KOREA ELECTRIC POWER CORP
Form 20-F
April 30, 2019
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As filed with the Securities and Exchange Commission on April 30, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 20-F

(Mark One)

REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR (g) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2018

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

SHELL COMPANY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Date of event requiring this shell company report

For the transition period from to

Commission File Number: 001-13372

KOREA ELECTRIC POWER CORPORATION

(Exact name of registrant as specified in its charter)

N/A	**The Republic of Korea**
(Translation of registrant s name into English)	***(Jurisdiction of incorporation or organization)***

55 Jeollyeok-ro, Naju-si, Jeollanam-do, 58322, Korea

(Address of principal executive offices)

Yoon Hye Cho, +82 61 345 4213, yoonhye.cho@kepco.co.kr, +82 61 345 4299

55 Jeollyeok-ro, Naju-si, Jeollanam-do, 58322, Korea

(Name, telephone, e-mail and/or facsimile number and address of company contact person)

Securities registered or to be registered pursuant to Section 12(b) of the Act:

Title of each class:	**Name of each exchange on which registered:**
Common stock, par value Won 5,000 per share	**New York Stock Exchange***
American depositary shares, each representing	**New York Stock Exchange**

one-half of share of common stock

* Not for trading, but only in connection with the listing of American depositary shares on the New York Stock Exchange, pursuant to the requirements of the Securities and Exchange Commission.

Securities registered or to be registered pursuant to Section 12(g) of the Act:

None

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act:

One Hundred Year 7.95% Zero-to-Full Debentures, due April 1, 2096

6% Debentures due December 1, 2026

7% Debentures due February 1, 2027

6¾% Debentures due August 1, 2027

Indicate the number of outstanding shares of each of the issuer s classes of capital or common stock as of the close of the period

covered by the annual report:

641,964,077 shares of common stock, par value of Won 5,000 per share

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934. Yes No

Note Checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 from their obligations under those Sections.

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports) and (2) has been subject to such filing requirements for the past 90 days: Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files): Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, or a non-accelerated filer, or an emerging growth company. See definition of large accelerated filer , accelerated filer , and emerging growth company in Rule 12b-2 of the Exchange Act.

Large accelerated filer Accelerated filer Non-accelerated filer Emerging Growth Company

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

The term new or revised financial accounting standard refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP International Financial Reporting Standards as issued by the International Accounting Standards Board Other

If Other has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow. Item 17 Item 18

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

(APPLICABLE ONLY TO ISSUERS INVOLVED IN BANKRUPTCY PROCEEDINGS DURING THE PAST FIVE YEARS)

Indicate by check mark whether the registrant has filed all documents and reports required to be filed by Sections 12, 13 or 15(d) of the Securities Exchange Act of 1934 subsequent to the distribution of securities under a plan confirmed by a court. Yes No

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CERTAIN DEFINED TERMS AND CONVENTIONS

All references to Korea or the Republic in this annual report on Form 20-F, or this annual report, are references to the Republic of Korea. All references to the Government in this annual report are references to the government of the Republic. All references to we, us, our, ours, the Company or KEPCO in this annual report are references to K Electric Power Corporation and, as the context may require, its subsidiaries, and the possessive thereof, as applicable. All references to the Ministry of Trade, Industry and Energy and the Ministry of Economy and Finance include the respective predecessors thereof. All references to tons are to metric tons, equal to 1,000 kilograms, or 2,204.6 pounds. Any discrepancies in any table between totals and the sums of the amounts listed are due to rounding. All references to IFRS in this annual report are references to the International Financial Reporting Standards as issued by the International Accounting Standard Board. Unless otherwise stated, all of our financial information presented in this annual report has been prepared on a consolidated basis and in accordance with IFRS.

In addition, in this annual report, all references to:

EWP are to Korea East-West Power Co., Ltd.,

KHNP are to Korea Hydro & Nuclear Power Co., Ltd.,

KOMIPO are to Korea Midland Power Co., Ltd.,

KOSEP are to Korea South-East Power Co., Ltd.,

KOSPO are to Korea Southern Power Co., Ltd., and

KOWEPO are to Korea Western Power Co., Ltd.,

each of which is our wholly-owned generation subsidiary.

FORWARD-LOOKING STATEMENTS

This annual report includes forward-looking statements (as defined in Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934), including statements regarding our expectations and projections for future operating performance and business prospects. The words believe, expect, anticipate, estimate, project similar words used in connection with any discussion of our future operation or financial performance identify forward-looking statements. In addition, all statements other than statements of historical facts included in this annual report are forward-looking statements. Although we believe that the expectations reflected in such forward-looking statements are reasonable, we can give no assurance that such expectations will prove to be correct. We caution you not to place undue reliance on the forward-looking statements, which speak only as of the date of this annual report.

This annual report discloses, under the caption Item 3.D. Risk Factors and elsewhere, important factors that could cause actual results to differ materially from our expectations (Cautionary Statements). All subsequent written and

oral forward-looking statements attributable to us or persons acting on our behalf are expressly qualified in their entirety by the Cautionary Statements.

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PART I

ITEM 1. *IDENTITY OF DIRECTORS, SENIOR MANAGEMENT AND ADVISERS*

Not applicable.

ITEM 2. *OFFER STATISTICS AND EXPECTED TIMETABLE*

Not applicable.

ITEM 3. *KEY INFORMATION*

Item 3.A. Selected Financial Data

The selected consolidated financial data set forth below as of and for the years ended December 31, 2014, 2015, 2016, 2017 and 2018 have been derived from our audited consolidated financial statements which have been prepared in accordance with IFRS.

You should read the following data with the more detailed information contained in Item 5. Operating and Financial Review and Prospects and our consolidated financial statements included in Item 18. Financial Statements. Historical results do not necessarily predict future results.

Consolidated Statement of Comprehensive Income (Loss) Data

	2014	2015	2016	2017	2018	2018
	(in billions of Won and millions of US$, except per share data)[1]					
Sales	57,123	58,582	59,763	59,336	60,033	$ 53,943
Cost of sales	49,763	45,458	45,550	52,099	58,208	52,303
Gross profit	7,360	13,124	14,213	7,237	1,825	1,640
Selling and administrative expenses	1,924	2,153	2,639	2,763	2,628	2,362
Other income, net	666	699	652	689	739	664
Other gains (losses), net	107	8,611	70	157	(621)	(558)
Operating profit (loss)	6,209	20,281	12,296	5,320	(685)	(616)
Finance expense, net	(2,255)	(1,832)	(1,646)	(1,596)	(1,674)	(1,504)
Income (loss) before income taxes	4,229	18,656	10,513	3,614	(2,001)	(1,798)
Income tax (expense) benefit	(1,430)	(5,239)	(3,365)	(2,173)	826	742
Profit (loss) for the period	2,799	13,416	7,148	1,441	(1,175)	(1,056)
Other comprehensive income (loss)	(358)	34	(2)	(95)	(107)	(96)
Total comprehensive income (loss)	2,441	13,450	7,146	1,346	(1,282)	(1,152)
Profit (loss) attributable to:						
Owners of the Company	2,687	13,289	7,048	1,299	(1,315)	(1,182)
Non-controlling interests	112	127	100	142	140	126

Total comprehensive income (loss) attributable to:						
Owners of the Company	2,336	13,308	7,042	1,230	(1,426)	(1,281)
Non-controlling interests	105	142	104	116	144	129
Earnings (loss) per share						
Basic[(2)]	4,290	20,701	10,980	2,023	(2,048)	(1.84)
Earnings (loss) per ADS						
Basic[(2)]	2,145	10,351	5,490	1,012	(1,024)	(0.92)
Dividends per share	500	3,100	1,980	790		

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Consolidated Statements of Financial Position Data

	As of December 31,					
	2014	2015	2016	2017	2018	2018
	(in billions of Won and millions of US$, except share and per share data)[1]					
Net working capital deficit[3]	(4,780)	(686)	(5,031)	(4,283)	(2,096)	$ (1,883)
Property, plant and equipment, net	135,812	141,361	145,743	150,882	152,743	137,248
Total assets	163,708	175,257	177,837	181,789	185,249	166,456
Total shareholders equity	54,825	67,942	73,051	72,965	71,093	63,881
Equity attributable to owners of the Company	53,601	66,634	71,724	71,682	69,744	62,669
Non-controlling interests	1,224	1,308	1,327	1,283	1,349	1,212
Share capital	3,210	3,210	3,210	3,210	3,210	2,884
Number of common shares as adjusted to reflect any changes in capital stock	641,964,077	641,964,077	641,964,077	641,964,077	641,964,077	641,964,077
Long-term debt (excluding current portion)	55,720	50,907	44,700	45,624	53,073	47,689
Other long term liabilities	31,563	33,697	35,347	39,776	39,242	35,261

Notes:

(1) The financial information denominated in Won as of and for the year ended December 31, 2018 has been translated into U.S. dollars at the exchange rate of Won 1,112.9 to US$1.00, which was the Noon Buying Rate as of December 31, 2018.

(2) Basic earnings (loss) per share are calculated by dividing net income available to holders of our common shares by the weighted average number of common shares issued and outstanding for the relevant period. Basic earnings (loss) per ADS have been computed as if all of our issued and outstanding common shares are represented by ADSs during each of the years presented. Each ADS represents two common shares. Dilutive earnings (loss) per share were the same as basic earnings (loss) per share for the years ended December 31, 2014 through 2018 since there were no potential dilutive instruments.

(3) Net working capital is defined as current assets minus current liabilities. For the periods indicated, current liabilities exceeded current assets, which resulted in working capital deficit for such periods.

Currency Translations and Exchange Rates

In this annual report, unless otherwise indicated, all references to Won, KRW or are to the currency of Korea, all references to U.S. dollars, Dollars, USD , $ or US$ are to the currency of the United States of America; all refere to Euro or are references to the currency of the European Union; all references to Yen or ¥ are references to the currency of Japan; all references to A$ are to the currency of Australia; and all references to RMB are to the currency of the People s Republic of China. Unless otherwise indicated, all translations from Won to U.S. dollars were made at Won 1,112.9 to US$1.00, which was the noon buying rate of the Federal Reserve Board (the Noon Buying Rate) in effect as of December 31, 2018, which rates are available on the H.10 statistical release of the Federal Reserve Board. On April 18, 2019, the Noon Buying Rate was Won 1,136.2 to US$1.00. The exchange rate between the U.S. dollar and Korean Won may be highly volatile from time to time and the U.S. dollar amounts referred to in this annual report should not be relied upon as an accurate reflection of our results of operations. No representation is made that the Won or U.S. dollar amounts referred to in this annual report could have been or could be converted into U.S. dollars or Won, as the case may be, at any particular rate or at all.

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The following table sets forth, for the periods and dates indicated, certain information concerning the Noon Buying Rate in Won per US$1.00.

Year Ended December 31,	At End of Period	Average[(1)]	High	Low
		(Won per US$1.00)		
2014	1,090.9	1,054.0	1,117.7	1,008.9
2015	1,169.3	1,133.7	1,196.4	1,063.0
2016	1,203.7	1,160.5	1,242.6	1,090.0
2017	1,067.4	1,141.6	1,207.2	1,067.4
2018	1,112.9	1,099.3	1,141.7	1,054.6
October	1,140.8	1,130.9	1,141.7	1,112.4
November	1,118.6	1,125.7	1,132.3	1,117.5
December	1,112.9	1,122.4	1,133.2	1,108.8
2019 (through April 18)	1,136.2	1,127.0	1,143.3	1,111.8
January	1,111.8	1,120.3	1,129.5	1,111.8
February	1,124.7	1,121.8	1,128.0	1,116.1
March	1,136.3	1,131.6	1,138.1	1,126.5
April (through April 18)	1,136.2	1,136.4	1,143.3	1,131.7

Source: Federal Reserve Board

Note:

(1) The average rates for annual and interim periods were calculated by taking the simple average of the Noon Buying Rates on the last day of each month during the relevant period. The average rates for the monthly periods (or a portion thereof) were calculated by taking the simple average of the daily Noon Buying Rates during the relevant month (or a portion thereof).

Item 3.B. Capitalization and Indebtedness

Not Applicable

Item 3.C. Reasons for the Offer and Use of Proceeds

Not Applicable

Item 3.D. Risk Factors

Our business and operations are subject to various risks, many of which are beyond our control. If any of the risks described below actually occurs, our business, financial condition or results of operations could be seriously harmed.

Risks Relating to KEPCO

Increases in fuel prices will adversely affect our results of operations and profitability as we may not be able to pass on the increased cost to customers at a sufficient level or on a timely basis.

In 2018, fuel costs constituted 34.5% of our cost of sales, and the ratio of fuel costs to our sales was 33.5%. Our generation subsidiaries purchase substantially all of the fuel that they use (except for anthracite coal) from suppliers outside Korea at prices determined in part by prevailing market prices in currencies other than Won. For example, most of the bituminous coal requirements (which accounted for approximately 52.6% of our fuel requirements in 2018 in terms of electricity output) are imported principally from Indonesia, Australia, Russia and, to a lesser extent, South Africa and others, which accounted for approximately 35%, 30%, 14%, 8% and

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13%, respectively, of the annual bituminous coal requirements of our generation subsidiaries in 2018. Approximately 83% of the bituminous coal requirements of our generation subsidiaries in 2018 were purchased under long-term contracts and the remaining 17% from the spot market. Pursuant to the terms of our long-term supply contracts, prices are adjusted periodically based on prevailing market conditions. In addition, our generation subsidiaries purchase a significant portion of their fuel requirements under contracts with limited duration. See Item 4.B. Business Overview Fuel.

The prices of our main fuel types, namely, bituminous coal, oil and liquefied natural gas, or LNG, fluctuate, sometimes significantly, in tandem with their international market prices. For example, the average daily spot price of free on board Newcastle coal 6300 GAR published by Platts increased from US$88.3 per ton in 2017 to US$107.7 per ton in 2018 and decreased to US$84.0 per ton as of April 18, 2019. The prices of oil and LNG are substantially dependent on the price of crude oil, and according to Bloomberg (Bloomberg Ticker: PGCRDUBA), the average daily spot price of Dubai crude oil increased from US$53.1 per barrel in 2017 to US$69.3 per barrel in 2018 and to US$70.4 per barrel as of April 18, 2019. Furthermore, because the prices of LNG are dependent on the price of crude oil, an increase in such fuel prices can result in an increase in the prices of LNG, which, in turn, affect the cost of purchasing electricity from independent power producers. We cannot assure you that fuel prices will remain stable or will not significantly increase in the remainder of 2019 or thereafter. In addition, effective from January 1, 2020, the International Maritime Organization regulation referred to as IMO 2020 will mandate, among other requirements, a reduction in the fuel sulfur content cap from 3.5% currently to 0.5%. The implementation of new environmental regulations, such as IMO 2020, is expected to significantly increase the operating cost of the shipping lines, which are expected to pass on these additional costs to customers like us via higher freight rates. If fuel prices increase substantially in the future within a short span of time, our generation subsidiaries may be unable to secure requisite fuel supplies at prices commercially acceptable to them. In addition, any significant interruption or delay in the supply of fuel, bituminous coal in particular, from any of their suppliers may cause our generation subsidiaries to purchase fuel on the spot market at prices higher than the prices available under existing supply contracts, which would result in an increase in fuel costs.

Because the Government regulates the rates we charge for the electricity we sell to our customers (see Item 4.B. Business Overview Sales and Customers Electricity Rates), our ability to pass on fuel and other cost increases to our customers is limited. If fuel prices increase rapidly and substantially and the Government, out of concern for inflation or for other reasons, maintains the current level of electricity tariff or does not increase it to a level to sufficiently offset the impact of high fuel prices, the fuel price increases will negatively affect our profit margins or even cause us to suffer operating and/or net losses, and our business, financial condition, results of operations and cash flows would suffer.

The Government may also set or adjust electricity tariff rates that may not be necessarily responsive to fuel price movements. For example, effective January 1, 2017, the Government made several adjustments to the existing rate structure in order to ease the burden of electricity tariff on residential consumers as well as promote the use of renewable energy. First, the progressive rate structure applicable to the residential sector, which applies a gradient of increasing tariff rates for heavier electricity usage, was changed from a six-tiered structure with the highest rate being no more than 11.7 times the lowest rate (which gradient system has been in place since 2005) into a three-tiered structure with the highest rate being no more than three times the lowest rate, in order to reflect the changes in the pattern of electricity consumption and reduce the electricity charges payable by consumers. Second, a new tariff structure was implemented to encourage energy saving by offering rate discounts to residential consumers that voluntarily reduce electricity consumption while charging special high rates to residential consumers with heavy electricity consumption during peak usage periods in the summer and the winter. Third, a temporary rate discount will apply during 2017 to 2019 to investments in environmentally friendly facilities such as energy storage systems, renewable energy and electric cars. The temporary rate discount to investments in energy storage systems and

renewable energy was extended until 2020. Additionally, during July and August 2018, the Government reduced residential electricity charges by temporarily relaxing the application of the current tariff structure and offering higher rate discounts to economically or otherwise

disadvantaged households to ease the burden on households that have significantly increased their use of air conditioners during a heatwave. Such adjustments may lower our revenues from the sale of electricity and accordingly have a material adverse effect on our results of operation, financial condition and cash flows.

In addition, partly because the Government may have to undergo a lengthy deliberative process to approve an increase in electricity tariff, which represents a key component of the consumer price index, the electricity tariff may not be adjusted to a level sufficient to ensure a fair rate of return to us in a timely manner or at all, and we cannot assure that any future tariff increase by the Government will be sufficient to fully offset the adverse impact on our results of operations from current or potential rises in fuel costs. On the other hand, if fuel prices decrease, the public may demand a corresponding decrease in electricity tariff rates, and as a result the Government may decrease electricity tariff rates; however, we cannot assure you that the resulting tariff rate reduction will not be excessive and thus have a detrimental effect on our profit margins, results of operations or cash flows or that, if the fuel prices were to rise again subsequent to the tariff reduction, the tariff rates would be further adjusted upwards in a timely manner, in sufficient amounts or at all so as to fully offset the adverse impact from the increase in fuel prices.

The Government may adopt policy measures to substantially restructure the Korean electric power industry or our operational structure, which may have a material adverse effect on our business, operations and profitability.

From time to time, the Government considers various policy initiatives to foster efficiency in the Korean electric power industry, and at times have adopted policy measures that have substantially modified our business and operations. For example, in January 1999, with the aim of introducing greater competition in the Korean electric power industry and thereby improving its efficiency, the Government announced a restructuring plan for the Korean electric power industry, or the Restructuring Plan. For a detailed description of the Restructuring Plan, see Item 4.B. Business Overview Restructuring of the Electric Power Industry in Korea. As part of this initiative, in April 2001 the Government established the Korea Power Exchange to enable the sale and purchase of electricity through a competitive bidding process, established the Korea Electricity Commission to ensure fair competition in the Korean electric power industry, and, in order to promote competition in electricity generation, split off our electricity generation business to form one nuclear generation company and five non-nuclear generation companies, in each case, to be wholly owned by us. In 2002, the Government introduced a plan to privatize one of our five non-nuclear generation subsidiaries, but this plan was suspended indefinitely in 2004 due to prevailing market conditions and other policy considerations.

In August 2010, the Ministry of Trade, Industry and Energy announced the Proposal for the Improvement in the Structure of the Electric Power Industry, which was designed to promote responsible management by and improve operational efficiency of government-affiliated electricity companies by fostering competition among them. Pursuant to this proposal, while our six generation subsidiaries continued to be our wholly-owned subsidiaries, in January 2011 the six generation subsidiaries were officially designated as market-oriented public enterprises (same as us) under the Act on the Management of Public Institutions, whereupon the President of Korea appoints the president and the standing director who is to become a member of the audit committee of each such subsidiary; the selection of non-standing directors of each such subsidiary is subject to approval by the minister of the Ministry of Economy and Finance; the president of each such subsidiary is required to enter into a management contract directly with the minister of the Ministry of Trade, Industry and Energy; and the Public Agencies Operating Committee (which is comprised largely of Government officials and those recommended by Government officials) conducts performance evaluation of such subsidiaries. Previously, our president appointed the president and the statutory auditor of each such subsidiary; the selection of non-standing directors of each such subsidiary was subject to approval by our president; the president of each such subsidiary entered into a management contract with our president; and our evaluation committee conducted performance evaluation of such subsidiaries. As a result of these changes, our six generation subsidiaries took on additional operational responsibilities and management autonomy with respect to

construction and management of generation units and procurement of fuel, while we as the parent company continued to oversee and coordinate, among others,

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finances, corporate governance, overseas businesses, including nuclear export technology and overseas resource development, that jointly affect us and our generation subsidiaries. See also Item 16G. Corporate Governance The Act on the Management of Public Institutions Applications of the Act on Our Generation Subsidiaries,

In June 2016, the Government announced the Proposal for Adjustment of Functions of Public Institutions (Energy Sector) for the purpose of streamlining the operations of government-affiliated energy companies by discouraging them from engaging in overlapping or similar businesses with each other, reducing non-core assets and activities and improving management and operational efficiency. The initiatives contemplated in this proposal that would affect us and our generation subsidiaries include the following: (i) the generation companies should take on greater responsibilities in overseas resource exploration and production projects as these involve procurement of fuels necessary for electricity generation while fostering cooperation among each other through closer coordination, (ii) KHNP should take a greater role in export of nuclear technology, and (iii) the current system of retail sale of electricity to end-users should be liberalized to encourage more competition. In accordance therewith, we transferred a substantial portion of our assets and liabilities in our overseas resource business to our generation subsidiaries as of December 31, 2016. In addition, pursuant to this Proposal, we considered a sale in the public market of a minority of our shares in our five non-nuclear generation subsidiaries, KEPCO KDN and KHNP. However, the planned sales have been put on hold, primarily due to prevailing market conditions. In any event, we plan to maintain a controlling stake in each of these subsidiaries.

Other than as set forth above, we are not aware of any specific plans by the Government to resume the implementation of the Restructuring Plan or otherwise change the current structure of the electric power industry or the operations of us or our generation subsidiaries materially in the near future. However, for reasons relating to changes in policy considerations, socio-political, economic and market conditions and/or other factors, the Government may resume the implementation of the Restructuring Plan or initiate other steps that may change the structure of the Korean electric power industry or the operations of us or our generation subsidiaries materially. Any such measures may have a negative effect on our business, results of operations and financial condition. In addition, the Government, which beneficially owns a majority of our shares and exercises significant control over our business and operations, may from time to time pursue policy initiatives that could directly or indirectly impact our business and operations, and such initiatives may vary from the interest and objectives of our other shareholders.

Our capacity expansion plans, which are principally based on projections on long-term supply and demand of electricity in Korea, may prove to be inadequate.

We and our generation subsidiaries make plans for expanding or upgrading our generation capacity and transmission infrastructure based on the Basic Plan Relating to the Long-Term Supply and Demand of Electricity, or the Basic Plan, which is generally revised and announced every two years by the Government. In July 2015, the Government announced the Seventh Basic Plan relating to the future supply and demand of electricity, focusing on stable supply of electricity and increasing the portion of low carbon electricity supply sources, among others. In December 2017, the Government announced the Eighth Basic Plan to revise the Seventh Basic Plan, for the former to be effective for the period from 2017 to 2031. The Eighth Basic Plan focuses on, among other things, (i) decreasing the reliance on nuclear and coal-based supply sources, (ii) increasing utilization of renewable energy sources and (iii) balancing the existing cost-based pool system of purchase of electricity with an environmentally-focused pool system. Furthermore, the Eighth Basic Plan includes the following implementing measures: (i) six new nuclear generation units in a planning stage would not be constructed, (ii) extension of life of 10 decrepit nuclear generation units would not be granted, (iii) Wolsong #1 unit is not counted as part of domestic energy generation capacity, (iv) seven decrepit coal-fired generation plants will be retired by 2022, (v) six other coal-fired generation plants shall be converted to LNG fuel use and (vi) domestic renewable energy generation capacity shall be expanded to 58.5 gigawatts by 2030.

In January 2014, prior to the announcement of the Seventh Basic Plan, the Ministry of Trade, Industry and Energy adopted the Second Basic National Energy Plan following consultations with representatives from civic

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groups, the power industry and academia. The Second Basic National Energy Plan, which is a comprehensive plan that covers the entire spectrum of energy industries in Korea, covers the period from 2014 to 2035 and focuses on the following six key tasks: (i) shifting the focus of energy policy to demand management with a goal of reducing the growth of electricity demand by 15% by 2035 through efficiency enhancement programs compared to the projected growth in the absence of such efficiency enhancement programs, (ii) establishing a geographically decentralized electricity generation system so as to reduce transmission losses with a goal of supplying at least 15% of total electricity through such system by 2035, (iii) applying latest greenhouse gas emission reduction technologies to newly constructed generation units in order to further promote safety and environmental friendliness, (iv) strengthening resource exploration and fuel procurement capabilities to enhance Korea s energy security, (v) ensuring stable supply of energy and increasing the portion of electricity supplied from renewable sources to 11% by 2035, (vi) reinforcing the system for stable supply of conventional energy, such as oil and gas, and (vii) introducing in 2015 an energy voucher system in lieu of a tariff discount system for the benefit of consumers in the low income group. In addition, the Second Basic National Energy Plan revised the target level of electricity generated by nuclear sources as a percentage of total electricity generated to 29%, compared to 41% under the First Basic National Energy Plan announced in 2008, which covered the period from 2008 to 2030. In March 2018, the Government announced its plan to establish the Third Basic National Energy Plan and formed a working group consisting of government and industry officials and civilian experts. On November 7, 2018, the working group submitted its set of recommendations to the Ministry of Trade, Industry and Energy, and the formal discussions regarding the Third Basic National Energy Plan are ongoing.

We cannot assure that the Eighth Basic Plan, the Second Basic National Energy Plan, or their respective successor plans will successfully achieve their intended goals, the foremost of which is to ensure, through carefully calibrated capacity expansion and other means, balanced overall electricity supply and demand in Korea to end users while promoting efficiency and environmental friendliness in the consumption and production of electricity. If there is significant variance between the projected electricity supply and demand considered in planning our capacity expansions and the actual electricity supply and demand, or if these plans otherwise fail to meet their intended goals or have other unintended consequences, this may result in inefficient use of our capital, and undue financing costs on the part of us and our generation subsidiaries, among others, which may have a material adverse effect on our results of operations, financial condition and cash flows.

From time to time, we may experience temporary power shortages or circumstances bordering on power shortages due to factors beyond our control, such as extreme weather conditions. Such circumstances may lead to increased end-user complaints and greater public scrutiny, which may in turn require us to modify our capacity expansion plans, and if we were to substantially modify our capacity plans, this might result in additional capital expenditures and, as a result, have a material adverse effect on our results of operations, financial condition and cash flows.

Although the Government makes significant efforts to encourage conservation of electricity, including through public education campaigns, there is no assurance that such efforts will have the desired effect of substantially reducing the demand for electricity or improving efficient use thereof.

We are subject to various environmental regulations and related government initiatives, including in relation to climate change, which could cause significant compliance costs and operational liabilities.

We are subject to national, local and overseas environmental laws and regulations, including increasing pressure to reduce emission of carbon dioxide from our electricity generation activities as well as our natural resource development endeavors overseas. Our operations could expose us to the risk of substantial liability relating to environmental, health and safety issues, such as those resulting from the discharge of pollutants and carbon dioxide into the environment and the handling, storage and disposal of hazardous materials. We may be responsible for the

investigation and remediation of environmental conditions at current or former operational sites. We may also be subject to related liabilities (including liabilities for environmental damage, third party property damage or personal injury) resulting from lawsuits brought by governments or private litigants. In the

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course of our operations, hazardous wastes may be generated, disposed of or treated at third party-owned or -operated sites. If those sites become contaminated, we could also be held responsible for the cost of investigation and remediation of such sites for any related liabilities, as well as for civil or criminal fines or penalties.

We intend to fully comply with our environmental obligations. However, our environmental measures, including the use of, or replacement with, environmentally friendly but more expensive parts and equipment and budgeting capital expenditures for the installation or modification of such facilities, may result in increased operating costs and liquidity requirement. The actual cost of installation, replacement, modification and/or operation of such equipment and related liquidity requirement may depend on a variety of factors that are beyond our control. There is no assurance that we will continue to be in material compliance with legal or regulatory requirements or satisfy social norms and expectations in the future in relation to the environment, including in respect of climate change.

In recent years, partly driven by growing public awareness and sensitivity toward climate change and other environmental issues as well as in an effort to capture the economic and social potential associated with renewable energy and new energy -related industries (such as smart grids, energy storage systems and electrical vehicles, among others), the Government has introduced and implemented a number of new measures designed to reduce carbon emission, minimize environmental damage and spur related business opportunities. Some key examples of such Government initiatives pertinent to our and our generation subsidiaries operations are as follows:

Carbon Emission Trading System, Related Emission Reduction Targets and the Greenhouse Gas Reduction Roadmap. In accordance with the Act on Allocation and Trading of Greenhouse Gas Emission Allowances, enacted in March 2013, the Government is currently in the process of implementing a carbon emission trading system under which the Government will allocate the amount of permitted carbon emission to companies by industry and a company whose business emits more carbon than the permitted amount may purchase the right to emit more carbon through the carbon emission trading exchange. This system is expected to be implemented in three stages. During the first phase (2015 to 2017), the Government set up and made a test run of the trading system to ensure its smooth operation; during this phase, the carbon emission rights were allocated without charge. In July 2018, the Government released the allocation plan for the second phase (2018 to 2020). During the second phase, 97% of the carbon emission rights may be allocated free of charge, with 3% allocated through an auction. During the third phase (2021 to 2025), the Government plans to run the system on an expanded scale with aggressive carbon emission reduction targets, with 10% of the carbon emission rights allocated through an auction. In December 2016, the Government announced the Climate Change Response Initiatives and 2030 National Greenhouse Gas Reduction Roadmap, which set forth the carbon emission trading system as one of the primary means to reach the emission and greenhouse gas reduction targets of the policies. The 2030 National Greenhouse Gas Reduction Roadmap was amended on July 24, 2018 and sets forth a national target of greenhouse gas level as 536 million tons in the aggregate, representing a 37% reduction from the base case projection of greenhouse gas in 2030. In the electricity conversion sector, greenhouse gas reduction of 24 million tons (with a potential additional reduction of 34 million tons) is requested by year 2030, and our business is classified as part of this sector. The additional potential reduction amount will be confirmed prior to the finalization of the Government s 2020 Nationally Determined Contributions (NDCs). Adhering to such emission and greenhouse gas reduction requirement may result in our incurring significant compliance costs.

Regulation of Coal-Fired Generation Units. As a measure to address the high level of particulate matter pollution, the Government temporarily suspended the operations of eight coal-fired generation units that are

30 years or older throughout the month of June 2017. Subsequently, in July 2017, two of these units were shut down completely and one unit switched fuel from coal to wood pallets. One of these units stopped its operation in January 2019 for switching fuel to wood pallets. As part of the Comprehensive Measures against Particulate Matter and the Eighth Basic Plan, announced by the Government in September 2017 and December 2017, respectively, the Government set forth the

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following policy directions relating to coal-fired generation units: (i) two coal-fired generation units scheduled for construction and four existing coal-fired generation units shall convert to LNG fuel use, (ii) in principle, construction of new coal-fired generation units shall not be planned, (iii) seven of the coal-fired generation units that are 30 years or older will be shut down on an accelerated schedule, (iv) beginning in 2018, coal-fired generation units that are 30 years or older shall temporarily cease operations from March through June of each year, (v) coal-fired generation units shall be put through comprehensive functional and environmental upgrades and (vi) coal-fired generation units shall be subject to emission standards that came into effect in January 2019 that are twice as more rigorous than the previous standards. In October 2018, the Government introduced a pilot regulation to lower the output of 35 coal-fired power plants to approximately 80% of their capacity that emit more than a certain amount of particulate matter. The regulation was formally implemented in January 2019, targeting 40 coal-fired power plants with high emissions of particulate matter. From March to June 2019, the scope expanded to cover 60 units in total. In addition, coal-fired generation units scheduled for preventive maintenance during the second half of 2019 will be required to undertake such maintenance earlier in the spring of 2019. Although such plans may be subject to change, compliance with such measures is expected to result in our incurring costs, including in connection with adherence to more stringent particulate matter pollution regulations, retrofitting and overall replacement of environmental facilities.

Coal Consumption Tax. In January 2014, largely based on policy considerations of tax equity among different fuel types as well as environmental concerns, the Ministry of Economy and Finance announced that, effective July 1, 2014, consumption tax will apply to bituminous coal, which previously was not subject to consumption tax unlike other fuel types such as LNG or bunker oil. Pursuant to the amended Individual Consumption Tax Act effective as of April 1, 2019, which involved an increase of the unit tax rate for coal by Won 10 per kilogram across the board, the base tax rate (which is subject to certain adjustments) is Won 46 per kilogram for bituminous coal; however, due to concerns on the potential adverse effect on industrial activities, the applicable tax rate is applied differently based on the net heat generation amount. The currently applicable tax rate for bituminous coal is Won 43 per kilogram for net heat generation of less than 5,000 kilocalories, Won 46 per kilogram for net heat generation of 5,000 to 5,500 kilocalories and Won 49 per kilogram for net heat generation of 5,500 kilocalories or more. In contrast, the consumption tax and surcharge on importation of LNG decreased by Won 48 and Won 20.4 per kilogram, respectively, which came into effect in April 2019. The currently applicable consumption tax rate and surcharge on importation of LNG are Won 12 and Won 3.8 per kilogram, respectively. We expect an increase in our overall fuel costs, as bituminous coal currently represents the largest fuel type for our electricity generation, while the decrease in consumption tax and surcharge on importation of LNG will result in a decrease of our power purchase cost.

Renewable Portfolio Standard. Under this program, each of our generation subsidiaries is required to generate a specified percentage of total electricity to be generated by such generation subsidiary in a given year in the form of renewable energy or, in case of a shortfall, purchase a corresponding amount of a Renewable Energy Certificate (a form of renewable energy credit) from other generation companies whose renewable energy generation surpass such percentage. The target percentage was 3.0% in 2015, 3.5% in 2016, 4.0% in 2017, 5.0% in 2018, 6.0% in 2019 and will incrementally increase to 10.0% by 2023. Fines are to be levied on any subsidiary that fails to do so in the prescribed timeline. In 2017, all six of our generation subsidiaries met the target through renewable energy generation and/or the purchase of a Renewable Energy Certificate. Compliance by our generation subsidiaries of the 2018 target is currently under evaluation, and if any generation subsidiary is found to have failed to meet the target for 2018 or for

subsequent years, such generation subsidiary may become subject to fines. Additionally, as the target percentage is subject to change, changes to the target percentage may result in additional expenses for our generation subsidiaries.

Renewable Energy 3020 Plan. In December 2017, the Ministry of Trade, Industry and Energy announced the Renewable Energy 3020 Plan, an initiative to increase the generation and use of

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renewable energy on a nationwide basis. The Government plans to increase the required percentage of total electricity to be generated from renewable energy sources from 7% in 2016 to 10.5% and 20% by 2022 and 2030, respectively. Moreover, the Government plans to increase the domestic renewable energy generation capacity to 63.8 gigawatts by 2030 through the expansion of solar and wind power generation capacities to 36.5 gigawatts and 17.7 gigawatts, respectively, by 2030.

New Energy Industry Fund. In January 2016, the Ministry of Trade, Industry and Energy announced an initiative to promote the new energy industry by creating the New Energy Industry Fund, which is made up of funds sponsored by government-affiliated energy companies. We contributed Won 500 billion to the funds in 2016. The purpose of these funds is to invest in substantially all frontiers of the new energy industry, including renewable energy, energy storage systems, electric vehicles, small-sized self-sustaining electricity generation grids known as micro-grids , among others, as well as invest in start-up companies, ventures, small- to medium-sized enterprise and project businesses that engage in these businesses but have not previously attracted sufficient capital from the private sector.

Environmental and safety considerations in electricity supply and demand planning. In March 2017, the Electric Utility Act was amended to the effect that starting in June 2017, future national planning for electricity supply and demand in Korea should consider the environmental and safety impacts of such planning. However, to-date, no specific guidelines have been provided by the Government as to how to implement this provision, and it is therefore difficult to assess in advance what impact such provision will have on our business, results of operations or financial condition.

Complying with these Government initiatives and operating programs in furtherance thereof has involved and will likely involve significant costs and resources on our part. We and our generation subsidiaries could also become subject to substantial fines and other forms of penalties for non-compliance. There is no assurance that, particularly given the wide-ranging policy priorities for the Government, it will in fact raise the electricity tariff to a level sufficient to fully cover additional costs associated with implementing and operating these programs and otherwise complying with these programs, do so on a timely basis or at all. If the Government does not do so or provide us and our generation subsidiaries with other forms of assistance to offset the costs involved, our results of operation, financial condition and cash flows may be materially and adversely affected.

See Item 4.B. Business Overview Environmental Programs.

We may require a substantial amount of additional indebtedness to refinance existing debt and for future capital expenditures.

We anticipate that a substantial amount of additional indebtedness will be required in the coming years in order to refinance existing debt, make capital expenditures for construction of generation plants and other facilities and/or make acquisitions, invest in renewable energy and the new energy industry projects and fund our overseas businesses. In 2016, 2017 and 2018, our capital expenditures in relation to the foregoing amounted to Won 13,950 billion, Won 13,711 billion and Won 13,695 billion, respectively, and our budgeted capital expenditures for 2019, 2020 and 2021 amount to Won 16,831 billion, Won 19,138 billion and Won 18,804 billion, respectively.

While we currently do not expect to face any material difficulties in procuring short-term borrowings to meet our liquidity and short-term capital requirements, there is no assurance that we will be able to do so. We expect that a portion of our long-term debt will need to be paid or refinanced through foreign currency-denominated borrowings and capital raising in international capital markets. Such financing may not be available on terms commercially

acceptable to us or at all, especially if the global financial markets experience significant turbulence or a substantial reduction in liquidity or due to other factors beyond our control. If we are unable to obtain financing on commercially acceptable terms on a timely basis, or at all, we may be unable to meet our funding requirements for capital expenditures or debt repayment obligations, which could have a material adverse impact on our business, results of operations and financial condition.

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We and our generation subsidiaries have undertaken various programs to reduce debt and improve the overall financial health. For further information, see Item 4.B. Business Overview Debt Reduction Program and Related Activities. Despite our best efforts, however, for reasons beyond our control, including macroeconomic environments, government regulations and market forces (such as international market prices for our fuels), we cannot assure whether we or our generation subsidiaries will be able to successfully reduce debt burdens or otherwise improve our financial health to a level that would be optimal for our capital structure. If we or our generation subsidiaries fail to do so or the measures taken by us or our generation subsidiaries to reduce debt levels or improve financial health have unintended adverse consequences, such developments may have an adverse effect on our business, results of operations and financial condition.

The movement of Won against the U.S. dollar and other currencies may have a material adverse effect on us.

The Won has fluctuated significantly against major currencies from time to time. Even slight depreciation of Won against U.S. dollar and other foreign currencies may result in a material increase in the cost of fuel and equipment purchased by us from overseas since the prices for substantially all of the fuel materials and a significant portion of the equipment we purchase are denominated in currencies other than Won, generally in U.S. dollars. Changes in foreign exchange rates may also impact the cost of servicing our foreign currency-denominated debt. As of December 31, 2018, 17.7% of our long-term debt (including the current portion but excluding issue discounts and premium) without taking into consideration of swap transactions, was denominated in foreign currencies, principally U.S. dollars. In addition, even if we make payments in Won for certain fuel materials and equipment, some of these fuel materials may originate from other countries and their prices may be affected accordingly by the exchange rates between the Won and foreign currencies, especially the U.S. dollar. Since the substantial majority of our revenues are denominated in Won, we must generally obtain foreign currencies through foreign currency-denominated financings or from foreign currency exchange markets to make such purchases or service such debt. As a result, any significant depreciation of Won against the U.S. dollar or other major foreign currencies will have a material adverse effect on our profitability and results of operations.

We may not be successful in implementing new business strategies.

As part of our overall business strategy, we plan to (i) expand clean energy and stabilize electricity supply and demand, (ii) enhance sales profitability and competitiveness, (iii) explore convergence-based new businesses and markets, (iv) secure future strategic technologies and establish infrastructure for digital transformation, and (v) strengthen management efficiency and embody social value.

Due to their inherent uncertainties, such new and expanded strategic initiatives expose us to a number of risks and challenges, including the following:

- new and expanded business activities may require unanticipated capital expenditures and involve additional compliance requirements;

- new and expanded business activities may result in less growth or profit than we currently anticipate, and there can be no assurance that such business activities will become profitable at the level we desire or at all;

certain of our new and expanded businesses, particularly in the areas of renewable energy, require substantial government subsidies to become profitable, and such subsidies may be substantially reduced or entirely discontinued;

we may fail to identify and enter into new business opportunities in a timely fashion, putting us at a disadvantage vis-à-vis competitors, particularly in overseas markets; and

we may need to hire or retrain personnel to supervise and conduct the relevant business activities.

As part of our business strategy, we may also seek, evaluate or engage in potential acquisitions, joint ventures, strategic alliances, restructurings, combinations, rationalizations, divestments or other similar

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opportunities. The prospects of these initiatives are uncertain, and there can be no assurance that we will be able to successfully implement or grow new ventures, and these ventures may prove more difficult or costly than what we originally anticipated. In addition, we regularly review the profitability and growth potential of our existing and new businesses. As a result of such review, we may decide to exit from or to reduce the resources that we allocate to new or existing ventures in the future. There is a risk that these ventures may not achieve profitability or operational efficiencies to the extent originally anticipated, and we may fail to recover investments or expenditures that we have already made. Any of the foregoing may have a material adverse effect on our reputation, business, results of operations, financial condition and cash flows.

We plan to pursue overseas expansion opportunities that may subject us to different or greater risks than those associated with our domestic operations.

While our operations have, to-date, been primarily based in Korea, we and our generation subsidiaries may expand, on a selective and opportunistic basis, overseas operations in the future. In particular, we and our generation subsidiaries may further expand our project portfolio to include the construction and operation of conventional thermal generation units, nuclear generation units and renewable energy power plants, transmission and distribution and (primarily through our generation subsidiaries) mining and development of fuel sources.

