance		₩	10,434,865

29. Accumulated Deficit

(a) Details of accumulated deficit as December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Undisposed accumulated deficit	₩	(8,463,173)	(7,633,552)

(b) Changes in accumulated deficit for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	(7,633,552)	(6,539,889)
Net loss for the year attributed to owner of the Company		(733,763)	(1,091,917)
Changes in equity method retained earnings		-	12
Remeasurement components of defined benefits plan		3,142	(1,758)
Ending balance	₩	(8,364,173)	(7,633,552)

(c) Changes in remeasurement components for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Beginning balance	₩	(21,668)	(19,910)
Changes during the current year		4,145	(2,319)
Income tax effects		(1,003)	561
Ending balance	₩	(18,526)	(21,668)

30. Separate Statements of Disposition of Accumulated Deficit

Separate statements of disposition of accumulated deficit for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
I. Undisposed Deficit			
Undisposed accumulated deficit carried over from prior years	₩	(6,581,259)	(5,845,728)
Net loss		(1,594,028)	(733,773)
Remeasurement components		3,142	(1,758)
II. Undisposed deficit to be carried forward to the subsequent year	₩	(8,172,145)	(6,581,259)

These statements of disposition of accumulated deficit were based on the separate financial statements of the Parent Company.

31. Other Components of Equity

(a) Details of other components of equity as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Other capital surpluses(*)	₩	24,954	24,954
Accumulated other comprehensive loss		(601,799)	(339,409)
	₩	(576,845)	(314,455)

(*) All other capital surpluses are gains from assets contributed.

(b) Details of accumulated other comprehensive loss as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Gains on available-for-sale financial instruments	₩	12,088	76,185
Equity adjustments in equity method		23,839	18,560
Foreign currency translation differences for foreign operations		(654,015)	(497,774)
Gains on valuation of derivative instruments		16,289	63,620
	₩	(601,799)	(339,409)

32. Revenue

Details of revenues (based on customer locations) except for other income, other profit and financial income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017			2016		
		Domestic	Overseas	Total	Domestic	Overseas	Total
Sales of goods and finished goods	₩	160,926	1,997,153	2,158,079	85,605	2,180,883	2,266,488
Revenues from services provided		23,140	89,006	112,146	22,045	96,857	118,902
Income on government grants		5,131	-	5,131	4,954	-	4,954
Others		1,918	35,212	37,130	2,232	32,391	34,623
	₩	191,115	2,121,371	2,312,486	114,836	2,310,131	2,424,967

33. Other Income and Expenses

(a) Details of other income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Reversal of other provisions(*)	₩	31,518	2,996
Reversal of bad debt allowance		7,938	671
Gains on exemption of debts		76,744	220,473
Compensation and indemnity		12	11
Rental income		506	338
Other income from overseas fields		4,559	7,677
Others		30,992	3,507
	₩	152,269	235,673

(*) The Company recovered full amount of ₩29,967 million paid in the first trial against Hyundai Heavy Industries as a result of the ruling in the second trial in favor of the Company, and recognized it as a reversal of other provision. (see Note 44)

(b) Details of other expenses for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Other bad debt expense	₩	180,186	14,521
Donations		882	1,501
Losses on valuation of supplies		588	269
Other expenses from overseas fields		1,853	44
Others		23,727	9,909
	₩	207,236	26,244

34. Other Profit and Loss

Details of other profit and loss for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Gains on disposal of property, plant and equipment	₩	2,130	55,920
Gains on disposal of intangible assets other than goodwill		-	483
Gains on transactions of derivatives		1,695	-
Reversal of impairment losses on property, plant and equipment		163,645	400,959
Reversal of impairment losses on intangible assets other than goodwill		-	6,416
Gains on foreign currency translation		39,595	21,467
Gains on foreign currency transactions		41,699	55,275
Other gains		16,681	9,907
Losses on disposal of property, plant and equipment		(179)	(9,045)
Losses on disposal of intangible assets other than goodwill		(3,524)	(66,326)
Losses on transactions of derivatives		(1,695)	(1,423)
Losses on valuation of derivatives		-	(3,164)
Impairment losses on property, plant and equipment		(320,267)	(433,607)
Impairment losses on intangible assets(*)		(314,522)	(377,472)
Losses on foreign currency translation		(45,110)	(26,710)
Losses on foreign currency transactions		(40,259)	(54,432)
Other losses		(3,039)	(967)
	₩	(463,150)	(422,719)

(*) Impairment losses on intangible assets of ₩314,522 million due to failure to obtain renewal of certain mining right and relinquishment of exploration and others have been recognized for the year ended December 31, 2017. In connection with the relinquishment, gains on debt exemption of ₩17,119 million from loans and accrued interest based on Accounting for Energy and Resources have been recognized in other income and expense.

35. Finance Income

(a) Details of finance income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Interest income	₩	50,601	37,816
Dividend income		10	24
Gains on disposal of financial assets		-	26,232
Gains on transaction of derivatives financial instruments		1,168	738
Gains on repayment of financial liabilities		1,583	17,234
Gains on foreign currency translation		143,660	60,054
Gains on foreign currency transaction		107,536	40,759
	₩	304,558	182,857

35. Finance Income, Continued

(b) Details of interest income by sources included in finance income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Cash and cash equivalents	₩	12,066	6,154
Loans and receivables		38,535	31,662
	₩	50,601	37,816

36. Finance Costs

(a) Details of finance costs for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Interest expenses	₩	401,019	424,598
Impairment losses on available-for-sale financial instruments		71,586	45,577
Losses on valuation of derivatives financial instruments		25,305	-
Losses on transaction of derivatives financial instruments		15,251	5,749
Losses on foreign currency translation		93,115	205,690
Losses on foreign currency transactions		4,210	13,940
Other financial costs		99,926	125,229
	₩	710,412	820,783

(b) Details of interest expenses by sources included in finance costs for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Short-term borrowings	₩	7,363	29,868
Long-term borrowings		62,069	40,354
Bonds payable		342,992	362,087
Derivative liabilities		6,010	14,607
Other financial liabilities		11,028	5,362
		429,462	452,278
Less: capitalized costs of borrowings		(28,443)	(27,680)
	₩	401,019	424,598

The annual weighted average cost of capital of the borrowings is 4.56% for the year ended December 31, 2017 (3.87% and 8.30% for the year ended December 31, 2016).