Overseas operations often involve risks that are different from those we face in our domestic operations, including the following:

- challenges of complying with multiple foreign laws and regulatory requirements, including tax laws and laws regulating our operations and investments;
- volatility of overseas economic conditions, including fluctuations in foreign currency exchange rates;
- difficulties in enforcing creditors rights in foreign jurisdictions;
- risk of expropriation and exercise of sovereign immunity where the counterparty is a foreign government;
- difficulties in establishing, staffing and managing foreign operations;
- differing labor regulations;
- political and economic instability, natural calamities, war and terrorism;
- lack of familiarity with local markets and competitive conditions;

changes in applicable laws and regulations in Korea that affect foreign operations; and

obstacles to the repatriation of earnings and cash.

Any failure by us to recognize or respond to these differences may adversely affect the success of our operations in those markets, which in turn could materially and adversely affect our business and results of operations.

Furthermore, while we seek to enter into overseas business opportunities in a prudent manner, some of our new international business ventures carry inherent risks that are different from our traditional business of electricity power generation, transmission and distribution. While the overseas businesses in the aggregate currently do not comprise a material portion of our overall business, as we are relatively inexperienced in these new types of overseas businesses, the actual revenues and profitability from, and investments and expenditures into, such ventures may be substantially different from what we plan or anticipate and may have a material adverse impact on our overall business, results of operations, financial condition and cash flows.

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An increase in electricity generated by and/or sourced from private power producers may erode our market position and hurt our business, growth prospects, revenues and profitability.

As of December 31, 2018, we and our generation subsidiaries owned approximately 68.3% of the total electricity generation capacity in Korea (excluding plants generating electricity for private or emergency use). New entrants to the electricity business will erode our market share and create significant competition, which could have a material adverse impact on our financial condition and results of operations.

In particular, we compete with independent power producers with respect to electricity generation. The independent power producers accounted for 26.7% of total power generation in 2018 and 31.7% of total generation capacity as of December 31, 2018. As of December 31, 2018, there were 19 independent power producers in Korea, excluding renewable energy producers. Private enterprises became permitted to own and operate coal-fired power plants in Korea only after the Ministry of Trade, Industry and Energy approved plans for independent power producers to construct coal-fired power plants under the Sixth Basic Plan announced in February 2013. Under the Eighth Basic Plan announced in December 2017, (i) six coal-fired units under construction with aggregate generation capacity of 6,260 megawatts are scheduled to be completed between 2021 and 2022, and (ii) two coal-fired units scheduled for construction shall be converted to LNG fuel use. Currently there are no additional plans for construction of coal-fired power plants by independent power producers beyond 2022. While it remains to be seen whether construction of these generation units will be completed as scheduled, if these units were to be completed as scheduled and/or independent power producers are permitted to build additional generation capacity (whether coal-fired or not), our market share in Korea may decrease, which may have a material adverse effect on our results of operations and financial condition.

In addition, under the Community Energy System adopted by the Government in 2004, a minimal amount of electricity is supplied directly to consumers on a localized basis by independent power producers outside the cost-based pool system used by our generation subsidiaries and most independent power producers to distribute electricity nationwide. The purpose of this system is to geographically decentralize electricity supply and thereby reduce transmission losses and improve the efficiency of energy use. These entities do not supply electricity on a national level but are licensed to supply electricity on a limited basis to their respective districts under the Community Energy System. As of March 31, 2019, the aggregate generation capacity of suppliers participating in the Community Energy System amounted to less than 1% of that of our generation subsidiaries in the aggregate. We currently do not expect the Community Energy System to be widely adopted, especially in light of the significant level of capital expenditure required for such direct supply. However, if the Community Energy System is widely adopted, it may erode our currently dominant market position in the generation and distribution of electricity in Korea and may have a material adverse effect on our business, results of operations and financial condition.

Our market dominance in the electricity distribution in Korea also may face potential erosion in light of the recent Proposal for Adjustment of Functions of Public Institutions (Energy Sector) announced by the Government in June 2016. This proposal contemplates a gradual opening of the electricity trading market to the private sector although no detailed roadmap has been provided for such opening. It is currently premature to predict to what extent, or in what direction, the liberalization of the electricity trading market will happen. Nonetheless, any significant liberalization of the electricity trading market may result in substantial reduction of our market share in electricity distribution in Korea, which would have a material adverse effect on our business, results of operation and cash flows.

See also Item 4.B. Business Overview Competition.

Labor unrest or increases in labor cost may adversely affect our operations.

We and each of our generation subsidiaries have separate labor unions. As of December 31, 2018, approximately 69.4% of our and our generation subsidiaries employees in the aggregate were members of these

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labor unions. Since a six-week labor strike in 2002 by union members of our generation subsidiaries in response to a proposed privatization of one of our generation subsidiaries, there has been no material labor dispute. However, we cannot assure you that there will not be a major labor strike or other material disruptions of operations by the labor unions of us and our generation subsidiaries if the Government resumes privatization or other restructuring initiatives or for other reasons, which may adversely affect our business and results of operations.

Furthermore, the Government, as part of a response to low fertility amidst an aging population in Korea and to make the lives of workers more stable, has pledged to reduce the number of non-permanent workers and increase the employment of permanent workers, in part by transitioning from non-permanent to permanent positions in the public sector. In accordance with guidelines announced by the Government in July 2017, we have completed transitioning temporary workers to permanent positions as of December 31, 2018. In addition, we have agreed with the subcontracted workers who provide meter-reading and security services to transition them to permanent positions by establishing subsidiaries and hiring these workers through such subsidiaries. We plan to finalize the measures by the end of 2019. Our generation subsidiaries have partially completed transitioning of non-permanent workers to permanent positions by hiring them for an indefinite period or establishing subsidiaries and hiring them through such subsidiaries. Our thermal generation subsidiaries plan to form a labor-management consultative body to transition the in-house subcontracted workers for the fuel and environmental facilities to permanent positions. Although the Government guidelines suggest that we transition the non-permanent workers to permanent positions within our existing budget for the related business, we cannot assure you that this will not result in increased costs for us or our generation subsidiaries and have an adverse impact on us or our generation subsidiaries financial condition and results of operations.

Additionally, domestic and international policy changes may affect our relationship with our employees, such as the Government s potential ratification of four of the eight essential conventions of International Labor Organization and potential reformation of the public employee wage structure. We cannot assure you that such policy changes will not negatively affect our relationship with our employees, which may in turn adversely affect our business and results of operations.

Operation of nuclear power generation facilities inherently involves numerous hazards and risks, any of which could result in a material loss of revenues or increased expenses.

Through KHNP, we currently operate 23 nuclear-fuel generation units. Operation of nuclear power plants is subject to certain hazards, including environmental hazards such as leaks, ruptures and discharge of toxic and radioactive substances and materials. These hazards can cause personal injuries or loss of life, severe damage to or destruction of property and natural resources, pollution or other environmental damage, clean-up responsibilities, regulatory investigation and penalties and suspension of operations. Nuclear power has a stable and relatively inexpensive cost structure (which is least costly among the fuel types used by our generation subsidiaries) and is the second largest source of Korea s electricity supply, accounting for 23.4% of electricity generated in Korea in 2018. Due to significantly lower unit fuel costs compared to those for thermal power plants, our nuclear power plants are generally operated at full capacity with only routine shutdowns for fuel replacement and maintenance, with limited exceptions.

From time to time, our nuclear generation units may experience unexpected shutdowns or maintenance-related stoppage. For example, following an earthquake in the vicinity in September 2016, four nuclear generation units at the Wolsong site were shut down for approximately three months as part of a preventive and safety assurance program although these units were not directly affected by the earthquake. Furthermore, the utilization rates of our nuclear generation units fell in 2018 as our nuclear generation units stopped operation for safety and maintenance inspection more frequently in 2018 as compared to 2017, due to strengthening of safety enhancement measures. Any prolonged or substantial breakdown, failure or suspension of operation of a nuclear unit could result in a material loss of

revenues, an increase in fuel costs related to the use of alternative power sources, additional repair and maintenance costs, greater risk of litigation and increased social and political

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hostility to the use of nuclear power, any of which could have a material adverse impact on our financial condition and results of operations.

In addition, heightened concerns regarding the safety of operating nuclear generation units could impede with our ability to operating them for an extended period of time or at all. For example, the nuclear power plant at Wolsong #1 unit began operations in 1982 and ended its operations in 2012 pursuant to its 30-year operating license. In February 2015, the Nuclear Safety and Security Commission (NSSC) evaluated the safety of operating Wolsong #1 unit and approved its extended operation until November 2022. However, a civic group filed a lawsuit to annul such decision, and in February 2017, the Seoul Administrative Court ruled against the NSSC. The NSSC appealed this decision, and the civic group filed an injunction to suspend the operation of the Wolsong #1 unit. The civic group s injunction was denied in July 2017. KHNP, which operated the unit pursuant to the NSSC s initial decision, has joined this lawsuit. On June 15, 2018, the board of directors of KHNP decided to (i) retire Wolsong #1 unit earlier than planned due to its economic inefficiency and (ii) discontinue the construction of Chunji #1 and #2 as well as Daejin #1 and #2 units. As of December 31, 2018, impairment loss in connection with the property, plant and equipment of Wolsong #1 unit was Won 570,408 million and the provision for decommissioning costs of Wolsong #1 increased by Won 28,196 million, as the timing of actual cash outflows was accelerated due to the shortened operating period. As of December 31, 2018, impairment loss in connection with the property, plant and equipment of Chunji #1 and #2 as well as Daejin #1 and #2 units amounted to Won 38,886 million. Although the board of directors did not make any decisions regarding Shin-Hanul #3 and #4 units, which are new nuclear plants under construction, we cannot assure you that the construction of these units will not be discontinued. As of December 31, 2018, impairment loss in connection with the property, plant and equipment of Shin-Hanul #3 and #4 units was Won 132,725 million. There are ten other nuclear generation units whose life under their initial operating license will expire in the next ten years, or by 2029, and we may find it more difficult to have the life of other nuclear units extended as well. The failure to extend the life of these units would result in a loss of revenues from such units and the increase in our overall fuel costs (as nuclear fuel is the cheapest compared to coal, LNG or oil), which could adversely affect our results of operation and financial condition. Furthermore, in September 2016, Greenpeace and 559 Korean nationals brought a lawsuit against the NSSC to revoke the permit the NSSC granted to KHNP in relation to the construction of Shin-Kori #5 and #6 nuclear generation units. Although the lawsuit was dismissed on February 14, 2019, we cannot assure you that there will not be new challenges to prohibit the construction of these new nuclear units in the future, whereby we may experience a loss of revenues and an increase in fuel costs (as nuclear fuel is the cheapest compared to coal, LNG or oil) as a result of such prohibition, which could adversely affect our results of operation and financial condition.

In order to prevent damages to the nuclear facilities such as a result of the tsunami and earthquake in March 2011 in Japan, KHNP prepared a comprehensive safety improvement plan including, but are not limited to, installing additional automatic shut-down systems for earthquakes, extending coastal barriers for seismic waves, procuring mobile power generators and storage batteries, installing passive hydrogen removers at nuclear facilities and improving the radiology emergency medical system. All follow-up measures were finalized in December 2015. KHNP also developed 10 additional supplementary safety measures by analysis of overseas plants and its current operations and implemented eight of such measures in 2017, with the two remaining measures to be implemented by 2021. However, there is no assurance that a similar or worse natural disaster may require the adoption and implementation of additional safety measures, which may be costly and have a material adverse impact on our financial condition and results of operations.

Subsequently, the Government unveiled its roadmap to shift in energy sources in October 2017 and announced the Eighth Basic Plan to implement such roadmap in December 2017. The Eighth Basic Plan focuses on, among other things, (i) decreasing the reliance on nuclear and coal-based supply sources, (ii) increasing utilization of renewable energy sources and (iii) balancing the existing cost-based pool system of purchase of electricity with an environmentally-focused pool system. Accordingly, six new nuclear generation units in a planning stage (Shin-Hanul

#3 and #4, Chunji #1 and #2 and Singyu #1 and #2) would not be constructed, while

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five new nuclear plants under construction (Shin-Kori #4, #5, #6, Shin-Hanul #1 and #2) shall begin operation by 2024 upon completion of the construction. Future extensions of life of decrepit nuclear generation units would not be granted and the proportion of renewable energy sources would be increased. We cannot assure you that these policies will not have an adverse impact on our or our generation subsidiaries financial condition and results of operations.

The construction and operation of our generation, transmission and distribution facilities involve difficulties, such as opposition from civic groups, which may have an adverse effect on us.

From time to time, we encounter social and political opposition against construction and operation of our generation facilities (particularly nuclear units) and, to a lesser extent, our transmission and distribution facilities. For example, we recently faced intense opposition from local residents and civic groups to the construction of transmission lines in the Milyang area, which we resolved through various compensatory and other support programs. Such opposition delayed the schedule for completion of this project. Although we and the Government have undertaken various community programs to address concerns of residents in areas near our facilities, civic and community opposition could result in delayed construction or relocation of our planned facilities, which could have a material adverse impact on our business and results of operations.

Our risk management policies and procedures may not be fully effective at all times.

In the course of our operations, we must manage a number of risks, such as regulatory risks, market risks and operational risks. Although we devote significant resources to developing and improving our risk management policies and procedures and expect to continue to do so in the future, our risk management practices may not be fully effective at all times in eliminating or mitigating risk exposures in all market environments or against all types of risk, including risks that are unidentified or unanticipated, such as natural disasters or employee misconduct. For example, in May 2013, the Nuclear Safety and Security Commission (NSSC) of Korea discovered that certain parts used in several of our then-operating nuclear generation units had been supplied based on falsified certificates. This discovery led to full internal investigation and investigation by the Prosecutor s Office, which in turn led to prosecutions and convictions of several current and former employees of KHNP on related and separate bribery charges, as well as termination of the then-president of KHNP as part of a broad disciplinary action. The incident also led to suspended operation of the related nuclear generation units for several months pending safety inspection. A similar incident involving falsified certificates and bribery occurred also in November 2012. We and KHNP have fully cooperated with the authorities in terms of investigations as well as remedial and preventive measures, including enhanced internal compliance policies and procedures.

In April 2019, a forest fire broke out in Goseong in Gangwon Province, about 210 kilometers from Seoul, causing damages to nearby towns, covering approximately 700 hectares. The National Forensic Service has investigated the cause of the fire and has determined that the fire seems to have started by an electrical arc from our utility pole s wire, which broke as a result of a strong wind. Based on this finding, the police has begun a follow-up investigation, and the Ministry of the Interior and Safety is currently assessing the magnitude of the resulting losses. As the investigations are ongoing and the results of which are uncertain, we cannot assure you that we will not be found accountable for the fire and that the extent of our liabilities from the fire will not be significant, in which event our reputation and results of operations may be adversely affected.

Further, our operational activities like the generation of electricity involve inherent operating risks that may result in accidents involving serious injury or loss of life, environmental damage or property damage. In December 2018, an employee of KOWEPO s subcontractor died in an accident at a Taean thermal power unit, leading to a public scrutiny and review by the Ministry of Employment and Labor. As a result, KOWEPO was required to halt the operations of three Taean thermal power units (Taean #9 and #10 units as well as Taean Integrated Gasification Combined Cycle

(IGCC)) since December 2018. These thermal power units have not resumed their operations yet, and the re-start date is still undecided. We cannot assure you that the suspension of such operations will not result in an adverse impact on our and our subsidiaries results of operations.

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We believe we and our subsidiaries are in compliance in all material respects with internal compliance policies and procedures and all other additional safety measures initiated internally or required by regulatory and governmental agencies. However, we cannot assure you that, despite all precautionary and reform measures undertaken by us, these measures will prove to be fully effective at all times against all the risks we face or that an incident that could cause harm to our reputation and operation will not happen in the future, including due to factors beyond our control.

Our risk management procedures may not prevent losses in debt and foreign currency positions.

We manage interest rate exposure for our debt instruments by limiting our variable rate debt exposure as a percentage of our total debt and closely monitoring the movements in market interest rates. We also actively manage currency exchange rate exposure for our foreign currency-denominated liabilities by measuring the potential loss therefrom using risk analysis software and entering into derivative contracts to hedge such exposure when the possible loss reaches a certain risk limit. To the extent we have unhedged positions or our hedging and other risk management procedures do not work as planned, our results of operations and financial condition may be adversely affected.

The amount and scope of coverage of our insurance are limited.

Substantial liability may result from the operations of our nuclear generation units, the use and handling of nuclear fuel and possible radioactive emissions associated with such nuclear fuel. KHNP carries insurance for its generation units and nuclear fuel transportation, and we believe that the level of insurance is generally adequate and is in compliance with relevant laws and regulations. In addition, KHNP is the beneficiary of Government indemnity that covers damages which the insurance cannot cover. However, such insurance is limited in terms of amount and scope of coverage and does not cover all types or amounts of losses which could arise in connection with the ownership and operation of nuclear plants. Accordingly, material adverse financial consequences could result from a serious accident or a natural disaster to the extent it is neither insured nor covered by the government indemnity.

In addition, our non-nuclear generation subsidiaries carry insurance covering certain risks, including fire, in respect of their key assets, including buildings and equipment located at their respective power plants, construction-in-progress and imported fuel and procurement in transit. Such insurance and indemnity, however, cover only a portion of the assets that these generation subsidiaries own and operate and do not cover all types or amounts of loss that could arise in connection with the ownership and operation of these power plants. In addition, our generation subsidiaries are not permitted to self-insure, and accordingly have not self-insured, against risks of their uninsured assets or business. Accordingly, material adverse financial consequences could result from a serious accident to the extent it is uninsured.

In addition, because neither we nor our non-nuclear generation subsidiaries carry any insurance against terrorist attacks, an act of terrorism would result in significant financial losses. See Item 4.B. Business Overview Insurance.

We may not be able to raise equity capital in the future without the participation of the Government.

Under applicable laws, the Government is required to directly or indirectly own at least 51% of our issued capital stock. As of February 7, 2019, the last day on which our shareholders registry was closed, the Government, directly and through Korea Development Bank (a statutory banking institution wholly owned by the Government), owned 51.1% of our issued capital stock. Accordingly, without changes in the existing Korean law, it may be difficult or impossible for us to undertake, without the participation of the Government, any equity financing in the future.

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We may be exposed to potential claims made by current or previous employees for unpaid wages for the past three years under the expanded scope of ordinary wages and become subject to additional labor costs arising from the broader interpretation of ordinary wages under such decision.

Under the Labor Standards Act, an employee is legally entitled to ordinary wages. Under the guidelines previously issued by the Ministry of Employment and Labor, ordinary wages include base salary and certain fixed monthly allowances for work performed overtime during night shifts and holidays. Prior to the Supreme Court decision described below, many companies in Korea had typically interpreted these guidelines as excluding from the scope of ordinary wages fixed bonuses that are paid other than on a monthly basis, namely on a bi-monthly, quarterly or semi-annual basis, although such interpretation had been a subject of controversy and had been overruled in a few court cases.

In December 2013, the Supreme Court of Korea ruled that regular bonuses fall under the category of ordinary wages on the condition that those bonuses are paid regularly and uniformly, and that any agreement which excludes such regular bonuses from ordinary wage is invalid. One of the key rulings provides that bonuses that are given to employees (i) on a regular and continuous basis and (ii) calculated according to the actual number of days worked (iii) that are not incentive-based must be included in the calculation of ordinary wages. The Supreme Court further ruled that in spite of invalidity of such agreements, employees shall not retroactively claim additional wages incurred due to such court decision, in case that such claims bring to employees unexpected benefits which substantially exceeds the wage level agreed by employers and employees and cause an unpredicted increase in expenditures for their company, which would lead the company to material managerial difficulty or would be a threat to the existence of the company. In that case, the claim is not acceptable since it is unjust and is in breach of the principle of good faith.

As a result of such ruling by the Supreme Court of Korea, we and our subsidiaries became subject to a number of lawsuits filed by various industry-wide and company-specific labor unions based on claims that ordinary wage had been paid without including certain items that should have been included as ordinary wage. In July 2016, the court ruled against us, and in accordance with the court s ruling, in August 2016 we paid Won 55.1 billion to the employees for three years of back pay plus interest. As of December 31, 2018, 51 lawsuits were pending against our subsidiaries for an aggregate claim amount of Won 152 billion, for which our subsidiaries set aside an aggregate amount of Won 39 billion to cover any potential future payments of additional ordinary wage in relation to the related lawsuits. We cannot presently assure you that the court will not rule against our subsidiaries in these lawsuits, or that the foregoing reserve amount will be sufficient to cover the amounts payable under the court rulings.

Additionally, since the issue of determining which labor costs should be additionally included as part of ordinary wages has not been fully resolved by the courts reviewing the lawsuits to which our subsidiaries are a party and other ordinary wage lawsuits filed against other companies, we cannot presently assure you that there will not be additional lawsuits in relation to ordinary wages and that we or our subsidiaries may not become liable for greater amount of damages as a result of these lawsuits. Furthermore, court decisions or labor legislations expanding the definition of ordinary wages may prospectively increase the labor costs of us and our subsidiaries. As a result, there can be no assurance that the above-described lawsuits and circumstances will not have a material adverse effect on our results of operations. See Item 8.A. Consolidated Statements and Other Financial Information Legal Proceedings.

We are subject to cyber security risk.

Recently, our activities have been subject to an increasing risk of cyber-attacks and information leakages, the nature of which is continually evolving. For example, in December 2014, KHNP became subject to a cyber terror incident. Hackers hacked into the computer network of former KHNP employees and threatened to shut down certain of

KHNP s nuclear plants. The hacking incident did not jeopardize our nuclear operation in any material respect and none of the stolen information was material to our nuclear operation or the national nuclear

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policy. In response to such incident, we and our subsidiaries have further bolstered anti-hacking and other preventive and remedial measures in relation to potential cyber terror. In December 2018, we have obtained Personal Information Management System certification granted by the Korea Internet and Security Agency. Further, KHNP has established an organization dedicated to nuclear control security in accordance with the Government s strengthened information security regulation. However, there is no assurance that a similar or more serious hacking or other forms of cyber terror will not happen with respect to us and our generation subsidiaries, which could have a material adverse impact on our business, financial condition and results of operations.

We previously engaged in limited activities relating to Iran 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 our 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 we refer to as the OFAC sanctions) that impose restrictions upon activities or transactions within U.S. jurisdiction with certain countries, governments, entities and individuals that are the subject of OFAC sanctions, including Iran. Even though non-U.S. persons generally are not directly bound by OFAC sanctions, in recent years OFAC has asserted that such non-U.S. persons can be held liable on various legal theories if they engage in transactions completed in part in the United States or by U.S. persons (such as, for example, wiring an international payment that clears through a bank branch in New York). The European Union also enforces certain laws and regulations that impose restrictions upon nationals and entities of, and business conducted in, member states with respect to activities or transactions with certain countries, governments, entities and individuals that are the subject of such laws and regulations, including Iran. The United Nations Security Council and other governmental entities also impose similar sanctions.

In addition to the OFAC sanctions described above, the United States also maintains indirect sanctions under authority of, among others, the Iran Sanctions Act, the Comprehensive Iran Sanctions, Accountability and Divestment Act of 2010, or CISADA, the National Defense Authorization Act for Fiscal Year 2012, or the NDAA, the Iran Threat Reduction and Syria Human Rights Act of 2012, or ITRA, various Executive Orders, the Iran Freedom and Counter-Proliferation Act of 2012, or IFCA, and the Countering America s Adversaries Through Sanctions Act, or CAATSA. These indirect sanctions, which we refer to collectively as U.S. secondary sanctions, provide authority for the imposition of U.S. sanctions on foreign parties that provide services in support of certain Iran-related activities.

On July 14, 2015, the so-called P5+1 powers (consisting of the United States, the United Kingdom, Germany, France, Russia, and China) and the European Union, or the EU, entered into an agreement with Iran known as the Joint Comprehensive Plan of Action Regarding the Islamic Republic of Iran s Nuclear Program, or the JCPOA. The JCPOA was intended to significantly restrict Iran s ability to develop and produce nuclear weapons. Upon implementation of the JCPOA on January 16, 2016 the United States, the EU, and the UN suspended certain nuclear-related sanctions against Iran following an announcement by the International Atomic Energy Agency that Iran had fulfilled its initial obligations under the JCPOA. Most U.S. secondary sanctions concerning Iran were suspended following January 16, 2016.

However, on May 8, 2018, the U.S. Government announced that it was ending its participation in the JCPOA and that it would take steps to re-impose secondary sanctions targeting Iran. Sanctions that had been lifted pursuant to the JCPOA were re-imposed after two wind down periods; one ending on August 6, 2018 and one ending on November 4, 2018. Since November 4, 2018, sanctions that have been lifted pursuant to the JCPOA have been re-imposed. Consequently, dealings with Iran may now subject foreign parties to U.S. secondary sanctions.

Violations of OFAC sanctions via transactions with a U.S. jurisdictional nexus can result in substantial civil or criminal penalties. A range of sanctions may be imposed on companies that engage in sanctionable activities

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within the scope of U.S. secondary sanctions, including, among other things, the blocking of any property subject to U.S. jurisdiction in which the sanctioned company has an interest, which could include a prohibition on transactions or dealings involving securities of the sanctioned company or the sanctioned company effectively losing access to the U.S. financial system.

We previously engaged in limited activities relating to Iran, but all of such activities have been terminated upon the withdrawal of the United States from the JCPOA. We are currently in the process of closing down our representative office in Tehran, Iran, which is expected to take more than one year due to relevant legal procedures. We have announced to all relevant Iranian counterparties, all of which were either the Government of Iran or state-owned enterprises, our intention to terminate all business activities in Iran.

We previously entered into agreement with counterparties in Iran including the following:

- We engaged Mehr Renewable Energy Company for project design documentation services to register with United Nations Framework Convention on Climate Change our CDM business to be conducted in Iran.

- Korea Electric Power Research Institute, which is operated by us, entered into cooperation agreements with Iran s Niroo Research Institute regarding various joint research and development efforts relating to power plants, renewable energy, smart grids and other energy-related technologies.

To the extent any of our subsidiaries have dealings in or relating to Iran, we have internal policies and procedures, as well as a monitoring system, which are designed to prevent and detect violations of applicable laws, including applicable sanctions laws. We do not believe that our previous activities relating to Iran violated OFAC sanctions or were sanctionable under U.S. secondary sanctions, and in any event, we believe we were in compliance with applicable sanctions laws. We believe we were not in violation of any laws concerning re-exports of U.S.-origin goods to Iran.

There can be no guarantee that our previous activities relating to Iran will not be found to violate the OFAC sanctions or involve sanctionable activities under U.S. secondary sanctions, or that any other government will not determine that our activities violate applicable sanctions of other countries. Laws related to Iran sanctions are complex, dynamic, and subject to evolving interpretations by the regulatory authorities.

Certain institutional investors, including state and municipal governments in the United States and universities, as well as financial institutions, have proposed or adopted initiatives regarding investments in companies that do business with countries that are the target of OFAC sanctions, including Iran. Accordingly, as a result of our activities related to Iran, certain investors may not wish to invest in our shares or ADSs or do business with us. In September 2016, the New Jersey Department of the Treasury s Division of Investment notified of its preliminary determination of divestment pursuant to the New Jersey divestment laws. Such preliminary determination was reversed in February 2017 after we explained such determination was based on incorrect information about our business in Iran. As of February 2019, we were listed on the Iowa Public Employees Retirement System s (IPERS) Iran Prohibited Companies List. Such divestment initiatives and the decision not to invest in, or to divest from our shares or ADSs may have a material negative impact our reputation and the value of our shares or ADSs.

Violations of sanctions can result in penalties or other consequences adverse to us. Certain of our counterparties may be subjected to sanctions. If we violate sanctions, we may ourselves be subjected to sanctions or penalties. Our business and results of operations may be adversely affected or we may suffer reputational damage. In addition, such

sanctions may prevent us from consummating or continuing any of the projects we are currently pursuing in Iran, which could adversely affect our results of operations. Also, at any time, certain investors may divest their interests in our shares if we are found to have violated or are suspected of violating applicable sanctions law arising from our operation in a sanctioned country such as Iran.

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We purchase goods and services from Russia and those activities may be adversely impacted in a material manner by economic sanctions concerning Russia imposed by the United States and other jurisdictions.

The United States and the European Union have imposed economic sanctions concerning Russia. OFAC sanctions concerning Russia, *inter alia*, block the property of certain designated individuals and entities, target certain sectors of the Russian economy and prohibit certain transactions with certain targeted persons in targeted sectors of the Russian economy, and restrict investment in and trade with the Crimea region of Ukraine. Additionally, non-U.S. persons that engage in certain prohibited transactions concerning Russia or with certain sanctioned Russian persons or entities may be subject to secondary sanctions. In August 2017, the United States Congress passed CAATSA, which introduced a host of new U.S. secondary sanctions concerning Russia including, *inter alia*, for certain dealings with the Russian energy sector, support for Russia s energy export pipelines and engaging in a significant transaction with a person that is part of, or operates for or on behalf of, Russia s defense or intelligence sectors. Additionally, a non-U.S. person that knowingly facilitates a significant transaction or transactions for or on behalf of any person subject to sanctions imposed by the U.S. with respect to the Russian Federation or any child, spouse, parent, or sibling of such a sanctioned person may also be subject to secondary sanctions.

In 2018, we purchased 14% of our bituminous coal requirements from Russia. Additionally, we also purchase uranium and uranium separation services from a Russian supplier. In 2018, the total value of all goods and services purchased from Russia was approximately US$1 billion.

Risks Relating to Korea and the Global Economy

Unfavorable financial and economic conditions in Korea and globally may have a material adverse impact on us.

We are incorporated in Korea, where most of our assets are located and most of our income is generated. As a result, we are subject to political, economic, legal and regulatory risks specific to Korea, and our business, results of operations and financial condition are substantially dependent on the Korean consumers demand for electricity, which are in turn largely dependent on developments relating to the Korean economy.

The Korean economy is closely integrated with, and is significantly affected by, developments in the global economy and financial markets. In recent years, adverse conditions and volatility in the worldwide financial markets, fluctuations in oil and commodity prices and the general weakness of the global economy have contributed to the uncertainty of global economic prospects in general and have adversely affected, and may continue to adversely affect, the Korean economy, which in turn could adversely affect our business, financial condition and results of operations. As the Korean economy is highly dependent on the health and direction of the global economy, the prices of our securities may be adversely affected by investors reactions to developments in other countries. In addition, due to the ongoing volatility in the global financial markets, the value of the Won relative to the U.S. dollar has also fluctuated significantly in recent years, which in turn also may adversely affect our financial condition and results of operations.

Factors that determine economic and business cycles in the Korean or global economy are for the most part beyond our control and inherently uncertain. In light of the high level of interdependence of the global economy, any of the foregoing developments could have a material adverse effect on the Korean economy and financial markets, and in turn on our business and profitability.

More specifically, factors that could have an adverse impact on Korea s economy in the future include, among others:

increases in inflation levels, volatility in foreign currency reserve levels, commodity prices (including oil prices), exchange rates (particularly against the U.S. dollar), interest rates, stock market prices and inflows and outflows of foreign capital, either directly, into the stock markets, through derivatives or

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otherwise, including as a result of increased uncertainty in the wake of a referendum in the United Kingdom in June 2016 that voted in favor of exiting from the European Union, commonly known as Brexit ;

difficulties in the financial sectors in Europe, China and elsewhere and increased sovereign default risks in select countries and the resulting adverse effects on the global financial markets;

adverse developments in the economies of countries and regions to which Korea exports goods and services (such as the United States, Europe, China and Japan), or in emerging market economies in Asia or elsewhere that could result in a loss of confidence in the Korean economy, including potentially as a result of the Brexit;

potential escalation of the ongoing trade war between the U.S. and China as each country introduces tariffs on goods traded with the other;

social and labor unrest or declining consumer confidence or spending resulting from lay-offs, increasing unemployment and lower levels of income;

uncertainty and volatility and further decreases in the market prices of Korean real estate;

a decrease in tax revenues and a substantial increase in the Government s expenditures for unemployment compensation and other social programs that together could lead to an increased Government budget deficit;

political uncertainty, including as a result of increasing strife among or within political parties in Korea, and political gridlock within the government or in the legislature, which prevents or disrupts timely and effective policy making to the detriment of Korean economy, as well as the impeachment and indictment of the former president following a series of scandals and social unrest, which also involved the investigation of several leading Korean conglomerates and arrest of their leaders on charges of bribery and other possible misconduct;

deterioration in economic or diplomatic relations between Korea and its trading partners or allies, including deterioration resulting from territorial or trade disputes or disagreements in foreign policy, including as a result of any potential renegotiation of free trade agreements, or the ongoing tension between Korean and China in relation to the decision to allow deployment by the United States of the Terminal High Altitude Defense system known as THAAD in Korea;

increases in social expenditures to support the aging population in Korea or decreases in economic productivity due to the declining population size in Korea;

any other development that has a material adverse effect in the global economy, such as an act of war, the spread of terrorism or a breakout of an epidemic such as SARS, avian flu, swine flu, Middle East Respiratory Syndrome, ebola or Zika virus, or natural disasters, earthquakes and tsunamis and the related disruptions in the relevant economies with global repercussions;

hostilities involving oil-producing countries in the Middle East and elsewhere and any material disruption in the supply of oil or a material increase in the price of oil resulting from such hostilities; and

an increase in the level of tensions or an outbreak of hostilities in the Korean peninsula or between North Korea and the United States.

Any future deterioration of the Korean economy could have an adverse effect on our business, financial condition and results of operations.

Tensions with North Korea could have an adverse effect on us and the market value of our shares.

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.

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In particular, there continues to be uncertainty regarding the long-term stability of North Korea s political leadership since the succession of Kim Jong-un to power following the death of his father in December 2011, which has raised concerns with respect to the political and economic future of the region. In February 2017, Kim Jong-un s half-brother, Kim Jong-nam, was reported to have been assassinated in an international airport in Malaysia.

In addition, there continues to be heightened security tension in the region stemming from North Korea s hostile military and diplomatic actions, including in respect of its nuclear weapons and long-range missile programs. Some examples from recent years include the following:

In November 2017, North Korea conducted a test launch of another intercontinental ballistic missile, which, due to its improved size, power and range of distance, may potentially enable North Korea to target the United States mainland.

Recently, on September 3, 2017, North Korea conducted its sixth nuclear test, claiming it had tested a hydrogen bomb that could be mounted on an intercontinental ballistic missile. In response, on September 12, 2017, the United Nations Security Council unanimously adopted a resolution imposing additional sanctions on North Korea including new limits on gas, petrol and oil imports, a ban on textile exports and measures to limit North Korean laborers from working abroad.

On August 29, 2017, North Korea tested an intermediate-range ballistic missile which flew directly over northern Japan before landing in the Pacific Ocean. In response, the United Nations Security Council unanimously adopted a statement condemning such launch, reiterating demands that North Korea halt its ballistic missile and nuclear weapons programs.

On July 4, 2017, North Korea tested its first intercontinental ballistic missile. In response, the U.S. government and the Government both issued statements condemning North Korea and conducted a joint military exercise on July 5, 2017. On July 28, 2017, North Korea tested a second intercontinental ballistic missile which landed in the Sea of Japan, inside Japan s Economic Exclusion Zone. In response, on August 5, 2017, the United Nations Security Council unanimously adopted a resolution that strengthened sanctions on North Korea. The resolution includes a total ban on all exports of coal, iron, iron ore, lead, lead ore and seafood, which is expected to reduce North Korea s export revenue by a third each year.

In March 2017, North Korea launched four mid-range missiles, which landed off the east coast of the Korean peninsula.

On September 9, 2016, North Korea conducted its fifth nuclear test, which has been the largest in scale among North Korea s nuclear tests thus far. According to North Korean announcements, the test was successful in detonating a nuclear missile. The test created a sizable earthquake in South Korea. In response, in February 2017 the U.N. Security Council adopted Resolution 2321 (2016) against North Korea, the purpose of which is to strengthen its sanctions regime against North Korea and to condemn North Korea s September 9, 2016 nuclear test in the strongest terms.

On February 10, 2016, in retaliation of North Korea s recent launch of a long-range rocket, South Korea announced that it would halt its operations of the Kaesong Industrial Complex to impede North Korea s utilization of funds from the industrial complex to finance its nuclear and missile programs. In response, North Korea announced on February 11, 2016 that it would expel all South Korean employees from the industrial complex and freeze all South Korean assets there.

On February 7, 2016, North Korea launched a rocket, claimed by them to be carrying a satellite intended for scientific observation. The launch was widely suspected by the international community to be a cover for testing a long-range missile capable of carrying a nuclear warhead. On February 18, 2016, the President of the United States signed into law mandatory sanctions on North Korea to punish it for its recent nuclear and missile tests, human rights violations and cybercrimes. The bill, which marks the first measure by the United States to exclusively target North Korea, is intended to seize the

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assets of anyone engaging in business related to North Korea s weapons program, and authorizes US$50 million over five years to transmit radio broadcasts into the country and support humanitarian assistance projects. On March 2, 2016, the United Nations Security Council voted unanimously to adopt a resolution to impose sanctions against North Korea, which include inspection of all cargo going to and from North Korea, a ban on all weapons trade and the expulsion of North Korean diplomats who engage in illicit activities. Also, on March 4, 2016, the European Union announced that it would expand its sanctions on North Korea, adding additional companies and individuals to its list of sanction targets. On April 1, 2016, North Korea fired a short-range surface-to-air missile in apparent protest of these sanctions adopted by the United States and the United Nations Security Council.

On January 6, 2016, North Korea announced that it had successfully conducted its first hydrogen bomb test, hours after international monitors detected a 5.1 magnitude earthquake near a known nuclear testing site in the country. The claims have not been verified independently. The alleged test followed a statement made in the previous month by Kim Jong-un, who claimed that North Korea had developed a hydrogen bomb.

In August 2015, two Korean soldiers were injured in a landmine explosion near the South Korean demilitarized zone. Claiming the landmines were set by North Koreans, the South 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 and South Korea subsequently met for discussions and entered into an agreement on August 25, 2015 intending to deflate military tensions.

From time to time, North Korea has fired short- to medium-range missiles from the coast of the Korean peninsula into the sea. In March 2015, North Korea fired seven surface-to-air missiles into waters off its east coast in apparent protest of annual joint military exercises being held by Korea and the United States.

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 response, the United Nations Security Council unanimously passed resolutions that condemned North Korea for the nuclear tests and expanded sanctions against North Korea.

North Korea s economy also faces severe challenges, including severe inflation and food shortages, which may further aggravate social and political tensions within North Korea. In addition, reunification of Korea and North Korea could occur in the future, which would entail significant economic commitment and expenditure by Korea that may outweigh any resulting economic benefits of reunification. On April 27, 2018, May 26, 2018 and September 18, 2018, President Moon Jae-in met Kim Jong-un in a summit to discuss, among other matters, denuclearization of the Korean Peninsula. On June 12, 2018, President Donald Trump and Kim Jong-un in turn had an official summit in Singapore and on February 27, 2019, the parties held the second official summit in Hanoi, Vietnam. However, in March 2019, announcement was made that no agreement was reached in the second bilateral summit meeting between the United States and North Korea.

There can be no assurance that the level of tension on the Korean peninsula will not escalate in the future or that the political regime in North Korea may not suddenly collapse. Any further increase in tension or uncertainty relating to

the military, political or economic stability in the Korean peninsula, including a breakdown of diplomatic negotiations over the North Korean nuclear program, occurrence of military hostilities, heightened concerns about the stability of North Korea s political leadership or its actual collapse, a leadership crisis, a breakdown of high-level contacts or accelerated reunification could have a material adverse effect on our business, financial condition and results of operations, as well as the price of our common shares and our American depositary shares.

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We are generally subject to Korean corporate governance and disclosure standards, which differ in significant respects from those in other countries.

Companies in Korea, including us, are subject to corporate governance standards applicable to Korean public companies which differ in many respects from standards applicable in other countries, including the United States. As a reporting company registered with the Securities and Exchange Commission and listed on the New York Stock Exchange, we are, and will continue to be, subject to certain corporate governance standards as mandated by the Sarbanes-Oxley Act of 2002, as amended. However, foreign private issuers, including us, are exempt from certain corporate governance standards required under the Sarbanes-Oxley Act or the rules of the New York Stock Exchange. We and our generation subsidiaries are also subject to a number of special laws and regulations to Government-controlled entities, including the Act on the Management of Public Institutions. For a description of significant differences in corporate governance standards, see Item 16G. Corporate Governance. There may also be less publicly available information about Korean companies, such as us, 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.

You may not be able to enforce a judgment of a foreign court against us.

We are a corporation with limited liability organized under the laws of Korea. Substantially all of our directors and officers and other persons named in this annual report reside in Korea, and all or a significant portion of the assets of our directors and officers and other persons named in this annual report and substantially all of our assets are located in Korea. As a result, it may not be possible for holders of the American depository shares to affect service of process within the United States, or to enforce against them or us in the United States judgments obtained in United States courts based on 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 United States courts, of civil liabilities predicated on the United States federal securities laws.

Risks Relating to Our American Depositary Shares

There are restrictions on withdrawal and deposit of common shares under the depositary facility.

Under the deposit agreement, holders of shares of our common stock may deposit those shares with the depositary bank s custodian in Korea and obtain American depositary shares, and holders of American depositary shares may surrender American depositary shares to the depositary bank and receive shares of our common stock. However, under current Korean laws and regulations, the depositary bank is required to obtain our prior consent for the number of shares to be deposited in any given proposed deposit which exceeds the difference between (i) the aggregate number of shares deposited by us for the issuance of American depositary shares (including deposits in connection with the initial and all subsequent offerings of American depositary shares and stock dividends or other distributions related to these American depositary shares) and (ii) the number of shares on deposit with the depositary bank at the time of such proposed deposit. We have consented to the deposit of outstanding shares of common stock as long as the number of American depositary shares outstanding at any time does not exceed 80,153,810 shares. As a result, if you surrender American depositary shares and withdraw shares of common stock, you may not be able to deposit the shares again to obtain American depositary shares.

Ownership of our shares is restricted under Korean law.

Under the Financial Investment Services and Capital Markets Act, with certain exceptions, a foreign investor may acquire shares of a Korean company without being subject to any single or aggregate foreign investment ceiling. As one such exception, certain designated public corporations, such as us, are subject to a 40% ceiling on acquisitions of shares by foreigners in the aggregate. The Financial Services Commission may impose other restrictions as it deems necessary for the protection of investors and the stabilization of the Korean securities and derivatives market.

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In addition to the aggregate foreign investment ceiling, the Financial Investment Services and Capital Markets Act and our Articles of Incorporation set a 3% ceiling on acquisition by a single investor (whether domestic or foreign) of the shares of our common stock. Any person (with certain exceptions) who holds our issued and outstanding shares in excess of such 3% ceiling cannot exercise voting rights with respect to our shares exceeding such limit.

The ceiling on aggregate investment by foreigners applicable to us may be exceeded in certain limited circumstances, including as a result of acquisition of:

- shares by a depositary issuing depositary receipts representing such shares (whether newly issued shares or outstanding shares);
- shares by exercise of warrant, conversion right under convertible bonds, exchange right under exchangeable bonds or withdrawal right under depositary receipts issued outside of Korea;
- shares from the exercise of shareholders rights; or
- shares by gift, inheritance or bequest.

A foreigner who has acquired our shares in excess of any ceiling described above may not exercise his voting rights with respect to our shares exceeding such limit and the Financial Services Commission may take necessary corrective action against him.

Holders of our ADSs will not have preemptive rights in certain circumstances.

The Korean Commercial Code and our Articles of Incorporation require us, with some exceptions, to offer shareholders the right to subscribe for new shares in proportion to their existing ownership percentage whenever new shares are issued. If we offer any rights to subscribe for additional shares of our common stock or any rights of any other nature, the depositary bank, after consultation with us, may make the rights available to you or use reasonable efforts to dispose of the rights on your behalf and make the net proceeds available to you. The depositary bank, however, is not required to make available to you any rights to purchase any additional shares unless it deems that doing so is lawful and feasible and:

- a registration statement filed by us under the U.S. Securities Act of 1933, as amended, is in effect with respect to those shares; or
- the offering and sale of those shares is exempt from or is not subject to the registration requirements of the U.S. Securities Act.

We are under no obligation to file any registration statement with the U.S. Securities and Exchange Commission in relation to the registration rights. If a registration statement is required for you to exercise preemptive rights but is not filed by us, you will not be able to exercise your preemptive rights for additional shares and you will suffer dilution of your equity interest in us.

The market value of your investment in our ADSs may fluctuate due to the volatility of the Korean securities market.

Our common stock is listed on the KRX KOSPI Division of the Korea Exchange, which has a smaller market capitalization and is more volatile than the securities markets in the United States and many European countries. The market value of ADSs may fluctuate in response to the fluctuation of the trading price of shares of our common stock on the Stock Market Division of the Korea Exchange. The Stock Market Division of the Korea Exchange has experienced substantial fluctuations in the prices and volumes of sales of listed securities and the Stock Market Division of the Korea Exchange has prescribed a fixed range in which share prices are permitted to move on a daily basis. Like other securities markets, including those in developed markets, the Korean securities market has experienced problems including market manipulation, insider trading and

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settlement failures. The recurrence of these or similar problems could have a material adverse effect on the market price and liquidity of the securities of Korean companies, including our common stock and ADSs, in both the domestic and the international markets.

The Korean government has the ability to exert substantial influence over many aspects of the private sector business community, and in the past has exerted that influence from time to time. For example, the Korean government has promoted mergers to reduce what it considers excess capacity in a particular industry and has also encouraged private companies to publicly offer their securities. Similar actions in the future could have the effect of depressing or boosting the Korean securities market, whether or not intended to do so. Accordingly, actual or perceived actions or inactions by the Korean government may cause sudden movements in the market prices of the securities of Korean companies in the future, which may affect the market price and liquidity of our common stock and ADSs.

Your dividend payments and the amount you may realize in connection with a sale of your ADSs will be affected by fluctuations in the exchange rate between the U.S. dollar and the Won.

Investors who purchase the American depositary shares will be required to pay for them in U.S. dollars. Our outstanding shares are listed on the Korea Exchange and are quoted and traded in Won. Cash dividends, if any, in respect of the shares represented by the American depositary shares will be paid to the depositary bank in Won and then converted by the depositary bank into U.S. dollars, subject to certain conditions. Accordingly, fluctuations in the exchange rate between the Won and the U.S. dollar will affect, among other things, the amounts a registered holder or beneficial owner of the American depositary shares will receive from the depositary bank in respect of dividends, the U.S. dollar value of the proceeds which a holder or owner would receive upon sale in Korea of the shares obtained upon surrender of American depositary shares and the secondary market price of the American depositary shares.

If the Government deems that certain emergency circumstances are likely to occur, it may restrict the depositary bank from converting and remitting dividends in U.S. dollars.

If the Government deems that certain emergency circumstances are likely to occur, it may impose restrictions such as requiring foreign investors to obtain prior Government approval for the acquisition of Korean securities or for the repatriation of interest or dividends arising from Korean securities or sales proceeds from disposition of such securities. These emergency circumstances include any or all of the following:

- sudden fluctuations in interest rates or exchange rates;
- extreme difficulty in stabilizing the balance of payments; and
- a substantial disturbance in the Korean financial and capital markets.

The depositary bank may not be able to secure such prior approval from the Government for the payment of dividends to foreign investors when the Government deems that there are emergency circumstances in the Korean financial markets.

ITEM 4. *INFORMATION ON THE COMPANY*

Item 4.A. History and Development of the Company

General Information

Our legal and corporate name is Korea Electric Power Corporation. We were established by the Government on December 31, 1981 as a statutory juridical corporation in Korea under the Korea Electric Power Corporation (KEPCO) Act as the successor to Korea Electric Company. Our registered office is located at 55 Jeollyeok-ro, Naju-si, Jeollanam-do, 58322, Korea, and our telephone number is 82-61-345-4213. Our website address is www.kepco.co.kr.

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Our agent in the United States is Korea Electric Power Corporation, North America Office, located at 7th Floor, Parker Plaza, 400 Kelby Street, Fort Lee, NJ 07024.

The Korean electric utility industry traces its origin to the establishment of the first electric utility company in Korea in 1898. On July 1, 1961, the industry was reorganized by the merger of Korea Electric Power Company, Seoul Electric Company and South Korea Electric Company, which resulted in the formation of Korea Electric Company. From 1976 to 1981, the Government acquired the private minority shareholdings in Korea Electric Company. After the Government acquired all the remaining shares of Korea Electric Company, Korea Electric Company was dissolved, and we were incorporated in 1981 and assumed the assets and liabilities of Korea Electric Company. We ceased to be wholly owned by the Government in 1989 when the Government sold 21% of our common stock. As of February 7, 2019, the last day on which our shareholders registry was closed, the Government maintained 51.1% ownership in aggregate of our common shares by direct holdings by the Government and indirect holdings through Korea Development Bank, a statutory banking institution wholly owned by the Government.

Under relevant laws of Korea, the Government is required to own, directly or indirectly, at least 51% of our capital. Direct or indirect ownership of more than 50% of our outstanding common stock enables the Government to control the approval of certain corporate matters relating to us that require a shareholders resolution, including approval of dividends. The rights of the Government and Korea Development Bank as holders of our common stock are exercised by the Ministry of Trade, Industry and Energy, based on the Government s ownership of our common stock and a proxy received from Korea Development Bank, in consultation with the Ministry of Economy and Finance.

We operate under the general supervision of the Ministry of Trade, Industry and Energy. The Ministry of Trade, Industry and Energy, in consultation with the Ministry of Economy and Finance, is responsible for approving, subject to review by the Korea Electricity Commission, the electricity rates we charge our customers. See Item 4.B. Business Overview Sales and Customers Electricity Rates. We furnish reports to officials of the Ministry of Trade, Industry and Energy, the Ministry of Economy and Finance and other Government agencies and regularly consult with such officials on matters relating to our business and affairs. See Item 4.B. Business Overview Regulation. Our non-standing directors, who comprise a majority of our board of directors, must be appointed by the Ministry of Economy and Finance following the review and resolution of the Public Agencies Operating Committee (which is established by law and chaired by the minister of the Ministry of Economy and Finance and whose members consist of Government officials and others appointed by the President of the Republic based on recommendation by the minister of the Ministry of Economy and Finance) from a pool of candidates recommended by the director nomination committee. Our president and standing directors who concurrently serve as members of our audit committee must be appointed by the President of the Republic upon the motion of the minister of the Ministry of Trade, Industry and Energy (in the case of our president) and the minister of the Ministry of Economy and Finance (in the case of our standing director who concurrently serves as a member of the audit committee) and following the nomination by our director nomination committee, the review and resolution of the Public Agencies Operating Committee and an approval at the general meeting of shareholders. See Item 6.A. Directors and Senior Management Board of Directors and Item 16G. Corporate Governance The Act on the Management of Public Institutions).

Item 4.B. Business Overview

Introduction

We are an integrated electric utility company engaged in the transmission and distribution of substantially all of the electricity in Korea. Through our six wholly-owned generation subsidiaries, we also generate the substantial majority of electricity produced in Korea. As of December 31, 2018, we and our generation subsidiaries owned approximately 68.3% of the total electricity generation capacity in Korea (excluding plants generating electricity primarily for private

or emergency use). In 2018, we sold to our customers 526,149

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gigawatt-hours of electricity. We purchase electricity principally from our generation subsidiaries and, to a lesser extent, from independent power producers. Of the 536,287 gigawatt-hours of electricity we purchased in 2018, 24.6% was generated by KHNP, our wholly-owned nuclear and hydroelectric power generation subsidiary, 49.4% was generated by our wholly-owned five non-nuclear generation subsidiaries and 26.0% was generated by independent power producers that trade electricity to us through the cost-based pool system of power trading (excluding independent power producers that supply electricity under power purchase agreements with us). Our five non-nuclear generation subsidiaries are KOSEP, KOMIPO, KOWEPO, KOSPO and EWP, each of which is wholly owned by us and is incorporated in Korea. We derive substantially all of our revenues and profit from Korea, and substantially all of our assets are located in Korea.

In 2018, we had sales of Won 60,033 billion and net loss of Won 1,175 billion, compared to sales of Won 59,336 billion and net profit of Won 1,441 billion in 2017.

Our revenues are closely tied to demand for electricity in Korea. Demand for electricity in Korea increased at a compounded average growth rate of 2.1% per annum from 2014 to 2018, compared to the real gross domestic product, or GDP, which increased at a compounded average growth rate of 3.0% during the same period, according to the Bank of Korea. During 2018, the GDP growth rate was 2.7%, which was in tandem with the growth in demand for electricity in Korea during the same year, which also grew by 3.6%.

Strategy

As our overall strategy, we seek to become a leading global energy enterprise by actively responding to the market s demand for a stable supply of clean, safe, affordable and convenient source of energy. To this end, we plan to develop key competencies needed for digital transformation of our operations and energy transition. We also aim to strengthen competitiveness in our core operations and to develop new businesses and markets by focusing on low-carbon and renewable energy projects. We evaluate and renew our mid- to long-term strategy every three years, and in 2019 established the Vision 2030 Mid- to Long-Term Strategy. Under this vision, we will aim for sustainable growth of our operations through the supply of clean energy as well as a balanced new industry initiatives with growth potential.

Expand clean energy and stabilize electricity supply and demand. We plan to contribute to the Government s Nationally Determined Contributions (NDCs) by reducing carbon emissions from our generation subsidiaries and leading large-scale projects to promote the use of renewable energy. In addition, we will focus on ensuring smooth and stable connection for the renewable energy as part of our energy networks. We will also seek to enhance the efficiency of our electricity networks through the use of advanced technology.

Enhance sales profitability and competitiveness. We will seek to become a market leader through the development of customized tariffs and new services. We will also maintain profitability through the cost-based tariff system and improve the demand-side efficiency to streamline energy use at the national level.

Explore convergence-based new businesses and markets. We plan to selectively focus on and pursue profitable new businesses through in-depth market analysis (considering the market environment and our capabilities) to build a business ecosystem. In connection with our overseas business, we plan to explore

opportunities to develop low-carbon, renewable energy to expand our market and to diversify our portfolio and provide suitable solutions meeting the different needs of various countries.

We will focus on R&D and commercialization of technologies essential to achieving our strategy. We will also create a platform for developing new businesses and enhance the efficiency of our operations based on digital technology.

In order to develop a management system suitable for sustainable growth, we will continue to develop sound corporate governance, financial structure and human resources. In addition, we will continue to implement the environment, health and safety management system and focus on fostering shared social values and growth with local communities.

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Government Ownership and Our Interactions with the Government

The KEPCO Act requires that the Government own at least 51% of our capital stock. Direct or indirect ownership of more than 50% of our outstanding common stock enables the Government to control the approval of certain corporate matters which require a shareholders resolution, including approval of dividends. The rights of the Government and Korea Development Bank as holders of our common stock are exercised by the Ministry of Trade, Industry and Energy in consultation with the Ministry of Economy and Finance. We are currently not aware of any plans of the Government to cease to own, directly or indirectly, at least 51% of our outstanding common stock.

We play an important role in the implementation of the Government s national energy policy, which is established in consultation with us, among other parties. As an entity formed to serve public policy goals of the Government, we seek to maintain a fair level of profitability and strengthen our capital base in order to support the growth of our business in the long term.

The Government, through its various policy initiatives for the Korean energy industry as well as direct and indirect supervision of us and our industry, plays an important role in our business and operations. Most importantly, the electricity tariff rates we charge to our customers are regulated by the Government taking into account, among others, our needs to recover the costs of operations, make capital investments and recoup a fair return on capital invested by us, as well as the Government s overall policy considerations, such as inflation. See Item 4.B. Business Overview Sales and Customers Electricity Rates.

In addition, pursuant to the Basic Plan determined by the Government, we and our generation subsidiaries have made, and plan to make, substantial expenditures for the construction of generation plants and other facilities to meet demand for electric power. See Item 5.B. Liquidity and Capital Resources Capital Requirements.

Restructuring of the Electric Power Industry in Korea

On January 21, 1999, the Ministry of Trade, Industry and Energy published the Restructuring Plan. The overall objectives of the Restructuring Plan consisted of: (i) introducing competition and thereby increasing efficiency in the Korean electric power industry, (ii) ensuring a long-term, inexpensive and stable electricity supply, and (iii) promoting consumer convenience through the expansion of consumer choice.

The following provides further details relating to the Restructuring Plan.

Phase I

During Phase I, which served as a preparatory stage for Phase II and lasted from the announcement of the Restructuring Plan in January 1999 until April 2001, we undertook steps to split our generation business units off into one wholly-owned nuclear generation subsidiary (namely, KHNP) and five wholly-owned non-nuclear generation subsidiaries (namely, KOSEP, KOMIPO, KOWEPO, KOSPO and EWP), each with its own management structure, assets and liabilities. These steps were completed upon approval at our shareholders meeting in April 2001.

The Government s principal objectives in the split-off of the generation units into separate subsidiaries were to: (i) introduce competition and thereby increase efficiency in the electricity generation industry in Korea, and (ii) ensure a stable supply of electricity in Korea.

Following the implementation of Phase I, we have substantial monopoly with respect to the transmission and distribution of electricity in Korea.

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While our ownership percentage of our generation subsidiaries will depend on further adjustments to the Restructuring Plan to be adopted by the Government, we plan to retain 100% ownership of our transmission and distribution business.

Phase II

At the outset of Phase II in April 2001, the Government introduced a cost-based competitive bidding pool system under which we purchase power from our generation subsidiaries and other independent power producers for transmission and distribution to customers. For a further description of this system, see Purchase of Electricity Cost-based Pool System below.

Pursuant to the Electric Utility Act amended in December 2000, the Government established the Korea Power Exchange in April 2001. The primary function of the Korea Power Exchange is to deal with the sale of electricity and implement regulations governing the electricity market to allow for electricity distribution through a competitive bidding process. The Government also established the Korea Electricity Commission in April 2001 to regulate the Korean electric power industry and ensure fair competition among industry participants. To facilitate this goal, the Korea Power Exchange established the Electricity Market Rules relating to the operation of the bidding pool system. To amend the Electricity Market Rules, the Korea Power Exchange must have the proposed amendment reviewed by the Korea Electricity Commission and then obtain the approval of the Ministry of Trade, Industry and Energy.

The Korea Electricity Commission s main functions include implementation of standards and measures necessary for electricity market operation and review of matters relating to licensing participants in the Korean electric power industry. The Korea Electricity Commission also acts as an arbitrator in tariff-related disputes among participants in the Korean electric power industry and investigates illegal or deceptive activities of the industry participants.

Privatization of Generation Subsidiaries

In April 2002, the Ministry of Trade, Industry and Energy released the basic privatization plan for five of our generation subsidiaries other than KHNP. Pursuant to this plan, we commenced the process of selling our equity interest in KOSEP in 2002. According to the original plan, this process was, in principle, to take the form of a sale of management control, potentially supplemented by an initial public offering as a way of broadening the investor base. In November 2003, KOSEP submitted its application to the Korea Exchange for a preliminary screening review, which was approved in December 2003. However, in June 2004, KOSEP made a request to the Korea Exchange to delay its stock listing due to unfavorable stock market conditions at that time.

In accordance with the Proposal for Adjustment of Functions of Public Institutions (Energy Sector) announced by the Government in June 2016, we considered a sale in the public market of a minority of our shares in our five non-nuclear generation subsidiaries, KEPCO KDN and KHNP gradually. However, the planned sales have been put on hold, primarily due to prevailing market conditions. In any event, we plan to maintain a controlling stake in each of these subsidiaries.

Suspension of the Plan to Form and Privatize Distribution Subsidiaries

In 2003, the Government established a Tripartite Commission consisting of representatives of the Government, leading businesses and labor unions in Korea to deliberate on ways to introduce competition in electricity distribution, such as by forming and privatizing new distribution subsidiaries. In 2004, the Tripartite Commission recommended not pursuing such privatization initiatives but instead creating independent business divisions within us to improve operational efficiency through internal competition. Following the adoption of such recommendation by the

Government in 2004 and further studies by Korea Development Institute, in 2006 we created nine strategic business units (which, together with our other business units, were subsequently

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restructured into 14 such units in February 2012) that have a greater degree of autonomy with respect to management, financial accounting and performance evaluation while having a common focus on increasing profitability.

Initiatives to Improve the Structure of Electricity Generation

In August 2010, the Ministry of Trade, Industry and Energy announced the Proposal for Improvement in the Structure of the Electric Power Industry in order to resolve uncertainty related to restructuring plans for the electric power industry and maintain competitiveness of the electric power industry. Key initiatives of the proposal included the following: (i) maintain the current structure of having six generation subsidiaries and designate the six generation subsidiaries as market-oriented public enterprises under the Act on the Management of Public Institutions in order to foster competition among the generation subsidiaries and promote efficiency in their operations, (ii) clarify the scope of the business of us and the six generation subsidiaries (namely, that we shall manage the financial structure and governance of the six generation subsidiaries and nuclear power plant and overseas resources development projects, while the six generation subsidiaries will have greater autonomy with respect to construction and management of generation units and procurement of fuel), (iii) create a nuclear power export business unit to systematically enhance our capabilities to win projects involving the construction and operation of nuclear power plants overseas, (iv) further rationalize the electricity tariff by adopting a fuel-cost based tariff system in 2011 and a voltage-based tariff system in a subsequent year, and (v) create separate accounting systems for electricity generation, transmission, distribution and sales with the aim of introducing competition in electricity sales in the intermediate future.

In January 2011, the Ministry of Economy and Finance created a joint cooperation unit consisting of officers and employees selected from the five thermal power generation subsidiaries in order to reduce inefficiencies in areas such as fuel transportation, inventories, materials and equipment and construction, etc. and allow the thermal power generation subsidiaries to continue utilizing the benefits of economy of scale after split off of our generation business units into separate subsidiaries. The purpose of the joint cooperation unit was to give greater autonomy to the generation subsidiaries with regard to power plant construction and management and fuel procurements, and thereby enhance efficiency in operating power plants. The main functions of the joint cooperation unit are as follows: (i) maintain inventories of bituminous coal through volume exchanges and joint purchases, (ii) reduce shipping and demurrage expenses through joint operation and distribution of dedicated vessels, (iii) reduce costs by sharing information on generation material inventories and (iv) sharing human resources among the five thermal power generation subsidiaries for construction projects, among other things.

Furthermore, in January 2011 the six generation subsidiaries were officially designated as market-oriented public enterprises, whereupon the President of Korea appoints the president and the statutory auditor of each such subsidiary; the selection of non-standing directors of each such subsidiary is subject to approval by the minister of the Ministry of Economy and Finance; the president of each such subsidiary is required to enter into a management contract directly with the minister of the Ministry of Trade, Industry and Energy; and the Public Enterprise Management Evaluation Team which is established by the Public Agencies Operating Committee conducts performance evaluation of such subsidiaries. Previously, our president appointed the president and the statutory auditor of each such subsidiary; the selection of non-standing directors of each such subsidiary was subject to approval by our president; the president of each such subsidiary entered into a management contract with our president; and our evaluation committee conducted performance evaluation of such subsidiaries. For further details of the impact of the designation of our generation subsidiaries as market-oriented public enterprises, see Item 16G. Corporate Governance The Act on the Management of Public Institutions.

Proposal for Adjustment of Functions of Public Institutions (Energy Sector)

In June 2016, the Government announced the Proposal for Adjustment of Functions of Public Institutions (Energy Sector) for the purpose of streamlining the operations of government-affiliated energy companies by discouraging them from engaging in overlapping or similar businesses with each other, reducing non-core assets

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and activities and improving management and operational efficiency. The initiatives contemplated in this proposal that would affect us and our generation subsidiaries include the following: (i) the generation companies should take on greater responsibilities in overseas resource exploration and production projects as these involve procurement of fuels necessary for electricity generation while fostering cooperation among each other through closer coordination, (ii) KHNP should take a greater role in export of nuclear technology, and (iii) the current system of retail sale of electricity to end-users should be liberalized to encourage more competition. In accordance therewith, we transferred a substantial portion of our assets and liabilities in our overseas resource business to our generation subsidiaries as of December 31, 2016. In addition, this Proposal contemplated selling a minority stake in our generation subsidiaries and KEPCO KDN, but the planned sales have been put on hold, as discussed above in Privatization of Generation Subsidiaries.

Purchase of Electricity

Cost-based Pool System

Since April 2001, the purchase and sale of electricity in Korea is required to be made through the Korea Power Exchange, which is a statutory not-for-profit organization established under the Electric Utility Act with responsibilities for setting the price of electricity, handling the trading and collecting relevant data for the electricity market in Korea. The suppliers of electricity in Korea consist of our six generation subsidiaries, which were split-off from us in April 2001, and independent power producers, which numbered 19 (excluding renewable energy producers) as of December 31, 2018. We distribute electricity purchased through the Korea Power Exchange to end users.

Our Relationship with the Korea Power Exchange

The key features of our relationships with the Korea Power Exchange include the following: (i) we and our six generation subsidiaries are member corporations of the Korea Power Exchange and collectively own 100% of its share capital, (ii) three of the 11 members of the board of directors of the Korea Power Exchange are currently our or our subsidiaries employees, and (iii) one of our employees is currently a member in three of the key committees of the Korea Power Exchange that are responsible for evaluating the costs of producing electricity, making rules for the Korea Power Exchange and gathering and disclosing information relating to the Korean electricity market.

Notwithstanding the foregoing relationships, however, we do not have control over the Korea Power Exchange or its policies since, among others, (i) the Korea Power Exchange, its personnel, policies, operations and finances are closely supervised and controlled by the Government, namely through the Ministry of Trade, Industry and Energy, and are subject to a host of laws and regulations, including, among others, the Electric Utility Act and the Act on the Management of Public Institutions, as well as the Articles of Incorporation of the Korea Power Exchange, (ii) we are entitled to elect no more than one-third of the Korea Power Exchange directors and our representatives represent only a minority of its board of directors and committees (with the other members being comprised of representatives of the Ministry of Trade, Industry and Energy, employees of the Korea Power Exchange, businesspersons and/or scholars), and (iii) the role of our representatives in the policy making process for the Korea Power Exchange is primarily advisory based on their technical expertise derived from their employment at us or our generation subsidiaries. Consistent with this view, the Finance Supervisory Service issued a ruling in 2005 that stated that we are not deemed to have significant influence or control over the decision-making process of the Korea Power Exchange relating to its business or financial affairs.

Pricing Factors

The price of electricity in the Korean electricity market is determined principally based on the cost of generating electricity using a system known as the cost-based pool system. Under the cost-based pool system,

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the price of electricity has two principal components, namely the marginal price (representing in principle the variable cost of generating electricity) and the capacity price (representing in principle the fixed cost of generating electricity).

Under the merit order system, the electricity purchase allocation, the system marginal price (as described below) and the final allocation adjustment are automatically determined based on an objective formula. The variable cost (including the adjusted coefficient as described below) and the capacity price are determined in advance of trading by the Cost Evaluation Committee, which is comprised of representatives from the Ministry of Trade, Industry and Energy, the Korea Power Exchange, us, generation companies, scholars and researchers. Accordingly, a supplier of electricity cannot exercise control over the merit order system or its operations to such supplier s strategic advantage.

Marginal Price

The primary purpose of the marginal price is to compensate the generation companies for fuel costs, which represents the principal component of the variable costs of generating electricity. We currently refer such marginal price as the system marginal price.

The system marginal price represents, in effect, the marginal price of electricity at a given hour at which the projected demand for electricity and the projected supply of electricity for such hour intersect, as determined by the merit order system, which is a system used by the Korea Power Exchange to allocate which generation units will supply electricity for which hour and at what price. To elaborate, the projected demand for electricity for a given hour is determined by the Korea Power Exchange based on a forecast made one day prior to trading, and such forecast takes into account, among others, historical statistics relating to demand for electricity nationwide by day and by hour, seasonality and on-peak-hour versus off-peak hour demand analysis. The projected supply of electricity at a given hour is determined as the aggregate of the available capacity of all generation units that have submitted bids to supply electricity for such hour. These bids are submitted to the Korea Power Exchange one day prior to trading.

Under the merit order system, the generation unit with the lowest variable cost of producing electricity among all the generation units that have submitted a bid for a given hour is first awarded a purchase order for electricity up to the available capacity of such unit as indicated in its bid. The generation unit with the next lowest variable cost is then awarded a purchase order up to its available capacity in its bid, and so forth, until the projected demand for electricity for such hour is met. We refer to the variable cost of the generation unit that is the last to receive the purchase order for such hour as the system marginal price, which also represents the highest price at which electricity can be supplied at a given hour based on the demand and supply for such hour. Generation units whose variable costs exceed the system marginal price for a given hour do not receive purchase orders to supply electricity for such hour. The variable cost of each generation unit is determined by the Cost Evaluation Committee on a monthly basis and reflected in the following month based on the fuel costs two months prior to such determination. The purpose of the merit order system is to encourage generation units to reduce its electricity generation costs by making its generation process more efficient, sourcing fuels from most cost-effective sources or adopting other cost savings programs.

The final allocation of electricity supply is further adjusted on the basis of other factors, including the proximity of a generation unit to the geographical area to which power is being supplied, network and fuel constraints and the amount of power loss. This adjustment mechanism is designed to adjust for transmission losses in order to improve overall cost-efficiency in the transmission of electricity to end-users.

The price of electricity at which our generation subsidiaries sell electricity to us is determined using the following formula:

Variable cost + [System marginal price Variable cost] * Adjusted coefficient

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An adjusted coefficient applies in principle to all generation units operated by our generation subsidiaries and the coal-fired generation units operated by independent power producers. The adjusted coefficient applicable to the generation units operated by our generation subsidiaries is determined based on considerations of, among others, electricity tariff rates, the differential generation costs for different fuel types and the relative fair returns on investment in respect of us compared to our generation subsidiaries. The purpose of the adjusted coefficient here is to prevent electricity trading from resulting in undue imbalances as to the relative financial results among generation subsidiaries as well as between us (as the purchaser of electricity) and our generation subsidiaries (as sellers of electricity). Such imbalances may arise from excessive profit taking by base load generators (on account of their inherently cheaper fuel cost structure compared to non-base load generators) as well as from fluctuations in fuel prices (it being the case that during times of rapid and substantial rises in fuel costs which are not offset by corresponding rises in electricity tariff rates charged by us to end-users, on a non-consolidated basis our profitability will decline compared to that our generation subsidiaries since our generation subsidiaries are entitled to sell electricity to us at cost plus a guaranteed margin). In comparison, the adjusted coefficient applicable to the coal-fired generation units operated by independent power producers is determined to enable such independent power producers to recover the total costs of building and operating such units.

The adjusted coefficient applicable to our generation subsidiaries is currently set at the highest level for the marginal price of electricity generated using nuclear fuel, followed by coal and (depending the prevailing relative market prices) oil and/or LNG. The differentiated adjusted coefficients reflect the Government s prevailing energy policy objectives and have the effect of setting priorities in the fuel types to be used in electricity generation.

The adjusted coefficient is determined by the Cost Evaluation Committee in principle on an annual basis, although in exceptional cases driven by external or structural factors such as rapid and substantial changes in fuel costs, adjustments to electricity tariff rates or changes in the electricity pricing structure, the adjusted coefficient may be adjusted on a quarterly basis.

Previously, it was contemplated that the vesting contract system would gradually replace the application of the adjusted coefficient. However, since the implementation of the vesting contract system has been suspended indefinitely, it is unlikely to impact the application of the adjusted coefficient in the foreseeable future.

Capacity Price

In addition to payment in respect of the variable cost of generating electricity, generation units receive payment in the form of capacity price, the purpose of which is to compensate them for the fixed costs of constructing generation facilities, provide incentives for construction of new generation units and maintain reliability of the nationwide electricity transmission network.

The capacity price is determined by the Cost Evaluation Committee as a function of the following factors:
(i) reference capacity price, (ii) reserve capacity factor, (iii) time-of-the-day capacity coefficient and (iv) since October 2016, fuel switching factor. The time-of-the-day capacity coefficient are determined annually before the end of December for the subsequent 12-months period. The reference capacity price, reserve capacity factor and the fuel switching factor are determined annually before the end of June for the subsequent 12-months period.

The reference capacity price refers to the Won amount per kilowatt-hour payable annually for annualized available capacity indicated in the bids submitted the day before trading (provided that such capacity is actually available on the relevant day of trading), and is determined based on the construction costs and maintenance costs of a standard generation unit and related transmission access facilities, and a base rate for loading electricity. Prior to October 2016, the same reference capacity price applied uniformly to all generation units. Since October 2016, the reference capacity

price applies differentially to each generation unit depending on the start year of its commercial operation. Accordingly, the reference capacity price currently ranges from Won 9.17 to 10.07 per kilowatt hour.

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The reserve capacity factor relates to the requirement to maintain a standard capacity reserve margin in the range of 15% in order to prevent excessive capacity build-up as well as induce optimal capacity investment at the regional level. The capacity reserve margin is the ratio of peak demand to the total available capacity. Under this system, generation units in a region where available capacity is insufficient to meet demand for electricity as evidenced by failing to meet the standard capacity reserve margin receive increased capacity price. Conversely, generation units in a region where available capacity exceeds demand for electricity as evidenced by exceeding the standard capacity reserve margin receive reduced capacity price. Since October 2016, the reserve capacity factor also factors in the transmission loss per generation unit in order to favor transmission of electricity from a nearby generation unit.

The time-of-the-day capacity coefficient allows hourly and seasonal adjustments in order to incentivize our generation subsidiaries to operate their generation facilities at full capacity during periods of highest demand. For example, the capacity price paid differs depending on whether the relevant hour is an on-peak hour, a mid-peak hour or an off-peak hour (the capacity price being highest for the on-peak hours and lowest for the off-peak hours) and the capacity price paid is highest during the months of January, July and August when electricity usage is highest due to weather conditions.

The fuel switching factor, which was introduced in October 2016 to promote environmental sensitivities to climate change, seeks to encourage reduced carbon emission by penalizing generation units (mostly coal-fired units) for excessive carbon emission.

Other than subject to the aforementioned variations, the same capacity pricing mechanism applies to all generation units regardless of fuel types used.

Vesting Contract System

In May 2014, the Electric Utility Act was amended to introduce a vesting contract system in determining the price and quantity of electricity to be sold and purchased between the purchaser of electricity (namely, us) and the sellers of electricity (namely, our generation subsidiaries and independent power producers). Under the vesting contract system, electricity generators using base load fuels (such as nuclear, coal, hydro and by-product gas) at a particular generation unit were to be required to enter into a contract with the purchaser of electricity (namely, us), which specifies, among other things, the quantity of electricity to be generated and sold at a particular generation unit and the price at which such electricity is sold, subject to certain adjustments.

The vesting contract system was introduced principally to prevent excessive profit-taking by low-cost producers of electricity using base load fuels (such as nuclear, coal, hydro and by-product gas) by replacing the adjusted coefficient as the basis for determining the guaranteed return to generation companies, as well as to enhance the stability of electricity supply by requiring long-term contractual arrangements for the purchase and sale of electricity and promote cost savings, productivity enhancements and operational efficiency by providing incentives and penalties depending on the degree to which the generation companies could supply electricity at costs below the contracted electricity prices.

In order to minimize undue shock to the electricity trading market in Korea, the vesting contract system was to be implemented in phases starting with by-product gas-based electricity in 2015, which accounted for 1.8% of electricity purchased by us during such year. The rollout of the vesting contract system was further studied by a task force consisting of representatives from the Government, the Korea Power Exchange and generation companies.

Following such study, the Government announced in June 2016 that, due to changes in the electricity business environment (including an increase in generation capacity relative to peak usage, reduced fuel costs following a

decline in oil prices and greater environmental concerns related to coal-fired electricity generation), it will indefinitely suspend any further rollout of the vesting contract system beyond by-product gas-based electricity, and revert to the adjusted coefficient-based electricity pricing adjustment mechanism.

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Power Trading Results

The results of power trading, as effected through the Korea Power Exchange, for our generation subsidiaries and independent power producers in 2018 are as follows:

	Items	Volume (Gigawatt hours)	Percentage of Total Volume (%)	Sales to KEPCO[2] (in billions of Won)	Percentage of Total Sales (%)	Unit Price (Won/kWh)
Generation Companies	KHNP	131,931	24.6	8,889	17.6	67.38
	KOSEP	64,128	12.0	5,793	11.4	90.33
	KOMIPO	45,569	8.5	4,355	8.6	95.57
	KOWEPO	49,222	9.2	5,020	9.9	101.99
	KOSPO	55,525	10.3	5,700	11.2	102.65
	EWP	50,697	9.4	5,157	10.2	101.72
	Others[1]	139,215	26.0	15,770	31.1	113.28
	Total	536,287	100.0	50,684	100.0	94.51
Energy Sources	Nuclear	126,883	23.7	7,889	15.6	62.18
	Bituminous coal	226,585	42.2	18,793	37.1	82.94
	Anthracite coal	2,420	0.5	258	0.5	106.49
	Oil	6,834	1.3	1,185	2.3	173.37
	LNG/Combined-cycle	144,039	26.9	17,485	34.5	121.39
	Renewables	22,165	4.1	2,161	4.3	97.50
	Hydro	2,762	0.5	302	0.6	109.36
	Pumped storage	3,891	0.7	490	1.0	125.81
	RPS		0.0	2,054	4.0	190.14
	Others	708	0.1	67	0.1	96.25
	Total	536,287	100.0	50,684	100.0	94.51
Load	Base load	355,887	66.4	26,940	53.2	75.70
	Non-base load	180,400	33.6	23,744	46.8	131.62
	Total	536,287	100.0	50,684	100.0	94.51

Note:

(1) Others represent independent power producers that trade electricity through the cost-based pool system of power trading (excluding independent power producers that supply electricity under power purchase agreements with us).

(2) Based on the payment made by us through Korea Power Exchange.

Power Purchased from Independent Power Producers Under Power Purchase Agreements

In 2018, we purchased an aggregate of 11,805 gigawatt hours of electricity generated by independent power producers under existing power purchase agreements. These independent power producers had an aggregate generation capacity of 6,474 megawatts as of December 31, 2018.

Power Generation

As of December 31, 2018, we and our generation subsidiaries had a total of 640 generation units, including nuclear, thermal, hydroelectric and internal combustion units, representing total installed generation capacity of 81,362 megawatts. Our thermal units produce electricity using steam turbine generators fired by coal, oil and LNG. Our internal combustion units use oil or diesel-fired gas turbines and our combined-cycle units are primarily LNG-fired. We also purchase power from several generation plants not owned by our generation subsidiaries.

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The table below sets forth as of and for the year ended December 31, 2018 the number of units, installed capacity and the average capacity factor for each type of generating facilities owned by our generation subsidiaries.

	Number of Units	Installed Capacity[1] (Megawatts)	Average Capacity Factor[2] (Percent)
Nuclear	23	21,850	65.9
Thermal:			
Coal	59	34,218	74.4
Oil	11	2,950	22.2
LNG			
Total thermal	70	37,168	70.2
Internal combustion	214	339	17.8
Combined-cycle[3]	110	15,726	34.0
Integrated gasification combined cycle[4]	1	346	56.1
Hydro	58	5,352	11.1
Wind	14	140	15.9
Solar	128	151	13.9
Fuel cell	18	121	49.9
Biogas	3	160	70.7
Others[5]	1	9	75.0
Total	640	81,362	58.7

Notes:

(1) Installed capacity represents the level of output that may be sustained continuously without significant risk of damage to plant and equipment.
(2) Average capacity factor represents the total number of kilowatt hours of electricity generated in the indicated period divided by the total number of kilowatt hours that would have been generated if the generation units were continuously operated at installed capacity, expressed as a percentage.
(3) Involves generation through gas and oil.
(4) Involves generation through coal and gasified coal.
(5) Includes waste-to-energy.

The expected useful life of a unit, assuming no substantial renovation, is approximately as follows: nuclear, over 40 years; thermal, over 30 years; internal combustion, over 25 years; and hydroelectric, over 55 years. Substantial renovation can extend the useful life of thermal units by up to 20 years.

We seek to achieve efficient use of fuels and diversification of generation capacity by fuel type. In the past, we relied principally upon oil-fired thermal generation units for electricity generation. Since the oil shock in 1974, however,

Korea s power development plans have emphasized the construction of nuclear generation units. While nuclear units are more expensive to construct than thermal generation units of comparable capacity, nuclear fuel is less expensive than fossil fuels in terms of electricity output per unit cost. However, efficient operation of nuclear units requires that such plants be run continuously at relatively constant energy output levels. As it is impractical to store large quantities of electrical energy, we seek to maintain nuclear power production capacity at approximately the level at which demand for electricity is continuously stable. During those times when actual demand exceeds the usual level of electricity supply from nuclear power, we rely on units fired by fossil fuels and hydroelectric units, which can be started and shut down more quickly and efficiently than nuclear units, to meet the excess demand. Bituminous coal is currently the least expensive thermal fuel per kilowatt-hour of electricity produced, and therefore we seek to maximize the use of bituminous coal for generation needs in excess of the stable demand level, except for meeting short-term surges in demand which require rapid start-up and shutdown. Thermal units fired by LNG, hydroelectric units and internal

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combustion units are the most efficient types of units for rapid start-ups and shutdowns, and therefore we use such units principally to meet short-term surges in demand. Anthracite coal is a less efficient fuel source than bituminous coal in terms of electricity output per unit cost.

Our generation subsidiaries have constructed and operated thermal and internal combustion units in order to help meet power demand. Subject to market conditions, our generation subsidiaries plan to continue to add additional thermal and internal combustion units. These units generally take less time to complete construction than nuclear units.

The high average age of our oil-fired thermal units is attributable to our reliance on oil-fired thermal units as the primary means of electricity generation until mid-1970s. Since then, we have diversified our fuel sources and constructed relatively few oil-fired thermal units compared to units of other fuel types.

The table below sets forth, for the periods indicated, the amount of electricity generated by facilities linked to our grid system and the amount of power used or lost in connection with transmission and distribution.

	2014	2015	2016	2017	2018	% of 2018 Gross Generation[1]
	(in gigawatt hours, except percentages)					
Electricity generated by us and our generation subsidiaries:						
Nuclear	156,407	164,762	161,995	148,426	133,505	23.4
Coal	203,765	207,533	207,912	227,186	222,818	39.0
Oil	6,838	8,822	13,055	5,242	5,845	1.0
LNG	568	222	369	220		
Internal combustion	656	633	573	496	528	0.1
Combined-cycle	68,134	45,923	46,477	36,957	46,780	8.2
Hydro	5,976	4,424	4,835	5,263	5,187	0.9
Wind	148	181	186	209	195	0.03
Solar, fuel cells and others	422	420	908	2,485	3,469	0.6
Total generation by us and our generation subsidiaries	442,914	432,920	436,310	426,484	418,327	73.3
Electricity generated by IPPs:						
Thermal	63,088	72,316	83,789	103,745	125,830	22.1
Hydro and other renewable	15,968	17,106	20,342	23,238	26,490	4.6
Total generation by IPPs	79,056	89,422	104,131	126,983	152,320	26.7
Gross generation	521,970	522,343	540,441	553,467	570,647	100
Auxiliary use[2]	20,610	21,293	21,605	22,279	22,309	3.9
Pumped-storage[3]	6,644	4,824	4,716	5,477	5,106	0.9
Total net generation[4]	494,716	496,226	514,120	525,711	543,232	95.2

Transmission and distribution losses[5]	18,270	18,063	18,475	18,790	19,359	3.56

IPPs = Independent power producers

Notes:

(1) Unless otherwise indicated, percentages are based on gross generation.
(2) Auxiliary use represents electricity consumed by generation units in the course of generation.
(3) Pumped storage represents electricity consumed during low demand periods in order to store water which is utilized to generate hydroelectric power during peak demand periods.
(4) Total net generation represents gross generation minus auxiliary and pumped-storage use.

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(5) Transmission and distribution losses represents total transmission and distribution losses divided by total net generation.

The table below sets forth our total capacity at the end of, and peak and average loads during, the indicated periods.

	2014	2015	2016	2017	2018
			(Megawatts)		
Total capacity	93,216	94,102	100,180	116,657	117,205
Peak load	80,154	78,790	85,183	85,133	92,478
Average load	59,586	60,284	61,694	63,188	65,142

Korea Hydro & Nuclear Power Co., Ltd.

We commenced nuclear power generation activities in 1978 when our first nuclear generation unit, Kori #1, began commercial operation. On April 2, 2001, all of our nuclear and hydroelectric power generation assets and liabilities were transferred to KHNP.

KHNP owns and operates 23 nuclear generation units at four power plant complexes in Korea, located in Kori, Wolsong, Yonggwang (Hanbit) and Ulchin (Hanul), 51 hydroelectric generation units including 16 pumped storage hydro generation units as well as ten solar generation units and one wind generation unit as of December 31, 2018.