37. Income Tax Benefit

(a) The components of income tax benefit for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Current income tax	₩	111,491	76,264
Deferred tax directly charged to equity		34,769	(230)
Changes in deferred taxes arising from temporary differences		(338,594)	(359,170)
Adjustment for prior periods		(7,606)	69,009
Income tax benefit	₩	(199,940)	(214,127)
Income tax benefit from continuing operations		(194,163)	(211,684)
Income tax benefit from discontinued operations	₩	(5,777)	(2,443)

(b) Reconciliations of expected income tax benefit computed by applying the statutory income tax rate to loss before income tax to the actual income tax benefit for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Loss before income tax	₩	(933,701)	(1,332,974)
Benefits computed at the statutory rate (*)		(225,956)	(322,580)
Adjustments			
Adjustments to prior year tax return		224	685
Non-taxable income		(1)	(13,274)
Non-deductible expenses		45,752	1,532
Effect from tax deduction and exemption		(96,328)	(16,898)
Temporary differences not recognized in deferred tax assets		44,096	155,827
Effect from temporary differences not recognized in prior years		(14,809)	(28,554)
Differences in tax rates in overseas entities		46,313	(1,206)
Effect of changes in tax rates		769	10,341
Income tax benefit	₩	(199,940)	(214,127)
Effective tax benefit rate		21.41%	16.06%

(*) The expected applicable statutory tax rate for the years ended December 31, 2017 and 2016 is 24.2%, which is the Korea statutory corporate income tax rate where the Company is domiciled.

(c) Income tax recognized as accumulated other comprehensive income for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Available-for-sale financial assets	₩	20,464	791
Net change in the unrealized fair value of derivatives using cash flow hedge accounting		15,308	(1,582)
Remeasurement components		(1,003)	561
	₩	34,769	(230)

37. Income Tax Benefit, Continued

(d) Changes in deferred income tax assets (liabilities) recognized in the consolidated statements of financial position for the years ended December 31, 2017 and 2016 are as follows:

(i) For the year ended December 31, 2017

In millions of Korean won		Beginning balance	Amounts recognized in profit or loss	Amounts recognized in other comprehensive income	Others	Ending balance
Deferred income tax on temporary differences						
Contributions for construction	₩	1,061	(77)	-	(117)	867
Investment in associates and others		52,324	(14,106)	-	(5,194)	33,024
Financial guarantee liabilities		2,615	9,836	-	(813)	11,638
Allowance for doubtful accounts		198,308	(27,257)	-	(21,065)	149,986
Available-for-sale financial instruments		89,237	65,501	20,464	(14,642)	160,560
Intangible assets		118,198	94,022	-	(18,351)	193,869
Accrued expense		50,888	(644)	-	(5,740)	44,504
Asset retirement obligation		41,881	6,650	-	(5,101)	43,430
Property, plant and equipment		105,446	(88,307)	-	(7,321)	9,818
Land		(70,006)	(1)	-	7,942	(62,065)
Loss on valuation of derivatives		(8,422)	3,522	(555)	800	(4,655)
Employee benefits		(2,846)	6,477	(1,003)	35	2,663
Others		(82,261)	73,687	-	5,461	(3,113)
Deferred assets of subsidiaries		658,119	42,118	15,863	(77,710)	638,390
Differences in fair value and book value from business combination and others		(156,812)	96,262	-	12,729	(47,821)
Deferred tax liabilities of subsidiaries		(134,498)	36,143	-	13,358	(84,997)
	₩	863,232	303,826	34,769	(115,729)	1,086,098
Deferred tax assets	₩	1,154,542				1,218,915
Deferred tax liabilities	₩	(291,310)				(132,817)

Temporary differences not recognized in deferred tax assets, tax loss carryforwards and tax deduction are ₩11,885,988 million as of December 31, 2017.

37. Income Tax Benefit, Continued

(d) Changes in deferred income tax assets (liabilities) recognized in the consolidated statements of financial position for the years ended December 31, 2017 and 2016 are as follows, continued:

(ii) For the year ended December 31, 2016

In millions of Korean won		Beginning balance	Amounts recognized in profit or loss	Amounts recognized in other comprehensive income	Others	Ending balance
Deferred income tax on temporary differences						
Contributions for construction	₩	1,109	(79)	-	31	1,061
Investment in associates and others		(34,737)	84,641	-	2,420	52,324
Financial guarantee liabilities		3,271	(727)	-	71	2,615
Allowance for doubtful accounts		170,159	21,942	-	6,207	198,308
Available-for-sale financial instruments		74,604	11,030	791	2,812	89,237
Intangible assets		112,938	1,673	-	3,587	118,198
Accrued expense		57,146	(7,719)	-	1,461	50,888
Asset retirement obligation		39,058	1,543	-	1,280	41,881
Property, plant and equipment		20,396	81,062	-	3,988	105,446
Land		(61,756)	(6,073)	-	(2,177)	(70,006)
Loss on valuation of derivatives		(9,376)	-	1,196	(242)	(8,422)
Employee benefits		1,223	(4,506)	561	(124)	(2,846)
Others		(37,263)	(42,097)	-	(2,901)	(82,261)
Deferred assets of subsidiaries		605,344	32,575	-	20,200	658,119
Differences in fair value and book value from business combination and others		(281,015)	127,674	-	(3,471)	(156,812)
Deferred tax liabilities of subsidiaries		(186,671)	58,461	(2,778)	(3,510)	(134,498)
	₩	474,430	359,400	(230)	29,632	863,232
Deferred tax assets	₩	942,116				1,154,542
Deferred tax liabilities	₩	(467,686)				(291,310)

38. Expenses Classified by Nature

(a) Expenses classified by nature for the year ended December 31, 2017 are as follows:

In millions of Korean won		Changes in inventories	Selling and administrative expenses	Cost of sales	Total
Changes in inventories - merchandise	₩	3,981	-	-	3,981
Changes in inventories - finished goods		8,639	-	-	8,639
Changes in inventories - others		11,284	-	-	11,284
Purchases of inventories		-	-	170,046	170,046
Raw materials used		-	-	4,857	4,857
Salaries		-	89,570	141,420	230,990
Severance and retirement benefits		-	7,764	3,941	11,705
Other employee benefits		-	13,712	7,088	20,800
Insurance		-	2,920	19,354	22,274
Depreciation		-	16,672	785,779	802,451
Amortization		-	5,015	93,468	98,483
Commissions and fees		-	21,736	42,957	64,693
Advertising		-	192	29	221
Education and training		-	3,522	631	4,153
Vehicle maintenance		-	1,394	545	1,939
Books and printing		-	592	14	606
Business development		-	119	37	156
Rent		-	6,718	46,449	53,167
Communications		-	930	528	1,458
Transport		-	-	140,373	140,373
Taxes and dues		-	2,197	33,218	35,415
Supplies		-	1,089	2,582	3,671
Utilities		-	1,460	43,830	45,290
Repairs		-	7,568	134,061	141,629
Research and development		-	260	2,382	2,642
Travel		-	1,753	350	2,103
Clothing expenses		-	13	80	93
Investigation and analysis		-	-	208	208
Association fee		-	159	13	172
Sales promotion		-	57	617	674
Sales commissions		-	90,768	-	90,768
Others		-	10,145	151,528	161,673
	₩	23,904	286,325	1,826,385	2,136,614