The table below sets forth the number of units and installed capacity as of December 31, 2018 and the average capacity factor by types of generation units in 2018.

	Number of Units	Installed Capacity[(1)] (Megawatts)	Average Capacity Factor[(2)] (Percent)
Nuclear	23	21,850	65.9
Hydroelectric	51	5,307	11.2
Solar	10	21	14.86
Wind	1	1	6.1
Total	85	27,179	

Notes:

(1) Installed capacity represents the level of output that may be sustained continuously without significant risk of damage to plant and equipment.

(2) Average capacity factor represents the total number of kilowatt hours of electricity generated in the indicated period divided by the total number of kilowatt hours that would have been generated if the generation units were continuously operated at installed capacity, expressed as a percentage.

KHNP commenced commercial operation of Shin-Kori #3, with a 1,400 megawatt capacity, in December 2016. KHNP is currently building five additional nuclear generation units, three at the Shin-Kori and two at Shin-Hanul sites, each with a 1,400 megawatt capacity. KHNP expects to complete these units between 2019 and 2024. In June 2018, the board of directors of KHNP decided to retire Wolsong #1 unit earlier than planned due to the unit s economic inefficiency. The initial phase of the decommissioning of Kori #1, which primarily involves safety inspections and the removal of spent fuels, has begun after its permanent shutdown in June 2017.

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Nuclear

The table below sets forth certain information with respect to the nuclear generation units of KHNP as of December 31, 2018.

Unit[5]	Reactor Type[1]	Reactor Design[2]	Turbine and Generation[3]	Commencement of Operations	Installed Capacity (Megawatts)	Average Capacity Factor[4] (%)
Kori-2	PWR	W	GEC	1983	650	47.9
Kori-3	PWR	W	GEC, Hitachi	1985	950	63.4
Kori-4	PWR	W	GEC, Hitachi	1986	950	71.5
Shin-Kori-1	PWR	D, KEPCO E&C, W	D, GE	2011	1,000	80.7
Shin-Kori-2	PWR	D, KEPCO E&C, W	D, GE	2012	1,000	79.0
Shin-Kori-3	PWR	D, KEPCO E&C, W	D, GE	2016	1,400	48.7
Wolsong-2	PHWR	AECL, H, K	H, GE	1997	700	83.3
Wolsong-3	PHWR	AECL, H	H, GE	1998	700	73.6
Wolsong-4	PHWR	AECL, H	H, GE	1999	700	83.1
Shin-Wolsong-1	PWR	D, KEPCO E&C, W	D, GE	2012	1,000	80.4
Shin-Wolsong-2	PWR	D, KEPCO E&C, W	D, GE	2015	1,000	77.2
Hanbit-1	PWR	W	W, D	1986	950	62.4
Hanbit-2	PWR	W	W, D	1987	950	53.7
Hanbit-3	PWR	H, CE, K	H, GE	1995	1,000	35.6
Hanbit-4	PWR	H, CE, K	H, GE	1996	1,000	0.0
Hanbit-5	PWR	D, CE, W, KEPCO E&C	D, GE	2002	1,000	83.7
Hanbit-6	PWR	D, CE, W, KEPCO E&C	D, GE	2002	1,000	91.5
Hanul-1	PWR	F	A	1988	950	65.9
Hanul-2	PWR	F	A	1989	950	59.5
Hanul-3	PWR	H, CE, K	H, GE	1998	1,000	67.5
Hanul-4	PWR	H, CE, K	H, GE	1999	1,000	76.8
Hanul-5	PWR	D, KEPCO E&C, W	D, GE	2004	1,000	79.8
Hanul-6	PWR	D, KEPCO E&C, W	D, GE	2005	1,000	84.2
Total nuclear					21,850	65.9

Notes:

(1) PWR means pressurized light water reactor; PHWR means pressurized heavy water reactor.

(2) W means Westinghouse Electric Company (U.S.A.); AECL means Atomic Energy Canada Limited (Canada); F means Framatome (France); H means Hanjung; CE means Combustion Engineering (U.S.A.); D means Doosan Heavy Industries; K means Korea Atomic Energy Research Institute; KEPCO E&C means KEPCO

Engineering & Construction.

(3) GEC means General Electric Company (U.K.); P means Parsons (Canada and U.K.); W means Westinghouse Electric Company (U.S.A.); A means Alstom (France); H means Hanjung; GE means General Electric (U.S.A.); D means Doosan Heavy Industries; Hitachi means Hitachi Ltd. (Japan).

(4) The average fuel cost per kilowatt in 2018 for the entire generation units was Won 9.57 per kilowatt.

(5) Kori-1 was permanently shut down on June 18, 2017. In June 2018, the board of directors of KHNP decided to shut down Wolsong-1.

Under extended-cycle operations, nuclear units can be run continuously for periods longer than the conventional 12-month period between scheduled shutdowns for refueling and maintenance. Since 1987, we have adopted the mode of extended-cycle operations for all of our pressurized light water reactor units and plan to use it for our newly constructed units. The duration of shutdown for fuel replacement, maintenance and the evaluation period for approval to start after maintenance was 2,824.1 days in the aggregate in 2018. In addition,

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KHNP s nuclear units experienced an average of 0.17 unplanned shutdowns per unit in 2018. In the ordinary course of operations, KHNP s nuclear units routinely experience damage and wear and tear, which are repaired during routine shutdown periods or during unplanned temporary suspensions of operations. No significant damage has occurred in any of KHNP s nuclear reactors, and no significant nuclear exposure or release incidents have occurred at any of KHNP s nuclear facilities since the first nuclear plant commenced operation in 1978.

Hydroelectric

The table below sets forth certain information relating to KHNP s pumped-storage and hydroelectric business units, including the installed capacity as of December 31, 2018 and the average capacity factor in 2018.

Location of Unit	Number of Units	Classification	Year Built	Installed Capacity (Megawatts)	Average Capacity Factor (%)
Hwacheon	4	Dam waterway	1944	108.0	17.62
Chuncheon	2	Dam	1965	62.3	18.46
Euiam	2	Dam	1967	48.0	28.47
Cheongpyung	4	Dam	1943	140.1	19.37
Paldang	4	Dam	1973	120.0	22.65
Chilbo (Seomjingang)	3	Basin deviation	1945	35.4	18.00
Boseonggang	2	Basin deviation	1937	4.5	25.23
Kwoesan	2	Dam	1957	2.8	17.70
Anheung	3	Dam waterway	1978	0.4	20.17
Kangreung	2	Basin deviation	1991	82.0	0
Topyeong	1	Dam	2011	0.04	4.36
Muju	1	Dam	2003	0.4	14.62
Sancheong	2	Dam	2001	1.0	18.80
Yangyang	2	Dam	2005	1.4	10.71
Yecheon	1	Dam	2011	0.9	15.15
Cheongpeoung	2	Pumped Storage	1980	400.0	7.62
Samrangjin	2	Pumped Storage	1985	600.0	9.20
Muju	2	Pumped Storage	1995	600.0	11.83
Sancheong	2	Pumped Storage	2001	700.0	9.54
Yangyang	4	Pumped Storage	2006	1,000.0	8.85
Cheongsong	2	Pumped Storage	2006	600.0	9.62
Yecheon	2	Pumped Storage	2011	800.0	13.58
Total	51			5,307.2	11.20

Solar/Wind

The table below sets forth certain information, including the installed capacity as of December 31, 2018 and the average capacity factor in 2018, of the solar and wind power units of KHNP.

Location of Unit	Classification	Year Built	Installed Capacity (Megawatts)	Average Capacity Factor (Percent)
Yonggwang	Solar	2008	13.9	15.7
Yecheon	Solar	2012	2.0	15.9
Kori	Wind	2008	0.8	6.1
Kori	Solar	2017	5.1	15.9
Total			21.8	

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Korea Water Resources Corporation, which is a Government-owned entity, assumes full control of multi-purpose dams, while KHNP maintains the dams used for power generation. Existing hydroelectric power units have exploited most of the water resources in Korea available for commercially viable hydroelectric power generation. Consequently, we expect that no new major hydroelectric power plants will be built in the foreseeable future. Due to the ease of its start-up and shut-down mechanism, hydroelectric power generation is reserved for peak demand periods.

Korea South-East Power Co., Ltd.

The table below sets forth, by fuel type, the weighted average age and installed capacity as of December 31, 2018 and the average capacity factor and average fuel cost per kilowatt in 2018 based upon the net amount of electricity generated, of KOSEP.

	Weighted Average Age of Units (Years)	Installed Capacity (Megawatts)	Average Capacity Factor (Percent)	Average Fuel Cost per kWh (Won)
Bituminous:				
Samcheonpo #1, 2, 3, 4, 5, 6	27.4	3,240	75.6	62.39
Yeongheung #1, 2, 3, 4, 5, 6	9.5	5,080	85.9	58.33
Yeosu # 2	4.8	669	78.6	73.26
Anthracite:				
Yeongdong #1, 2	39.2	200	27.6	75.45
Combined cycle and internal Combustion:				
Bundang gas turbine #1,2,3,4,5,6,7,8; steam turbine #1, 2	25.0	922	25.8	139.52
Hydro, Solar and other renewable energy		266		168.78
Total	16.7	10,377	74.9	66.37

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Korea Midland Power Co., Ltd.

The table below sets forth, by fuel type, the weighted average age and installed capacity as of December 31, 2018 and the average capacity factor and average fuel cost per kilowatt in 2018 based upon the net amount of electricity generated, of KOMIPO.

	Weighted Average Age of Units (Years)	Installed Capacity (Megawatts)	Average Capacity Factor (Percent)	Average Fuel Cost per kWh (Won)
Bituminous:				
Boryeong #1, 2, 3, 4, 5, 6, 7, 8	23.91	4,000	73.07	60.00
Shin Boryeong #1, 2	1.46	1,945	66.17	59.14
Anthracite:				
Seocheon #1, 2[(1)]				
Oil-fired:				
Jeju #2, 3	18.46	150	62.45	173.75
LNG-fired:				
Seoul #5[(1)]				
Combined-cycle and internal combustion:				
Boryeong gas turbine #1, 2, 3, 4, 5, 6; steam turbine #1, 2, 3,	19.82	1,350.00	10.27	123.37
Incheon gas turbine #1, 2, 3, 4,5,6; steam turbine #1, 2,3	9.85	1,462.45	37.62	108.97
Jeju gas turbine #1, 2; steam turbine #1, 2	0.52	187.45	3.08	
Sejong gas turbine #1,2; steam turbine #1	5.17	530.44	78.46	107.03
Jeju Gas Turbine #3	24.58	55.00	0.93	615.87
Jeju Internal Combustion Engine #1,2	11.58	80.00	35.66	123.78
Wind:				
Yangyang #1, 2	12.58	3.00	15.14	
Sejong Maebongsan Wind	12.49	8.80	5.91	
Jeju Sangmyung Wind	2.42	21.00	18.96	
Combined heat and power:				
Wonju #1	3.67	10.00	75.22	85.62
Hydroelectric:				
Boryeong	9.86	7.50	24.82	0.26
Shin Boryeong	2.25	5.00	31.03	
Photovoltaic (PV) power and fuel cell generation:				
Boryeong (PV) site	4.45	1.74	13.93	3.13
Shin Boryeong (PV) site	2.58	2.90	14.62	
Seocheon (PV) site	11.00	1.23	13.97	
Jeju (PV) site	5.90	2.34	12.08	
Seoul (PV) site	7.42	1.30	15.43	2.52
Sejong (PV) site	1.08	0.33	14.72	
Yeosu (PV) site	6.83	2.22	15.58	
Incheon (PV) site	7.08	0.30	13.28	

Boryeong (fuel cell) site	10.33	0.30	72.92	165.68
Shin Boryeong (fuel cell) site	1.17	7.48	79.23	144.80
Total	15.04	9,836	56.52	73.00

Note:

(1) Seocheon #1 and Seocheon #2 were shut down in July 2017 and Seoul #5 was shut down in April 2017.

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Korea Western Power Co., Ltd.

The table below sets forth, by fuel type, the weighted average age and installed capacity as of December 31, 2018 and the average capacity factor and average fuel cost per kilowatt in 2018 based upon the net amount of electricity generated, of KOWEPO.

	Weighted Average Age of Units (Years)	Installed Capacity (Megawatts)	Average Capacity Factor (Percent)	Average Fuel Cost per kWh (Won)
Bituminous:				
Taean #1, 2, 3, 4, 5, 6, 7, 8, 9, 10	12.7	6,100	72.7	60.1
Oil-fired:				
Pyeongtaek #1, 2, 3, 4	37.1	1,400	10.4	132.51
Combined cycle:				
Pyeongtaek #2	4.2	868.5	57.1	102.07
Gunsan	8.6	718.4	38.5	116.09
West Incheon	26.5	1,800	20.0	114.05
Hydroelectric:				
Taean	11.3	2.2	17.5	
Solar:				
Taean	1.4	17.3	13.7	
Pyeongtaek	1.5	2.9	13.8	
West Incheon	1.5	1.2	15.2	
Gunsan	3.2	1.0	14.1	
Samryangjin	11.1	3.0	13.9	
Sejong City	6.5	4.9	14.7	
Gyeonggi-do	5.7	2.5	15.0	
Yeongam	5.8	13.3	15.4	
Fuel Cell:				
West Incheon 1	4.3	16.2	43.1	
West Incheon 2	2.6	18.0	71.2	
Wind Power:				
Hwasun	3.0	16	18.21	
Integrated gasification combined cycle:				
Taean	2.4	346.3	56.11	69.49
Total	16.5	11,332	52.0	71.86

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Korea Southern Power Co., Ltd.

The table below sets forth, by fuel type, the weighted average age and installed capacity as of December 31, 2018 and the average capacity factor and average fuel cost per kilowatt in 2018 based upon the net amount of electricity generated, of KOSPO.

	Weighted Average Age of Units (Years)	Installed Capacity (Megawatts)	Average Capacity Factor (Percent)	Average Fuel Cost per kWh (Won)
Bituminous:				
Hadong #1, 2, 3, 4, 5, 6, 7, 8	17.3	4,000	85.1	58.8
Samcheok #1	1.8	2,044	63.2	58.3
Oil-fired:				
Nam Jeju #3, 4	12.0	200	72.8	161.6
Combined cycle:				
Shin Incheon #1, 2, 3, 4	22.2	1,800	22.9	112.2
Busan #1, 2, 3, 4	15.2	1,800	51.6	105.0
Yeongwol #1	8.2	848	16.6	116.8
Hallim	22.5	105	23.9	205.9
Andong #1	4.8	362	64.1	98.9
Wind power:				
Hankyung	12.2	21	20.3	1.32
Seongsan	9.2	20	26.0	0.94
Solar	3.3	17	14.2	0.04
Small Hydropower	1.4	3	37.1	
Fuel Cell	0.7	20	77.3	139.6
Total	13.7	11,240	58.8	74.4

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Korea East-West Power Co., Ltd.

The table below sets forth, by fuel type, the weighted average age and installed capacity as of December 31, 2018 and the average capacity factor and average fuel cost per kilowatt in 2018 based upon the net amount of electricity generated, of EWP.

	Weighted Average Age of Units (Years)	Installed Capacity (Megawatts)	Average Capacity Factor (Percent)	Average Fuel Cost per kWh (Won)
Bituminous:				
Dangjin #1, 2, 3, 4, 5, 6, 7, 8, 9, 10	11.3	6,040	66.7	81.62
Honam #1, 2	45.7	500	64.2	99.43
Anthracite:				
Donghae #1, 2	19.8	400	62.6	113.93
Oil-fired:				
Ulsan #4, 5, 6	38.5	1,200	23.6	171.93
Combined cycle:				
Ulsan gas turbine #1, 2, 3, 4, 5, 6, 7, 8; steam turbine #1, 2, 3, 4	15.1	2,072	45.3	128.37
Ilsan gas turbine #1, 2, 3, 4, 5, 6; steam turbine #1, 2	24.9	900	15.6	200.73
Mini hydro, Photovoltaic, Fuel Cell, Wind-Power, Biomass:		82	48.7	208.23
Total	17.9	11,194	54.6	98.87

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Power Plant Remodeling and Recommissioning

Our generation subsidiaries supplement power generation capacity through remodeling or recommissioning of thermal units. Recommissioning includes installation of anti-pollution devices, modification of control systems and overall rehabilitation of existing equipment. The following table shows recent remodeling and recommissioning initiatives by our generation subsidiaries.

Power Plant	Capacity	Completed (Year)	Extension	Company
Taean #1-10	5,050 MW (500 MW×8, 1,050 MW×2)	EP[1] upgrade (#2, 2016) EP[1] upgrade (#1, 3, 2017) EP[1] upgrade (#2, 4, 2018) SCR[2] upgrade (#2, 4, 7, 2016) SCR[2] upgrade (#1, 3, 8, 9, 10, 2017) SCR[2] upgrade (#5,6, ,10, 2018) FGD[5] upgrade, (#1, 3, 2017) FGD[5] upgrade, (#2, 4, 2018)	Anti-pollution	KOWEPO
Pyeongtaek #1-4	1,400 MW (350 MW×4)	Steam turbine upgrade (#2, 3, 2014)	10-year performance-improvement	KOWEPO
Boryeong #1-2	1,000 MW (500 MW×2)	FGD upgrade (#1, 2, 2014)	Performance-improvement	KOMIPO
Boryeong #3-6	2,000 MW (500 MW×8)	Retrofit(#3, 2019) Retrofit(#5, 6, 2021) Retrofit(#4, 2023) FGD, EP, SCR upgrade (#3, 2019) FGD, EP, SCR upgrade (#5, 6, 2021) FGD, EP, SCR upgrade (#4, 2023)	Lifetime extension & Performance-improvement Performance-improvement	KOMIPO
Boryeong #7, 8	1,000 MW (500 MW×2)	FGD,EP upgrade (#7, 2025) FGD,EP upgrade (#8, 2026)	Performance-improvement	KOMIPO
Seocheon #1-2	400 MW (200 MW×2)	SCR[2]: 2012	Anti-pollution	KOMIPO

Yeosu #1, 2	668.6MW (#1:340, #2:328.6MW)	Boiler Type Change (CFBC(3):#1:2016, #2:2011)	30 years	KOSEP
Samcheonpo #1-2	1,120 MW (560 MW ×2)	Boiler, EP, Draft System Upgrade (#1, 2: 2012)	10 years Refurbishing-modernization	KOSEP
Yeongdong #1	125 MW (125 MW ×1)	Boiler, Hybrid SCR & EP, Draft System Retrofit (Biomass (4) #1: 2017)	Renewable energy	KOSEP
Yeongdong #2	200 MW (200 MW ×1)	Boiler, Hybrid SCR & EP, Draft System Retrofit (Biomass(4) #1: 2020)	Renewable energy	KOSEP
Yeongheung #1,2	1,600 MW (800 MW ×2)	FGD, SCR upgrade (#1, 2021) FGD, SCR upgrade (#2, 2022)	Performance-improvement	KOSEP
Donghae #1,2	400 MW (200 MW×2)	SNCR(2018), DCS(2018)	Anti-pollution & modification of control systems	EWP
Ulsan GT #3-6	600 MW (150 MW×4)	SCR(2019)	Anti-pollution	EWP
Ulsan ST #2~3	300 MW (150 MW×2)	DCS(2019)	Modification of control systems	EWP
Ilsan GT #2-6	500 MW (100 MW×5)	SCR(2019)	Anti-pollution	EWP

Notes:

(1) EP means an electrostatic precipitation system.

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(2) SCR means a selective catalytic reduction system.
(3) CFBC means a circulating fluidized bed combustion system.
(4) Biomass means wood pallet powered plant.
(5) FGD means flue-gas desulfurization designed to remove sulfur oxides.

Transmission and Distribution

We currently transmit and distribute substantially all of the electricity in Korea.

As of December 31, 2018, our transmission system consisted of 34,155 circuit kilometers of lines of 765 kilovolts and others including high-voltage direct current lines, and we had 850 substations with aggregate installed transformer capacity of 316,661 megavolt-amperes.

As of December 31, 2018, our distribution system consisted of 120,057 megavolt-amperes of transformer capacity and 9,464,748 units of support with a total line length of 493,331 circuit kilometers.

We make substantial investments in our transmission and distribution systems to minimize power interruptions and improve efficiency. Our current projects principally focus on increasing capabilities of the existing power networks and reducing our transmission and distribution loss, which was 3.56% of our gross generation in 2018. To cope with increasing damages to large-scale transmission and distribution facilities, we plan to reinforce stability of our transmission and distribution facilities through stricter design and material specifications. In addition, we also plan to expand underground transmission and distribution facilities to meet customer demand for more environment-friendly facilities. In order to reduce the interruption time in power distribution, which is an indicator of the quality of electricity transmission, we are also continuing to invest in automation of electricity transmission and development of new transmission technologies, among others.

Some of the facilities we own and use in our distribution system use rights of way and other concessions granted by municipal and local authorities in areas where our facilities are located. These concessions are generally renewed upon expiration.

New Energy Industry Projects

Certain of our new energy industry projects are described below.

Advanced Metering Infrastructure

In July 2012, the Government implemented a master plan to build out a smart grid, which includes the Advanced Metering Infrastructure (AMI) roadmap. In accordance with such plan, we are in the process of installing smart meters and related communication networks and operating systems as part of the smart grid initiative in an effort to enhance efficiency in the power electricity industry and alleviate growing energy shortage concerns. Our goal is to complete such installation for 22 million households by 2020. Smart meters refer to digital meters that record, on a real-time basis, electricity consumption within a household so that consumers will have a price-based incentive to enhance efficiency in their electricity usage. As of December 31, 2018, we have installed 7 million smart meter units, and plan to install an additional 15 million units by 2020. The AMI project is expected to cost Won 1.6 trillion through 2020.

Smart Grids

Smart grids refer to next-generation networks for electricity distribution that integrate information technology into existing power grids with the aim of enabling two-way real time exchange of information between electricity suppliers

and consumers for optimal efficiency in electricity use. As part of our overall business strategy, we are currently developing and implementing smart grids based on advanced information

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technology, in order to promote more efficient allocation and use of electricity by consumers. We expect that such technology will improve efficiency and reduce electricity loss over the course of electricity transmission and distribution. We also expect that the smart grid initiative will significantly increase efficient energy consumption by providing real-time data to customers, which would in turn help to reduce greenhouse gas emission and decrease Korea s reliance on foreign energy sources.

Leveraging our experience gained through high-tech intelligent power transmission and distribution network, or smart grid test beds in Jeju Island from 2009 to 2013, we plan to expand our smart grid project. We successfully implemented the KEPCO-Smart Energy Management (K-SEM) at our Guri-Namyangju branch and the Smart Grid Deployment Project in 2014. In recognition of our achievement, we were awarded a special prize from the International Smart Grid Action Network in 2018. By the end of 2018, we implemented smart grid technology in 120 of our branches and 46 public sites (6 buildings, 5 campuses, 25 factories and 10 dispersed generation). Based on this experience, we plan to expand implementation of smart grid technology to residential and industrial buildings.

Energy Storage Systems

In October 2013, as part of an endeavor to create new markets for energy demand management applications using information and communication technology, we established a business plan to roll out energy storage systems for frequency regulation nationwide. These systems involve the establishment and operation of batteries and transformers with large-sized charge and discharge capabilities adjacent to substations to transmit electricity stably with regulated frequencies and optimize the efficiency of the substation operation. This system allows full conversion of reserve capacity for frequency regulation at existing low-cost generators into electricity storage and, if operated in sizable scale, offers opportunities for substantial cost savings in purchase of electricity.

In December 2014, we conducted a pilot project for this initiative by installing a 52 megawatts energy storage system at the Seo-Anseong substation and the Shin-Yongin substation. In July 2015, these substations began to commercially operate energy storage systems, and we expanded the energy storage capacity nationwide by an additional 184 megawatts in 2016, an additional 140 megawatts in 2017, with a total capacity of 376 megawatts as of December 31, 2018. In addition, we completed construction of one of the world s largest indoor energy storage systems for frequency regulation in Gimje substation with a 48 megawatts capacity.

Electric Vehicle Charging Infrastructure

In order to promote the use of environment-friendly electric vehicles, we began constructing infrastructures for electric vehicles in 2009. Since 2016, we have installed electric vehicle charging stations throughout public space and residential building complexes. In 2017, we created a platform for businesses in the electric vehicle charging industry by charging for the service and making the infrastructures available to the market. We plan to expand such infrastructures and to install 3,000 high speed electric vehicle charging stations by 2022.

In January 2016, the Ministry of Trade, Industry and Energy announced an initiative to promote the new energy industry by creating the New Energy Industry Fund. For further details, see Capital Investment Program.

Fuel Sources and Requirements

Nuclear

Uranium, the principal fuel source for nuclear power, accounted for 37.1%, 34.8% and 31.9% of the fuel requirements for electricity generation by us and our generation subsidiaries in 2016, 2017 and 2018, respectively.

All uranium ore concentrates used by KHNP are imported from, and conversion and enrichment of such concentrates are provided by, sources outside Korea and are paid for with currencies other than Won, primarily U.S. dollars.

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In order to ensure stable supply, KHNP enters into long-term and medium-term contracts with various suppliers and supplements such supplies with purchases in spot markets. In 2018, KHNP purchased 100%, or approximately 8,500 tons, of its uranium concentrate requirement under both long-term and spot supply contracts with suppliers in Canada, the United Kingdom, Kazakhstan, Germany, Niger, Australia and the United States. Under the long-term supply contracts, the purchase prices of uranium concentrates are adjusted annually based on base prices and spot market prices prevailing at the time of actual delivery. The conversion and enrichment services of uranium concentrates are provided by suppliers in Canada, France, Germany, Japan, China, Russia, the United Kingdom and the United States. A Korean supplier typically provides fabrication of fuel assemblies. Except for certain fixed contract prices, contract prices for processing of uranium are adjusted annually in accordance with the general rate of inflation. KHNP intends to obtain its uranium requirements in the future, in part, through purchases under medium- to long-term contracts and, in part, through spot market purchases.

Coal

Bituminous coal accounted for 45.9%, 52.2% and 52.6% of the fuel requirements for electricity generation by us and our generation subsidiaries in 2016, 2017 and 2018, respectively, and anthracite coal accounted for 1.8%, 1.0% and 0.6% of our fuel requirements for electricity generation in 2016, 2017 and 2018, respectively.

In 2018, our generation subsidiaries purchased approximately 89 million tons of bituminous coal, of which approximately 35%, 30%, 14%, 8% and 13% were imported from Indonesia, Australia, Russia, South Africa and others, respectively. Approximately 83% of the bituminous coal requirements of our generation subsidiaries in 2018 were purchased under long-term contracts with the remaining 17% purchased in the spot market. Some of our long-term contracts relate to specific generating plants and extend through the end of the projected useful lives of such plants, subject in some cases to periodic renewal. Pursuant to the terms of our long-term supply contracts, prices are adjusted periodically based on market conditions. The average cost of bituminous coal per ton purchased under such contracts amounted to Won 89,118, Won 98,891 and Won 107,233 in 2016, 2017 and 2018, respectively.

In 2018, our generation subsidiaries purchased approximately 1 million tons of anthracite coal. The prices for anthracite coal under such contracts are set by the Government. The average cost of anthracite coal per ton purchased under such contracts was Won 96,121, Won 124,036 and Won 129,976 in 2016, 2017 and 2018, respectively.

Oil

Oil accounted for 3.0%, 1.2% and 1.4% of the fuel requirements for electricity generation by us and our generation subsidiaries in 2016, 2017 and 2018, respectively.

In 2018, our generation subsidiaries purchased approximately 9 million barrels of fuel oil, substantial portion] of which was purchased from domestic refiners through competitive open bidding. Purchase prices are based on the spot market price in Singapore. The average cost per barrel was Won 53,842, Won 77,188 and Won 85,116 in 2016, 2017 and 2018, respectively.

LNG

LNG accounted for 10.7%, 8.7% and 11.2% of the fuel requirements for electricity generation by us and our generation subsidiaries in 2016, 2017 and 2018, respectively. In 2018, for use in electricity generation we purchased approximately 6 million tons of LNG from Korea Gas Corporation, a Government-controlled entity in which we currently own a 21.57% equity interest (excluding treasury shares). In 2018, we purchased a substantial portion of our LNG requirements for use in power generation from Korea Gas Corporation. Under the terms of the LNG contract

with Korea Gas Corporation, all of our five non-nuclear generation subsidiaries jointly and severally agreed to purchase a total of 5.2 million tons of LNG in 2018, subject to an automatic price adjustment

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annually based on a pre-determined formula if the actual purchased amount exceeds or falls short of the contracted amount. We believe the quantities of LNG provided under such contract will be adequate to meet the needs of our generation subsidiaries for LNG for the next several years. The LNG supply contracts between our generation subsidiaries and Korea Gas Corporation generally have a term of 20 years and provide for minimum purchase requirements for our generation subsidiaries, the specific terms of which are subject to negotiation between Korea Gas Corporation and our generation subsidiaries and approval by the Government. The average cost per ton of LNG was Won 594,662, Won 655,127 and Won 763,460, in 2016, 2017 and 2018, respectively.

Hydroelectric

Hydroelectric power generation accounted for 1.1%, 1.2% and 1.2%, of the fuel requirements for electricity generation by us and our generation subsidiaries in 2016, 2017 and 2018, respectively. The availability of water for hydroelectric power depends on rainfall and competing uses for available water supplies, including residential, commercial, industrial and agricultural consumption. Pumped storage enables us to increase the available supply of water for use during periods of peak electricity demand.

Sales and Customers

Our sales depend principally on the level of demand for electricity in Korea and the rates we charge for the electricity we sell to the end-users.

Demand for electricity in Korea grew at a compounded average rate of 2.1% per annum for the five years ended December 31, 2018. According to the Bank of Korea, the compounded growth rate for GDP was approximately 3.0% for the same period. The GDP growth rate was approximately 2.9%, 3.1% and 2.7% during 2016, 2017 and 2018, respectively.

The table below sets forth, for the periods indicated, the annual rate of growth in Korea s GDP and the annual rate of growth in electricity demand (measured by total annual electricity consumption) on a year-on-year basis.

	2014	2015	2016	2017	2018
Growth in GDP	3.3%	2.8%	2.9%	3.1%	2.7%
Growth in electricity consumption	0.6%	1.3%	2.8%	2.2%	3.6%

Electricity demand in Korea varies within each year for a variety of reasons other than the general growth in GDP demand. Electricity demand tends to be higher during daylight hours due to heightened commercial and industrial activities and electronic appliance use. Due to the use of air conditioning during the summer and heating during the winter, electricity demand is higher during these two seasons than the spring or the fall. Variation in weather conditions may also cause significant variation in electricity demand.

We do not use any marketing channels, including any special sales methods, to sell electricity to our customers, other than to install electricity meters on-site and take monthly readings of such meters, based upon which invoices are sent to our customers.

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Demand by the Type of Usage

The table below sets forth consumption of electric power, and growth of such consumption on a year-on-year basis, by the type of usage (in gigawatt hours) for the periods indicated.

	2014 (GWh)	YoY growth (%)	2015 (GWh)	YoY growth (%)	2016 (GWh)	YoY growth (%)	2017 (GWh)	YoY growth (%)	2018 (GWh)	YoY growth (%)	% of Total 2018
Residential	64,457	(2.1)	65,619	1.8	68,057	3.7	68,544	0.7	72,895	6.3	13.9
Commercial	100,761	(1.4)	103,679	2.9	108,617	4.8	111,298	2.5	116,934	5.1	22.2
Educational	7,438	(6.4)	7,691	3.4	8,079	5.1	8,316	2.9	8,678	4.3	1.6
Industrial	272,552	2.7	273,548	0.4	278,828	1.9	285,969	2.6	292,999	2.5	55.7
Agricultural	14,505	4.6	15,702	8.3	16,580	5.6	17,251	4.0	18,504	7.3	3.5
Street lighting	3,221	2.1	3,341	3.7	3,462	3.6	3,557	2.7	3,582	0.7	0.7
Overnight Power	14,658	(11.1)	14,075	(4.0)	13,416	(4.7)	12,811	(4.5)	12,557	(2.0)	2.4
Total	477,592	0.6	483,655	1.3	497,039	2.8	507,746	2.2	526,149	3.6	100.0

The industrial sector represents the largest segment of electricity consumption in Korea. Demand for electricity from the industrial sector was 292,999 gigawatt hours in 2018, representing a 2.5% increase from 2017, largely due to the increased volume of semiconductor and other exports, which resulted in increased industrial output and greater utilization of industrial plants. Demand for electricity from the commercial sector depends largely on the level and scope of commercial activities in Korea, which in recent years have resulted in increased office building construction, office automation and use of air conditioners and heaters. Demand for electricity from the commercial sector increased to 116,934 gigawatt hours in 2018, representing a 5.1% increase from 2017 largely due to the extreme weather conditions that have led to increased demand for heating and air conditioning. Demand for electricity from the residential sector is largely dependent on population growth and use of heaters, air conditioners and other electronic appliances. Demand for electricity from the residential sector increased to 72,895 gigawatt hours in 2018, representing a 6.3% increase compared to 2017, largely due to an increase in household electricity usage for air conditioning and heating.

Demand Management

Our ability to provide adequate supply of electricity is principally measured by the facility reserve margin and the supply reserve margin. The facility reserve margin represents the difference between the peak usage during a year and the installed capacity at the time of such peak usage, expressed as a percentage of such installed capacity. The supply reserve margin represents the difference between the peak usage in a year and the average available capacity at the time of such peak usage, expressed as a percentage of such peak usage. The following table sets forth our facility reserve margin and supply reserve margin for the periods indicated.

	2014	2015	2016	2017	2018
Facility reserve margin	16.3%	19.4%	17.6%	37.0%	26.7%
Supply reserve margin	11.5%	11.6%	8.5%	12.9%	7.7%

While we seek to meet the growing demand for electricity in Korea primarily by continuing to expand our generation capacity, we have also implemented several measures to curtail electricity consumption, especially during peak periods. We apply time-of-use and seasonality tariff, which are structured so that higher tariffs are charged at the time and months of peak demand to select types of customers, and we also apply a progressive rate structure for the residential use of electricity. We have several demand management programs to control demand and induce power conservation during peak hours and peak seasons such as providing incentives for reducing power consumption during peak hours.

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Electricity Rates

The Electric Utility Act and the Price Stabilization Act of 1975, each as amended from time to time, prescribe the procedures for the approval and establishment of rates charged for the electricity we sell. We submit our proposals for revisions of rates or changes in the rate structure to the Ministry of Trade, Industry and Energy. The Ministry of Trade, Industry and Energy then reviews these proposals and, following consultation with the Ministry of Economy and Finance and review by the Korea Electricity Commission, makes the final decision.

Under the Electric Utility Act and the Price Stabilization Act, electricity rates are established at levels that would enable us to recover our operating costs attributable to our basic electricity generation, transmission and distribution operations as well as receive a fair investment return on capital used in those operations.

In May 2014, in order to make conforming changes to the standards for determining the public utility rates and to further bolster the reasonableness of cost determination, the Ministry of Trade, Industry and Energy amended the standards for determining the electricity tariff rates. The main amendments include (i) recording as our cost of electricity (which forms part of our operating costs) the pretax income of our six generation subsidiaries (which was previously deducted from our operating costs), (ii) excluding from our rate base our equity interests in our six generation subsidiaries (which were previously included in the rate base discussed below), and (iii) when determining working capital, considering the actual time of our cost recovery (namely, the accounts receivable collection period and the accounts payable payment period).

For the purposes of rate approval, operating costs are defined as the sum of our operating expenses (which principally consists of cost of sales and selling and administrative expenses) and our adjusted income taxes.

Fair investment return represents an amount equal to the rate base multiplied by the rate of return.

Following the amendments to its computation methods in May 2014 as described above, the rate base is currently equal to the sum of:

- net utility plant in service (which is equal to utility plant minus accumulated depreciation minus revaluation reserve);
- the portion of working capital which is equal to the appropriate level of operating costs minus depreciation and other non-cash charges while taking into account the actual time of cost recovery; and
- the portion of construction-in-progress which is charged from our retained earnings.

The amounts used for the variables in the rates are those projected by us for the periods to be covered by the rate approval.

For the purpose of determining the fair rate of return, the rate base is divided into two components in proportion to our total shareholders equity and our total debt. The rate of return permitted in relation to the debt component of the rate base is set at a level designed to approximate the weighted average interest cost on all types of borrowing for the periods covered by the rate approval. The rate of return permitted in relation to the equity component of the rate base is set by applying the capital asset pricing model which takes account of the risk-free rate, the return on the Korea

Stock Price Index, KOSPI, a Korean equity market index, and the correlation of the stock price of our company with KOSPI. In 2016, the approved rate of return on the debt component of the rate base was 0.9% while the approved rate of return on the equity component of the rate base was 3.34%. As a result of such approved rates of returns, the fair rate of return in 2016 was determined to be 4.24%. The fair rates of return for 2017 and 2018 have not yet been determined.

The Electric Utility Act and the Price Stabilization Act do not specify a basis for determining the reasonableness of our operating expenses or any other items (other than the level of the fair investment return) for the purposes of the rate calculation. However, the Government exercises substantial control over our budgeting and other financial and operating decisions.

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In addition to the calculations described above, a variety of other factors are considered in setting overall tariff levels. These other factors include consumer welfare, our projected capital requirements, the effect of electricity tariff on inflation in Korea and the effect of tariff on demand for electricity.

From time to time, our actual rate of return on invested capital may differ significantly from the fair rate of return on invested capital assumed for the purposes of electricity tariff approvals, for reasons, among others, related to movements in fuel prices, exchange rates and demand for electricity that differ from what is assumed for determining our fair rate of return. For example, between 1987 and 1990, the actual rate of return was above the fair rate of return due to declining fuel costs and rising demand for electricity at a rate not anticipated for purposes of determining our fair rate of return. Similarly, depreciation of the Won against the U.S. dollar accounted for our actual rates of return being lower than the fair rate of return for the period from 1996 to 2000. For the period between 2006 and 2013, our actual rates of return were lower than the fair rate of return largely due to a general increase in fuel costs and additional facility investment costs incurred, the effects of which were not offset by timely increases in our tariff rates. Between 2014 and 2016, however, largely due to a decrease in fuel costs reflective of the drop in oil prices, our actual rate of return has surpassed the fair rate of return; however, substantially all of the resulting excess has been used to fund capital expenditure and repair and maintenance, as well as to offer tariff discounts to economically or otherwise disadvantaged households, and make investments in renewable energy and other environmental programs.

Partly in response to the variance between our actual rates of return and the fair rates of return, the Government from time to time increases the electricity tariff rates, but there typically is a significant time lag for the tariff increases as such increases requires a series of deliberative processes and administrative procedures and the Government also has to consider other policy considerations, such as the inflationary effect of overall tariff increases and the efficiency of energy use from sector-specific tariff increases.

Prior to November 2013, the Government from time to time effected tariff increases that typically covered all sectors, namely, residential, commercial and industrial, mainly in response to sustained increases in fuel prices. No cross-sector tariff increase has been implemented since November 2013 largely due to a general decline in fuel prices and relatively stable exchange rates. However, effective January 1, 2017, the Government made several adjustments to the existing rate structure in order to ease the burden of electricity tariff on residential consumers as well as promote the use of renewable energy. First, the progressive rate structure applicable to the residential sector, which applies a gradient of increasing tariff rates for heavier electricity usage, was changed from a six-tiered structure with the highest rate being no more than 11.7 times the lowest rate (which gradient system has been in place since 2005) into a three-tiered structure with the highest rate being no more than three times the lowest rate in order to reflect the changes in the pattern of electricity consumption and reduce the electricity charges payable by consumers. Second, the new tariff structure encourages energy saving by offering rate discounts to residential consumers that voluntarily reduce electricity consumption while charging special high rates to residential consumers with heavy electricity consumption during peak usage periods during the summer and the winter. Third, a temporary rate discount will apply during 2017 to 2019 to investments in environmentally friendly facilities such as energy storage systems, renewable energy and electric cars. The temporary rate discount to investments in energy storage systems and renewable energy was extended until 2020. Additionally, during July and August 2018, the Government reduced residential electricity charges by temporarily relaxing the application of the current tariff structure and offering higher rate discounts to economically or otherwise disadvantaged households to ease the burden on households that have significantly increased their use of air conditioners during a heatwave. Such adjustments may lower our revenues from the sale of electricity and accordingly have a material adverse effect on our results of operation and cash flows.

The tariff rates we charge for electricity vary among the different classes of consumers, which principally consist of industrial, commercial, residential, educational and agricultural consumers. The tariff also varies depending upon the voltage used, the season, the time of usage, the rate option selected by the user and, in the residential sector, the

amount of electricity used per household, as well as other factors. For example, we adjust for seasonal tariff variations by applying higher rates when demand tends to rise such as during the months of

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June, July and August (when the demand tends to rise due to increased use of air conditioning) and November, December, January and February (when demand tends to rise due to increased use of heating), which reflects the policy of the Korean government to cope with the rise in electricity demand during peak seasons by encouraging a more efficient use of electricity by customers. In addition, we provide discounts on tariff rates to certain users such as low income households.

Our current tariff schedule, which became effective as of January 1, 2017 reflecting the adjustments outlined above, is summarized below by the type of usage:

Industrial. The monthly basic charge varies from Won 5,550 per kilowatt to Won 9,810 per kilowatt depending on the type of contract, the voltage used and the rate option. The energy usage charge varies from Won 52.8 per kilowatt-hour to Won 196.6 per kilowatt-hour depending on the type of contract, the voltage used, the season, the time of day and the rate option.

Commercial. The monthly basic charge varies from Won 6,160 per kilowatt to Won 9,810 per kilowatt depending on the type of contract, the voltage used and the rate option. The energy usage charge varies from Won 53.7 per kilowatt-hour to Won 196.6 per kilowatt-hour depending on the type of contract, the voltage used, the season, the time of day and the rate option.

Residential. The monthly basic charge varies from Won 910 for electricity usage of less than 200 kilowatt hours to Won 7,300 for electricity usage in excess of 400 kilowatt hours. Residential tariff also includes an energy usage charge ranging from Won 93.3 to Won 280.6 per kilowatt-hour for electricity usage depending on the amount of usage and voltage. During the peak usage periods during the summer and the winter, namely the months of July and August and December to February, a higher energy usage charge of Won 709.5 per kilowatt-hour applies to residential consumers whose monthly electricity consumption exceeds 1,000 kilowatts hour.