38. Expenses Classified by Nature, Continued

(b) Expenses classified by nature for the year ended December 31, 2016 are as follows:

In millions of Korean won		Changes in inventories	Selling and administrative expenses	Cost of sales	Total
Changes in inventories - merchandise	₩	54,103	-	-	54,103
Changes in inventories - finished goods		(520)	-	-	(520)
Changes in inventories - others		4,399	-	-	4,399
Purchases of inventories		-	-	375,571	375,571
Raw materials used		-	-	6,564	6,564
Salaries		-	97,456	129,797	227,253
Severance and retirement benefits		-	8,833	4,161	12,994
Other employee benefits		-	11,548	7,573	19,121
Insurance		-	3,389	25,984	29,373
Depreciation		-	18,904	931,270	950,174
Amortization		-	7,023	144,908	151,931
Bad debt expenses		-	429	-	429
Commissions and fees		-	19,202	47,347	66,549
Advertising		-	160	10	170
Education and training		-	3,723	791	4,514
Vehicle maintenance		-	1,583	662	2,245
Books and printing		-	800	17	817
Business development		-	111	39	150
Rent		-	8,271	57,307	65,578
Communications		-	1,071	6,207	7,278
Transport		-	-	165,472	165,472
Taxes and dues		-	3,029	38,161	41,190
Supplies		-	1,352	2,461	3,813
Utilities		-	1,294	42,839	44,133
Repairs		-	7,919	145,145	153,064
Research and development		-	253	856	1,109
Travel		-	1,879	365	2,244
Clothing expenses		-	12	81	93
Investigation and analysis		-	-	152	152
Association fee		-	163	9	172
Sales promotion		-	57	1,119	1,176
Sales commissions		-	55,470	-	55,470
Others		-	6,183	204,306	210,489
	₩	57,982	260,114	2,339,174	2,657,270

39. Categories of financial instruments

(a) Details of current financial assets by category as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Loans and receivables	Hedging financial assets	Total
Cash and cash equivalents	₩	791,075	-	791,075
Short-term loans		3,185	-	3,185
Short-term financial instruments		2,074	-	2,074
Derivative assets		-	4,532	4,532
Others		14,919	-	14,919
Trade and other receivables		556,270	-	556,270
	₩	1,367,523	4,532	1,372,055

(ii) As of December 31, 2016

In millions of Korean won		Loans and receivables	Hedging financial assets	Total
Cash and cash equivalents	₩	812,651	-	812,651
Short-term financial instruments		2,032	-	2,032
Derivative assets		-	949	949
Others		16,026	-	16,026
Trade and other receivables		567,212	-	567,212
	₩	1,397,921	949	1,398,870

39. Categories of Financial Instruments, Continued

(b) Details of non-current financial assets by category as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Loans and receivables	Available-for-sale financial instruments	Hedging financial assets	Total
Available-for-sale financial instruments	₩	-	90,807	-	90,807
Long-term loans		479,465	-	-	479,465
Long-term financial instruments		4,873	-	-	4,873
Derivative assets		-	-	47,302	47,302
Trade and other receivables		97,768	-	-	97,768
	₩	582,106	90,807	47,302	720,215

(ii) As of December 31, 2016

In millions of Korean won		Loans and receivables	Available-for-sale financial instruments	Hedging financial assets	Total
Available-for-sale financial instruments	₩	-	269,278	-	269,278
Long-term loans		601,075	-	-	601,075
Long-term financial instruments		5,083	-	-	5,083
Derivative assets		-	-	9,011	9,011
Trade and other receivables		118,664	-	-	118,664
	₩	724,822	269,278	9,011	1,003,111

39. Categories of financial instruments, Continued

(c) Details of current financial liabilities by category as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
Trade and other payables	₩	786,399	-	786,399
Short-term borrowings		53,570	-	53,570
Current portion of long-term borrowings		782,300	-	782,300
Bonds payable		2,322,715	-	2,322,715
Derivative liabilities		-	93,512	93,512
	₩	3,944,984	93,512	4,038,496

(ii) As of December 31, 2016

In millions of Korean won		Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
Trade and other payables	₩	973,354	-	973,354
Short-term borrowings		897,965	-	897,965
Current portion of long-term Borrowings		245,165	-	245,165
Current portion of Bonds payable		2,022,753	-	2,022,753
Derivative liabilities		-	42,572	42,572
	₩	4,139,237	42,572	4,181,809

39. Categories of financial instruments, Continued

(d) Details of non-current financial liabilities by category as of December 31, 2017 and 2016 are as follows:

(i) As of December 31, 2017

In millions of Korean won		Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
Trade and other payables	₩	503,799	-	503,799
Long-term borrowings		1,035,022	-	1,035,022
Bonds payable		9,012,821	-	9,012,821
Derivative liabilities		-	48,229	48,229
	₩	10,551,642	48,229	10,599,871

(ii) As of December 31, 2016

In millions of Korean won		Financial liabilities measured at amortized cost	Hedging financial liabilities	Total
Trade and other payables	₩	293,434	-	293,434
Long-term borrowings		1,096,208	-	1,096,208
Bonds payable		10,251,433	-	10,251,433
Derivative liabilities		-	147,831	147,831
	₩	11,641,075	147,831	11,788,906

39. Categories of financial instruments, Continued

(e) Net gains or losses by financial instruments for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Loans and receivables:			
Interest income	₩	50,601	37,816
Gain on foreign currency transactions, net		72,429	5,185
Gain (loss) on foreign currency translation, net		(39,367)	7,562
Available-for-sale financial investments:			
Dividend income		10	24
Gain on disposal		-	26,232
Impairment loss		(71,586)	(45,577)
Other comprehensive loss, net of tax		(64,097)	(2,479)
Hedge financial assets:			
Loss on transaction, net		-	(84)
Loss on foreign currency transactions, net		-	(661)
Gain (loss) on foreign currency translation, net		39,243	(3,882)
Other comprehensive income, net of tax		-	6,467
Other financial liabilities with amortized cost:			
Interest cost		(401,019)	(424,598)
Gain on foreign currency transactions, net		27,787	13,962
Loss on foreign currency translations, net		(17,456)	(114,909)
Gain on repayment of financial liabilities		1,583	17,234
Other financial cost (*)		(26,611)	(32,224)
Hedge financial liabilities:			
Loss on transactions, net		(14,083)	(4,927)
Loss on valuation, net		(25,305)	-
Gain on foreign currency transactions, net		3,110	8,333
Gain (loss) on foreign currency translation, net		68,124	(34,407)
Other comprehensive loss, net of tax		(47,331)	(7,434)
	₩	(443,968)	(548,367)