Educational. The monthly basic charge varies from Won 5,230 per kilowatt to Won 6,980 per kilowatt depending on the voltage used and the rate option. The energy usage charge varies from Won 43.8 per kilowatt-hour to Won 160.4 per kilowatt-hour depending on the voltage used, the season and the rate option.

Agricultural. The monthly basic charge varies from Won 360 per kilowatt to Won 1,210 per kilowatt depending on the type of usage. The energy usage charge varies from Won 21.6 per kilowatt-hour to Won 41.9 per kilowatt-hour depending on the type of contract, the voltage used and the season.

Street-lighting. The monthly basic charge is Won 6,290 per kilowatt and the energy usage charge is Won 85.9 per kilowatt-hour. For electricity capacity of less than 1 kilowatt or for places where the installation of the electricity meter is difficult, a fixed rate of Won 37.5 per watt applies, with the minimum monthly charge of Won 1,220.

In 2001, as part of implementing the Restructuring Plan, the Ministry of Trade, Industry and Energy established the Electric Power Industry Basis Fund to enable the Government to take over certain public services previously

performed by us. In 2018, 3.7% of the tariff we collected from our customers was transferred to this fund prior to recognizing our sales revenue.

Power Development Strategy

We and our generation subsidiaries make plans for expanding or upgrading our generation capacity based on the Basic Plan, which is generally revised and announced every two years by the Government. In July 2015, the Government announced the Seventh Basic Plan relating to the future supply and demand of electricity, focusing on stable supply of electricity and increasing the portion of low carbon electricity supply sources, among others. To revise the Seventh Basic Plan, in December 2017, the Government announced the Eighth Basic Plan which are more environmentally focused than the Seventh Basic Plan and to be effective for the period from 2017 to 2031. The Eighth Basic Plan focuses on, among other things, (i) decreasing the reliance on nuclear and coal-

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based supply sources, (ii) increasing utilization of renewable energy sources and (iii) balancing the existing cost-based pool system of purchase of electricity with an environmentally-focused pool system. Furthermore, the Eighth Basic Plan includes the following implementing measures: (i) six new nuclear generation units in a planning stage would not be constructed, (ii) extension of life of 10 decrepit nuclear generation units would not be granted, (iii) Wolsong #1 unit is not counted as part of domestic energy generation capacity, (iv) seven decrepit coal-fired generation plants will be retired by 2022, (v) six other coal-fired generation plants shall be converted to LNG fuel use and (vi) domestic renewable energy generation capacity shall be expanded to 58.5 gigawatts by 2030.

In January 2014, prior to the announcement of the Seventh Basic Plan, the Ministry of Trade, Industry and Energy adopted the Second Basic National Energy Plan following consultations with representatives from civic groups, the power industry and academia. The Second Basic National Energy Plan, which is a comprehensive plan that covers the entire spectrum of energy industries in Korea, covers the period from 2014 to 2035 and focuses on the following six key tasks: (i) shifting the focus of energy policy to demand management with a goal of reducing the growth of electricity demand by 15% by 2035 through efficiency enhancement programs compared to the projected growth in the absence of such efficiency enhancement programs, (ii) establishing a geographically decentralized electricity generation system so as to reduce transmission losses with a goal of supplying at least 15% of total electricity through such system by 2035, (iii) applying latest greenhouse gas emission reduction technologies to newly constructed generation units in order to further promote safety and environmental friendliness, (iv) strengthening resource exploration and fuel procurement capabilities to enhance Korea s energy security, (v) ensuring stable supply of energy and increasing the portion of electricity supplied from renewable sources to 11% by 2035, (vi) reinforcing the system for stable supply of conventional energy, such as oil and gas, and (vii) introducing in 2015 an energy voucher system in lieu of a tariff discount system for the benefit of low-income consumers. In addition, the Second Basic National Energy Plan has revised the target level of electricity generated by nuclear sources as a percentage of total electricity generated to 29%, compared to 41% under the First Basic National Energy Plan announced in 2008, which covered the period from 2008 to 2030. In March 2018, the Government announced its plan to establish the Third Basic National Energy Plan and formed a working group consisting of government and industry officials and civilian experts. On November 7, 2018, the working group submitted its set of recommendations to the Ministry of Trade, Industry and Energy, and the formal discussions regarding the Third Basic National Energy Plan are ongoing.

We cannot assure that the Eighth Basic Plan, the Second Basic National Energy Plan or the respective plans to be subsequently adopted will successfully achieve their intended goals, the foremost of which is to ensure, through carefully calibrated capacity expansion and other means, balanced overall electricity supply and demand in Korea at to end users while promoting efficiency and environmental friendliness in the consumption and production of electricity. If there is significant variance between the projected electricity supply and demand considered in planning our capacity expansions and the actual electricity supply and demand or if these plans otherwise fail to meet their intended goals or have other unintended consequences, this may result in inefficient use of our capital, mispricing of electricity and undue financing costs on the part of us and our generation subsidiaries, among others, which may have a material adverse effect on our results of operations, financial condition and cash flows.

Capital Investment Program

The table below sets forth, for each of the years ended December 31, 2016, 2017 and 2018, the amounts of capital expenditures for the construction of generation, transmission and distribution facilities.

2016	2017	2018
	(In billions of Won)	

13,950	13,711	13,695

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The table below sets forth the currently estimated installed capacity for new or expanded generation units to be completed by our generation subsidiaries in each year from 2019 to 2021 based on the Eighth Basic Plan, as amended.

Year	Number of Units	Type of Units	Total Installed Capacity (Megawatts)
2019	2	Nuclear power	2,800
	2	LNG-combined	800
	13	Renewables	244
2020	1	Nuclear power	1,400
	1	LNG-combined	150
	14	Renewables	233
2021	1	Coal-fired	1,000
	15	Renewables	308

For the period from 2022 to 2024, our generation subsidiaries currently plan to complete two additional nuclear units with an aggregate installed capacity of 2,800 megawatts.

As part of our capital investment program, we also intend to add new transmission lines and substations, continue to replace overhead lines with underground cables and improve the existing transmission and distribution systems.

The actual number and capacity of generation units and transmission and distribution facilities we construct and the timing of such construction are subject to change depending upon a variety of factors, including, among others, changes in the Basic Plan, demand growth projections, availability and cost of financing, changes in fuel prices and availability of fuel, ability to acquire necessary plant sites, environmental considerations and community opposition.

The table below sets forth, for the period from 2019 to 2021, the budgeted amounts of capital expenditures pursuant to our capital investment program, which primarily consist of budgets for the construction of generation, transmission and distribution facilities and, to a lesser extent, renewable energy generation and new energy industry projects. The budgeted amounts may vary from the actual amounts of capital expenditures for a variety of reasons, including, among others, the implementation of the Eighth Basic Plan, changes in the number of units to be constructed, the actual timing of such construction, changes in rates of exchange between the Won and foreign currencies and changes in interest rates.

	2019	2020	2021	Total
		(in billions of Won)		
Generation[(1)]:				
Nuclear	4,040	3,462	3,173	10,675
Thermal	3,367	3,524	3,589	10,480
Renewables and others	1,202	2,297	3,001	6,500
Sub-total	8,609	9,283	9,763	27,655
Transmission and Distribution:				
Transmission	2,718	4,510	4,258	11,486
Distribution	3,434	3,097	3,064	9,595

Sub-total	6,152	7,607	7,322	21,081
Others[(2)]	2,070	2,248	1,719	6,037
Total	16,831	19,138	18,804	54,773

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Notes:

(1) The budgeted amounts for our generation facilities are based on the Eighth Basic Plan, as amended.
(2) Principally consists of investments in telecommunications and new energy industry projects, among others. In January 2016, the Ministry of Trade, Industry and Energy announced an initiative to promote the new energy industry by creating the New Energy Industry Fund, which is made up of funds sponsored by government-affiliated energy companies. We contributed Won 500 billion to the funds in 2016. The purpose of these funds is to invest in substantially all frontiers of the new energy industry, including renewable energy, energy storage systems, electric vehicles, small-sized self-sustaining electricity generation grids known as micro-grids , among others, as well as invest in start-up companies, ventures, small- to medium-sized enterprise and project businesses that engage in these businesses but have not previously attracted sufficient capital from the private sector.

Furthermore, as part of the Comprehensive Measures against Particulate Matter and the Eighth Basic Plan, announced by the Government in September 2017 and December 2017, respectively, the Government set forth the following policy directions relating to coal-fired generation units: (i) two coal-fired generation units scheduled for construction and four existing coal-fired generation units shall convert to LNG fuel use, (ii) in principle, construction of new coal-fired generation units shall not be planned, (iii) seven of the coal-fired generation units that are 30 years or older will be shut down on an accelerated schedule, (iv) beginning in 2018, coal-fired generation units that are 30 years or older shall temporarily cease operations from March through June of each year, (v) coal-fired generation units shall be put through comprehensive functional and environmental upgrades and (vi) coal-fired generation units shall be subject to emission standards that came into effect in January 2019 that are twice as more rigorous than the previous standards. Compliance with such measures is expected to result in our incurring significant costs.

We have financed, and plan to finance in the future, our capital investment programs primarily through net cash provided by our operating activities and financing in the form of debt securities and loans from domestic financial institutions, and to a lesser extent, borrowings from overseas financial institutions. In addition, in order to prepare for potential liquidity shortage, we and our generation subsidiaries maintain several credit facilities with domestic financial institutions in the aggregate amounts of Won 4,424 billion and US$383 million, the full amount of which was available as of December 31, 2018. We, KHNP, KOMIPO and KOWEPO also maintain global medium-term note programs in the aggregate amount of US$13 billion, of which approximately US$9 billion remains currently available for future drawdown. KOSEP also maintains an A$2 billion Australian dollar medium-term note program, of which approximately A$1.7 billion remains current available for future drawdown. See also Item 5.B. Liquidity and Capital Resources Capital Resources.

Environmental Programs

The Environmental Policy Basic Act, the Air Quality Preservation Act, the Water Quality Preservation Act, the Marine Pollution Prevention Act and the Waste Management Act, collectively referred in this annual report as the Environmental Acts, are the major laws of Korea that regulate atmospheric emissions, waste water, noise and other emissions from our facilities, including power generators and transmission and distribution units. Our existing facilities are currently in material compliance with the requirements of these environmental laws and international agreements, such as the United Nations Framework Convention on Climate Change, the Montreal Protocol on Substances that Deplete the Ozone Layer, the Stockholm Convention on Persistent Organic Pollutants and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. In order to foster

coordination among us and our generation subsidiaries in respect of climate change, we and 11 of our electricity-related subsidiaries formed the CEO Coordination Committee in June 2016.

We continuously endeavor to contribute to sustainable growth (whether as an economy, a society or an ecosystem) by actively taking actions that befit our social responsibility as a corporate citizen in the energy

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industry. For example, in 2005, we became the first public company in Korea to join the United Nations Global Compact, an international voluntary initiative designed to hold a forum for corporations, United Nations agencies, labor and civic groups to promote reforms in economic, environmental and social policies. As part of our involvement with such initiative, we issue an annual report named the Sustainability Report to disclose our activities from the perspectives of economy, environment and society, in accordance with the reporting guidelines of the Global Reporting Initiative, the official collaborating center of the United Nations Environment Program that works in cooperation with United Nations Secretary General. In recognition of our efforts and achievements to reduce carbon emissions in response to global climate change, in May 2013, we obtained the Carbon Trust Standard certification issued by Carbon Trust, a British nonprofit organization with the goal of establishing a sustainable, low carbon economy. In 2015, we obtained recertification from Carbon Trust by satisfying even more rigorous evaluation criteria. We are also a participant of the Carbon Disclosure Project, an international organization that promotes transparency in informational disclosure of carbon management process, and in 2016, 2017 and 2018 we were recognized by the Carbon Disclosure Project and received honors in energy and utility sector. In 2016, 2017 and 2018, pursuant to the Dow Jones Sustainability Indices, which measures management performance in terms of contribution to sustainability, we were selected as one of the notable companies in the Asia Pacific in the global electricity utility sector. We aim to become a global leader in carbon management and reduction.

The table below sets forth the number of emission control equipment installed at thermal power plants by our generation subsidiaries as of December 31, 2018.

	KOSEP	KOMIPO	KOWEPO	KOSPO	EWP
Flue Gas Desulphurization System	14	12	14	15	18
Selective Non-catalytic Reduction System	1				8
Selective Catalytic Reduction System	14	22	16	14	18
Electrostatic Precipitation System	16	14	14	14	18
Low NO2 Combustion System	22	28	25	30	29
Total	67	76	69	73	91

In accordance with the Act on Allocation and Trading of Greenhouse Gas Emission Allowances, enacted in March 2013, the Government is currently in the process of implementing a carbon emission trading system under which the Government will allocate the amount of permitted carbon emission to companies by industry and a company whose business emits more carbon than the permitted amount may purchase the right to emit more carbon through the carbon emission trading exchange. This system is expected to be implemented in three stages. During the first phase (2015 to 2017), the Government set up and made a test run of the trading system to ensure its smooth operation; during this phase, the carbon emission rights were allocated without charge. In July 2018, the Government released the allocation plan for the second phase (2018 to 2020). During the second phase, 97% of the carbon emission rights may be allocated freely, with 3% allocated through an auction. During the third phase (2021 to 2025), the Government plans to run the system on an expanded scale with aggressive carbon emission reduction targets, with 10% of the carbon emission rights allocated through an auction. In December 2016, the Government announced the Climate Change Response Initiatives and 2030 National Greenhouse Gas Reduction Roadmap, which set forth the carbon emission trading system as one of the primary means to reach the emission and greenhouse gas reduction targets of the policies. The 2030 National Greenhouse Gas Reduction Roadmap was amended on July 24, 2018 and sets forth a national target of greenhouse gas level as 536 million tons in the aggregate, representing a 37% reduction from the base case projection of greenhouse gas in 2030. In the electricity conversion sector, for which greenhouse gas reduction of 24 million tons (with a potential additional reduction of 34 million tons) is requested by year 2030, and our business is

classified as part of this sector. The additional potential reduction amount will be confirmed prior to the finalization of the Government s 2020 Nationally Determined Contributions (NDCs). Adhering to such emission and greenhouse gas reduction requirement is expected to result in our incurring significant compliance costs.

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The table below sets forth the amount of annual emission from all generating facilities of our generation subsidiaries for the periods indicated. The amount of CO_2 emissions may increase in the near future due to the construction of additional coal thermal power plants but is expected to decrease in the long-term, principally due to an increased use of nuclear power and renewable energy and the implementation of the carbon emission trading system.

Year[1]	SOx (g/MWh)	NOx (g/MWh)	TSP[2] (g/MWh)	CO_2 (kg/MWh)
2015	165	266	8	464
2016	156	246	7	477
2017	138	177	7	506

Notes:

(1) The amounts of annual emission for 2018 are expected to be determined in June 2019.
(2) TSP means Total Suspended Particles.

In order to comply with the current and expected environmental standards and address related legal and social concerns, we intend to continue to install additional equipment, make related capital expenditures and undertake several environment-friendly measures to foster community goodwill. For example, under the Persistent Organic Pollutants Management Act enacted in 2007, we are required to remove polychlorinated biphenyl, or PCB, a toxin, from the insulating oil of our transformers by 2025. In addition, when constructing certain large new transmission and distribution facilities, we assess and disclose their environmental impact at the planning stage of such construction, as well as consult with local residents, environmental groups and technical experts to generate community support for such projects. We exercise additional caution in cases where such facilities are constructed near ecologically sensitive areas such as wetlands or preservation areas. We also make reasonable efforts to minimize any negative environmental impact, for example, by using more environment-friendly technology and hardware. In addition, we also undertake measures to minimize losses during the transmission and distribution process by making our power distribution network more energy-efficient in terms of loss of power, as well as to lower consumption of energy, water and other natural resources. In addition, we and our subsidiaries acquired the ISO 14000 certification, an environmental management system widely adopted internationally, in 2007 and have made it a high priority to make our electricity generation and distribution more environmentally friendly. In addition to the ISO 14000 certification, we further reinforced our environmental management system by acquiring the ISO 14001 certification as well as a domestic GMS (Green Management System), KS I 7001/7002 certification, which relates to the management of resources, energy, green house effects and social responsibilities, in 2013. In 2014, we were awarded the presidential award for environmental contributions as a corporate citizen, after scoring the highest among 102 corporations that competed for the award. In order to encourage the implementation of environment-friendly measures by other corporations and enhance environmental awareness at a social level, we have been disclosing our environment-related activities and achievements to the public through the Environment Information System managed by the Ministry of Environment since 2012.

Our environmental measures, including the use of environment-friendly but more expensive parts and equipment and allocation of capital expenditures for the installation of such facilities, may result in increased operating costs and liquidity requirement. The actual cost of installation and operation of such equipment and related liquidity requirement will depend on a variety of factors which may be beyond our control. There is no assurance that we will

continue to be in material compliance with legal or social standards or requirements in the future in relation to the environment.

As part of our long-term strategic initiatives, we plan to take other measures designed to promote the generation and use of environmentally friendly, or green, energy. See Item 4.B. Business Overview Strategy.

Some of our generation facilities are powered by renewable energy sources, such as solar energy, wind power and hydraulic power. While such facilities are currently insignificant as a proportion of our total

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generation capacity or generation volume of our generation subsidiaries, we expect that the portion will increase in the future, especially since we are required to comply with the Renewable Portfolio Standard program as described below.

The following table sets forth the generation capacity and generation volume in 2018 of our generation facilities that are powered by renewable energy sources.

	Generation Capacity (megawatts)	Generation Volume (gigawatt-hours)
Hydraulic Power[1]	651	1,276
Wind Power	140	195
Solar Energy, Fuel Cells, Biogas and others	788	3,468
Subtotal	1,579	4,939
As percentage of total[2]	1.9%	1.2%

Notes:

(1) Excluding generation capacity and volume of pumped storage, which is generally not classified as renewable energy.
(2) As a percentage of the total generation capacity or total generation volume, as applicable, of us and our generation subsidiaries.

In order to deal with shortage of fuel and other resources and also to comply with various environmental standards, in 2012 the Government adopted the Renewable Portfolio Standard program, which replaced the Renewable Portfolio Agreement which had been in effect from 2006 to 2011. Under this program, each of our generation subsidiaries is required to generate a specified percentage of total electricity to be generated by such generation subsidiary in a given year in the form of renewable energy or, in case of a shortfall, purchase a corresponding amount of a Renewable Energy Certificate (a form of renewable energy credit) from other generation companies whose renewable energy generation surpass such percentage. The target percentage was 4.0% in 2017, 5.0% in 2018 and 6.0% in 2019 and will incrementally increase to 10.0% by 2023. Fines are to be levied on any subsidiary that fails to do so in the prescribed timeline. In 2017, all six of our generation subsidiaries met the target through renewable energy generation and/or the purchase of a Renewable Energy Certificate. Compliance by our generation subsidiaries of the 2018 target is currently under evaluation, and if any generation subsidiary is found to have failed to meet the target for 2018 or for subsequent years, such generation subsidiary may become subject to fines.

As to how we plan to finance our capital expenditures related to our environmental programs, see Capital Investment Program.

In March 2017, the Electric Utility Act was amended to the effect that starting in June 2017, future national planning for electricity supply and demand in Korea should consider the environmental and safety impacts of such planning. However, to-date, no specific guidelines have been provided by the Government as to how to implement this provision, and it is therefore difficult to assess in advance what impact such provision will have on our business, results of operations or financial condition. However, the amendment will likely lead to the expansion of our environmental programs.

Furthermore, under the new electricity rate structure effected by the Government effective January 1, 2017, a temporary rate discount will apply in the case of investments in environmentally friendly facilities such as energy storage systems, renewable energy and electric cars. The temporary rate discount will apply during 2017 to 2019 to investments in environmentally friendly facilities such as energy storage systems, renewable energy and electric cars. The temporary rate discount to investments in energy storage systems and renewable energy was extended until 2020.

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Community Programs

Building goodwill with local communities is important to us in light of concerns among the local residents and civic groups in Korea regarding construction and operation of generation units, particularly nuclear generation units. The Act for Supporting the Communities Surrounding Power Plants and the Act on the Compensation and Support for Areas Adjacent to Transmission and Substation Facilities require that the generation companies and the affected local governments carry out various activities up to a certain amount annually to address neighboring community concerns. Pursuant to these Acts, we and our generation subsidiaries, in conjunction with the affected local and municipal governments, undertake various programs, including scholarships and financial assistance to low-income residents.

Under the Act for Supporting the Communities Surrounding Power Plants, activities required to be undertaken under the Act are funded partly by the Electric Power Industry Basis Fund (see Sales and Customers Electricity Rates) and partly by KHNP as part of its budget. KHNP is required to make annual contributions to the affected local communities in an amount equal to Won 0.25 per kilowatt-hour of electricity generated by its nuclear generation units during the one-year period before the immediately preceding fiscal year, Won 5 million per thousand kilowatts of hydroelectric generation capacity and Won 0.5 million per thousand kilowatts of pumped-storage generation capacity. In addition, under Korean tax law, KHNP is required to pay local tax levied on its nuclear generation units in an amount equal to Won 1 (effective January 1, 2015, which reflects an increase from the previous Won 0.5 per kilowatt-hour of their generation volume in the affected areas) and Won 2 per 10 cubic meters of water used for hydroelectric generation.

The Act on the Compensation and Support for Areas Adjacent to Transmission and Substation Facilities, enacted in January 2014 with effect from July 2014, prescribes measures to be taken by power generation or transmission companies with respect to the communities adjacent to transmission and substation facilities. Under this Act, those who own land or houses in the vicinity of transmission lines and substation may claim compensation for damages or compel purchase of such properties by the power generation or transmission companies which are legally obligated in principle to pay for such damages or purchase such properties. In addition, under this Act, residents of communities adjacent to transmission and substation facilities are entitled to subsidies on electricity tariff as well as support for a variety of welfare projects and collective business ventures.

Prior to the construction of a generation unit, our generation subsidiaries perform an environmental impact assessment which is designed to evaluate public hazards, damage to the environment and concerns of local residents. A report reflecting this evaluation and proposing measures to address the problems identified must be submitted to and approved by the Ministry of Trade, Industry and Energy following agreement with related administrative bodies, including the Ministry of Environment prior to the construction of the unit. Our generation subsidiaries are then required to implement the measures reflected in the approved report. Despite these activities, civic community groups may still oppose the construction and operation of generation units (including nuclear units), and such opposition could adversely impact our construction plans for generation units (including nuclear units) and have a material adverse effect on our business, results of operations and cash flow.

Upon relocation of our corporate headquarters in November 2014, we developed and established Bitgaram Energy Valley as a smart energy hub city in Gwangju and Jeollanamdo, to attract and facilitate the growth of start-ups and research institutions related to new energy industries while contributing to the local economy, balanced regional development and job creation. To achieve this goal, we provide funding, business networks and research and development assistance to companies which entered into investment contracts with us. As of March 31, 2019, we had signed agreements with 360 companies relating to investments in the Bitgaram Energy Valley, and we currently aim to increase the total number of companies investing in the Bitgaram Energy Valley to 430 companies by the end of 2019 and 500 companies by the end of 2020.

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Nuclear Safety

KHNP takes nuclear safety as its top priority and continues to focus on ensuring the safe and reliable operation of nuclear power plants. KHNP also focuses on enhancing corporate ethics and transparency in the operation of its plants.

KHNP has a corporate code of ethics and is firmly committed to enhancing nuclear safety, developing new technologies and improving transparency. KHNP has also established the Statement of Safety Policy for Nuclear Power Plants to ensure the highest level of nuclear safety. Furthermore, KHNP invests approximately 5% of its total annual sales into research and development for the enhancement of nuclear safety and operational performance.

KHNP implements comprehensive programs to monitor, ensure and improve safety of nuclear power plants. In order to enhance nuclear safety through risk-informed assessment, KHNP conducts probabilistic safety assessments, including for low power-shutdown states, for all its nuclear power plants. In order to systematically verify nuclear safety and identify the potential areas for safety improvements, KHNP performs periodic safety reviews on a 10-year frequency basis for all its operating units. These reviews have been completed for Kori #1, #2, #3, #4; Hanbit #1, #2, #3, #4, #5, #6; Wolsong #1, #2, #3 and #4; and Hanul #1, #2, #3, #4, #5, #6 once or more. Reviews for Wolsong #3, #4 and Hanul #1, #2, #3, #4 are in progress. In order to enhance nuclear safety and plant performance, KHNP has established a maintenance effectiveness monitoring program based on the maintenance rules issued by the United States Nuclear Regulatory Commission, which covers all of KHNP s nuclear power plants in commercial operation.

KHNP has developed the Risk Monitoring System for operating nuclear power plants, which it implements in all of its nuclear power plants. The Risk Monitoring System is intended to help ensure nuclear plant safety. In addition, KHNP has developed and implemented the Severe Accident Management Guidelines and is developing the Severe Accident Management Guidelines for Low Power-Shutdown States in order to manage severe accidents for all of its nuclear power plants.

KHNP conducts various activities to enhance nuclear safety such as quality assurance audits and reviews by the KHNP Nuclear Review. KHNP maintains a close relationship with international nuclear organizations in order to enhance nuclear safety. KHNP invites international safety review teams such as the World Association of Nuclear Operators (WANO) Peer Review Team to its nuclear plants for purposes of meeting international standards for independent review of its facilities. KHNP actively exchanges relevant operational information and technical expertise with its peers in other countries. For example, KHNP conducted three WANO Peer Reviews for Hanbit #5 and #6 units, Wolsong #1 and #2 units as well as Shin-Kori #1 and #2 units in 2018. KHNP also invited second WANO Pre-Startup Peer Review Team at Shin-Kori #4 unit in 2018. The recommendations and findings from this event were shared with KHNP s other nuclear plants to implement improvements at such plants. In addition, KHNP has applied for the Operational Safety Review Team at the International Atomic Energy Agency to conduct a mission at Shin-Kori #3 and #4 units in the second half year of 2020. The purpose of such application was to ensure that KHNP nuclear generation units reflect the global safety standards.

The average level of radiation dose per unit amounted to a relatively low level of 0.36 man-Sv in 2018, which was substantially lower than the global average of 0.49 man-Sv/year in 2018 as reported in the WANO performance indicator report.

In response to the damage to the nuclear facilities in Japan as a result of the tsunami and earthquake in March 2011, the Government conducted additional safety inspections on nuclear power plants by a group of experts from governmental authorities, civic groups and academia. As a result of such inspections, the Government required KHNP to perform 46 comprehensive safety improvement measures. As of December 31, 2018, KHNP has completed

implementation of 43 measures and will implement the three remaining measures by 2020. The Government also established the Nuclear Safety & Security Commission in October 2011 for neutral

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and independent safety appraisals. KHNP developed ten additional measures through benchmarking of overseas cases and internal analysis of current operations. As of December 31, 2018, KHNP has completed implementation of eight measures and will implement the two remaining measures by 2021.

From time to time, our nuclear generation units may experience unexpected shutdowns. For example, on September 12, 2016, multiple earthquakes including a magnitude 5.8 earthquake hit the city of Gyeongju, a home to KHNP s headquarters and Wolsong Nuclear Power Plant. Although there was no material safety issues, KHNP had manually stopped the operations of Wolsong Nuclear Power Plant units #1, 2, 3, and 4 according to the safety guidelines. All units have resumed their operations on December 5, 2016, with the approval by the Nuclear Power Safety Commission. KHNP continues to implement measures to improve the safety by reinforcing seismic capability of its core facilities and performing stress tests across all its nuclear power plants. In 2018, KHNP finished the implementation of such measures for 24 units and enhanced seismic design of the core facilities to withstand a magnitude 7.0 earthquake (6.5 before implementation). As for the units under construction (Shin-Kori#5 and #6), the core facilities will be able to withstand a magnitude 7.4 earthquake.

Low and intermediate level waste, or LILW, and spent fuels are stored in temporary storage facilities at each nuclear site of KHNP. The temporary LILW storage facilities at the nuclear sites had been sufficient to accommodate all LILWs produced up to 2015. Korea Radioactive Waste Agency (KORAD) completed the construction of a LILW disposal facility in the city of Gyeongju, and government approval for its operations was obtained in December 2014.

In order to increase the storage capacity of temporary storage facilities for spent fuels, KHNP has been pursuing various projects, such as installing high-density racks in spent fuel pools and building dry storage facilities. Through these activities, we expect that the storage capacity for spent fuels in all nuclear sites will be sufficient to accommodate all the spent fuels produced by 2019. The policy for spent fuel management options is currently under development.

In 2009, the Radioactive Waste Management Act (RWMA) was enacted in order to centralize management of the disposal of spent fuel and LILW and enhance the security and efficiency of related management processes. The RWMA designates KORAD to manage the disposal of spent fuels and LILW. Pursuant to the RWMA, the Government has established the Radioactive Waste Management Fund. The management expense for LILW is paid when LILW is transferred to KORAD, and the charge for spent fuel is paid based on the quantity generated every quarter. LILW-related management costs and charges for spent fuel are reviewed by the Ministry of Trade, Industry and Energy every two years. In December 2017, after the review by the committee composed of Government officials, KHNP, Korea Radioactive Waste Management Corporation and experts in finance and accounting, LILW-related management costs were increased while charges for spent-fuel remained the same. The change in LILW-related management costs caused an increase in KHNP s expenses relating to radioactive waste.

All of KHNP s nuclear plants are currently in compliance with Korean law and regulations and the safety standards of the IAEA in all material respects. For a description of certain past incidents relating to quality assurance in respect of KHNP, see Item 3.D. Risk Factors Our risk management policies and procedures may not be fully effective at all times.

Decommissioning

Decommissioning of a nuclear power unit is the process whereby the unit is shut down at the end of its life, the fuel is removed and the unit is eventually dismantled. KHNP implements a dismantling policy under which dismantling would take place five to ten years after the unit s closure. KHNP renewed the operating license of Kori #1, the first nuclear power plant constructed in Korea, which commenced operation in 1978, for an additional ten years in 2007.

At the recommendation of the Ministry of Trade, Industry and Energy, KHNP has decided not to renew the operating license of Kori #1 and the initial phase of decommissioning (namely, safety

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inspection and removal of spent fuels) of Kori #1 has begun after its permanent shutdown in June 2017. In February 2015, KHNP also renewed the operation license of Wolsong #1 (which originally expired in November 2012) for an additional ten years until 2022. In June 2015, reactivation of Wolsong #1 was approved by the NSSC after periodic inspection. However, a civic group has since then brought a lawsuit to reverse such approval, and in February 2017, a lower court ruled to annul the NSSC s approval, which ruling has since been appealed. On June 15, 2018, the board of directors of KHNP decided to (i) retire Wolsong #1 unit earlier than planned due to its economic inefficiency and (ii) discontinue the construction of Chunji #1 and #2 as well as Daejin #1 and #2 units. As of December 31, 2018, impairment loss in connection with the property, plant and equipment of Wolsong #1 unit was Won 570,408 million and the provision for decommissioning costs of Wolsong #1 increased by Won 28,196 million, as the timing of actual cash outflows was accelerated due to the shortened operating period. As of December 31, 2018, impairment loss in connection with the property, plant and equipment of Chunji #1 and #2 as well as Daejin #1 and #2 units amounted to Won 38,886 million. Although the board of directors did not make any decisions regarding Shin-Hanul #3 and #4 units, which are new nuclear plants under construction, we cannot assure you that the construction of these units will not be discontinued. As of December 31, 2018, impairment loss in connection with the property, plant and equipment of Shin-Hanul #3 and #4 units was Won 132,725 million. KHNP retains full financial and operational responsibility for decommissioning its units.

KHNP has accumulated decommissioning costs as a liability since 1983. The decommissioning costs of nuclear facilities are defined by the Radioactive-Waste Management Act, which requires KHNP to credit annual appropriations separately. These costs are estimated based on studies conducted by the relevant committees, and are reviewed by the Ministry of Trade, Industry and Energy every two years. In 2017, the actual discount rates decreased and the decommissioning cost per unit increased. As of December 31, 2018, KHNP was required to accrue Won 16,240 billion for the costs of dismantling and decontaminating existing nuclear power plants, which consisted of dismantling costs of nuclear plants of Won 13,388 billion and dismantling costs of spent fuel and radioactive waste of Won 2,852 billion. For accounting treatment of decommissioning costs, see Item 5.A. Operating Results Critical Accounting Policies Decommissioning Costs.

Overseas Activities

We are engaged in a number of overseas activities. We believe that such activities help us diversify our revenue streams by leveraging the operational experience of us and our subsidiaries gathered from providing a full range of services, such as power plant construction and specialized engineering and maintenance services in Korea, as well as establishing strategic relationships with countries that are or may become providers of fuels.

Throughout the years, we have sought to expand our project portfolio to include the construction and operation of conventional thermal generation units, nuclear generation units and renewable energy power plants, transmission and distribution and mining and development of fuel sources. While strategically important, we believe that our overseas activities, as currently being conducted, are not in the aggregate significant in terms of scope or amount compared to our domestic activities. In addition, a number of the overseas contracts currently being pursued are based on non-binding memoranda of understanding and the details of such projects may significantly change during the course of negotiating the definitive agreements.

Below is a description of our major overseas projects.

Generation projects

Nuclear Generation Project

In December 2009, following an international open bidding process, we entered into a prime contract for the original contract amount of US$18.6 billion with the Emirates Nuclear Energy Corporation (ENEC), a state-

owned nuclear energy provider of the United Arab Emirates (UAE), to design and construct four civil nuclear power generation units to be located in Barakah, a region approximately 270 kilometers from Abu Dhabi, for the UAE s peaceful nuclear energy program. Under the contract, we and our subcontractors, some of which are our subsidiaries, are to perform various duties including, among others, designing and constructing four nuclear power generation units each with a capacity of 1,400 megawatts, supplying nuclear fuel for three fuel cycles including initial loading, with each cycle currently projected to last for approximately 18 months, and providing technical support, training and education related to plant operation. In connection with the parties execution of an amendment to the prime contract, the target completion dates for the four units were amended to range between December 2018 and December 2020. The contract amount of US$18.6 billion was increased to US$19.1 billion, and the amendment was signed in November 2017.

On October 20, 2016, in order to foster a long-term strategic partnership and stable management of the units post-construction we entered into an investment agreement with ENEC to jointly establish Barakah One PJSC, a special purpose company which will oversee the operation and management of the nuclear power plant currently being constructed in Barakah, United Arab Emirates. Barakah One PJSC is capitalized with loans in the amount of US$19.6 billion and equity of US$4.7 billion. We have a 18% equity interest in Barakah One PJSC, and also have a 18% equity interest in Nawah Energy Company, a subsidiary of ENEC, which will also be responsible for the operation and maintenance of the Barakah nuclear power plant. On December 20, 2018, the board of directors of KEPCO resolved to invest additional US$380 million in Barakah One PJSC. With the additional investment, KEPCO s total capital investment amount in Barakah One PJSC is expected to be US$1.28 billion. KEPCO s equity interest in the project is 18%, which remains unchanged. The total project cost of the construction and operation of the Barakah nuclear power plant is expected to be approximately US$29.5 billion, and the operational period is expected to be 60 years after the project commercial operation date in 2025. Actual capital contribution is currently scheduled to be made in September 2025.

Non-nuclear Generation Projects

We are currently engaged in three major power projects in the Philippines: (i) a build, operate and transfer of a 1,200-megawatt combined-cycle power plant project in Ilijan, construction of which began in November 1997 and was completed in June 2002 and which is being operated by us until 2022 (the project cost of the Ilijan project was US$721 million, for which project finance on a limited recourse basis was provided), (ii) ownership of a 39.6% equity interest in SPC Power Corporation, an independent power producer, and a 39.6% equity interest in two distribution companies in the Philippines, and (iii) a build, operate and own of a 200-megawatt CFBC coal power plant in Cebu for which construction began in February 2008 and was completed in May 2011, followed by operation thereof until 2036. The project cost of the Cebu project was US$451 million, for which project financing on a limited recourse basis was provided.

In April 2007, we formed a limited partnership with Shanxi International Electricity Group and Deutsche Bank in China to develop and operate power projects and coal mines in Shanxi province, China, which was approved by the Chinese government. The total capital investment in these projects amounted to US$1.33 billion, of which our capital investment was US$450 million. We are expected to participate in the operation of the project for a period of 50 years ending 2057. The total installed capacity of these projects is 6,532 megawatts and capacity under construction was 2,603 megawatts, and our equity interest in the partnership was 34%.

In July 2008, a consortium consisting of us and Xenel of Saudi Arabia won the bid to build, own and operate a gas-fired power plant with installed capacity of 373 megawatts in Al Qatrana, near Amman, and we entered into definitive agreements in October 2009. Construction of this project was completed in December 2011, and the plant is currently in operation and will be operated until 2035. The total project cost was US$461 million, of which the

consortium made an equity contribution of US$143 million and the remainder was funded with debt financing. We and Xenel own 80:20 equity interests in the project, respectively.

In December 2008, we formed a consortium with ACWA Power International of Saudi Arabia and submitted a bid for the 1,204 megawatt oil-fired power project in Rabigh, Saudi Arabia. In March 2009, we were

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selected as the preferred bidder, and in July 2009, we entered into a power purchase agreement with Saudi Electricity Company. Construction of the project was completed in April 2013, and we will participate in the operation of the plant for 20 years. The total project cost was approximately US$2.5 billion. We currently hold a 40.0% equity interest in the joint venture entity, Rabigh Electricity Company, which operates the project.

In August 2010, a consortium led by us was selected as the preferred bidder in an international auction for the construction and operation of the Norte II gas-fueled combined-cycle electricity generation facility in Chihuahua, Mexico, as ordered by the Commission Federal de Electricidad (CFE) of Mexico. The consortium established a special purpose vehicle, KST Electric Power Company (KST), to act as the operating entity, and in September 2010, KST entered into a power purchase agreement with CFE in relation to the construction and operation of a 433-megawatt combined-cycle power plant at Chihuahua in Mexico. In October 2010, KST was licensed by the Mexican government as an independent power producer, which allows it to produce and sell electricity to CFE during the specified contract period. The project will be undertaken on a build, own and operate basis. The total cost of the project is approximately US$430 million. We hold a 56% equity interest in the consortium, with the remaining equity interests held by Samsung C&T (with a 34% equity interest) and Techint, a Mexico company (with a 10% equity interest). Approximately 24% of the total project costs is being financed through equity investments by the consortium and the remaining 77.5% through project financing. Commercial operation commenced in December 2013, and the operation period will run for 25 years until 2038. Our wholly-owned subsidiary, KEPCO Energy Service Company, currently manages the operation of the project.

In October 2010, a consortium including us was selected by Abu Dhabi Water & Electricity Authority (ADWEA), a state-run utilities provider in the UAE, as the preferred bidder in an international bidding for the construction and operation of the combined-cycle natural gas-fired electricity generation facilities in Shuweihat, UAE with aggregate capacity of 1,600 megawatts. Construction was completed in July 2014 and we will participate in the operation of the plant until 2039. The total project cost was approximately US$1.4 billion, of which 20% was financed through equity investments by the consortium members and the remaining 80% through debt financing. Equity interests in the consortium are owned by ADWEA (60.0%), Sumitomo (20.4%) and us (19.6%). The total amount of our equity investment in the project is approximately US$56 million.

In January 2012, a consortium consisting of us, Mitsubishi Corporation and Wartsila Development & Financial Services of Finland was selected by National Electric Power Corporation, a state-run electricity provider in Jordan, to construct and operate a diesel engine power project in Almanakher with an expected total generation capacity of 573 megawatts. Construction of this project was completed in October 2014 and the plant is currently in operation and will be operated until 2039. The total project cost was approximately US$760 million, of which the consortium made an equity contribution of approximately US$190 million and the remainder was funded with debt financing. We, Mitsubishi Corporation and Wartsila Development & Financial Services own 60:35:5 equity interests in the project, respectively. Our equity investment in this project is US$104 million.

In March 2013, a consortium consisting of us and Marubeni, a Japanese corporation, was selected by the Ministry of Industry and Trade of Vietnam for the construction and operation of a 1,200 megawatt coal-fired power plant in Thanh Hoa province, Vietnam. We started construction in July 2018 and to complete completion by July 2022, followed by operation for 25 years. The total project cost is expected to be US$2.5 billion, of which 24% will be funded by equity contribution and the remaining 76% by debt financing. The share capital of the special purpose entity in charge of this project is US$568 million, and we and Marubeni each hold 50% equity interest in such entity.

On October 6, 2016, a consortium comprised of us, Marubeni Corporation and four local entities, with equity interest in the consortium of 24.5%, 24.5% and 51.0%, respectively, was notified that it has been selected by the Republic of South Africa Department of Energy as the preferred bidder for the construction and operation project of a coal-fired

power plant in the Republic of South Africa. Once negotiations and financing arrangements are completed, the construction of the coal-fired power plant is expected to commence. The plant is

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expected to have an aggregate capacity of 630 megawatts, and construction is expected to take 52 months to complete. The consortium plans to participate in the operation of the plant for a period of 30 years from the commercial operation date. The total cost of the project is estimated to be around US$2.14 billion, of which our total capital investment is expected to be approximately US$133 million. In connection with the project, we plan to establish a holding company and a project company in the Republic of South Africa.

On September 28, 2017, we entered into a joint development agreement with Tadmax Resources Bhd, a Malaysian corporation, in relation to a gas-fired power plant with capacity of 1,200 megawatts in Pulau Indah, Malaysia. We obtained approval for this project from Malaysian Energy Commission, the project sponsor. We will hold a 25% equity interest in this project, and Tadmax Resources Bhd will hold a 75% equity interest in it. The total project cost is expected to be approximately US$1 billion, and we expect to invest approximately US$50 million for the equity interest. Upon closing of the financing, the construction for this project will begin in the fourth quarter of 2019, following the approval of the applicable tariff rates by the Malaysian Energy Commission, which is currently expected to occur in the second quarter of 2019. This project marks our first entry into the Malaysian power generation market. We expect to enter into a power purchase agreement with Tenaga Nasional Berhad for a term of 21 years, with a goal of generating a stable revenue stream from this project.

Exploration and Production Projects

In order to secure a more reliable supply of fuel for power generation and hedge against fluctuations in fuel price, from 2007 to 2016, we pursued overseas exploration and production projects, including five bituminous coal projects and five uranium projects involving investments of approximately Won 1.4 trillion. However, pursuant to the Government s Proposal for Adjustment of Functions of Public Institutions (Energy Sector) announced in June 2016, as of December 31, 2016, except for the Bylong project described below, we transferred all our assets and liabilities for our overseas resource business to our six generation subsidiaries, which are the end-consumers of fuels and are therefore expected to more responsively manage these projects. The amount of net assets that we transferred to our generation subsidiaries as of December 31, 2016 was Won 622 billion.

Some of the assets transferred include our equity interest in PT Adaro Energy TBK, which is one of the largest coal producers in Indonesia, as well as our 20% equity interest in PT. Bayan Resources Tbk pursuant to which we were entitled to an off-take of 7 million tons per year beginning in 2015.

One exception to the transfers on such date was our 90% equity interest in KEPCO Bylong Pty Ltd., for which we are currently processing a development application and mining leases from the New South Wales government and Environment Protection and Biodiversity Conservation referral from Australian (Commonwealth) government. After the approval of such permit, we and our generation subsidiaries expect to make additional investment (expected to amount to approximately US$400 million paid pro rata by us and our generation subsidiaries over the course of three years). Commercial production is expected to commence in 2021. We transferred 10% of our equity interest in the KEPCO Bylong Pty Ltd. to our five non-nuclear generation subsidiaries as of December 31, 2016, and we plan to gradually transfer the remainder of our interest in the KEPCO Bylong Pty Ltd. to them subject to the progress of the regulatory approval process and resource production phase of the project.

Our nuclear generation subsidiary, KHNP, is also pursuing development projects for procurements of uranium in countries including Canada, the United States and Niger.

Renewable Energy Projects

Our overseas renewable energy projects include the generation of electricity through renewable energy sources.

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Since 2005, joint ventures between us and China Datang Corporation of the People s Republic of China have built and operated a number of wind farms in Inner Mongolia, Liaoning and Gansu provinces. We own 40% of these joint ventures, whose equity in the aggregate amount is approximately US$450 million. The projects are funded one-third by equity contributions and two-thirds by debt financing. As of December 31, 2018, the joint venture operated 22 wind farms with a total capacity of 1,017 megawatts and a 7-megawatt photovoltaic power station.

In December 2015, we entered into an agreement with the Ministry of Energy and Mineral Resources of Jordan to build, own and operate a wind farm with installed capacity of 89.1 megawatts in Fujeij, Ma an, Jordan. Construction is currently underway with commercial operations expected to commence in May 2019. Total project cost is approximately US$184 million, of which 40% is financed through equity investments by us and the remaining 60% through debt financing. We believe that this project will help us to further diversify our business portfolio in the Middle East from the existing focus on nuclear and thermal power plants to expand to renewable energy facilities.

In June 2015, we entered into a memorandum of understanding with Energy Product, a Japanese local developer, to build, own and operate photovoltaic power station with a capacity of 28 megawatts, together with a 13.7 megawatts-hour energy storage system, in Chitose, Hokkaido prefecture in Japan. The parties subsequently signed the joint development agreement and other definitive agreements. The power station, in which we own 80.1% interest, started commercial operation in July 2017. Total project cost is approximately JPY 11.3 billion, of which 20% was financed through 80:20 equity investments by us and EP. The remaining 80% is funded through debt financing.

In August 2016, we entered into a Purchase and Sale Agreement with Cogentrix Solar Holdings to operate a photovoltaic power station in Colorado, United States, with a capacity of 30 megawatts for 25 years. Total project cost is approximately US$85 million, of which 50.1% was financed through 50.1:49.9 equity investments by us and a private equity fund formed by us and National Pension Service. It was our first foray into the North American power market.

In June 2017, a consortium between us and LG CNS Co., Ltd. won a project to build, own and operate a photovoltaic power station in Guam, United States, with a capacity of 60 megawatts for 25 years, including 32 megawatts-hour energy storage system. The total project cost is approximately US$200 million, of which 25% will be financed through equity investment by us and LG CNS Co., Ltd., each holding 70% and 30% of equity interests, respectively, and the remaining 75% will be funded through debt financing. The debt to equity ratio will be fixed upon financial closing. The consortium has entered into a power purchase agreement with Guam Power Authority in August 2018 and the construction of the project is expected to start in the first half of 2019. It is expected the power station will begin commercial operation by June 2021.

In September 2017, we entered into an agreement with Recurrent Energy to operate 3 solar photovoltaic project in southern California, United States, with a capacity of 235MW for 34 years. KEPCO partnered with the Corporate Partnership Fund, a Korean private equity fund. We invested USD 38 million in the project, and the transaction marks our largest investment in the U.S. solar market.

In October 2018, we entered into a Share Purchase Agreement and Share Subscription Agreement to operate a photovoltaic power station with a capacity of 50 megawatts in Calatagan in Philippines. The parties, KEPCO and Solar Philippines Power Project Holdings, Inc., subsequently signed the Shareholders Agreement in December 2018, in which KEPCO owns 38% interest. We financed PHP 2.25 billion (approximately USD 42.8 million) for the Calatagan Project, of which 80% was financed through equity investments and the remaining 20% was funded through debt financing.

Although renewable energy projects are currently insignificant as a proportion of our total overseas activities and our generation activities, we expect the portion of renewable energy projects to increase in the

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future as we seek to penetrate the overseas renewable energy market, diversify our businesses and actively address climate change. We expect to further diversify our business in the renewable energy sector to also include smart transmission and distribution facilities, smart grids and utilization of new energy related technologies.

North Korea

Kaesong Complex

Since 2005, we have provided electricity to the industrial complex located in Kaesong, North Korea, which was established pursuant to an agreement made during the summit meeting of the two Koreas in June 2000. The Kaesong complex is the largest economic project between the two Koreas and is designed to combine the Republic s capital and entrepreneurial expertise with the availability of land and labor of North Korea. In March 2005, we built a 22.9 kilovolt distribution line from Munsan substation in Paju, Gyeonggi Province to the Kaesong complex and became the first to supply electricity to pilot zones such as ShinWon Ebenezer. In April 2006, we started to construct a 154 kilovolt, 16 kilometer transmission line connecting Munsan substation to the Kaesong complex as well as Pyunghwa substation in the complex and began operations in May 2007.

At the end of 2015, we supplied electricity to 254 units, including administrative agencies, support facilities and resident corporations, using a tariff structure identical to that of South Korea. However, we suspended power transmission to the Kaesong Industrial Complex since February 11, 2016 following the Government s decision to halt operations of the industrial complex to impede North Korea s utilization of funds from the industrial complex to finance its nuclear and missile programs. As of December 31, 2018, the book value of our facility located at the complex was Won 17.5 billion. For the year ended December 31, 2018, the amount of trade receivables from the companies residing in Kaesong complex was Won 2.9 billion. It is currently uncertain if we can exercise the property rights for our facility in the Kaesong complex. No assurance can be given that we will not experience any material losses as a result of the suspension of this project or failure of the project as a result of a breakdown or escalation of hostilities in the relationship between the Republic and North Korea. See Item 3.D. Risk Factors Risks Relating to Korea and the Global Economy Tensions with North Korea could have an adverse effect on us and the market value of our shares.

Insurance

We and our generation subsidiaries carry insurance covering against certain risks, including fire, in respect of key assets, including buildings, equipment, machinery, construction-in-progress and procurement in transit, as well as, in the case of us, directors and officers liability insurance. We and our generation subsidiaries maintain casualty and liability insurance against risks related to our business to the extent we consider appropriate. Other than KHNP, neither we nor our generation subsidiaries separately insure against terrorist attacks. These insurance and indemnity policies, however, cover only a portion of the assets that we own and operate and do not cover all types or amounts of loss that could arise in connection with the ownership and operation of these assets.

Substantial liability may result from the operations of our nuclear generation units, the use and handling of nuclear fuel and possible radioactive emissions associated with such nuclear fuel. KHNP maintains property and liability insurance against risks of its business to the extent required by the related law and regulations or considered as appropriate and otherwise self-insures against such risks. KHNP carries insurance for its generation units against certain risks, including property damage, nuclear fuel transportation and liability insurance for personal injury and property damage. KHNP carries property damage insurance covering up to US$1 billion per accident for all properties within its plant complexes, which includes property insurance coverage for acts of terrorism up to US$300 million and for breakdown of machinery up to US$300 million. In addition to the insurance on operating nuclear power generation

units, KHNP has construction insurance for Shin-Kori #4, #5 and #6 and Shin-Hanul #1 and #2. KHNP maintains nuclear liability insurance for personal injury and third-party property damage for coverage of up to 300 million Special Drawing Rights, or SDRs,

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which amounts to approximately US$435 million, at the rate of 1 SDR = US$1.387090 as posted on the Internet homepage of the International Monetary Fund on April 5, 2019 per plant complex, for a total coverage of 1.5 billion SDRs. KHNP is also the beneficiary of a Government indemnity with respect to such risks for damage claims of up to Won 300 million SDRs per nuclear plant complex, for a total coverage of 1.5 billion SDRs. Under the Nuclear Damage Compensation Act of 1969, as amended, KHNP is liable only up to 300 million SDRs, per single accident per plant complex; provided that such limitation will not apply where KHNP intentionally causes harm or knowingly fails to prevent the harm from occurring. KHNP will receive the Government s support, subject to the approval of the National Assembly, if (i) the damages exceed the insurance coverage amount of 300 million SDRs and (ii) the Government deems such support to be necessary for the purposes of protecting damaged persons and supporting the development of nuclear energy business. KHNP carries insurance for its generation units and nuclear fuel transportation, and we believe that the level of insurance is generally adequate and is in compliance with relevant laws and regulations. In addition, KHNP is the beneficiary of Government indemnity which covers a portion of liability in excess of the insurance. However, such insurance is limited in terms of amount and scope of coverage and does not cover all types or amounts of losses which could arise in connection with the ownership and operation of nuclear plants. Accordingly, material adverse financial consequences could result from a serious accident or a natural disaster to the extent it is neither insured nor covered by the government indemnity. See Item 3.D. Risk Factors Risks Relating to KEPCO The amount and scope of coverage of our insurance are limited.

Competition

As of December 31, 2018, we and our generation subsidiaries owned approximately 68.3% of the total electricity generation capacity in Korea (excluding plants generating electricity for private or emergency use). New entrants to the electricity business will erode our market share and create significant competition, which could have a material adverse impact on our financial condition and results of operations.

In particular, we compete with independent power producers with respect to electricity generation. The independent power producers accounted for 26.7% of total power generation in 2018 and 31.7% of total generation capacity as of December 31, 2018. As of December 31, 2018, there were 19 independent power producers in Korea, excluding renewable energy producers. Private enterprises became permitted to own and operate coal-fired power plants in Korea only after the Ministry of Trade, Industry and Energy approved plans for independent power producers to construct coal-fired power plants under the Sixth Basic Plan announced in February 2013. Under the Eighth Basic Plan announced in December 2017, six coal-fired units under construction with aggregate generation capacity of 6,260 megawatts are scheduled to be completed between 2021 and 2022. While it remains to be seen whether construction of these generation units will be completed as scheduled, if these units were to be completed as scheduled and/or independent power producers are permitted to build additional generation capacity (whether coal-fired or not), our market share in Korea may decrease, which may have a material adverse effect on our results of operations and financial condition.

In addition, under the Community Energy System adopted by the Government in 2004, a minimal amount of electricity is supplied directly to consumers on a localized basis by independent power producers outside the cost-based pool system used by our generation subsidiaries and most independent power producers to distribute electricity nationwide. The purpose of this system is to geographically decentralize electricity supply and thereby reduce transmission losses and improve the efficiency of energy use. These entities do not supply electricity on a national level but are licensed to supply electricity on a limited basis to their respective districts under the Community Energy System. As of March 31, 2019, the aggregate generation capacity of suppliers participating in the Community Energy System amounted to less than 1% of that of our generation subsidiaries in the aggregate. We currently do not expect the Community Energy System to be widely adopted, especially in light of the significant level of capital expenditure required for such direct supply. However, if the Community Energy System is widely adopted, it may

erode our currently dominant market position in the generation and distribution of electricity in Korea and may have a material adverse effect on our business, results of operations and financial condition.

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Our market dominance in the electricity distribution in Korea also may face potential erosion in light of the recent Proposal for Adjustment of Functions of Public Institutions (Energy Sector) announced by the Government in June 2016. This proposal contemplates a gradual opening of the electricity trading market to the private sector although no detailed roadmap has been provided for such opening. It is currently premature to predict to what extent, or in what direction, the liberalization of the electricity trading market will happen. Nonetheless, any significant liberalization of the electricity trading market may result in substantial reduction of our market share in electricity distribution in Korea, which would have a material adverse effect on our business, results of operation and cash flows.

The electric power industry, which began its liberalization process with the establishment of our power generation subsidiaries in April 2001, may become further liberalized in accordance with the Restructuring Plan. See Item 4.B. Business Overview Restructuring of the Electric Power Industry in Korea.

In the residential sector, consumers may use natural gas, oil and coal for space and water heating and cooking. However, currently there is no practical substitute for electricity for lighting and other household appliances, which is available on commercially affordable terms.

In the commercial sector, electricity is the dominant energy source for lighting, office equipment and air conditioning. For its other uses, such as space and water heating, natural gas and, to a lesser extent, oil, provide competitive alternatives to electricity.

In the industrial sector, electricity is the dominant energy source for a number of industrial applications, including lighting and power for many types of industrial machinery and processes that are available on commercially affordable terms. For other uses, such as heating, electricity competes with oil and natural gas and potentially with gas-fired combined heating and power plants.

Regulation

We are a statutory juridical corporation established under the KEPCO Act for the purpose of ensuring a stable supply of electric power and further contributing toward the sound development of the national economy through facilitating development of electric power resources and carrying out proper and effective operation of the electricity business. The KEPCO Act (including the amendment thereto) prescribes that we engage in the following activities:

1. development of electric power resources;

2. generation, transmission, transformation and distribution of electricity and other related business activities;

3. research and development of technology related to the businesses mentioned in items 1 and 2;

4. overseas businesses related to the businesses mentioned in items 1 through 3;

5. investments or contributions related to the businesses mentioned in items 1 through 4;

6. businesses incidental to items 1 through 5;

7. Development and operation of certain real estate held by us to the extent that:

   a. it is necessary to develop certain real estate held by us due to external factors, such as relocation, consolidation, conversion to indoor or underground facilities or deterioration of our substation or office; or

   b. it is necessary to develop certain real estate held by us to accommodate development of relevant real estate due to such real estate being incorporated into or being adjacent to an area under planned urban development; and

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8. other activities entrusted by the Government.

The KEPCO Act currently requires that our profits be applied in the following order of priority:

first, to make up any accumulated deficit;

second, to set aside 20.0% or more of profits as a legal reserve until the accumulated reserve reaches one-half of our capital;

third, to pay dividends to shareholders;

fourth, to set aside a reserve for expansion of our business;

fifth, to set aside a voluntary reserve for the equalization of dividends; and

sixth, to carry forward surplus profit.

As of December 31, 2018, the legal reserve was Won 1,605 billion and the voluntary reserve was Won 35,906 billion, which consisted of reserve for business expansion of Won 30,089 billion, reserve for investment in social overhead capital of Won 5,277 billion, reserve for research and human development of Won 330 billion and reserve for equalizing dividends of Won 210 billion.

We are under the supervision of the Ministry of Trade, Industry and Energy, which has principal supervisory responsibility (in consultation with other Government agencies, such as the Ministry of Economy and Finance, as applicable) over us with respect to the appointments of our directors and our other senior management as well as approval of electricity tariff rate adjustments, among others.

Because the Government owns part of our capital stock, the Government s Board of Audit and Inspection may audit our books.

The Electric Utility Act requires that licenses be obtained in relation to generation, transmission, distribution and sales of electricity, with limited exceptions. We hold the license to generate, transmit, distribute and sell electricity. Each of our six generation subsidiaries holds an electricity generation license. The Electric Utility Act governs the formulation and approval of electricity rates in Korea. See Sales and Customers Electricity Rates above.

Our operations are subject to various laws and regulations relating to environmental protection and safety.

Debt Reduction Program and Related Activities

In light of the general policy guideline of the Government for public institutions (including us and our generation subsidiaries) to reduce their respective overall debt levels, we and our generation subsidiaries have, in consultation with the Ministry of Trade, Industry and Energy and as approved by the Public Agencies Operating Committee, previously set target debt-to-equity levels every year from 2014 to 2017 and undertook various programs to reduce

debt and improve the overall financial health, including through rationalizing and applying stricter review to (from a profitability and efficiency perspective) various aspects of our operations (both domestic and overseas), inviting private sector investments, disposing of non-core assets (such as non-core or loss-generating overseas operations and real property unrelated to operations), reducing costs, exploring alternative ways to generate additional revenue and developing contingency plans for further cost savings. Such debt-reduction initiatives ended at the end of 2017 as initially planned. However, we plan to continue carry out similar initiatives to manage our level of debt.

Despite our best efforts, however, for reasons beyond our control, including macroeconomic environments, government regulations and market forces (such as international market prices for our fuels), we cannot assure whether we or our generation subsidiaries will be able to successfully reduce debt burdens or otherwise improve

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our financial health or to a level that would be optimal for our capital structure. If we or our generation subsidiaries fail to do so or the measures taken by us or our generation subsidiaries to reduce debt levels or improve financial health have unintended adverse consequences, such developments may have an adverse effect on our business, results of operations and financial condition.

Establishment of an University

In light of President Moon Jae-in s key policy for Korea s southwestern Honam region and in an effort to cultivate talents and establish a research platform for new market expansions, we plan to establish an university in South Jeolla Province. The university is planned to focus on energy studies and is expected to have 100 professors and more than 1,000 students. The opening date is tentatively scheduled for 2022. The estimated cost of such project is Won 700 billion. Although the source of the funding has not yet been finalized, we are endeavoring to secure funds from both the central government and the municipality government. For example, for ten years after the commencement of the university, we will receive funding (to be used for expenses in operating the school) from the municipality government in the amount of Won 200 billion. We are also currently discussing with the government-wide University Establishment and Support Committee regarding a potential funding from the central government. Other than the funds provided by the municipality and the central governments, we may have to provide a portion of the funds at our own expense, which, if significant, may have an adverse effect on our results of operations and financial condition.

Proposed Sale of Certain Power Plants and Equity Interests

The following table summarizes our current plans for sale of certain of our assets. These sales will be made pursuant to the Government s plans to reduce debt levels and improve management efficiency of public enterprises. The consummation of these plans, however, is subject to, among others, related Government policies and market conditions.

Equity Holdings	Primary Business	Fair Value[(1)] as of December 31, 2018 (in billions of Won)	Ownership Percentage as of December 31, 2018	Ownership Percentage to be Sold
KEPCO Engineering & Construction Co., Inc.	Architectural engineering for utility plants	525	65.77	14.77
Korea Electric Power Industrial Development Co., Ltd.	Electricity metering	34	29.00	29.00

Note:

(1) Fair value has been computed as the product of the closing share price on December 31, 2018 multiplied by the number of shares owned by KEPCO.

KEPCO Engineering & Construction Co., Inc.

Pursuant to the Third Phase of the Public Institution Reform Plan announced by the Government in August 2008, we conducted the initial public offering of Korea Engineering and Construction Co., Inc., or KEPCO E&C formerly known as Korea Power Engineering Co., Ltd., in December 2009 for gross proceeds to us of Won 165 billion, following which we owned 77.9% of KEPCO E&C s shares. In furtherance of the Public Institution Reform Plan and to improve our financial profile, we sold our equity interests representing 3.1%, 4.0%, 4.5% and 0.54% of KEPCO E&C shares in November 2011, December 2013, December 2014 and December 2016, respectively, in each case to third party investors. We currently hold a 65.77% equity interest in KEPCO E&C.

Korea Electric Power Industrial Development Co., Ltd.

In 2003, we privatized Korea Electric Power Industrial Development, or KEPID, formerly our wholly-owned subsidiary, by selling 51.0% of its equity interest to Korea Freedom Federation. Pursuant to the Fifth Phase of the Public Institution Reform Plan announced by the Government in 2009, we sold 20% of the KEPID shares through additional listing. We currently plan to sell the remaining 29.0% of KEPID s equity interest based on, among others, considerations of economic and market conditions.

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Item 4.C. Organizational Structure

As of December 31, 2018, we had 106 subsidiaries, 58 associates and 55 joint ventures (not including any special purpose entities).

Subsidiaries

Our wholly-owned six generation subsidiaries are KHNP, KOSEP, KOMIPO, KOWEPO, KOSPO and EWP. Our non-generation subsidiaries include KEPCO E&C, KEPCO KPS, KEPCO NF, and KEPCO KDN. For a full list of our subsidiaries, including foreign subsidiaries, and their respective jurisdiction of incorporation, please see Exhibit 8.1 attached to this annual report.

Associates and Joint Ventures

An associate is an entity over which we have significant influence and that is neither a subsidiary nor a joint venture. Significant influence is the power to participate in the financial and operating policy decisions of the investee but does not have control or joint control over those policies. A joint venture is a joint arrangement whereby the parties that have joint control of the arrangement (i.e. joint ventures) have rights to the net assets of the arrangement.

The table below sets forth each of our associates and joint ventures as of December 31, 2018 by name, the percentage of our shareholdings and their principal activities.

	Ownership (Percent)	Principal Activities
Associates:		
Korea Gas Corporation[1]	20	Importing and wholesaling LNG
Korea Electric Power Industrial Development Co., Ltd.	29	Electricity metering and others
YTN Co., Ltd.	21	Broadcasting
Cheongna Energy Co., Ltd.	44	Generating and distributing vapor and hot/cold water
Gangwon Wind Power Co., Ltd.[2]	15	Power generation
Hyundai Green Power Co., Ltd.	29	Power generation
Korea Power Exchange[5]	100	Management of power market and others
AMEC Partners Korea Ltd.[3]	19	Resources development
Hyundai Energy Co., Ltd.[8]	31	Power generation
Ecollite Co., Ltd.	36	Artificial light-weight aggregate
Taebaek Wind Power Co., Ltd.	25	Power generation
Taeback Guinemi Wind Power Co., Ltd.	25	Power generation
Pyeongchang Wind Power Co., Ltd.	25	Power generation
Daeryun Power Co., Ltd.[3]	9	Power generation
Changjuk Wind Power Co., Ltd.	30	Power generation
KNH Solar Co., Ltd.	27	Power generation
SPC Power Corporation	38	Power generation
Gemeng International Energy Co., Ltd.	34	Power generation
PT. Cirebon Electric Power	28	Power generation

KNOC Nigerian East Oil Co., Ltd.(4)	15	Resources development
KNOC Nigerian West Oil Co., Ltd.(4)	15	Resources development
PT Wampu Electric Power	46	Power generation
PT. Bayan Resources TBK	20	Resources development
S-Power Co., Ltd.	49	Power generation
Pioneer Gas Power Limited(7)	39	Power generation
Eurasia Energy Holdings	40	Power generation and resources development

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	Ownership (Percent)	Principal Activities
Xe-Pian Xe-Namnoy Power Co., Ltd.	25	Power generation
Hadong Mineral Fiber Co., Ltd.(3)	8	Recycling fly ashes
Green Biomass Co., Ltd.(10)	9	Power generation
PT. Mutiara Jawa	29	Manufacturing and operating floating coal terminal
Samcheok Eco Materials Co., Ltd.(9)	2	Recycling fly ashes
Noeul Green Energy Co., Ltd.	29	Power generation
Naepo Green Energy Co., Ltd.	42	Power generation
Goseong Green Energy Co., Ltd.(2)	1	Power generation
Gangneung Eco Power Co., Ltd.(2)	2	Power generation
Shin Pyeongtaek Power Co., Ltd.	40	Power generation
Heang Bok Do Si Photovoltaic Power Co., Ltd.	28	Power generation
Dongducheon Dream Power Co., Ltd.(14)	34	Power generation
Jinbhuvish Power Generation Pvt. Ltd.(2)	5	Power generation
SE Green Energy Co., Ltd.	48	Power generation
Daegu Photovoltaic Co., Ltd.	29	Power generation
Jeongam Wind Power Co., Ltd.	40	Power generation
Korea Power Engineering Service Co., Ltd.	29	Construction and service
Busan Green Energy Co., Ltd.	29	Power generation
Gunsan Bio Energy Co., Ltd.(2)	19	Power generation
Korea Electric Vehicle Charging Service	28	Electric vehicle charge service
Ulleungdo Natural Energy Co., Ltd.	30	Renewable power generation
Korea Nuclear Partners Co., Ltd.	29	Electric material agency
Tamra Offshore Wind Power Co., Ltd.	27	Power generation
Korea Electric Power Corporation Fund(11)	98	Developing electric enterprises
Energy Infra Asset Management Co., Ltd.(3)	10	Asset management
Daegu clean Energy Co., Ltd.	28	Renewable power generation
YaksuESS Co., Ltd	29	Installing ESS related equipment
Nepal Water & Energy Development Company Private Limited(13)	58	Construction and operation of utility plant
Gwangyang Green Energy Co., Ltd.	20	Power generation
PND solar., Ltd	29	Power generation
Hyundai Eco Energy Co., Ltd.(2)	19	Power generation
YeongGwang Yaksu Wind Electric. Co., Ltd(2)	10	Power generation
Joint Ventures:		
KEPCO-Uhde Inc.(6)	53	Power generation
Eco Biomass Energy Sdn. Bhd.(6)	62	Power generation
Shuweihat Asia Power Investment B.V.	49	Holding company
Shuweihat Asia Operation & Maintenance Company(6)	55	Maintenance of utility plant
Waterbury Lake Uranium L.P.	34	Resources development
ASM-BG Investicii AD	50	Power generation
RES Technology AD	50	Power generation
KV Holdings, Inc.	40	Power generation
KEPCO SPC Power Corporation(6)	75	Construction and operation of utility plant

Gansu Datang Yumen Wind Power Co., Ltd.	40	Power generation
Datang Chifeng Renewable Power Co., Ltd.	40	Power generation
Datang KEPCO Chaoyang Renewable Power Co., Ltd.	40	Power generation

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	Ownership (Percent)	Principal Activities
Rabigh Electricity Company	40	Power generation
Rabigh Operation & Maintenance Company Limited	40	Maintenance of utility plant
Jamaica Public Service Company Limited	40	Power generation
KW Nuclear Components Co., Ltd.	45	Manufacturing
Busan Shinho Solar Power Co., Ltd.	25	Power generation
GS Donghae Electric Power Co., Ltd.	34	Power generation
Global Trade Of Power System Co., Ltd.	29	Exporting products and technology of small or medium business by proxy
Expressway Solar-light Power Generation Co., Ltd.	29	Power generation
Daejung Offshore Wind Power Co., Ltd.	50	Power generation
Amman Asia Electric Power Company(6)	60	Power generation
KAPES, Inc.(6)	51	R&D
Dangjin Eco Power Co., Ltd.	34	Power generation
Honam Wind Power Co., Ltd.	29	Power generation
Chun-cheon Energy Co., Ltd.	30	Power generation
Yeonggwangbaeksu Wind Power Co., Ltd.(3)	15	Power generation
Nghi Son 2 Power LLC	50	Power generation
Kelar S.A(6)	65	Power generation
PT. Tanjung Power Indonesia	35	Power generation
Incheon New Power Co., Ltd.	29	Power generation
Seokmun Energy Co., Ltd.	29	Power generation
Daehan Wind Power PSC	50	Power generation
Barakah One Company(12)	18	Power generation
Nawah Energy Company(12)	18	Operation of utility plant
MOMENTUM	33	International thermonuclear experimental reactor construction management
Daegu Green Power Co., Ltd.	29	Power generation
Yeonggwang Wind Power Co., Ltd.	41	Power generation
Chester Solar IV SpA(6)	82	Power generation
Chester Solar V SpA(6)	82	Power generation
Diego de Almagro Solar SpA(6)	82	Power generation
South Jamaica Power Company Limited	20	Power generation
Daesan Green Energy Co., Ltd.	35	Power generation
RE Holiday Holdings LLC	50	Power generation
RE Pioneer Holdings LLC	50	Power generation
RE Barren Ridge 1 Holdings LLC	50	Power generation
RE Astoria 2 LandCo LLC	50	Power generation
RE Barren Ridge LandCo LLC	50	Power generation
Laurel SpA(6)	82	Power generation
KIAMCO KOWEPO Bannerton Hold Co Pty Ltd(3)	12	Power generation
Chile Solar JV SpA	50	Power generation
Taebaek Gadeoksan Wind Power Co., Ltd.	47	Power generation
Cheong-Song Noraesan Wind Power Co., Ltd.	25	Power generation
Chester Solar I SpA(6)	82	Power generation
Solar Philippines Calatagan Corporation	38	Power generation

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Notes:

(1) The effective percentage of ownership (excluding the treasury stocks) is 21.57%.
(2) Our effective percentage of ownership is less than 20%, but we can exercise significant influence by virtue of our contractual right to appoint directors to the board of directors of this entity and, through such directors, we can influence the financial and operating policy of the board of directors.
(3) Our effective percentage of ownership is less than 20%, but we can exercise significant influence by virtue of our contractual right to appoint a director to the board of directors of this entity.
(4) Our effective percentage of ownership is less than 20%, but we can exercise significant influence by virtue of our contractual right to appoint one out of four members of the steering committee of this entity. Moreover, we have significant financial transactions with this entity to the effect that we can exercise significant influence on this entity.
(5) The Government regulates our ability to make operating and financial decisions over this entity, as the Government requires maintaining arms-length transactions between the Korea Power Exchange and our other subsidiaries. We can exercise significant influence by virtue of our right to nominate directors to the board of directors of this entity.
(6) Our effective percentage of ownership is more than 50%. However, according to the shareholders agreement, all critical financial and operating decisions must be agreed to by all shareholders. For this reason, these entities are classified as joint ventures.
(7) The reporting period of all associates and joint ventures ends on December 31, except for Pioneer Gas Power Limited, whose reporting period ends on March 31.
(8) As of December 31, 2018, 15.64% of ownership of Hyundai Energy Co., Ltd. is held by NH Power II Co., Ltd. and NH Bank. According to the shareholders agreement reached on March 2011, we have a call option to acquire the investment in Hyundai Energy Co., Ltd. from NH Power II Co., Ltd. and NH Bank upon a certain rate of return, and NH Power II Co., Ltd. and NH Bank also have put options to dispose of their investment to us. In connection with this agreement, we applied the equity method on our 46.30% equity investment in Hyundai Energy Co., Ltd.
(9) Our effective percentage of ownership (excluding the redeemable convertible preferred stock) is 25.54%.
(10) Our effective percentage of ownership is less than 20%, but we can exercise significant influence by virtue of our contractual right to appoint a director to the board of directors of this entity and the fact that a dominant portion of the investee s sales transactions is generated from us.
(11) Our effective percentage of ownership is more than 50% but we do not hold control over relevant business while we exercise significant influence by participating in the Investment Decision Committee. For this reason, this entity is classified as an associate.
(12) Our effective percentage of ownership is less than 20%, but we have joint control over this entity as decisions on the major activities require the unanimous consent of the parties that collectively control this entity.
(13) Our effective percentage of ownership is more than 50%, but we do not control this entity according to the shareholders agreement. For this reason, this entity is classified as an associate.
(14) Our effective percentage of ownership is 34.01% considering redeemable convertible preferred stock.

Item 4.D. Property, Plant and Equipment

Our property consists mainly of power generation, transmission and distribution equipment and facilities in Korea. See Item 4.B. Business Overview Power Generation, Transmission and Distribution and Capital Investment Progra
In addition, we own our corporate headquarters building complex at 55 Jeollyeok-ro, Naju-si, Jeollanam-do, 58322,

Korea. As of December 31, 2018, the net book value of our property, plant and equipment was Won 152,743 billion. As of December 31, 2018, investment property, which is accounted for separately from our property, plant and equipment, amounted to Won 160 billion. No significant amount of our properties is leased. There are no material encumbrances on our properties, including power generation, transmission and distribution equipment and facilities.

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Pursuant to a Government plan announced in 2005, which mandated relocation of the headquarters of select government-invested enterprises from the Seoul metropolitan area to other provinces in Korea as part of an initiative to foster balanced economic growth in the provinces, we, our generation subsidiaries and our certain subsidiaries relocated our respective headquarters to the designated locations during 2014 and 2015. Our headquarters are currently located in Naju in Jeollanam-do Province while the headquarters of our six generation subsidiaries and other subsidiaries are various cities outside of Seoul across Korea.

In connection with the relocation of our headquarters, in September 2014 we entered into an agreement to sell the property housing our prior headquarters to a consortium consisting of members of the Hyundai Motor group for Won 10,550 billion through an open bidding. The sale was completed in September 2015.

During 2018, we completed the sales of 126 properties (including residential properties, storage spaces, and substation lots that are located in Korea) which are not directly related to our operations for an aggregate sale price of approximately Won 166 billion. The book value of such properties amounted to Won 106 billion, representing 1.3% of our total real properties as of December 31, 2018. The foregoing sales reflect our ongoing efforts to improve our financial soundness through debt reduction and enhance our management efficiency, selling noncore properties that have no direct relations to electricity facilities.

ITEM 4A. UNRESOLVED STAFF COMMENTS

We do not have any unresolved comments from the SEC staff regarding our periodic reports under the Securities Exchange Act of 1934, as amended (the Exchange Act).

ITEM 5. OPERATING AND FINANCIAL REVIEW AND PROSPECTS

You should read the following discussion on our operating and financial review and prospects together with our consolidated financial statements and the related notes which appear elsewhere in this annual report. Our results of operations, financial condition and cash flows may materially change from time to time, for reasons including various policy initiatives (including changes to the Restructuring Plan) by the Government in relation to the Korean electric power industry, and accordingly our historical performance may not be indicative of our future performance. See Item 4.B. Business Overview Restructuring of the Electric Power Industry in Korea and Item 3D. Risk Factors The Government may adopt policy measures to substantially restructure the Korean electric power industry or our operational structure, which may have a material adverse effect on our business, operations and profitability.

Item 5.A. Operating Results

Overview

We are a predominant market participant in the Korean electric power industry, and our business is heavily regulated by the Government, including with respect to the rates we charge to customers for the electricity we sell. In addition, our business requires a high level of capital expenditures for the construction of electricity generation, transmission and distribution facilities and is subject to a number of variable factors, including demand for electricity in Korea and fluctuations in fuel costs, which are in turn impacted by the movements in the exchange rates between the Won and other currencies.

Under the Electric Utility Act and the Price Stabilization Act, the Government generally establishes electricity rates at levels that are expected to permit us to recover our operating costs attributable to our basic electricity generation, transmission and distribution operations in addition to receiving a fair investment return on capital used in those operations. For a detailed description of the fair investment return, see Item 4.B. Business Overview Sales and Customers Electricity Rates. From 2014 to 2016, largely due to the general decline of fuel prices, relatively stable exchange rates, the sale of the properties in our previous headquarters and the greater use of coal relative to LNG (the former being a cheaper source of fuel) as a proportion of the fuels used to produce electricity, our gross profit, operating profit and net profit increased significantly.

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If fuel prices were to rise substantially and rapidly in the future, such rise may have a material adverse effect on our results of operations and profitability. In part to address these concerns, the Government from time to time increases the electricity tariff rates. However, such increases may be insufficient to fully offset the adverse impact from the rise in fuel costs, and since such increases typically require lengthy public deliberations in order to be implemented, the tariff increases often occur with a significant time lag and as a result our results of operations and cash flows may suffer. On the other hand, if fuel prices decrease, substantial political pressure may lead the Government to lower the level of electricity tariff in a relatively shorter period of time due to the lack of public opposition, which could negatively affect our profit margins and in turn our financial condition and results of operations.

The results of our operations are largely affected by the following factors:

- demand for electricity;
- electricity rates we charge to our customers;
- fuel costs; and
- the exchange rates of Won against other foreign currencies, in particular the U.S. dollar.

Demand for Electricity

Our sales are largely dependent on the level of demand for electricity in Korea and the rates we charge for the electricity we sell.

Demand for electricity in Korea grew at a compounded average rate of 2.1% per annum for the five years ended December 31, 2018. According to the Bank of Korea, the compounded growth rate for GDP was approximately 3.0% for the same period. The GDP growth rate was approximately 2.9%, 3.1% and 2.7% during 2016, 2017 and 2018, respectively.

The table below sets forth, for the periods indicated, the annual rate of growth in Korea s GDP and the annual rate of growth in electricity demand (measured by total annual electricity consumption) on a year-on-year basis.

	2014	2015	2016	2017	2018
Growth in GDP	3.3%	2.8%	2.9%	3.1%	2.7%
Growth in electricity consumption	0.6%	1.3%	2.8%	2.2%	3.6%

Demand for electricity may be categorized either by the type of its usage or by the type of customers. The following describes the demand for electricity by the type of its usage, namely, industrial, commercial and residential:

- The industrial sector represents the largest segment of electricity consumption in Korea. Demand for electricity from the industrial sector was 292,999 gigawatt hours in 2018, representing a 2.5% increase from

2017, largely due to the increased volume of semiconductor and other exports.

Demand for electricity from the commercial sector depends largely on the level and scope of commercial activities in Korea, which in recent years have resulted in increased office building construction, office automation and use of air conditioners and heaters. Demand for electricity from the commercial sector increased to 116,934 gigawatt hours in 2018, representing a 5.1% increase from 2017 largely due to the extreme weather conditions that have led to increased demand for heating and air conditioning.

Demand for electricity from the residential sector is largely dependent on population growth and use of heaters, air conditioners and other electronic appliances. Demand for electricity from the residential

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sector increased to 72,895 gigawatt hours in 2018, representing a 6.3% increase compared to 2017, largely due to an increase in household electricity usage for air conditioning and heating. For a discussion on demand by the type of customers, see Item 4.B. Business Overview Sales and Customers Demand by the Type of Usage.

Since our inception, we have had the predominant market share in terms of electricity generated in Korea. As for electricity we purchase from the market for transmission and distribution to our end-users, our generation subsidiaries accounted for 81.5%, 77.8% and 74.0% in 2016, 2017 and 2018, respectively, while the remainder was accounted for by independent power producers. As for transmission and distribution of electricity, we have historically handled, expect to continue to handle, substantially all of such activities in Korea.

We expect that we will continue to have a dominant market share in the generation, transmission and distribution of electricity in Korea for the foreseeable future, absent any substantial changes to the Restructuring Plan or other policy initiatives by the Government in relation to the Korean electric power industry, or an unexpected level of market penetration by independent power producers or localized electricity suppliers under the Community Energy System. However, our market dominance in the electricity distribution in Korea may face potential erosion in light of the recent Proposal for Adjustment of Functions of Public Institutions (Energy Sector) announced by the Government in June 2016. This proposal contemplates a gradual opening of the electricity trading market to the private sector although no detailed roadmap has been provided for such opening. It is currently premature to predict to what extent, or in what direction, the liberalization of the electricity trading market will happen. Nonetheless, any significant liberalization of the electricity trading market may result in substantial reduction of our market share in electricity distribution in Korea, which would have a material adverse effect on our business, results of operation and cash flows. See Item 4.B. Business Overview Competition.

Electricity Rates

Under the Electric Utility Act and the Price Stabilization Act, electricity rates are established at levels that will permit us to recover our operating costs attributable to our basic electricity generation, transmission and distribution operations in addition to receiving a fair investment return on capital used in those operations. For further discussion of fair investment return, see Item 4.B. Business Overview Sales and Customers Electricity Rates.

From time to time, our actual rate of return on invested capital may differ significantly from the fair rate of return on invested capital assumed for the purposes of electricity tariff approvals, for reasons, among others, related to movements in fuel prices, exchange rates and demand for electricity that differs from what is assumed for determining our fair rate of return. For example, between 1987 and 1990, the actual rate of return was above the fair rate of return due to declining fuel costs and rising demand for electricity. In contrast, depreciation of the Won against the U.S. dollar accounted for our actual rates of return being lower than the fair rate of return for the period from 1996 to 2000. Partly in response to the variance between our actual rates of return and the fair rate of return, the Government from time to time increases the electricity tariff rates, but there typically is a significant time lag for the tariff increase as such increase requires a series of deliberative processes and administrative procedures and the Government also has to consider other policy considerations, such as the inflationary effect of overall tariff increases and the efficiency of energy use through sector-specific tariff increases. For the period between 2006 and 2013, our actual rates of return were lower than the fair rate of return largely due to a general increase in fuel costs and additional facility investment costs incurred, the effects of which were not offset by timely increases in our tariff rates. Between 2014 and 2016, however, largely due to the decrease in fuel costs reflective of the drop in oil prices, our actual rate of return has surpassed the fair rate of return; however, substantially all of the resulting excess has been used to fund capital expenditure and repair and maintenance, as well as to offer tariff discounts to economically or otherwise disadvantaged households, and investments in renewable energy and other environmental programs.

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Partly in response to the variance between our actual rates of return and the fair rates of return, the Government from time to time increases the electricity tariff rates, but there typically is a significant time lag for the tariff increases as such increases requires a series of deliberative processes and administrative procedures and the Government also has to consider other policy considerations, such as the inflationary effect of overall tariff increases and the efficiency of energy use from sector-specific tariff increases.

In the past, the Government effected tariff increases that typically covered all sectors, namely, residential, commercial and industrial. No cross-sector tariff increase has been implemented since November 2013, largely due to the downward trend in fuel costs. However, effective January 1, 2017, the Government made several adjustments to the existing rate structure in order to ease the burden of electricity tariff on residential consumers as well as promote the use of renewable energy. First, the progressive rate structure applicable to the residential sector, which applies a gradient of increasing tariff rates for heavier electricity usage, was changed from a six-tiered structure with the highest rate being no more than 11.7 times the lowest rate (which gradient system has been in place since 2005) into a three-tiered structure with the highest rate being no more than three times the lowest rate in order to reflect the changes in the pattern of electricity consumption and reduce the electricity charges payable by consumers. Second, the new tariff structure encourages energy saving by offering rate discounts to residential consumers that voluntarily reduce electricity consumption while charging special high rates to residential consumers with heavy electricity consumption during peak usage periods during the summer and the winter. Third, a temporary rate discount will apply during 2017 to 2019 to investments in environmentally friendly facilities such as energy storage systems, renewable energy and electric cars. The temporary rate discount to investments in energy storage systems and renewable energy was extended until 2020. Additionally, during July and August 2018, the Government reduced residential electricity charges by temporarily relaxing the application of the current tariff structure and offering higher rate discounts to economically or otherwise disadvantaged households to ease the burden on households that have significantly increased their use of air conditioners during a heatwave. Such adjustments may lower our revenues from the sale of electricity and accordingly have a material adverse effect on our results of operation, financial condition and cash flows.