(*) Excludes increase in other provisions amounting to ₩73,315 million and ₩93,005 million for the years ended December 31, 2017 and 2016 respectively

40. Netting Agreements

(a) Offsetting of financial assets and financial liabilities

As of December 31, 2017 and 2016, financial assets and financial liabilities subject to offsetting, enforceable master netting arrangements and similar agreements are as follows:

(i) As of December 31, 2017

In millions of Korean won

		Gross amounts recognized as financial instruments	Gross amounts of recognized financial instruments set off in the statement of financial position	Net amounts of financial instruments presented in the statement of financial position	Related amounts not set off in the statement of financial position		Net Amounts
					Financial instruments	Collateral received or pledged	
Financial assets							
Derivatives(*)	₩	51,834	-	51,834	(51,834)	-	-
Financial liabilities							
Derivatives(*)		141,741	-	141,741	(51,834)	-	89,907

(*) Some of derivative contracts are made under International Swaps and Derivatives Association (ISDA) master netting agreements. In general, under such agreements the amounts owed by each counter party on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. In certain circumstances (i.e. when a default occurs), all standing transactions under the agreement are terminated, the termination value is assessed and only a single amount is payable in settlement of all transactions.

(ii) As of December 31, 2016

In millions of Korean won

		Gross amounts recognized as financial instruments	Gross amounts of recognized financial instruments set off in the statement of financial position	Net amounts of financial instruments presented in the statement of financial position	Related amounts not set off in the statement of financial position		Net Amounts
					Financial instruments	Collateral received or pledged	
Financial assets							
Derivatives(*)	₩	9,960	-	9,960	(9,960)	-	-
Financial liabilities							
Derivatives(*)		190,403	-	190,403	(9,960)	-	180,443

(*) Some of derivative contracts are made under International Swaps and Derivatives Association (ISDA) master netting agreements. In general, under such agreements the amounts owed by each counter party on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. In certain circumstances (i.e. when a default occurs), all standing transactions under the agreement are terminated, the termination value is assessed and only a single amount is payable in settlement of all transactions.

41. Risk Management

(a) Capital management

The primary objective of the Group's capital management is to ensure that it maintains a strong credit rating and capital ratios in order to support its business and maximize the owners' value. To maintain the sound capital structure, management periodically reviews the Group's capital structure which consist of equity and net debt, net of cash and cash equivalents and borrowing and debt securities. No changes were made in the objectives, policies or processes for managing capital for the year ended December 31, 2017.

The Group's debt-to-equity ratios as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Total borrowings and debt securities	₩	13,206,427	14,513,524
Cash and cash equivalents		(791,075)	(812,651)
Net borrowings and debt securities		12,415,352	13,700,873
Total equity	₩	2,437,074	3,508,732
Net borrowings and debt securities-to-equity ratio		509.44%	390.48%

(b) Financial risk management

The Group is exposed to various risks related to its financial instruments such as credit risk, market risk (currency risk, interest rate risk and price risk) and liquidity risk.

(i) Risk management structure

The board of directors is responsible for implementing and monitoring the Group's risk management structure and the management regularly updates the policies for each risk and confirms the validity of the policies. The purpose of the risk management policies is to identify the risks that could potentially affect the Group's financial results and reduce, to an acceptable level, avoid or eliminate those risks. The policies are reviewed regularly to reflect the current market conditions and the Group's activities. The Group makes constant efforts to improve the policies by monitoring on real time basis and with support from the outside experts. The audit committee oversees the Group's compliance to the risk management policies and procedures and reviews the effectiveness of the structure.

41. Risk Management, Continued

(b) Financial risk management, continued

(ii) Credit risk

Credit risk is the risk of financial loss to the Group if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the Group's receivables from customers, investment securities, derivatives and financial guarantee contracts.

Credit risk also arises from transactions with financial institutions, and such transactions include transactions of cash and cash equivalents, various deposits, and financial instruments such as derivative contracts. The Group manages its exposure to this credit risk by only entering into transactions with banks that have high international credit ratings. The Group implements a credit risk management policy under which the Group only transacts business with counterparties that have a certain level of credit rate evaluated based on financial condition, historical experience, and other factors.

Book values of the financial assets and guarantee amounts by the contract represent the maximum amounts exposed to the credit risk. Details of the Group's level of maximum exposure to credit risk as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		**December 31, 2017**	**December 31, 2016**
Cash and cash equivalents	₩	791,075	812,651
Derivatives assets		51,834	9,960
Loans and receivables(*)		1,158,554	1,310,092
Financial guarantee contracts		34,541	38,961

(*) Comprised of loans, account receivables, non-trade receivables and others.

41. Risk Management, Continued

(b) Financial risk management, continued

(ii) Credit risk, continued

Details of maturities for loans and receivables and their impaired amounts as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Balance	**Impairment**	**Balance**	**Impairment**
Not past due	₩	1,820,957	(741,763)	1,951,467	(731,090)
0 ~ 30 days		22,112	-	8,167	-
31 ~ 60 days		9,981	-	13,892	-
More than 61 days		47,373	(106)	68,583	(927)
	₩	1,900,423	(741,869)	2,042,109	(732,017)

Details of changes in allowance for impairment of loans and receivables for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		**2017**	**2016**
Beginning balance	₩	732,017	697,957
Impairment		180,186	14,950
Reversal of impairment loss		(7,938)	(671)
Write-off		(769)	(588)
Others (*)		(161,627)	20,369
Ending balance	₩	741,869	732,017

(*) Include the effect of changes in exchange rates.

Aging of past due but not impaired financial assets as of December 31, 2017 and 2016 are as follows:

① As of December 31, 2017

In millions of Korean won		**Book value**	**Less than 6 months**	**6~12 Months**	**1~2 years**	**2~5 years**	**More than 5 years**
Loans and receivables	₩	79,360	36,287	387	42,424	262	-

② As of December 31, 2016

In millions of Korean won		**Book value**	**Less than 6 months**	**6~12 Months**	**1~2 years**	**2~5 years**	**More than 5 years**
Loans and receivables	₩	89,715	21,757	89	66,694	1,146	29

41. Risk Management, Continued

(b) Financial risk management, continued

(iii) Market risk

① Crude oil price risk

Crude oil price risk is the risk that the profit or cash flows will fluctuate due to changes in the international market prices of crude oil. With all other variables held constant, the changes in Group's profit before tax for the years ended December 31, 2017 and 2016 from crude oil price fluctuations are as follows:

		2017		2016	
In millions of Korean won		**Increase by 10%**	**Decrease by 10%**	**Increase by 10%**	**Decrease by 10%**
Increase (decrease) of profit before tax	₩	147,766	(147,766)	139,823	(139,823)

② Interest rate risk

The Group is exposed to interest rate risk due to its borrowings with floating interest rates. Assuming a 100 basis points increase or decrease in interest rates as of December 31, 2017 the Group's total equity and its profit or loss will also increase or decrease. The Group mitigates risks from fluctuation in interest rate through derivative contracts.