Fuel Costs

Our results of operations are also significantly affected by the cost of producing electricity, which is subject to a variety of factors, including, in particular, the cost of fuel.

Cost of fuel in any given year is a function of the volume of fuels consumed and the unit fuel cost for the various types of fuel used for generation of electricity which affects the cost structure for both our generation subsidiaries and independent power producers from whom we purchase electric power. A significant change in the unit fuel costs materially impacts the costs of electricity generated by our generation subsidiaries, which mainly comprise our fuel costs under the cost of sales, as well as, to our knowledge, the costs of electricity generated by the independent power producers that sell their electricity to us (see Item 4.A. Purchase of Electricity Cost-based Pool System), which mainly comprise our purchased power costs under the cost of sales. We are however unable to provide a comparative analysis since the unit fuel cost information for independent power producers and their cost structures are proprietary information.

Fuel costs constituted 30.9%, 31.7% and 34.5% of our cost of sales, and the ratio of fuel costs to our sales was 23.4%, 27.8% and 33.5% in 2016, 2017 and 2018, respectively. Substantially all of the fuel (except for anthracite coal) used by our generation subsidiaries is imported from outside of Korea at prices determined in part by prevailing market prices in currencies other than Won. In addition, our generation subsidiaries purchase a significant portion of their fuel requirements under contracts with limited quantity and duration. Pursuant to the terms of our long-term supply contracts, prices are adjusted from time to time subject to prevailing market conditions. See Item 4.B. Business

Overview Fuel.

Uranium accounted for 37.1%, 34.8% and 31.9% of our fuel requirements in 2016, 2017 and 2018, respectively. Coal accounted for 47.7%, 53.3% and 53.2% of our fuel requirements in 2016, 2017 and 2018,

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respectively. LNG accounted for 10.7%, 8.7% and 11.2% of our fuel requirements in 2016, 2017 and 2018, respectively. Oil accounted for 3.0%, 1.2% and 1.4% of our fuel requirements in 2016, 2017 and 2018, respectively. In each case, the fuel requirements are measured by the amount of electricity generated by us and our generation subsidiaries and do not include electricity purchased from independent power producers. In order to ensure stable supplies of fuel materials, our generation subsidiaries enter into long-term and medium-term contracts with various suppliers and supplement such supplies with fuel materials purchased on spot markets.

The price of bituminous coal, which represents our largest fuel requirement, fluctuates significantly from time to time. In 2018, approximately 83% of the bituminous coal requirements of our generation subsidiaries were purchased under long-term contracts and the remaining 17% purchased on the spot market. The average daily spot price of free on board Newcastle coal 6300 GAR published by Platts increased from US$88.3 per ton in 2017 to US$107.7 per ton in 2018 and decreased to US$84.0 per ton as of April 18, 2019. If the price of bituminous coal were to sharply rise, our generation subsidiaries may not be able to secure their respective bituminous coal supplies at prices commercially acceptable to them. In addition, any significant interruption or delay in the supply of fuel, bituminous coal in particular, from any of their suppliers could cause our generation subsidiaries to purchase fuel on the spot market at prices higher than contracted, resulting in an increase in fuel cost.

From 2016 to 2018, the prices of oil and LNG fluctuated significantly. The prices of oil and LNG are substantially dependent on the price of crude oil, and according to Bloomberg (Bloomberg Ticker: PGCRDUBA), the average daily spot price of Dubai crude oil increased from US$53.1 per barrel in 2017 to US$69.3 per barrel in 2018 and to US$70.4 per barrel as of April 18, 2019.

Nuclear power has a stable and relatively low-cost structure and forms a significant portion of electricity supplied in Korea. Due to significantly lower unit fuel costs compared to those for thermal power plants, our nuclear power plants are generally operated at full capacity with only routine shutdowns for fuel replacement and maintenance, with limited exceptions. In case of shortage in electricity generation resulting from stoppages of the nuclear power plants, we seek to make up for such shortage with power generated by our thermal power plants.

Because the Government heavily regulates the rates we charge for the electricity we sell (see Item 4.B. Business Overview Sales and Customers Electricity Rates), our ability to pass on such cost increases to our customers is limited. For example, from 2008 to 2012 we had consecutive net losses and, from time to time, operating losses, largely due to sustained rises in fuel costs that were neither timely nor sufficiently offset by a corresponding rise in electricity tariff rates. If fuel prices substantially increase and the Government, out of concern for inflation or for other reasons, maintains the current level of electricity tariff and does not increase it to a level to sufficiently offset the impact of rising fuel prices, the price increases will negatively affect our profit margins or even cause us to suffer operating and/or net losses, and our business, financial condition, results of operations and cash flows would suffer.

Movements of the Won against the U.S. Dollar and Other Foreign Currencies

Korean Won has fluctuated significantly against major currencies from time to time. For fluctuations in exchange rates, see Item 3.A. Selected Financial Data Currency Translations and Exchange Rates. In particular, Korean Won underwent substantial fluctuations during the recent global financial crisis, and remains subject to significant volatility. The Noon Buying Rate per one U.S. dollar decreased from Won 1,203.7 on December 31, 2016 to Won 1,067.4 on December 31, 2017 and rebounded to 1,112.9 on December 31, 2018 and to Won 1,136.2 on April 18, 2019. In 2018, the Won generally depreciated against U.S. dollar and other foreign currencies, and such depreciation may result in a significant increase in the cost of fuel materials and equipment purchased from overseas as well as the cost of servicing our foreign currency debt. As of December 31, 2018, 17.7% of our long-term debt (including the current portion but excluding issue discounts and premium) without taking into consideration of swap transactions

was denominated in foreign currencies, principally U.S. dollars. The prices for substantially all of the fuel materials and a significant portion of the equipment we purchase are

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stated in currencies other than Won, generally in U.S. dollars. Since a substantial portion of our revenues is denominated in Won, we must generally obtain foreign currencies through foreign currency-denominated financings or from foreign currency exchange markets to make such purchases or service such debt, fulfill our obligations under existing overseas investments and make new overseas investments. As a result, any significant depreciation of Won against U.S. dollar or other foreign currencies will have a material adverse effect on our profitability and results of operations. See Item 3.D. Risk Factors Risks Relating to KEPCO The movement of Won against the U.S. dollar and other currencies may have a material adverse effect on us.

Recent Accounting Changes

New Amendments Adopted

New amendments to IFRS and other accounting standards are set forth below.

We have initially applied IFRS 9 Financial Instruments and IFRS 15 Revenue from Contracts with Customers from January 1, 2018. Due to the transition methods chosen by us in applying these standards, comparative information throughout the financial statements has not been restated to reflect the requirements of the new standards.

IFRS 9 Financial Instruments

IFRS 9 sets out requirements for recognizing and measuring financial assets, financial liabilities and certain contracts to buy or sell non-financial items. This standard replaces existing guidance in IAS 39 Financial Instruments: Recognition and Measurement .

We have taken an exemption not to restate comparative information for prior periods upon adoption of IFRS 9. Accordingly, the information presented for 2017 and 2016 has not been restated and differences in the carrying amounts of financial instruments resulting from the adoption of IFRS 9 are recognized in retained earnings and other components in equity at January 1, 2018.

Classification and measurement of financial assets and financial liabilities

IFRS 9 contains three principal classification categories for financial assets: measured at amortized cost, FVOCI and FVTPL. The classification of financial assets under IFRS 9 is generally based on the business model in which a financial assets is managed and its contractual cash flow characteristics. Under IFRS 9, derivatives embedded in contracts where the host is a financial asset in the scope of the standard are never separated. Instead, the hybrid financial instrument as a whole is assessed for classification.

The adoption of IFRS 9 has not had a significant effect on our accounting policies related to financial liabilities and derivative financial instruments (for derivatives that are used as hedging instruments).

The following table reconciles the carrying amounts of financial assets under IAS 39 to the carrying amounts under IFRS 9 on transition to IFRS 9 on January 1, 2018.

Original classification under IAS 39 **New classification under IFRS 9**

		Original carrying amount under IAS 39	New carrying amount under IFRS 9
		(in millions of won)	
Financial assets at FVTPL	FVTPL	111,512	111,512
Loans and receivables	Amortized cost	15,203,663	14,405,570
Loans and receivables	FVTPL		791,324
Available-for-sale financial assets	FVOCI	699,833	471,903
Available-for-sale financial assets	FVTPL		227,930
Held-to-maturity investments	Amortized cost	3,144	3,144
Total financial assets (excluding derivative instruments)		16,018,152	16,011,383

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Impairment of financial assets

IFRS 9 replaces the incurred loss model in IAS 39 with an expected credit loss (ECL) model. The new impairment model applies to financial assets measured at amortized cost and debt investments at FVOCI, but not to investments in equity instruments.

We have used an exemption not to restate comparative information for prior periods with respect to classification and measurement (including impairment) requirements. Differences in the carrying amounts of financial assets resulting from the adoption of IFRS 9 are recognized in other components of equity and retained earnings as at January 1, 2018 as follows:

Type	Equity attributable to owners of the controlling company		Non-controlling interests	Total equity
	Retained earnings	Other components of equity		
	(in millions of won)			
Reclassification of cumulative gain or loss of available-for-sale financial assets	76,851	(76,851)		
Remeasurement of expected credit loss				
Trade and other receivables	(6,769)			(6,769)
Income tax effect	1,846			1,846
Total	71,928	(76,851)		(4,923)

The detailed accounting policies under IFRS 9 are described in Note 3(21) of the notes to our consolidated financial statements included in this annual report.

IFRS 15 Revenue from Contracts with Customers

IFRS 15 Revenue from Contracts with Customers replaced IAS 18 Revenue , IAS 11 Construction Contracts , SIC-31 Revenue-Barter Transactions Involving Advertising Services , IFRIC 13 Customer Loyalty Programs , IFRIC 15 Agreements for the Construction of Real Estate and IFRIC 18 Transfers of Assets from Customers .

Under IFRS 15, revenue is recognized when a customer obtains control of the goods or services. Determining the timing of the transfer of control at a point in time or over time requires judgment.

We have retrospectively applied this standard and recognized the cumulative effect of the adoption of IFRS 15 at the date of initial application (January 1, 2018) and have retrospectively applied IFRS 15 to only those contracts that were not completed as of the date of initial application (January 1, 2018). Accordingly, we have not restated the comparative periods.

IFRS 15 did not have a significant impact on our consolidated financial statements at the date of initial application (January 1, 2018). For additional information about our accounting policies relating to revenue recognition, see Note 3(7) of the notes to our consolidated financial statements included in this annual report.

IFRIC 22 Foreign Currency Transactions and Advance Consideration

We have adopted IFRIC 22 Foreign Currency Transactions and Advance Consideration since January 1, 2018. IFRIC 22 clarifies the date of the transaction for the purpose of determining the exchange rate to use on initial recognition of the related asset, expense or income, when an entity has received or paid advance consideration in a foreign currency. Upon adoption of this interpretation, there is no significant impact on our consolidated financial statements.

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Amendments to IAS 40 Investment Property

We have adopted amendments to IAS 40 Investment Property since January 1, 2018. Amendments to IAS 40 clarify when an entity should transfer a property asset to, or from, investment property. Upon adoption of these amendments, there is no significant impact on our consolidated financial statements.

New Standards and Amendments Not Yet Adopted

A number of new standards are effective for annual periods beginning after January 1, 2018 and earlier application is permitted; however, we have not adopted early the new or amended standards in preparing our consolidated financial statements.

IFRS 16 Leases

General information

IFRS 16 replaces existing leases guidance, including IAS 17 Leases , IFRIC 4 Determining whether an Arrangement contains a Lease , SIC-15 Operating Leases Incentives and SIC-27 Evaluating the Substance of Transactions Involving the Legal Form of a Lease .

We plan to apply IFRS 16 retrospectively with the cumulative effect of initially applying the standard recognized at the date of initial application on January 1, 2019. Therefore, the cumulative effect of adopting IFRS 16 will be recognized as an adjustment to the opening balance of retained earnings (or other component of equity, as appropriate) at January 1, 2019, with no restatement of comparative information.

For a contract that is, or contains, a lease, we shall account for each lease component within the contract as a lease separately from non-lease components of the contract. A lessee recognizes a right-of-use asset representing its right to use the underlying asset and a lease liability representing its obligation to make lease payments. There are recognition exemptions for short-term leases and leases of low-value items. In addition, as a practical expedient, a lessee may elect, by class of underlying asset, not to separate non-lease components from lease components, and instead account for each lease component and any associated non-lease components as a single lease component.

Lessor accounting remains similar to the existing guidance IAS 17 Leases i.e. lessors continue to classify leases as finance or operating leases.

Identifying a lease

We assess whether the contract is, or contains, a lease at inception of a contract and also shall identify whether the contract is, or contains, a lease at the date of initial application.

The definition of this new standard is mainly related to the control model. This standard classifies a lease contract and a service contract based on whether the identified asset is controlled by the customer. If the customer has all of the following rights, right-of-use is transferred to the customer.

- Right to obtain substantially all of the economic benefits from use of the identified asset

- Right to direct the use of the identified asset

Lessee accounting

The adoption of IFRS 16 will change the accounting of operating leases, which was previously not included in the consolidated statements of financial position under IAS 17, and at the date of initial application of IFRS 16, we shall account for all leases, except for short-term leases and leases of low-value items, as follows:

- recognizes the present value of the lease payments that are not paid at the date of initial recognition in the consolidated statements of financial position as right-of-use asset and lease liabilities

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- recognizes the depreciation charge for right-of-use asset and interest expense on the lease liability in the consolidated statements of comprehensive income

- classifies cash payments for the principal portion (financial activities) and for the interest portion (operating activities) in the consolidated statements of cash flows

Lessor accounting

Under IFRS 16, a lessor continues to classify each of its leases as either a finance leases or an operating leases.

However, under IFRS 16, a lessor shall disclose additional information such as the nature of the lessor s leasing activities and how the lessor manages the risk associated with any rights it retains in underlying assets.

In assessing the financial impact of the initial adoption of IFRS 16, we assessed the impact on our consolidated financial statements for the year 2019 based on the context and available information as of January 1, 2019. As a result of a detailed analysis of the effect on our consolidated financial statements, we expect to increase the amount of right-of-use assets and lease liabilities by Won 4,590,988 million and Won 4,584,555 million as of January 1, 2019, respectively. However, the financial impact assessment may change depending on additional information available in the future.

Critical Accounting Policies

The following discussion and analysis are based on our consolidated financial statements included in this annual report. The fundamental objective of financial reporting is to provide useful information that allows a reader to comprehend our business activities. To aid in that understanding, our management has identified critical accounting policies.

We make a number of estimates and judgments in preparing our consolidated financial statements. These estimates may differ from actual results and have a significant impact on our recorded assets, liabilities, revenues and expenses and related disclosure of contingent assets and liabilities. We consider an estimate to be a critical accounting estimate if it requires a high level of subjectivity or judgment, and a significant change in the estimate would have a material impact on our financial condition or results of operations. Further discussion of these critical accounting estimates and policies is included in the notes to our consolidated financial statements included in this annual report.

The accounting policies set out below have been applied consistently by us and our subsidiaries to all periods presented in the consolidated annual financial statements, unless otherwise indicated.

Sale and Purchase of Electricity

The Government approves the rates we charge to customers. Our utility rates are designed to recover our reasonable costs plus a fair investment return. We purchase electricity principally from our generation subsidiaries based on a competitive bidding process though the Korea Power Exchange.

We recognize electricity sales revenue based on power sold (transferred to the customer) up to the reporting date. To determine the amount of power sold, we make reasonable estimates on daily power volumes for residential, commercial, industrial and other uses. The differences between the current month s estimated amounts and actual (meter-read) amounts are adjusted (trued-up) during the next month period.

Construction Contracts

For each performance obligation satisfied over time, we recognize revenue over time by measuring the progress towards complete satisfaction of that performance obligation. We apply a single method of measuring

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progress for each performance obligation satisfied over time and apply that method consistently to similar performance obligations and in similar circumstances. Revenue and costs are recognized based on the progress towards complete satisfaction of a performance obligation utilizing the cost-based input method at the end of the reporting period. In applying the cost-based input method, it is necessary to use estimates and assumptions related to our efforts or inputs expected to be incurred in the future, costs incurred which are not related to the performance obligation, changes in our efforts or inputs due to change of the performance obligation, etc. Total revenue is measured based on an agreed contract price; however, it may fluctuate due to the variation of performance obligations. The measurement of revenue is affected by various uncertainties resulting from unexpected future events.

Construction contracts are generally performed over a long term, and the total contract costs are estimated based on estimated future amounts such as material costs, labor costs, outsourcing costs and others which are expected to be incurred during construction period. The actual total contract costs can vary from our original estimates because of changes in conditions that affect material costs, labor costs, outsourcing costs and others. The uncertainty of estimated total contract costs and changes in such estimates have an impact on the completion progress and contract revenue for each reporting period. Also, there is uncertainty in future estimates due to various internal and external factors such as fluctuation of market, the risk of business partner and the experience of project performance and others.

Derivative Instruments

We recognize rights and obligations arising from derivative instruments as assets and liabilities, which are stated at fair value. The gains and losses that result from the change in the fair value of derivative instruments are reported in current earnings. However, for derivative instruments designated as hedging the exposure of variable cash flows, the effective portions of the gains or losses on the hedging instruments are recorded as accumulated other comprehensive income (loss) and credited or charged to operations at the time the hedged transactions affect earnings, and the ineffective portions of the gains or losses are credited or charged immediately to operations.

Significant management judgment is involved in determining the fair value of estimated derivative instruments. The estimates and assumptions used by our management to determine fair value can be impacted by many factors, such as the estimated discount factor derived from observable market data, credit risk of the counterparty and the estimated cash flow based on settlement period, interest convention, and other contract information of the derivative instruments.

As of December 31, 2016 and 2017, we had Won 643 billion as assets and Won 395 billion of net amounts as liabilities. As of December 31, 2018, we had Won 210 billion of net amounts as liabilities. Changes in the estimated discount factor or cash flow, or changes in the assumptions and judgments by management underlying these estimates, may cause material revisions to the estimated total gain or loss effect of derivative instruments, which could have a material effect on the recorded asset or liability.

Decommissioning Costs

We recognize the fair value of estimated decommissioning costs as a liability in the period in which we incur a legal obligation associated with retirement of long-lived assets that result from acquisition, construction, development and/or normal use of the assets. We also recognize a corresponding asset that is depreciated over the life of the asset. Accretion expense consists of period-to-period changes in the liability for decommissioning costs resulting from the passage of time and revisions to either the timing or the amount of the original estimate of undiscounted cash flows. Depreciation and accretion expenses are included in the cost of electric power in the accompanying consolidated statements of comprehensive income.

Significant management judgment is involved in determining the fair value of estimated decommissioning costs. The estimates and assumptions used by our management to determine fair value can be impacted by many

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factors, such as the estimated decommissioning costs based on engineering studies commissioned and approved by the Korean government, and changes in assumed dates of decommissioning, inflation rate, discount rate, decommissioning technology, regulation and the general economy.

As of December 31, 2016, 2017 and 2018, we had a liability for decommissioning costs in the amounts of Won 13,050 billion, Won 15,985 billion and Won 16,364 billion, respectively. Changes in the estimated costs or timing of decommissioning, or changes in the assumptions and judgments by management underlying these estimates, may cause material revisions to the estimated total cost to decommission these facilities, which could have a material effect on the recorded liability. We used discount rates of 3.55%, 2.94% and 2.94% and inflation rates of 1.40%, 1.21% and 1.21% when calculating the decommissioning cost liability of nuclear plants recorded as of December 31, 2016, 2017 and 2018, respectively, and discount rate of 4.49% and inflation rate of 2.93% when calculating the decommissioning cost liability of spent fuel recorded as of December 31, 2016, 2017 and 2018. In addition, the following is a sensitivity analysis of the potential impact on decommissioning costs from a 0.1% increase or decrease in each of the inflation rate and the discount rate, assuming that all other aforementioned assumptions remain constant:

	Sensitivity to inflation rate		Sensitivity to discount rate	
	+0.10%	-0.10%	+0.10%	-0.10%
	(in billions of Won)			
Increase (decrease) of liability for decommissioning costs	347	(337)	(306)	315

See Notes 29 and 48 of the notes to our consolidated financial statements included in this annual report for further related information.

Provision for Decontamination of Transformer

Under the Persistent Organic Pollutants Management Act which was enacted in 2007, we are required to remove PCB from our transformers insulating oil by 2025. We are also required to inspect the PCB levels in our transformers and dispose of any PCBs in excess of established safety standards.

As of December 31, 2016, 2017 and 2018, we had liabilities of Won 192 billion, Won 180 billion and Won 148 billion, respectively, for inspection and disposal costs related to the decontamination of existing transformers.

The estimates and assumptions used by our management to determine fair value can be affected by many factors, such as the estimated costs of inspection and disposal, inflation rate, discount rate, regulations and the general economy.

Changes in the estimated costs or changes in the assumptions and judgments underlying these estimates may cause material revisions to the estimated total costs, which could have a material effect on our recorded liability. When calculating the provision for the decontamination of our transformers, we used a discount rate of 2.77% and an inflation rate of 1.29% as of December 31, 2016, a discount rate of 2.55% and an inflation rate of 1.23% as of December 31, 2017 and a discount rate of 2.18% and an inflation rate of 1.27 % as of December 31, 2018.

Deferred Tax Assets

In assessing the realizability of the deferred tax assets, our management considers whether it is probable that a portion or all of the deferred tax assets will not be realized. The ultimate realization of our deferred tax assets is dependent on

whether we are able to generate future taxable income in specific tax jurisdictions during the periods in which temporary differences become deductible. Our management has scheduled the expected future reversals of the temporary differences and projected future taxable income in making this assessment. Based on

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these factors, our management believes that it is probable that we will realize the benefits of these temporary differences as of December 31, 2018. However, the amount of deferred tax assets that is realized may be different if we do not realize estimated future taxable income during the carry forward periods as originally expected.

In relation to the deferred tax assets recognized for tax loss, future taxable income is estimated considering the following: (i) five-year mid-to long-term financial forecasts of earnings before tax approved by management and submitted to the Ministry of Economy and Finance, and (ii) average amount of tax adjustments for the recent three years.

For tax credits carried forward, similar to deferred tax assets recognized for tax loss, our management estimates the probability timing of future taxable profits in determining the probability of utilization of tax credits carried forward. In addition, our management considers the possible carry forward period and available tax credit or deductible temporary differences within the tax laws of each country in which the tax credits originated.

Similarly, our management also estimates the probability of utilization of temporary differences considering the probability of generating future taxable profits in the periods that the deductible temporary differences reverse. We do not recognize deferred tax assets for certain temporary differences associated with investments in subsidiaries, associates, and interests in joint ventures considering future dividends or disposals.

We recognize deferred tax assets and liabilities based on the differences between the financial statement carrying amounts and the tax bases of assets and liabilities at each separate taxpaying entity. Under IFRS, a deferred tax asset is recognized for temporary differences that will result in deductible amounts in future years and for carry forwards. If, based on the weight of available evidence, it is more likely that some or the entire portion of the deferred tax asset will not be realized, that portion is deducted directly from the deferred tax asset.

We believe that the accounting estimate related to the realizability of deferred tax asset is a critical accounting estimate because: (i) it requires management to make assessments about the timing of future events, including the probability of expected future taxable income and available tax planning opportunities, and (ii) the difference between these assessments and the actual performance could have a material impact on the realization of tax benefits as reported in our results of operations. Management s assumptions require significant judgment because actual performance has fluctuated in the past and may continue to do so.

Useful Lives of 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.

Economic useful life is the duration of time the asset is expected to be productively employed by us, which may be less than its physical life. Management s assumptions on the following factors, among others, affect the determination of estimated economic useful life: wear and tear, obsolescence, technical standards, changes in market demand and technological changes.

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The estimated useful lives of our property, plant and equipment are as follows:

	Useful lives (years)
Buildings	8 ~ 40
Structures	8 ~ 50
Machinery	2 ~ 32
Vehicles	3 ~ 8
Loaded heavy water	30
Asset retirement costs	18, 30, 40, 60
Finance lease assets	6 ~ 32
Ships	9
Others	4~15

A component that is significant compared to the total cost of property, plant and equipment is depreciated over its separate useful life. Depreciation methods, residual values and useful lives of property, plant and equipment are reviewed at the end of each reporting period and if change is deemed appropriate, it is treated as a change in accounting estimate. As a result of such annual review, useful lives of certain structures and machinery were changed during the year ended December 31, 2018. Depreciation expenses decreased by Won 25,985 million for the year ended December 31, 2018. Depreciation expenses are expected to decrease by Won 157,333 million and Won 170,471 million for the years ending December 31, 2019 and 2020, respectively, and to increase by Won 353,789 million for the years after December 31, 2020.

Impairment of Long-lived Assets

At the end of each reporting period, we review the carrying amounts of tangible and intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). Where it is not possible to estimate the recoverable amount of an individual asset, we estimate the recoverable amount of the cash-generating unit to which the asset belongs. Where a reasonable and consistent basis of allocation can be identified, corporate assets are also allocated to individual cash-generating units, or otherwise they are allocated to the smallest group of cash-generating units for which a reasonable and consistent allocation basis can be identified.

Intangible assets with indefinite useful lives and intangible assets not yet available for use are tested for impairment at least annually, and whenever there is an indication that the asset may be impaired. Recoverable amount is the higher of fair value less costs to sell or value in use. In assessing value in use, the estimated future cash flows are discounted to their present values using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset (or a cash-generating unit) is estimated to be less than its carrying amount, the carrying amount of the asset (or the cash-generating unit) is reduced to its recoverable amount. An impairment loss is recognized immediately in income or loss, unless the relevant asset is carried at a revalued amount, in which case the impairment loss is treated as a revaluation decrease.

In the event that an impairment loss subsequently reverses, the carrying amount of the asset (or a cash-generating unit) is increased to the revised estimate of its recoverable amount, ensuring that such carrying amount increase does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset (or the cash-generating unit) in prior years. A reversal of an impairment loss is recognized immediately in income or loss,

unless the relevant asset is carried at a revalued amount, in which case the reversal of the impairment loss is treated as a revaluation increase.

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The assessment of impairment is a critical accounting estimate, because significant management judgment is required to determine: (i) whether an indicator of impairment has occurred, (ii) how assets should be grouped, and (iii) the recoverable amount of the asset or asset group in the case of impairment. If management s assumptions about these assets change as a result of events or circumstances, and management believes the assets may have declined in value, we may record impairment charges, resulting in lower profits. Our management uses its best estimate in making these evaluations and considers various factors, including the future prices of energy, fuel costs and other operating costs. However, actual market prices and operating costs could vary from those used in the impairment evaluations, and the impact of such variations could be material. For the year ended December 31, 2016, there were no potential indicators of impairment, and we therefore did not perform an impairment test for such year. For the year ended December 31, 2017, we performed impairment tests on individual assets of KOMIPO and KOWEPO, both of which are wholly owned subsidiaries, due to potential indicators of impairment. For the year ended December 31, 2018, we performed impairment tests on individual assets of KHNP and KOWEPO due to potential indication of impairment. Accordingly, we recognized the amount by which the carrying amount exceeds its recoverable amount as impairment loss on our consolidated statements of comprehensive income. See Note 21 of the notes to our consolidated financial statements included in this annual report for further information.

Accrual for Loss Contingencies for Legal Claims

We are involved in legal proceedings regarding matters arising in the ordinary course of business. In relation to these matters, as of December 31, 2018, we and our subsidiaries were engaged in 570 lawsuits as a defendant and 174 lawsuits as a plaintiff. The total amount claimed against us and our subsidiaries was Won 674 billion and the total amount claimed by us was Won 793 billion as of December 31, 2018. As of December 31, 2018, our provisions for these legal claims amounted to Won 78 billion. These provisions are adjusted when events or circumstances cause these judgments or estimates to change.

Actual amounts of our liabilities as determined upon settlement of legal claims or by final decisions of the courts in relation thereto may be substantially different from the amounts of provisions recognized or contingent liabilities disclosed. If the actual amounts are higher than the amounts of related provisions, the resulting additional liabilities would adversely impact our results of operations, financial condition and cash flows.

Consolidated Results of Operations

2018 Compared to 2017

In 2018, our consolidated sales, which is principally derived from the sale of electric power, slightly increased by 1.2% to Won 60,033 billion in 2018 from 59,336 billion in 2017, primarily reflecting an increase in sales of electric power. Our sale of electric power increased by 3.8% to Won 57,898 billion for 2018 from Won 55,773 billion for 2017, primarily due to an increase in the volume of electricity sold, which was partially offset by a decline in the average unit sales price. The volume of electricity sold increased by 3.6% to 526,149 gigawatt hours in 2018 from 507,746 gigawatt hours in 2017, primarily due to a 2.5% increase in the volume of electricity sold to the industrial sector, which represents the largest segment of electricity consumption in Korea, to 292,999 gigawatt hours in 2018 from 285,969 gigawatt hours in 2017, a 5.1% increase in the volume of electricity sold to the commercial sector, which represents the second largest segment of electricity consumption in Korea, to 116,934 gigawatt hours in 2018 from 111,298 gigawatt hours in 2017, and a 6.3% increase in the volume of electricity sold to the residential sector to 72,895 gigawatt hours in 2018 from 68,544 gigawatt hours in 2017. The increase in the volume of electricity sold to the industrial sector was primarily due to the increased volume of semiconductor and other exports. The increase in the volume of electricity sold to the commercial sector was primarily due to extreme weather conditions that have led to increased demand for heating and air conditioning. The increase in the volume of electricity sold to the residential

sector was primarily due to an increase in household electricity usage for air conditioning and heating as a result of extreme weather conditions. Average unit sales price decreased by 0.7% to Won 108.75 per kilowatt-hour in 2018 from Won 109.53 per kilowatt-hour in 2017, primarily due to a decrease in the average

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tariff resulting from a rate discount applicable to households during the summer of 2018. Our sales of construction services decreased by 45.8% to Won 1,742 billion in 2018 from Won 3,212 billion in 2017, primarily due to a decrease in sales amount recorded from the ongoing construction of our nuclear complex construction projects in the United Arab Emirates as the projects progress over time.

Our consolidated cost of sales, which is principally derived from the purchase of power from independent power producers and to a lesser extent, from raw materials used and depreciation, increased by 11.7%, to Won 58,208 billion in 2018 from Won 52,099 billion in 2017, primarily due to a 28.3% increase in power purchase, a 22.7% increase in raw material used and a 2.3% increase in depreciation, which were offset by a 45.5% decrease in other cost of sales.

Power purchase, which accounted for 31.5% and 27.4% of our cost of sales in 2018 and 2017, respectively, increased by 28.3% to Won 18,307 billion in 2018 from Won 14,264 billion in 2017, primarily due to a 9.0% increase in the unit cost of power purchased from Won 104.3 per kilowatt-hour in 2017 to Won 113.7 per kilowatt-hour in 2018, largely resulting from a general increase in international market prices for the main fuel types, which led to an increase in the price of electricity generated by independent power producers, from whom we are purchasing an increasing amount of electricity.

Raw materials used, which accounted for 33.6% and 30.6% of our cost of sales in 2018 and 2017, respectively, increased by 22.7% to Won 19,538 billion in 2018 from Won 15,925 billion in 2017, largely due to a general increase in international market prices.

Depreciation expense, excluding amortization of nuclear fuel charged to fuel costs in the amounts of Won 923 billion and Won 1,069 billion in 2018 and 2017, respectively, increased by 4.4% to Won 8,760 billion in 2018 from Won 8,393 billion in 2017 primarily due to additional property, plant and equipment acquired in relation to the construction of new generation facilities pursuant to our capital investment program.

Other cost of sales decreased by 45.5% to Won 2,170 billion in 2018 from Won 3,980 billion in 2017 primarily due to a decrease of other cost of overseas sales in relation to our nuclear complex construction projects in the United Arab Emirates.

As a cumulative result of the foregoing factors, our consolidated gross profit decreased by 74.8% to Won 1,825 billion in 2018 from Won 7,237 billion in 2017, and our consolidated gross profit margin decreased to 3.0% in 2018 from 12.2% in 2017. The decreases in our consolidated gross profit and consolidated gross profit margin were largely attributable to a 11.7% increase in our consolidated cost of sales (which was mainly due to a 28.3% increase in power purchase, a 22.7% increase in raw materials used and the 2.3% increase in depreciation, which were offset by a 45.5% decrease in other cost of sales and a 14.6% decrease in welfare and benefit expense), which substantially outpaced the 1.2% increase in our consolidated sales (which was primarily due to the 3.6% increase in the volume of electricity sold, which was offset by a 45.8% decrease in the sales of construction services).

Our consolidated selling and administrative expenses decreased by 4.9% to Won 2,628 billion in 2018 from Won 2,763 billion in 2017, largely due to a 68.6% decrease in bad debt expense to Won 40 billion in 2018 from Won 127 billion in 2017, which mainly related to an allowance in 2017 for KOSEP s accounts receivables with low possibility of collection from Hyundai Energy Co., Ltd., which was not applicable in 2018, and a 73.0% decrease in advertising expenses to Won 31 billion in 2018 from Won 115 billion in 2017, which mainly related to our sponsorships for the PyeongChang 2018 Winter Olympics incurred in 2017, which was not applicable in 2018.

Our consolidated other income, net of expenses, increased by 7.3% to Won 739 billion in 2018 from Won 689 billion in 2017, mainly as a result of an increase in gains on assets contributed, gains on liabilities

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exempted and income related to transfer of assets from customers, which include items of property, equipment, or cash that we receive from customers in relation to supplying electricity.

Our consolidated net other losses increased significantly to Won 621 billion in 2018 from net other gains of Won 157 billion in 2017, primarily due to an increase in impairment loss on property, plant and equipment, largely resulting from the early retirement of Wolsong #1 unit and a recognition of impairment loss related to Shin-Hanul #3 and #4 units.

As a cumulative result of the foregoing factors, our consolidated operating profit decreased by 112.9% to an operating loss of Won 685 billion in 2018 from an operating profit of Won 5,320 billion in 2017, and our consolidated operating income margin decreased to (1.1)% in 2018 from 9.0% in 2017. These decreases were mainly due to an increase in our cost of sales primarily as a result of an increase in raw materials and power purchases due to increases in the fuel costs and the volume of electricity sold.

Our consolidated finance expenses, net, increased by 4.8% to Won 1,674 billion in 2018 from Won 1,597 billion in 2017, primarily as a result of a decrease in net gains on foreign currency translation and transaction, which was partially offset by an increase in net gains on valuation of derivatives.

We recorded consolidated profit of associates or joint ventures using equity method of Won 358 billion in 2018 compared to a loss of Won 108 billion in 2017, primarily as a result of an increase in profit of Korea Gas Corporation.

As a cumulative result of the foregoing factors, our consolidated income (loss) before income taxes decreased by 155.4% to a loss of Won 2,001 billion in 2018 from an income of Won 3,614 billion in 2017.

Our income tax benefit increased significantly to Won 826 billion in 2018 from an income tax expense of Won 2,173 billion in 2017, largely as a result of the decrease in our profit before income taxes. Our effective tax expense rate, which represents tax expense as a percentage of profit before income taxes, was not calculated for income tax benefit in 2018 and was 60.1% in 2017. Our recognition of deferred tax liabilities was mainly due to temporary differences with respect to property, plant and equipment and investments in subsidiaries and associates. The applicable statutory tax rate was 27.5% in 2018 and 2017. See Note 44 to our financial statements included in this annual report.

As a cumulative result of the above factors, our consolidated profit (loss) decreased by 181.5% to a loss of Won 1,175 billion in 2018 from a profit of Won 1,441 billion in 2017. Our consolidated net profit margin also decreased to (2.0)% in 2018 from 2.4% in 2017. Our profit (loss) attributable to the owners of the company was a loss of Won 1,315 billion in 2018 compared to a profit of Won 1,299 billion attributable to the owners of the company in 2017.

We reported consolidated other comprehensive loss of Won 107 billion in 2018 compared to consolidated other comprehensive loss of Won 95 billion in 2017, largely due to our recognition of loss from remeasurements of defined benefit liability whereas we recognized income from such remeasurements in 2017.

As a cumulative result of the above factors, our consolidated total comprehensive income (loss) decreased by 195.2% to a loss of Won 1,282 billion in 2018 from an income of Won 1,346 billion in 2017.

2017 Compared to 2016

In 2017, our consolidated sales, which is principally derived from the sale of electric power, slightly decreased by 0.7% to Won 59,336 billion in 2017 from Won 59,763 billion in 2016, primarily reflecting a decrease in sales of

construction services, which was partially offset by an increase in sales of electric power. Our sales of construction services decreased by 20.2% to Won 3,212 billion in 2017 from Won 4,027 billion in

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2016, primarily due to a decrease in sales amount recorded from the ongoing construction of our nuclear complex construction projects in the United Arab Emirates as the construction projects progress over time. Our sale of electric power increased by 0.7% to Won 55,773 billion for 2017 from Won 55,379 billion for 2016, primarily due to an increase in the volume of electricity sold, which was partially offset by a decline in the average unit sales price. The volume of electricity sold increased by 2.2% to 507,746 gigawatt hours in 2017 from 497,039 gigawatt hours in 2016, primarily due to a 2.6% increase in the volume of electricity sold to the industrial sector, which represents the largest segment of electricity consumption in Korea, to 285,969 gigawatt hours in 2017 from 278,828 gigawatt hours in 2016, a 2.5% increase in the volume of electricity sold to the commercial sector, which represents the second largest segment of electricity consumption in Korea, to 111,298 gigawatt hours in 2017 from 108,617 gigawatt hours in 2016, and a 0.7% increase in the volume of electricity sold to the residential sector to 68,544 gigawatt hours in 2017 from 68,057 gigawatt hours in 2016. The increase in the volume of electricity sold to the industrial sector was primarily due to the continued export-based growth of the Korean economy, which resulted in increased industrial output and greater utilization of industrial plants. The increase in the volume of electricity sold to the commercial sector was primarily due to the recovery of market demand as a result of various Government policies to boost the economy. The increase in the volume of electricity sold to the residential sector was primarily due to an increase in household electricity usage for air conditioning and heating. Average unit sales price decreased by 1.5% to Won 109.53 per kilowatt-hour in 2017 from Won 111.23 per kilowatt-hour in 2016, primarily due to the amendment to the progressive rate structure to ease the tariff burden on residential customers, effective as of January 1, 2017.

Our consolidated cost of sales, which is principally derived from the purchase of power from independent power producers and to a lesser extent, from raw materials used and depreciation, increased by 14.4%, to Won 52,099 billion in 2017 from Won 45,550 billion in 2016, primarily due to a 32.6% increase in power purchase, a 18.2% increase in raw materials used and a 8.7% increase in depreciation, which were offset by a 11.3% decrease in other cost of sales.

Power purchase, which accounted for 27.4% and 23.6% of our cost of sales in 2017 and 2016, respectively, increased by 32.6% to Won 14,264 billion in 2017 from Won 10,756 billion in 2016, primarily due to a 9.6% increase in the unit cost of power purchased from Won 95.2 per kilowatt-hour in 2016 to Won 104.3 per kilowatt-hour in 2017, largely resulting from a general increase in international market prices for the main fuel types, which led to an increase in the price of electricity generated by independent power producers.

Raw materials used, which accounted for 30.6% and 29.6% of our cost of sales in 2017 and 2016, respectively, increased by 18.2% to Won 15,925 billion in 2017 from Won 13,471 billion in 2016, largely due to a general increase in international market prices.

Depreciation expense, excluding amortization of nuclear fuel charged to fuel costs in the amounts of Won 1,069 billion and Won 1,085 billion in 2017 and 2016, respectively, increased by 10.1% to Won 8,393 billion in 2017 from Won 7,620 billion in 2016 primarily due to an increase of additional property, plant and equipment acquired in relation to new generation facilities pursuant to our capital investment program.

Other cost of sales decreased by 11.3% to Won 3,980 billion in 2017 from Won 4,488 billion in 2016 primarily due to a decrease in other cost of overseas sales.

As a cumulative result of the foregoing factors, our consolidated gross profit decreased by 49.1% to Won 7,237 billion in 2017 from Won 14,213 billion in 2016, and our consolidated gross profit margin decreased to 12.2% in 2017 from 23.8% in 2016. The decreases in our consolidated gross profit and consolidated gross profit margin were largely attributable to a 14.4% increase in our consolidated cost of sales (which was mainly due to a 32.6% increase in power purchase, a 18.2% increase in raw materials used and the 8.7% increase in depreciation, which were offset by a 11.3% decrease in other cost of sales and a 5.9% decrease in taxes and dues), which substantially outpaced the 0.7% decrease

in our consolidated sales (which was primarily due to the 2.2% increase in the volume of electricity sold, as well as the 20.2% decrease in the sales of construction services).

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Our consolidated selling and administrative expenses increased by 4.7% to Won 2,763 billion in 2017 from Won 2,639 billion in 2016, largely due to a 227.3% increase in bad debt expense to Won 127 billion in 2017 from Won 39 billion in 2016, which mainly related to KOSEP s accounts receivables with low possibility of collection from Hyundai Energy Co., Ltd. and a 230.4% increase in advertising expenses to Won 115 billion in 2017 from Won 35 billion in 2016, related to our sponsorships for the PyeongChang 2018 Winter Olympics and a 11.2% increase in commissions to Won 674 billion in 2017 from Won 606 billion in 2016, for electricity metering, which was offset by a 53.3% decrease in other expenses to Won 155 billion in 2017 from Won 332 billion in 2016, due to a decrease in costs for energy efficiency improvement project.

Our consolidated other income, net of expenses, increased by 5.7% to Won 689 billion in 2017 from Won 652 billion in 2016, mainly as a result of an increase in income related to transfer of assets from customers.

Our consolidated net other gains increased significantly to Won 157 billion in 2017 from Won 70 billion in 2016, primarily due to an increase in net gain on foreign currency transaction, largely resulting from fluctuations in the value of Won against other foreign currencies in 2017.

As a cumulative result of the foregoing factors, our consolidated operating profit decreased by 56.7% to Won 5,320 billion in 2017 from Won 12,296 billion in 2016, and our consolidated operating income margin decreased to 9.0% in 2017 from 20.6% in 2016. These decreases were mainly due to a decrease in our consolidated sales and an increase in our cost of sales primarily as a result of increases in power purchase and raw materials due to increases in the fuel costs and the volume of electricity sold.