Except for the effect of derivative transactions, this analysis considers the Group's total exposed risks associated with the fluctuation in interest rate. This analysis assumes that all other variables are held constant and the same method is applied as the method used in the prior periods. The details of increase or decrease in the total equity and profit or loss are as follows:

		2017		2016	
In millions of Korean won		**Increase by 1%**	**Decrease by 1%**	**Increase by 1%**	**Decrease by 1%**
Increase (decrease) of profit before tax	₩	(34,033)	34,033	(37,262)	37,262

41. Risk Management, Continued

(b) Financial risk management, continued

(iii) Market risk, continued

③ Foreign currency risk

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates (the 'functional currency'). The Group is exposed to currency risk from the sales, purchases and borrowings not in United States dollar. The Group reduces currency risk from fluctuations in foreign exchange rates by carrying out derivative contracts.

Without considering the effect of the derivatives aforementioned, the Group's exposures to foreign currency risk as of December 31, 2017 and 2016 are as follows:

In thousands of foreign currencies and millions of Korean won

		December 31, 2017		December 31, 2016	
	Currency unit	Foreign currencies	Equivalent to Korean won	Foreign currencies	Equivalent to Korean won
Financial assets denominated in foreign currencies	KRW	357,539	357,539	254,691	254,691
Financial liabilities denominated in foreign currencies	KRW	593,153	593,153	331,915	331,915
	EUR	201,026	257,162	197,000	249,718
	SGD	303	243	235	196
	HKD	2,447,211	335,346	2,390,000	372,434
	CHF	240,351	263,126	540,000	637,918
	AUD	734,511	613,431	730,000	636,597
	GBP	-	-	3	4
	AED	13	4	195	64
			2,062,465		2,228,846

The exchange rates applied for the years ended and as of December 31, 2017 and 2016 are as follows:

In US dollar per one foreign currency

	Average rates		Reporting date spot rate	
	2017	2016	December 31, 2017	December 31, 2016
KRW	0.0009	0.0009	0.0009	0.0008
EUR	1.1294	1.1058	1.1940	1.0489
SGD	0.7244	0.7242	0.7473	0.6906
HKD	0.1283	0.1288	0.1279	0.1289
CHF	1.0159	1.0145	1.0218	0.9775
AUD	0.7666	0.7439	0.7795	0.7216
GBP	1.2876	1.3547	1.3436	1.2248
AED	0.2723	0.2723	0.2723	0.2723

41. Risk Management, Continued

(b) Financial risk management, continued

(iii) Market risk, continued

③ Foreign currency risk, continued

The Company and its subsidiaries use various functional currencies depending on their primary economic environment in which the entities operate. A sensitivity analysis below indicates the effect on the Group's profit before tax from the fluctuations in each function currency exchange rate. As of December 31, 2017 and 2016 the effect of a 5% increase or decrease in each functional currency exchange rate on profit before tax assuming all other variables held constant is as follows:

In millions of Korean won			2017		2016	
			Increase by 5%	**Decrease by 5%**	**Increase by 5%**	**Decrease by 5%**
Increase (decrease) of profit before tax	KRW	₩	(12,434)	12,434	(3,861)	3,861
	HKD		(17,698)	17,698	(18,622)	18,622
	CHF		(13,886)	13,886	(31,896)	31,896
	EUR		(23,808)	23,808	(12,388)	12,388
	AUD		(32,373)	32,373	(31,830)	31,830
	Others		(717)	717	(30)	30

(iv) Liquidity risk

The details of contractual maturities of financial liabilities and other contractual obligations as of December 31, 2017 are as follows:

In millions of Korean won		**Book value**	**Contractual cash flows(*1)**	**Less than 1 year**	**1 ~ 2 years**	**2 ~ 5 years**	**More than 5 years(*2)**
Short-term borrowings	₩	53,570	54,281	54,281	-	-	-
Bonds payable		11,335,535	12,845,151	2,602,331	1,601,844	3,879,198	4,761,778
Long-term borrowings		1,817,322	1,888,855	828,846	233,380	611,225	215,404
Trade and other payables		1,290,198	1,290,198	786,399	23,560	78,605	401,634
Derivatives liabilities		141,741	141,741	93,512	36,273	3,564	8,392
Financial guarantee contracts (*3)		-	34,541	34,541	-	-	-
	₩	14,638,366	16,254,767	4,399,910	1,895,057	4,572,592	5,387,208

(*1) Contractual cash flows include the estimated interest payments but exclude the effects of offsetting contracts.

(*2) Loans from Special Accounting for Energy and Resources ("SAER") included in borrowings have no specific maturity as entities were borrowed under the condition that the Group is not obligated to make repayment of the principal and interest until the exploration is proven to be successful.

(*3) Financial guarantee is allocated at the earliest period that the maximum amount could be requested.

41. Risk Management, Continued

(b) Financial risk management, continued

(iv) Liquidity risk, continued

The Group had a working capital (current assets minus current liabilities) deficit of ₩2,632,950 million as of December 31, 2017. The Group’s management currently anticipates that expected future capital contributions from the Government and the cash flows that the Group generates from its operations, together with its existing cash and cash equivalents and credit sources, will be sufficient to meet its currently anticipated needs for working capital, capital expenditures and business expansion throughout the foreseeable future.

(v) Other price risk

Other price risk is the risk that the fair value or cash flows of financial instruments will fluctuate because of changes in market prices other than interest rate risk and foreign currency risk. The Group's marketable available-for-sale equity securities are exposed to market price risk arising from the fluctuation in the price of the securities. However, the Group's management believes that the effect of the fluctuation in the price of the securities on the financial statements is not significant.

(c) Fair value measurement

(i) Fair value and book value of financial assets and liabilities as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017		December 31, 2016	
		Book value	Fair value	Book value	Fair value
Assets recognized at fair value					
Available-for-sale financial assets	₩	89,987	89,987	268,353	268,353
Currency forwards		2,596	2,596	-	-
Currency swap		44,269	44,269	8,803	8,803
Interest rate swap		4,110	4,110	1,157	1,157
Other derivatives		859	859	-	-
Investments in associates and joint ventures(*)		48,047	48,047	96,358	96,358
		189,868	189,868	374,671	374,671
Liabilities recognized at fair value					
Currency swap		64,662	64,662	190,403	190,403
Other derivatives		77,079	77,079	-	-
		141,741	141,741	190,403	190,403

(*) The investments in joint ventures for Deep Basin Partnership and HKMS Partnership held by the Group are measured at the fair value at each financial statement date using the hypothetical liquidation book value method to estimate the Group’s interests in the net assets of the joint ventures.

The fair values of the financial assets and liabilities measured at amortized costs do not significantly differ from their book values.

41. Risk Management, Continued

(c) Fair value measurement, continued

(ii) Fair value hierarchy

The following table provides an analysis of financial instruments that are measured subsequent to initial recognition at fair value, classified as Level 1, 2, or 3, based on the degree to which the fair value is observable.

Level 1: Unadjusted quoted prices in active markets for identical assets or liabilities;
Level 2: Inputs other than quoted prices that are observable for the asset or liability either directly or indirectly; and
Level 3: Inputs that are not based on observable market data.

Fair values of financial instruments by hierarchy level as of December 31, 2017 are as follows:

In millions of Korean won		December 31, 2017			
		Level 1	**Level 2**	**Level 3**	**Total**
Financial assets at fair value					
Available-for-sale financial assets	₩	79,083	-	10,904	89,987
Investments in associates and joint ventures		-	-	48,047	48,047
Derivative assets		-	51,834	-	51,834
		79,083	51,834	58,951	189,868
Financial liabilities at fair value					
Derivative liabilities		-	141,741	-	141,741

42. Related Parties

(a) The Group's major related parties as of December 31, 2017 are as follows:

Type	Related parties
Associates	Oilhub Korea Yeosu Co., Ltd.
	Kernhem B.V.
	ADA Oil LLP
	Parallel Petroleum LLC
Joint ventures	KNOC Inam Ltd.
	KNOC Kamchatka Petroleum Ltd.
	KC Karpovsky B.V.
	KNOC Bazian Ltd.
	KNOC Nigerian West Oil Company Ltd.
	KNOC Nigerian East Oil Company Ltd.
	KNOC Aral Ltd.
	Korea kamchatka Co., Ltd.
	KC kazakh B.V.
	Offshore International Group, Inc.
	KNOC Ferghana Ltd.
	KNOC Ferghana2 Ltd.
	KADOC Ltd.
	Korea Oil Terminal Co., Ltd.
	Deep Basin Partnership
	HKMS Partnership

42. Related Parties, Continued

(b) Significant transactions with related parties for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won	Transaction		Sales and others 2017	Sales and others 2016	Purchases and others 2017	Purchases and others 2016
Oilhub Korea Yeosu Co., Ltd.	Revenues from rental services	₩	1,470	1,495	-	-
	Expenses from rental services		-	-	13,646	16,472
Kernhem B.V.	Interest on loans		1,879	1,585	-	-
	Other bad debt expenses		-	-	41,685	-
ADA Oil LLP	Interest on loans		433	366	-	-
	Revenues from services		1,557	1,425	-	-
	Other bad debt expenses		-	-	12,692	-
KNOC Nigerian West Oil Company Ltd.	Interest on loans		2,544	1,886	-	-
	Other bad debt expenses		-	-	297	-
KNOC Nigerian East Oil Company Ltd.	Interest on loans		2,804	2,104	-	-
	Other bad debt expenses		-	-	297	-
Korea kamchatka Co., Ltd.	Other bad debt expenses		-	-	156	186
	Reversal of bad debt allowance		7,934	-	-	-
KC kazakh B.V.	Other bad debt expenses		-	-	-	456
	Reversal of bad debt allowance		-	609	-	-
Offshore International Group, Inc.	Interest on loans		3,215	2,467	-	-
KNOC Ferghana2 Ltd.	Other bad debt expenses		-	-	196	13,424
KADOC Ltd.	Interest on loans		6,381	5,749	-	-
Parallel Petroleum LLC	Interest on loans		323	172	-	-
Deep Basin Partnership	Other expenses		-	-	1,585	1,163
HKMS Partnership	Other expenses		-	-	280	186
		₩	28,540	17,858	70,834	31,887

42. Related Parties, Continued

(c) The outstanding receivables and payables, except for loans, arising from the transactions with related parties as of December 31, 2017 and 2016 are as follows:

In millions of Korean won	Transaction		Receivables 2017	Receivables 2016	Payables 2017	Payables 2016
Oilhub Korea Yeosu Co., Ltd.	Other account payables	₩	-	-	1,073	1,205
Kernhem B.V.	Accrued interest		-	9,154	-	-
ADA Oil LLP	Accrued interest		-	2,319	-	-
	Other receivables		-	1	-	-
KNOC Nigerian West Oil Company Ltd.	Accrued interest		20,946	20,908	-	-
KNOC Nigerian East Oil Company Ltd.	Accrued interest		23,239	23,216	-	-
KADOC Ltd.	Accrued interest		20,046	15,792	-	-
Offshore International Group, Inc.	Accrued interest		108	141	-	-
Deep Basin Partnership	Account payables		-	-	12,316	12,713
HKMS Partnership	Account payables		-	-	386	1,864
		₩	64,339	71,531	13,775	15,782

The Group recognized other bad debt expenses of ₩11,141million on receivables arising from the transaction with related parties for the year ended December 31, 2017.

(d) Loans to related parties as of December 31, 2017 and 2016 are as follows:

In millions of Korean won		December 31, 2017	December 31, 2016
Associates			
Kernhem B.V.	₩	-	41,989
ADA Oil LLP		-	11,998
Parallel Petroleum LLC		3,185	6,213
		3,185	60,200
Joint ventures			
KNOC Nigerian West Oil Company Ltd.		27,977	31,239
KNOC Nigerian East Oil Company Ltd.		31,280	34,928
Offshore International Group, Inc.		52,967	68,280
KADOC Ltd.		200,563	185,739
		312,787	320,186
	₩	315,972	380,386

The Group provided associates with additional loans of ₩48,425 million and received ₩15,921 million as the repayment of loans for the year ended December 31, 2017. The Group recognized other bad debt expenses of ₩47,280 million, and reversal of other bad debt allowance of ₩7,934 million. Also, the Group recognized increase of bad debt allowance due to equity method valuation amounting to ₩18,706 million and loss due to the effect of changes in exchange rates amounting to ₩38,866 million.

42. Related Parties, Continued

(e) There are no borrowings from the related parties as of December 31, 2017 and 2016.

(f) As of December 31, 2017, the Group does not provide any guarantees to the related parties.

(g) As of December 31, 2017, the Group is not provided with any guarantees from the related parties.

(h) The Company entered into a USD 70 million loan agreement available to December 31, 2017 with Offshore International Group Inc., an investment in joint venture. As of December 31, 2017, Offshore International Group Inc. had ₩52,967 million drawn under the loan agreement.

(i) The Company entered into Commercial Storage Agreement with Oilhub Korea Yeosu Co., Ltd., its associates, and leased storage with a volume of 240,000cbm per year. The agreement is terminated on March 31, 2021.

(j) The compensations to the key management personnel of the Group for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		**2017**	**2016**
Salaries	₩	552	518
Severance and retirement benefits		43	45
	₩	595	563

43. Additional Cash Flow Statement Information

(a) Non-Cash Transactions

Significant non-cash investment and finance transactions excluded from statements of cash flows for the years ended December 31, 2017 and 2016 are as follows:

In millions of Korean won		2017	2016
Bonds payable transferred to current portion	₩	2,435,235	1,954,941
Long-term borrowings transferred to current portion		825,658	261,647
Construction in progress transferred to other accounts		29,008	10,599
Non-current liabilities transferred to current portion		10,710	11,733

(b) Details of change in liabilities in financing activities are as follows:

				Non-cash transaction			
In millions of Korean won		Beginning balance	Cash flow	Change in exchange rate	Change in fair value	Others (*)	Ending balance
Current finance lease liability		-	-	(462)	-	8,789	8,327
Non-current finance lease liability		-	(7,856)	5,601	-	214,976	212,721
Short term borrowings	₩	897,965	(649,490)	(61,074)	-	(133,831)	53,570
Long term borrowings		1,341,373	558,695	(259,463)	-	176,717	1,817,322
Bond payables		10,251,433	2,209,148	(1,060,172)	-	(2,387,588)	9,012,821
Bond payables transferred into current portion		2,022,753	(1,946,543)	(268,239)	-	2,514,743	2,322,714
Liabilities held to hedge risk of bond payable		190,403	-	(15,823)	(109,918)	-	64,662

(*) Includes liquidity transfer and amortization to present value etc.

44. Contingencies and Commitments

(a) Details of the Group's significant pending litigations as of December 31, 2017 are as follows:

In millions of Korean won

Plaintiff	Defendant	Description(*1)	Amount	Process
Hanhwa Corp.	The Company	Claiming refunds of the premium paid to the Group acquire interests in Yemen 4 oil field(*2)	5,979	In third trial
Hyundai Heavy Industries	The Company	Claiming refunds of the acquisition costs and premium paid to the Group acquire interests in Yemen 4 oil field(*3)	20,906	In third trial

(*1) There are 6 cases againt the Company other than the litagations listed above amounting to total of ₩5,282 million.
(*2) The Company paid all claim amounts in February 2015 based on the loss of the first trial and received portion of statutory interest in January 2016 based on the partial loss of the second trial. The third trial is in the process as of December 31, 2017 by appealing to the decision of the second trial.
(*3) The Company received the return of the claim in March 2017 based on the win of the second trial and third trial is in the process as of December 31, 2017 by appealing to the decision.

Also, the Company is in the process of litigation with Dr. Owolabi claiming compensation for cooperation of acquiring Nigerian mining rights. The Group does not believe it has a present obligation and has not recognized any provisions for these lawsuits as of December 31, 2017.

44. Contingencies and Commitments, Continued

(b) The Group has provided loan guarantees to non-related parties as of December 31, 2017 and 2016 as follows:

In thousands of US dollar

Description of guarantee	Guaranteed Party	Effective Date	Guarantee period	December 31, 2017	December 31, 2016
Payment guarantee for Parallel business	Samsung C&T Corporation and others	2014-07-10 2016-06-20	Until loans fully repaid	8,459 23,780	8,459 23,780

(c) As of December 31, 2017, the Group has received guarantees provided by third parties for the Group's obligations and indebtedness as follows:

In thousands of US dollar

Provider	Description	Contractual currency amount	Description of guarantee
Sumitomo Mitsui Banking Corporation	Guarantee for payment in foreign currency	200,000	Guarantee for the principle and interests of bonds payable

(d) In 2007 and 2008, the Company and Korean Consortium entered into an agreement (Production Sharing Contract) for the exploration and production of oil fields located in Iraq, with the Kurdish regional government ("KRG"), in accordance with the local Kurdish oil exploration laws. In 2008, the Iraqi federal government announced that such agreement in the region without obtaining proper approval from the federal government would be invalid to the Company and other participating companies in the region. The Company was advised by legal consultants in the UK and in Iraq that there is no legal basis on the alleged nullity of the agreement by the Iraqi government.

(e) In 2009, the Company entered into an exclusive agreement with the Kurdish regional government ("KRG") to obtain rights on five exploratory areas. In consideration of obtaining these rights, the Company committed to pay USD 1.9 billion of construction services for the government's Social Overhead Capital (SOC).

However, the agreement was amended twice prior to 2012. The Company's rights on three exploratory areas, including Qush Tappa, were accordingly terminated and the Company's USD 1.9 billion commitment was reduced to USD 1.175 billion. In addition, the quantity of return-guaranteed crude oil was reduced.

The Company recorded mining rights in relation to this agreement and the carrying amount as of December 31, 2017 is ₩1,234,709 million. In addition, the Company recorded a current provision in relation to this agreement and the carrying amounts as of December 31, 2017 are ₩77,111 million which represent that the Company's estimated obligation of expected payments for KRG's SOC construction.

(f) The Company holds one-time right to purchase up to 30% of Korea GS E&P Pte. Ltd. which is owned by GS Energy Co. until February 2020. The exercise price is net of participation of GS Energy Co. in the business, cumulative expense and revenue until the date of the exercise.

44. Contingencies and Commitments, Continued

(g) As of December 31, 2017, other significant commitments and contingencies of the Company's subsidiaries are as follows:

(i) Harvest Operations Corp.("Harvest") and its subsidiaries

The Company provided a payment guarantee on senior notes issued by Harvest, its subsidiary in June 2016 for the principal amount of USD 196 million and their corresponding interest. The payment guarantee is effective until the maturity date (April 14, 2021) of the bonds.

The Company provided a payment guarantee on senior notes issued by Harvest, its subsidiary in May 2013 for the principal amount of USD 630 million and their corresponding interest. The payment guarantee is effective until the maturity date (May 14, 2018) of the bonds.

In February 2017, Harvest entered into a credit facility for CAD 500 million which payment guaranteed by Export-Import Bank of Korea and the Company. The payment guarantee is effective until February 24, 2020.

Harvest entered into a credit facility maturing on February 24, 2020 for CAD 500 million with the Canadian Imperial Bank of Commerce and other financial institutions

The Company provided a payment guarantee on senior notes issued by Harvest, its subsidiary in September and November 2017 for the principal amount of USD 285 million and USD 200 million respectively and their corresponding interest. The payment guarantee is effective until the maturity date (September 21, 2022) of the bonds.

(ii) Dana Petroleum Limited("Dana") and its subsidiaries

Dana entered into credit facilities agreements in a form of syndicated loan for up to USD 1.0 billion. Dana has drawn borrowings amounting to USD 660 million as of December 31, 2017. In relation to the credit facilities, certain financial ratios and cash flows are required to be in compliance with debt covenants and its oil and certain gas properties have been pledged as collateral.

The Company approved subordinated loan facility with a total amount of USD 600 million and the facility is available to December 31, 2018. It is undrawn as of December 31, 2017.

The Company, in relation to the acquisition of Dana Petroleum Limited's equity interest, has provided a guarantee for any potential environmental and bodily damages during the exploration and production activities by Dana Petroleum Norway AS to the Norwegian government

The Company provided a performance guarantee of GBP 80 million to Nexen and others for the expenses that will incur for restoration of the sites, decommissioning, dismantling and removal of the facilities and structures. Also, the Company provided a performance guarantee of NOK 167 million (limit: NOK 1,139 million) to ExxonMobile E&P Norway AS for transferring restoring obligation.

44. Contingencies and Commitments, Continued

(iii) ANKOR E&P Holdings Corp. ("ANKOR") and its subsidiaries

The Company provided a payment guarantee for ANKOR, its subsidiary, in relation to the borrowings from The Expert-Import Bank of Korea and others up to the limit of USD 108 million.

The Company provided a performance guarantee of USD 127 million to Chubb Limited and others for the future restoration of oil and gas sites held by ANKOR.

(iv) KNOC Yemen Ltd.
The Company is in the process of arranging the liquidation of KNOC Yemen Ltd. with YICOM, an acquirer. According to the arrangement, the Company may have a possibility of settlement, of which the amount cannot be estimated

(v) KNOC Eagle Ford and its subsidiaries

JB Patriot Investment Type Private Investment Limited Liability Company, non-controlling interest of KNOC Eagle Ford Corporation entered into an agreement of acquiring redeemable preferred shares with KNOC Eagle Ford Corporation and KNOC EF Star LLC, its subsidiary. The Company entered into the cash deficiency support agreement with KNOC Eagle Ford Corporation. In the case of a breach of covenants, JB Patriot Investment Type Private Investment Limited Liability Company is entitled to exercise a drag along right to require the KNOC Eagle Ford Corporation to sell the entire common shares held by KNOC Eagle Ford Corporation together with the preferred shares. Also, the Company holds the right to pay preferred shares and distributions on the preferred shares.

Details of agreements with financial facilities of KNOC Eagle Ford and its subsidiaries are as follows:

In thousands of US dollar

Agreement	Financial Institution	Credit line amount	Executed amount
Credit line	Bank of America	25,000	-
	Sumitomo Mitsui Banking Corporation	70,000	-
	Societe Generale Bank	30,000	-
		125,000	-

44. Contingencies and Commitments, Continued

(h) As of December 31, 2017, the Company 's significant commitments with the financial institutions are as follows:

In thousands of US dollar

Detail of contract	Financial institutions	Credit line amount	Executed amount
Trade finance	Deutsche Bank	350,000	-
	Development Bank of Singapore(*)	300,000	-
	Korea Development Bank	250,000	-
	Bank of America(*)	210,000	-
	ING Bank(*)	100,000	-
	Standard Chartered bank(*)	150,000	-
		1,360,000	-
Financial loans	BNP Paribas	400,000	-
	Development Bank of Singapore(*)	300,000	-
	Mizuho Corporate Bank	200,000	-
	Bank of America(*)	210,000	-
	ING Bank(*)	100,000	-
	Credit Agricole	100,000	-
	Bank of Tokyo-Mitsubishi UFJ	50,000	-
	Standard Chartered Bank(*)	150,000	-
	The Export-Import Bank of Korea	400,000	-
	Woori Bank	9,334	-
		1,919,334	-

(*) A portion of or all of lines of credit for trade finance and financial loans have been integrated and the integrated line of credit is USD 760 million.

45. Uncertainty of Deterioration in Operating Condition of Oil Market

Imbalance between supply and demand continues to drive low oil prices in the international crude oil market and oil prices are unlikely to increase in a short period of time. Low oil prices has continuously led to deterioration of Group's profitability and financial soundness.

The Group is carrying forward a scheme to improve the profitability and financial soundness against the unstable oil market. There is a significant uncertainty with respect to the Group's future business results depending on the recovery of oil prices.

46. Financial Statements Restatement

The consolidated financial statements of the Group were authorized for issue by the Board of Directors on February 28, 2018, but were restated as a result of accounting change in relation to disposal of headquarters building in Ulsan. The Group has changed accounting for sale-and-leaseback transaction of headquarters building from operating lease to finance lease. Details of the impact due to the accounting change are as follows:

(a) Details of the impact of the changes above on the Group's consolidated statement of financial position are as follows:

In millions of Korean won		**Before adjustment**	**After adjustment**
Non-current assets	₩		
Long-term trade receivables and other receivables		114,165	97,768
Property, plant and equipment		8,809,091	9,023,671
Deferred tax asset		1,218,549	1,218,915
		10,141,805	10,340,354
Current liabilities			
Trade receivables and other receivables		778,072	786,399
Current income tax liability		10,788	9,459
Current non-finance liability		107,806	108,686
		896,666	904,544
Non-current liabilities			
Long-term trade payables and other payables		291,077	503,799
Non-current non-finance liability		9,123	42,608
		300,200	546,407
Equity			
Accumulated other comprehensive income		(604,880)	(601,800)
Accumulated deficit		(8,404,557)	(8,463,173)
	₩	(9,009,437)	(9,064,973)

46. Financial Statements Restatement, Continued

(b) Details of the impact of the changes above on the Group's consolidated statement of comprehensive loss are as follows:

In millions of Korean won		**Before adjustment**	**After adjustment**
Selling and administrative expenses	₩		
Depreciation		(10,509)	(16,672)
Rent		(14,574)	(6,718)
		(25,083)	(23,390)
Other profit (loss)			
Gain on disposal of property, plant and equipment		43,642	2,130
Gain on foreign currency translation		39,287	39,595
Loss on disposal of property, plant and equipment		(5,419)	(179)
Loss on foreign currency translation		(27,707)	(45,110)
		49,803	(3,564)
Finance income			
Interest income		50,444	50,601
		50,444	50,601
Finance cost			
Interest expense		(392,131)	(401,019)
		(392,131)	(401,019)
Income tax benefit		192,374	194,163

As a result of the accounting changes, the Group's net asset decreased ₩55,536 million and loss for the year increased ₩58,616 million.