Our consolidated finance expenses, net, decreased by 3.0% to Won 1,597 billion in 2017 from Won 1,646 billion in 2016, primarily as a result of an increase in net losses on valuation of derivatives and an increase in net losses on transaction of derivatives, which were partially offset by an increase in net gains on foreign currency translation.

We recorded consolidated loss of associates or joint ventures using equity method of Won 108 billion in 2017 compared to a loss of Won 137 billion in 2016, primarily as a result of a decrease in profit of Korea Gas Corporation.

As a cumulative result of the foregoing factors, our consolidated income before income taxes decreased by 65.6% to Won 3,614 billion in 2017 from Won 10,513 billion in 2016.

Our income tax expense decreased by 35.4% to Won 2,173 billion in 2017 from Won 3,365 billion in 2016, largely as a result of the decrease in our profit before income taxes. Our effective tax expense rate, which represents tax expense as a percentage of profit before income taxes, increased from 32.0% in 2016 to 60.1% in 2017 primarily resulting from an adjustment for our recognition of deferred tax liabilities of Won 1,055 billion in 2017 due to 3.3% increase in tax rate, whereas we did not recognize such increase in 2016. Our recognition of deferred tax liabilities was mainly due to temporary differences regarding property, plant and equipment and investments in subsidiaries and associates. In 2017, the applicable statutory tax rate increased to 27.5% from the prior rate of 24.2% in 2016. See Note 44 to our financial statements included in this annual report.

As a cumulative result of the above factors, our consolidated profit decreased by 79.8% to Won 1,441 billion in 2017 from Won 7,148 billion in 2016. Our consolidated net profit margin also decreased to 2.4% in 2017 from 12.0% in 2016. Our profit attributable to the owners of the company was Won 1,299 billion in 2017 compared to Won 7,048 billion attributable to the owners of the company in 2016.

We reported consolidated other comprehensive loss of Won 95 billion in 2017 compared to consolidated other comprehensive loss of Won 2 billion in 2016, largely due to an increase in loss from equity method investments

primarily in relation to Korea Gas Corporation, which was partially offset by our recognition of income from remeasurements of defined benefit liability (whereas we recognized loss from such remeasurements) in 2016.

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As a cumulative result of the above factors, our consolidated total comprehensive income decreased by 81.2% to Won 1,346 billion in 2017 from Won 7,146 billion in 2016.

Inflation

The effects of inflation in Korea on our financial condition and results of operations are reflected primarily in construction costs as well as in labor expenses. Inflation in Korea has not had a significant impact on our results of operations in recent years. It is possible that inflation in the future may have an adverse effect on our financial condition or results of operations.

Segment Results

We operate the following business segments: transmission and distribution, nuclear power generation and thermal power generation and all others. The transmission and distribution segment, which is operated by us, the parent company, consists of operations related to the transmission, distribution and sale to end-users of electricity purchased from our generation subsidiaries as well as from independent power producers. The power generation segment, which is operated by our one nuclear generation subsidiary and five non-nuclear generation subsidiaries, consists of operations related to the generation of electricity sold to us through the Korea Power Exchange. The transmission and distribution segment and the power generation segment together represent our electricity business. The remainder of our operation is categorized as all others. The all other segment consists primarily of operations related to the plant maintenance and engineering service, information services, and sales of nuclear fuel, communication line leasing, overseas businesses and others. In 2016, 2017 and 2018, the unaffiliated revenues of the power generation segment (representing the six generation subsidiaries) and all our other revenues in the aggregate amounted to only 3.0%, 3.2% and 2.9% of our consolidated revenues, respectively, and the results of operations for our business segments substantially mirror our consolidated results of operations. For further information, see Note 4 of the notes to our consolidated financial statements included in this annual report.

Item 5.B. Liquidity and Capital Resources

We expect that our capital requirements, capital resources and liquidity position may change in the course of implementing the Restructuring Plan. See Item 4.B. Business Overview Restructuring of the Electric Power Industry in Korea and Item 3D. Risk Factors Risks Relating to KEPCO The Government may adopt policy measures to substantially restructure the Korean electric power industry or our operational structure, which may have a material adverse effect on our business, operations and profitability.

Capital Requirements

We anticipate that the following represent the major sources of our capital requirements in the short-term to intermediate future:

- capital expenditures pursuant to our capital investment program;
- working capital requirements, the largest component of which is fuel purchases;

payment of principal and interest on our existing debt; and

overseas investments.

In addition, if there were to occur unanticipated material changes to the Restructuring Plan, the Basic Plan or other major policy initiatives of the Government relating to the electric power industry, or natural disasters, such developments may require a significant amount of additional capital requirements.

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Capital Expenditures

We anticipate that capital expenditures will be the most significant use of our funds for the next several years. Our capital expenditures relate primarily to the construction of new generation units, maintenance of existing generation units and expansion of our transmission and distribution systems. Our capital expenditures generally follow budgets established under the Basic Plan, which contains projections relating to the supply and demand of electricity of Korea based on which we plan the construction of additional generation units and transmission systems.

Our total capital expenditures for the construction of generation, transmission and distribution facilities were Won 13,950 billion, Won 13,711 billion and Won 13,695 billion in 2016, 2017 and 2018, respectively, and under our current budgets, are estimated to be approximately Won 16,831 billion, Won 19,138 billion and Won 18,804 billion in 2019, 2020 and 2021, respectively. We plan to finance our capital expenditures primarily through issuance of securities in the capital markets, borrowings from financial institutions and construction grants.

In January 2016, the Ministry of Trade, Industry and Energy announced an initiative to promote the new energy industry by creating the New Energy Industry Fund, which is made up of funds sponsored by government-affiliated energy companies. We contributed Won 500 billion to the funds in 2016. The purpose of these funds is to invest in substantially all frontiers of the new energy industry, including renewable energy, energy storage systems, electric vehicles, small-sized self-sustaining electricity generation grids known as micro-grids , among others, as well as invest in start-up companies, ventures, small- to medium-sized enterprise and project businesses that engage in these businesses but have not previously attracted sufficient capital from the private sector.

Furthermore, as part of the Comprehensive Measures against Particulate Matter and the Eighth Basic Plan, announced by the Government in September 2017 and December 2017, respectively, the Government set forth the following policy directions relating to coal-fired generation units: (i) two coal-fired generation units scheduled for construction and four existing coal-fired generation units shall convert to LNG fuel use, (ii) in principle, construction of new coal-fired generation units shall not be planned, (iii) seven of the coal-fired generation units that are 30 years or older will be shut down on an accelerated schedule, (iv) beginning in 2018, coal-fired generation units that are 30 years or older shall temporarily cease operations from March through June of each year, (v) coal-fired generation units shall be put through comprehensive functional and environmental upgrades and (vi) coal-fired generation units shall be subject to emission standards that came into effect in January 2019 that are twice as more rigorous than the previous standards. Compliance with such measures is expected to result in our incurring significant costs.

Fuel Purchases

We require significant funds to finance our operations, principally in relation to the purchase of fuels by our generation subsidiaries for generation of electricity. In 2016, 2017 and 2018, fuel costs constituted 30.9%, 31.7% and 34.5% of our cost of sales and the ratio of fuel costs to our sales was 23.4%, 27.8% and 33.5%, respectively. We plan to fund our fuel purchases primarily with net operating cash, although in cases of rapid increases in fuel prices as is the case from time to time, we may also rely on borrowings from financial institutions and issuance of debt securities in the capital markets.

Repayment of Existing Debt

Payments of principal and interest on indebtedness will require considerable resources. The table below sets forth the scheduled maturities of the outstanding interest-paying debt (excluding issue discounts and premium) without taking into consideration of swap transactions of us and our six wholly-owned generation subsidiaries as of December 31, 2018 for each year from 2019 to 2023 and thereafter. As of December 31, 2018, such debt represented 95.7% of our

outstanding debt on a consolidated basis.

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Year ended December 31	Local Currency Borrowings	Foreign Currency Borrowings	Domestic Debentures	Foreign Debentures	Total
			(in billions of Won)		
2019	825		5,330	1,462	7,617
2020	8		6,140	1,151	7,299
2021	208	8	6,771	1,341	8,328
2022	207	1	5,650	1,398	7,256
2023	556	1	5,790	1,565	7,912
Thereafter	23		18,020	2,076	20,119
Total	1,827	10	47,701	8,993	58,531

We and our six wholly-owned generation subsidiaries incurred interest charges (including capitalized interest) in relation to our interest-paying debt of Won 2,490 billion, Won 2,287 billion and Won 2,362 billion in 2016, 2017 and 2018, respectively. We anticipate that interest charges will increase in future years because of, among other factors, anticipated increases in our long-term debt. See Capital Resources below. The weighted average rates of interest on our and our six wholly-owned generation subsidiaries debt were 3.69%, 3.20% and 3.23% in 2016, 2017 and 2018, respectively.

Overseas Investments

As part of our revenue diversification and fuel procurement strategy, we plan to continue to make overseas investments on a selective basis, which will be funded primarily through foreign currency-denominated borrowings and debt securities issuances as well as net operating cash from such projects.

Capital Resources

We have traditionally met our working capital and other capital requirements primarily from net cash provided by operating activities, issuance of debt securities and borrowings from financial institutions. Net cash provided by operating activities is primarily a function of electricity sales and fuel purchases and is also affected by increases and decreases in trade receivables, trade payables and inventory related to electricity sales and fuel purchases. Net cash provided by operating activities was Won 16,521 billion, Won 11,250 billion and Won 6,680 billion in 2016, 2017 and 2018, respectively.

As of December 31, 2016, 2017 and 2018, our long-term debt (excluding the current portion but including issue discounts and premium), without taking into consideration of swap transactions, amounted to Won 44,700 billion, Won 45,624 billion and Won 53,073 billion, respectively, representing 61.2%, 62.5% and 74.7% of shareholders equity, respectively, as of such dates. As of December 31, 2016, 2017 and 2018, the current portions of our long-term debt were Won 8,134 billion, Won 8,085 billion and Won 7,101 billion, respectively. As of December 31, 2016, 2017 and 2018, our short-term borrowings amounted to Won 806 billion, Won 1,038 billion and Won 861 billion, respectively. See Note 26 of the notes to our consolidated financial statements included in this annual report. Total long-term debt (including the current portion but excluding issue discounts and premium), without taking into consideration of swap transactions, as of December 31, 2018 was Won 60,289 billion, of which Won 49,618 billion was denominated in Won and an equivalent of Won 10,671 billion was denominated in foreign currencies, primarily U.S. dollars. We, KHNP, KOMIPO and KOWEPO also maintain global medium-term note programs in the aggregate amount of US$13 billion, of which approximately US$9 billion remains currently available for future drawdown. KOSEP also maintains an A$2 billion Australian dollar medium-term note program, of which approximately A$1.7 billion remains current available for future drawdown.

Subject to the implementation of our capital expenditure plan and the sale of our interests in our generation subsidiaries and other subsidiaries, our long-term debt may increase or decrease in future years. Until recently, a significant portion of our long-term debt was raised through foreign currency-denominated borrowings. Our

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foreign currency-denominated long-term debt (including the current portion but excluding issue discounts and premium), without taking into consideration of swap transactions, amounted to Won 10,463 billion and Won 10,671 billion as of December 31, 2017 and 2018, respectively.

Our ability to incur long-term debt in the future is subject to a variety of factors, many of which are beyond our control, including, the amount of capital that other Korean entities may seek to raise in capital markets. Economic, political and other conditions in Korea may also affect investor demand for our securities and those of other Korean entities. In addition, our ability to incur debt will also be affected by the Government s policies relating to foreign currency borrowings, the liquidity of the Korean capital markets and our operating results and financial condition. In case of adverse developments in Korea, the price at which such financing may be available may not be acceptable to us.

We incur our short-term borrowings primarily through commercial papers sold to domestic financial institutions. We have not had, and we do not expect to have, any material difficulties in obtaining short-term borrowings. In addition, in order to prepare for potential liquidity shortage, we maintain several credit facilities with financial institutions, with Won-denominated facilities amounting to Won 4,424 billion in aggregate and foreign currency-denominated facilities amounting to US$1,841 million in aggregate. The full amount of these facilities was available as of December 31, 2018.

We may raise capital from time to time through the issuance of equity securities. However, there are certain restrictions on our ability to issue equity, including limitations on shareholdings by foreigners. In addition, without changes in the existing KEPCO Act which requires that the Government, directly or pursuant to the Korea Development Bank Act, through Korea Development Bank, own at least 51% of our capital stock, it may be difficult or impossible for us to undertake any equity financing other than sales of treasury stock without the participation of the Government. Even if we are able to conduct equity financing with the participation of the Government, prevailing market conditions may be such that we may not be able conduct equity financing on terms that are commercially acceptable to us. See Item 3D. Risk Factors Risks Relating to Korea and the Global Economy.

Our total shareholders equity decreased by 2.6% from Won 72,965 billion as of December 31, 2017 to Won 71,093 billion as of December 31, 2018, mainly as a result of a decrease in total comprehensive income.

Liquidity

Our liquidity is substantially affected by our acquisition of property, plant and equipment, fuel purchases and schedule of repayment of debt. Our property, plant and equipment increased by 1.2% from Won 150,882 billion as of December 31, 2017 to Won 152,743 billion as of December 31, 2018. As fuel costs increased by 21.6% from Won 16,524 billion in 2017 to Won 20,093 billion in 2018, our current trade and other payables which is closely related to fuel costs increased by 6.8% from Won 6,000 billion as of December 31, 2017 to Won 6,405 billion as of December 31, 2018. Our current financial liabilities decreased by 13.2% from Won 9,195 billion as of December 31, 2017 to Won 7,982 billion as of December 31, 2018 according to our debt repayment schedule.

Our cash flows are also impacted by other factors. Our net cash provided by operating activities decreased by 40.6% from Won 11,250 billion in 2017 to Won 6,680 billion in 2018. The decrease in net cash provided by operating activities in 2018 compared to 2017 was mainly due to a decrease in profit for the period. Our cash flows from investing activities are affected by acquisition of and proceeds from disposals of financial assets. Our net cash used in investing activities increased by 3.2% from Won 12,607 billion in 2017 to Won 13,014 billion in 2018, mainly because our acquisition of financial assets outpaced disposals of financial assets. Our cash flows from financing activities are mainly affected by borrowings and issuance of debt securities and repayment thereof, as well as

dividends paid. Our net cash from financing activities was Won 746 billion in 2017 and Won 5,302 billion in 2018, respectively, largely due to an increase in proceeds from long-term borrowings and debt securities.

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Due to the capital-intensive nature of our business as well as significant volatility in fuel prices, from time to time we operate with working capital deficits, and we may have substantial working capital deficits in the future. As of December 31, 2016, 2017 and 2018, we had a working capital deficit of Won 5,031 billion, Won 4,283 billion and Won 2,096 billion, respectively. We have traditionally met our working capital and other capital requirements primarily with net cash provided by operating activities, issuance of debt securities, borrowings from financial institutions and construction grants. We also incur short-term borrowings primarily through commercial papers sold to domestic financial institutions. We have not had, and we do not expect to have, any material difficulties in obtaining short-term borrowings. See Capital Resources.

We may face liquidity concerns in the case of sudden and sharp depreciation of the Won against major foreign currencies or depreciation over a sustained period of time. While substantially all of our revenues and our cash and cash equivalents are denominated in Won, we pay for substantially all of our fuel purchases in foreign currencies and a substantial portion of our long-term debt is denominated in foreign currencies, and payment of principal and interest thereon is made in foreign currencies. In the past, we have incurred foreign currency debt principally due to the limited availability and the high cost of Won-denominated financing in Korea. However, in light of the increasing sophistication of the Korean capital markets and the recent increase in Won liquidity in the Korean financial markets, we plan to reduce the portion of our debt which is denominated in foreign currencies although we intend to continue to raise certain amounts of capital through long-term foreign currency debt for purposes of maintaining diversity in our funding sources as well as paying for overseas investments and fuel procurements in foreign currencies. As of December 31, 2018, 17.7% of our long-term debt (including the current portion but excluding issue discounts and premium) without taking into consideration of swap transactions was denominated in currencies other than Won.

We enter into currency swaps and other hedging arrangements with respect to our debt denominated in foreign currencies only to a limited extent due primarily to the limited size of the Korean market for such derivative arrangements. Such instruments include combined currency and interest rate swap agreements, interest rate swaps and foreign exchange agreements. We do not enter into derivative financial instruments in order to hedge market risk resulting from fluctuations in fuel costs. Our policy is to hold or issue derivative financial instruments for hedging purposes only. Our derivative financial instruments are entered into with major financial institutions, thereby minimizing the risk of credit loss. See Note 14 of the notes to our consolidated financial statements.

We paid dividends of Won 1,980 per share in respect of fiscal year 2016, Won 790 per share in respect of fiscal year 2017. We did not pay any dividends in respect of fiscal year 2018.

Other

Our operations are materially affected by the policies and actions of the Government. See Item 4.B. Business Overview Regulation.

Item 5.C. Research and Development, Patents and Licenses, etc.

Research and Development

Our research and development program is focused on developing advanced electric power, renewable energy, smart grid and customer-friendly electricity service technologies that will enable us to become a global leader in the energy industry. In order to achieve our corporate vision of becoming a A Smart Energy Creator in 2014, we adopted the KEPCO Technology Strategy, which emphasizes enhanced technological convergence and customer service. As part of such strategy, we are continuously investing in technology development to preemptively respond to changes in the energy paradigm and to improve the quality of the electricity. As a result, we secured 20 core strategic technologies

and 23 first-in-class technologies and 49 domestic top-level technologies in the related fields such as power network upgrading, 4th industrial revolution and renewable

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energy. In 2019, consistent with the Government guidelines, we plan to invest approximately 4.93% of our annual estimated net sales in the research and development. We also actively cope with changes in the external environment represented by 3Ds (Digitalization, Decarbonization and Decentralization) and established medium and long-term technology development strategies for core strategies to create sustainable new growth engines. We plan to invest in the following: (i) a system platform that combines technologies such as big data, artificial intelligence and cloud computing; (ii) digitalization technology of electric power facility; (iii) power energy storage technology; (iv) advanced renewable energy technology; (v) energy consumption optimization demand management technology; (vi) advanced power generation technology; (vii) international power grid connection technology and (viii) active distribution system technology to secure 150 core technologies that can contribute to national development and quality of life of our customers.

Our high-priority creative smart energy projects currently include the following:

- acquiring integrated gasified process technology;
- establishing smart energy cities for high efficient grid;
- developing highly efficient absorbents for carbon capture;
- commercializing offshore wind power plants;
- obtaining high-voltage direct currents technology suitable for domestic operation; and
- experimental testing of large-scale energy storage systems with capacities ranging from four to eight megawatts.

Our research and development activities also focus on the following:

- in the thermal power generation sector, reducing the greenhouse effect, enhancing efficiency and reducing cost in power plant construction and operation as well as in our plant maintenance, including through improvements in damage analysis and environment-friendly inspections;
- in the renewable energy sector, enhancing efficiency, lowering costs of power generation, identifying new energy sources and exploring new business opportunities;
- in the electric power system sector, enhancing the stability and reliability in the operation of our electric power grid as well as enhancing efficiency in electricity distribution, including through build-out of large-sized electricity storage facilities and superconducting transmission cable grids, introducing preventive

maintenance measures for substations and developing technologies related to system automation, power utilization and power line communication;

in the customer service sector, developing technologies enabling a greater range of business opportunities and heightened customer service in anticipation of the upcoming rollout of the smart grid system; and

in the technological convergence sector, identifying new business opportunities through convergence among technologies and businesses and maximizing synergy from such convergence in tandem with the promotion of creative economy in Korea as well as globally.

In addition, we cooperate closely with several other electric utility companies and research institutes, both foreign and domestic, on various projects to diversify the scope and scale of our research and development activities.

We and our six generation subsidiaries invested Won 530 billion, Won 975 billion and Won 929 billion in 2016, 2017 and 2018, respectively, and currently plan to invest Won 1,044 billion in 2019, on research and development. Our current focus in research and development is primarily in the area of ICT-based smart energy technological development. We had 1,208 employees engaged in research and development activities as of December 31, 2018. As a result of our research, we had 5,218 registered patents and 6,426 patent applications outstanding in Korea and abroad as of December 31, 2018.

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Item 5.D. Trend Information

Trends, uncertainties and events which could have a material impact on our sales, liquidity and capital resources are discussed above in Item 5.A. Operating Results and Item 5.B. Liquidity and Capital Resources.

Item 5.E. Off-Balance Sheet Arrangements

We had no significant off-balance sheet arrangements as of December 31, 2018.

Item 5.F. Tabular Disclosure of Contractual Obligations

The following summarizes certain of the contractual obligations of us and our six wholly-owned generation subsidiaries as of December 31, 2018 and the effect such obligations are expected to have on liquidity and cash flow in future periods.

		Payments Due by Period			
Contractual Obligations[1]	**Total**	**Less than 1 year**	**1 3 years**	**3 5 years**	**After 5 years**
		(in billions of Won)			
Long-term debt[2]	57,714	6,799	15,627	15,169	20,119
Short-term borrowings	817	817			
Interest payments[3]	10,209	1,709	2,682	1,755	4,063
Total	68,740	9,325	18,309	16,924	24,182

Notes:

(1) Other than as set forth in this table, we have several other contractual obligations, including finance lease agreements, fuel purchase agreements and consecutive voyage charter agreements. We believe the remaining annual payments under finance lease agreements as of December 31, 2018 were immaterial. Contractual obligations related to payment of debt of us and our six wholly-owned generation subsidiaries represented 94.2% of our outstanding debt as of December 31, 2018 on a consolidated basis. As for fuel purchase agreements, our generation subsidiaries have entered into several contracts under which they are committed to purchasing minimum quantities of fuel, including approximately 90 million tons of bituminous coal annually. As for all uranium ore concentrates, in order to ensure stable supply, our subsidiary enters into long-term and medium-term contracts with various suppliers and supplements such supplies with purchases in spot markets. We negotiate annually with Korea Gas Corporation and other suppliers, to purchase LNG. The fuel purchase price is typically negotiated near or at time of purchase subject to prevailing market conditions. In 2018, we purchased fuel in the amount of Won 20.1 trillion and the operating lease payment in connection with the consecutive voyage charter agreements was Won 872 billion.

(2) Includes the current portion.

(3)

A portion of our debt carried a variable rate of interest. We used the interest rate in effect as of December 31, 2018 for the variable rate of interest in calculating the interest payments on debt for the periods indicated.

For a description of our commercial commitments and contingent liabilities, see Note 53 of the notes to our consolidated financial statements included in this annual report.

We entered into a power purchase agreement with GS EPS Co., Ltd. and two other non-renewable energy independent power producers that are not part of the Community Energy System, under which we are required to purchase all electricity generated by these companies to the extent such electricity is traded through the Korea Power Exchange. The purchase prices for such electricity are predetermined under the power purchase agreements, subject to annual adjustments. We purchased power from these companies in the amounts of Won 896 billion, Won 941 billion and Won 966 billion in 2016, 2017 and 2018, respectively.

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We meet our coal requirements primarily through purchases of bituminous coal and anthracite coal under long-term supply contracts with domestic and foreign suppliers to purchase. Under these long-term supply contracts, purchase prices are adjusted periodically based on prevailing market conditions. We also purchase a substantial portion of our LNG requirements from Korea Gas Corporation, a related party. We have also entered into long-term transportation contracts with Pan Ocean Co., Ltd. and others.

We import all uranium ore concentrates from sources outside Korea (including the United Kingdom, Kazakhstan, France, Germany, Niger, Canada and Japan) through medium- to long-term contracts and pay for such concentrates with currencies other than Won, primarily U.S. dollars. Contract prices for processing of uranium are generally based on market prices. See Note 52 of the notes to our consolidated financial statements for further details of these contracts.

Under the Long-term Transmission and Substation Plan approved by the Ministry of Trade, Industry and Energy, we are liable for the construction of all of our power transmission facilities and the maintenance and repair expenses for such facilities.

Payment guarantee and short-term credit facilities from financial institutions as of December 31, 2018 were as follows:

Payment guarantee

Description	**Financial Institutions**	**Credit Lines (In millions of Won or thousands of USD, JPY, INR, CAD, SAR, NPR, ZAR and EUR)**	
Payment of import letter of credits	Shinhan Bank and others	USD	992,434
Inclusive credits	Shinhan Bank	INR	70,028
	KEB Hana Bank	KRW	258,000
	KEB Hana Bank and others	USD	30,930
Performance guarantees on Contract	KEB Hana Bank and others	EUR	4,158
	KEB Hana Bank and others	INR	237,321
	Korea Development Bank and others	JPY	637,322
	Seoul Guarantee Insurance and others	KRW	89,335
	First Abu Dhabi Bank and others	USD	923,915
	KEB Hana Bank	SAR	6,508
	Bank of Kathmandu	NPR	36,304
	KEB Hana Bank	CAD	617
Guarantees for bid	KEB Hana Bank and others	USD	110,000
	Shinhan Bank	ZAR	55,730
Warranty bond and others	Export-Import Bank of Korea and others	USD	3,934,928
Payment on payable from foreign country	Kookmin Bank and others	USD	44,680
Trade finance	BNP Paribas and others	USD	800,000
Other guarantees	Shinhan Bank	JPY	381,210
	Nonghyup Bank and others	KRW	307,436

Export-Import Bank of Korea and others	USD	1,171,470

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Overdraft and Others

Description	Financial Institutions	Credit Lines (In millions of Won, thousands of USD or thousands of PHP)	
Overdraft	Nonghyup Bank and others	KRW	2,135,000
Commercial paper	KEB Hana Bank and others	KRW	1,050,000
Limit amount available for card	KEB Hana Bank and others	KRW	55,904
	Banco de Oro	PHP	5,000
Loan limit	Kookmin Bank and others	KRW	1,238,500
	DBS Bank and others	USD	1,840,700

In order to secure our status as a shareholder of Navanakom Electric Co., Ltd., we have signed a fund supplement contract. According to the contract, in case Navanakom Electric Co., Ltd. does not have sufficient funds for its operation or repayment of borrowings, we bear a payment obligation in proportion to our ownership.

We have outstanding borrowings with a limit of US$275,600 thousand from creditors such as International Finance Corporation. Regarding the borrowing contract, we have guaranteed capital contribution of US$69,808 thousand and additional contribution up to US$19,000 million for contingencies, if any. For one of the electricity purchasers, Central Power Purchasing Agency Guarantee Ltd., we have provided payment guarantee up to US$2,777 thousand, in case of a construction delay or insufficient contract volume after commencement of the construction.

We have provided PT. Perusahaan Listrik Negara performance guarantee up to US$2,293 thousand and Mizuho Bank and others investment guarantee up to US$43,500 thousand in proportion to our ownership in the electricity purchase contract with PT. Cirebon Energi Prasarana in relation to the second electric power generation business in Cirebon, Indonesia.

We have provided MUFG Bank, Ltd. (MUFG) (formerly, the Bank of Tokyo Mitsubishi UFJ. Ltd. (BTMU)) borrowing guarantee up to US$ 41,258 thousand in connection with the equity bridge loan for PT. Cirebon Energi Prasarana in relation to the second electric power generation business in Cirebon, Indonesia. The guarantee amount is proportional to our equity interest in PT. Cirebon Energi Prasarana.

We have provided the Export-Import Bank of Korea, BNP Paribas and ING Bank guarantee of mutual investment of US$ 2,192 thousand, which is equivalent to the ownership interest of PT BS Energy and PT Nusantara Hydro Alam, in order to guarantee the expenses related to hydroelectric power business of Tanggamus, Indonesia.

We have provided the Export-Import Bank of Korea and SMBC guarantee of mutual investment of US$401 thousand, which is equivalent to the ownership interest of PT Mega Power Mandiri, in order to guarantee the expenses related to hydroelectric power business of PT Wampu Electric Power, our associate.

Existing guarantees provided by us to our associates and joint ventures as of December 31, 2018 are as follows.

Primary Guarantor (Providing Company)	Principal Obligator (Provided Company)	Type of Guarantees	Currency	Credit Limit	Guarantee (Final Provided Company)
	(In millions of Won or thousands of USD and SAR)				
KEPCO	Shuweihat Asia Operation & Maintenance Company	Performance guarantees	USD	11,000	SAPCO

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Primary Guarantor (Providing Company)	Principal Obligator (Provided Company)	Type of Guarantees	Currency	Credit Limit	Guarantee (Final Provided Company)
		(In millions of Won or thousands of USD and SAR)			
KEPCO	Rabigh Operation & Maintenance Company Limited	Performance guarantees and others	USD	1,387	RABEC
KEPCO	Barakah One Company	Debt guarantees	USD	900,000	Export-Import Bank of Korea and others
		Performance guarantees and others	USD	3,404,275	Export-Import Bank of Korea and others
KEPCO	RE Holiday Holdings LLC	Performance guarantees	USD	223,000	EPS Renewables Holdings, LLC, Santander Bank and others
KEPCO	RE Pioneer Holdings LLC	Performance guarantees	USD	170,000	EPS Renewables Holdings, LLC, Santander Bank and others
KEPCO	RE Barren Ridge 1 Holdings LLC	Performance guarantees	USD	149,000	Firstar Development, LLC, Santander Bank and others
KEPCO	Nghi Son 2 Power LLC	Performance guarantees	USD	28,000	SMBC Ho Chi Minh
KOWEPO	Cheongna Energy Co., Ltd.	Collateralized money invested	KRW	3,465	KEB Hana Bank and others
		Guarantees for supplemental funding and others[(1)]			KEB Hana Bank and others
KOWEPO	Xe-Pian Xe-Namnoy Power Co., Ltd.	Payment guarantees for business reserve	USD	2,500	Krung Thai Bank
		Collateralized money invested	KRW	77,165	Krung Thai Bank
		Impounding bonus guarantees	USD	5,000	SK E&C
KOWEPO	Rabigh Operation & Maintenance Company Limited	Performance guarantees and others	SAR	5,600	Saudi Arabia British Bank
KOWEPO	Daegu Photovoltaic Co., Ltd.	Collateralized money invested	KRW	2,002	Korea Development Bank
KOWEPO	Dongducheon Dream Power Co., Ltd.	Collateralized money invested[(7)]	KRW	41,389	Kookmin Bank and others
		Debt guarantees	KRW	20,300	BNK Securities and others
KOWEPO	PT. Mutiara Jawa		KRW	365	Woori Bank

		Collateralized money invested			
KOWEPO	Heang Bok Do Si Photovoltaic Power Co., Ltd.	Collateralized money invested	KRW	202	Nonghyup Bank

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Primary Guarantor (Providing Company)	Principal Obligator (Provided Company)	Type of Guarantees	Currency	Credit Limit	Guarantee (Final Provided Company)
		(In millions of Won or thousands of USD and SAR)			
KOWEPO	Shin Pyeongtaek Power Co., Ltd.	Collateralized money invested	KRW	67,600	Kookmin Bank
		Guarantees for supplemental funding[1]			Kookmin Bank
EWP	Busan Shinho Solar Power Co., Ltd.	Collateralized money invested	KRW	4,761	Korea Development Bank and others
EWP	Seokmun Energy Co., Ltd.	Collateralized money invested	KRW	16,751	Kookmin Bank and others
EWP	Chun-cheon Energy Co., Ltd.	Collateralized money invested	KRW	42,505	Kookmin Bank and others
		Guarantees for supplemental funding[1]	KRW	20,000	Kookmin Bank and others
EWP	Honam Wind Power Co., Ltd.	Collateralized money invested	KRW	4,860	Shinhan Bank and others
EWP	GS Donghae Electric Power Co., Ltd.	Collateralized money invested	KRW	240,591	Korea Development Bank and others
EWP	Yeonggwangbaeksu Wind Power Co., Ltd.	Collateralized money invested	KRW	2,843	Kookmin Bank and others
EWP	Yeonggwang Wind Power Co., Ltd.	Collateralized money invested	KRW	15,304	KDB Capital Corporation and others
EWP	Daesan Green Energy Co., Ltd.	Collateralized money invested	KRW	17,433	IBK
EWP	Taebaek Gadeoksan Wind Power Co., Ltd.	Collateralized money invested	KRW	8,508	Samsung Fire & Marine Insurance Co., Ltd. and others
EWP	PT. Tanjung Power Indonesia	Debt guarantees	USD	46,983	MUFG Bank, Ltd.(MUFG) (formerly, the Bank of Tokyo Mitsubishi UFJ, Ltd.(BTMU)) and others
		Other guarantees	USD	3,150	PT Adaro Indonesia
EWP	South Jamaica Power Company Limited	Performance guarantees	USD	14,400	Societe Generale
EWP Barbados 1 SRL	South Jamaica Power Company Limited	Guarantees for supplemental funding[1, 3]	USD	18,350	JCSD Trustee Services Limited and others
KOSPO	KNH Solar Co., Ltd.	Collateralized money invested	KRW	2,337	Shinhan Bank and Kyobo Life Insurance Co., Ltd.

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Primary Guarantor (Providing Company)	Principal Obligator (Provided Company)	Type of Guarantees	Currency	Credit Limit	Guarantee (Final Provided Company)
		(In millions of Won or thousands of USD and SAR)			
		Performance guarantees and guarantees for supplemental funding[1]			
KOSPO	Daeryun Power Co., Ltd.	Collateralized money invested	KRW	26,099	Korea Development Bank and others
		Guarantees for supplemental funding and others[1]			Korea Development Bank and others
KOSPO	Changjuk Wind Power Co., Ltd.	Collateralized money invested	KRW	8,086	Shinhan Bank
		Guarantees for supplemental funding[1]			Shinhan Bank
KOSPO	Daegu Green Power Co., Ltd.	Collateralized money invested	KRW	41,110	Shinhan Bank and others
KOSPO	Kelar S.A	Performance guarantees	USD	63,707	KEB Hana Bank, SMBC, Mizuho Bank, MUFG, Natixis
KOSPO	Daehan Wind Power PSC	Debt guarantees	USD	18,200	Shinhan Bank
		Performance guarantees	USD	3,000	Shinhan Bank
		Guarantees for supplemental funding[1]			Shinhan Bank
KOSPO	Pyeongchang Wind Power Co., Ltd.	Collateralized money invested	KRW	5,419	Woori Bank and Shinhan Bank and others
		Performance guarantees			Woori Bank and Shinhan Bank and others
KOSPO	Taebaek Wind Power Co., Ltd.	Guarantees for supplemental funding[1]			Shinhan Bank and others
KOSPO	Jeongam Wind Power Co., Ltd.	Collateralized money invested	KRW	4,589	IBK, SK Securities Co., Ltd. and others
		Performance guarantees			IBK, SK Securities Co., Ltd. and others
KOSPO	Samcheok Eco Materials Co., Ltd.	Payment guarantees[4]			SEM Investment Co., Ltd.
KOMIPO			KRW	127,160	

	Hyundai Green Power Co., Ltd.	Collateralized money invested			Korea Development Bank and others
KOMIPO	PT. Cirebon Electric Power	Debt guarantees	USD	11,825	Mizuho Bank
KOMIPO	PT Wampu Electric Power	Debt guarantees	USD	4,854	SMBC

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Primary Guarantor (Providing Company)	Principal Obligator (Provided Company)	Type of Guarantees	Currency	Credit Limit	Guarantee (Final Provided Company)
		(In millions of Won or thousands of USD and SAR)			
KOMIPO	YaksuESS Co., Ltd	Collateralized money invested	KRW	460	Hanwha Life Insurance Co., Ltd.
		Guarantees for supplemental funding[1]			Hanwha Life Insurance Co., Ltd.
KOMIPO	YeongGwang Yaksu Wind Electric. Co., Ltd	Collateralized money invested	KRW	533	Hanwha Life Insurance Co., Ltd. and others
KOSEP	Hyundai Energy Co., Ltd.	Collateralized money invested[5]			Korea Development Bank and others
		Guarantees for supplemental funding and others[1, 6]	KRW	78,600	Korea Development Bank and others
KOSEP	RES Technology AD	Collateralized money invested	KRW	15,209	UniCredit Bulbank and others
KOSEP	ASM-BG Investicii AD	Collateralized money invested	KRW	21,379	UniCredit Bulbank and others
KOSEP	Expressway Solar-light Power Generation Co., Ltd.	Guarantees for supplemental funding[1, 2]	KRW	2,500	Woori Bank
KOSEP	S-Power Co., Ltd.	Collateralized money invested	KRW	114,566	Korea Development Bank and others
KOSEP	Goseong Green Energy Co., Ltd.	Collateralized money invested	KRW	2,459	Kyobo Life Insurance Co., Ltd. and others
KOSEP	Gangneung Eco Power Co., Ltd.	Collateralized money invested	KRW	2,495	Kyobo Life Insurance Co., Ltd. and others
KOSEP	PND solar., Ltd.	Collateralized money invested	KRW	1,020	IBK and others
KOSEP	Tamra Offshore Wind Power Co., Ltd.	Collateralized money invested	KRW	10,401	Nonghyup Life Insurance Co., Ltd. and others
KOSEP	Hyundai Eco Energy Co., Ltd.	Collateralized money invested	KRW	3,388	Samsung Life Insurance and others
KHNP	Noeul Green Energy Co., Ltd.	Collateralized money invested	KRW	8,016	KEB Hana Bank and others
KHNP	Busan Green Energy Co., Ltd.	Collateralized money invested	KRW	12,537	Shinhan Bank and others

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Primary Guarantor (Providing Company)	Principal Obligator (Provided Company)	Type of Guarantees	Currency	Credit Limit	Guarantee (Final Provided Company)
		(In millions of Won or thousands of USD and SAR)			
KEPCO Plant Service & Engineering Co., Ltd.	Incheon New Power Co., Ltd.	Collateralized money invested	KRW	579	Shinhan Bank
		Guarantees for supplemental funding and others(1)			Shinhan Bank

Notes:

(1) We guarantee to provide supplemental funding for businesses with respect to excessive business expenses or insufficient repayment of borrowings.
(2) We have granted the right to Hana Financial Investment Co., Ltd., as an agent for the creditors to Express Solar-light Power Generation Co., Ltd.(ESPG), to the effect that in the event of acceleration of ESPG s payment obligations under certain borrowings to such creditors, Hana Financial my demand us to dispose of shares in ESPG held by us and apply the resulting proceeds to repayment of ESPG s obligations.
(3) This includes a guarantee for the shareholder s capital payment in connection with the business of 190MW has complex thermal power plant in Jamaica. EWP (Barbados) 1 SRL s capital contribution amount is USD 14,730 thousand and the total amount of guarantees is USD 8,257.5 thousand which consists of USD 3,670 thousand of EWP (Barbados) 1 SRL s contribution obligation and USD 4,587.5 thousand of South Jamaica Energy Holding Limited s portion (50%) of contribution obligation.
(4) We have the obligation to purchase the stocks should preferred stockholders elect to sell their stocks on the expected sell date (3 years from preferred stock payment date) and are required to guarantee the promised yield when preferred stockholders sell their stocks. In relation to this guarantee, we have recognized Won 2,155 million of derivative liabilities as of December 31, 2018.
(5) We recognized impairment loss on all of the equity securities of Hyundai Energy Co., Ltd. in prior years, and the acquisition cost of the securities provided as collateral is Won 47,067 million.
(6) Pursuant to the guarantee agreement, we recognized other provisions of Won 40,898 million as the possibility of economic outflow to fulfill the obligation was probable and the amount could be reasonably estimated.
(7) The common stocks of Dongducheon Dream Power Co., Ltd. held by us were pledged as collateral.

Other than as described in this annual report and also in Notes 50 and 53 of the notes to our consolidated financial statements included in this annual report, we did not have any other material credit lines and guarantee commitments provided to any third parties as of December 31, 2018.

ITEM 6. *DIRECTORS, SENIOR MANAGEMENT AND EMPLOYEES*

Item 6.A. Directors and Senior Management

Board of Directors

Under the KEPCO Act, the Act on the Management of Public Institutions and our Articles of Incorporation, our board of directors, which is required to consist of not more than 15 directors, including the president, is vested with the authority over our management.

Pursuant to our Articles of Incorporation and the Act on the Management of Public Institutions, we have two types of directors: standing directors (sangim-isa in Korean) and non-standing directors (bisangim-isa in Korean). The standing directors refer to our directors who serve their directorship positions in full-time capacity. The non-standing directors refer to our directors who do not serve their directorship positions in full-time capacity. The non-standing directors currently do not hold any executive positions with us or our subsidiaries.

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Under our Articles of Incorporation, there may not be more than seven standing directors, including our president, and more than eight non-standing directors. The number of non-standing directors must exceed the number of standing directors, including our president. A senior non-standing director appointed by the Ministry of Economy and Finance becomes our chairman of the board following the review and resolution of the Public Agencies Operating Committee.

Our president serves as our chief executive officer and represents us and administers our day-to-day business in all matters and bears the responsibility for the management s performance. Our president is appointed by the President of the Republic upon the motion of the Ministry of Trade, Industry and Energy following the nomination by our director nomination committee, the review and resolution of the Public Agencies Operating Committee pursuant to the Act on the Management of Public Institutions and an approval at the general meeting of our shareholders.

Our standing director who concurrently serve as members of the audit committee are appointed through the same appointment process applicable to our president, except that the motion for appointment is made by the Ministry of Economy and Finance instead of the Ministry of Trade, Industry and Energy. Standing directors other than our president or those who concurrently serve as members of the audit committee are appointed by our president with the approval at the general meeting of our shareholders.

Our non-standing directors must be appointed by the minister of the Ministry of Economy and Finance following the review and resolution of the Public Agencies Operating Committee from a pool of candidates recommended by the director nomination committee and must have ample knowledge and experience in business management. Appointment of non-standing directors to become part of the audit committee is subject to approval at the general meeting of our shareholders. Government officials that are not part of the teaching staff in national and public schools are ineligible to become our non-standing directors.

The term of our president is three years, while that of our directors (standing or non-standing, but not the president) is two years. According to the Act on the Management of Public Institutions, our president s term cannot be terminated unless done so by the President of the Republic pursuant to the Act on the Management of Public Institutions or upon an event as specified in our Articles of Incorporation.

Attendance by a majority of the board members constitutes a voting quorum for our board meetings, and resolutions can be passed by a majority of the board members. In the event the president acts in violation of law or the Articles of Incorporation, is negligent in his duties, or otherwise is deemed to be significantly impeded in performing his official duties as president, the board of directors may by resolution request the minister of the Ministry of Trade, Industry and Energy to dismiss or recommend the dismissal of the president.

Our non-standing directors may request any information necessary to fulfill their duties from our president, and except in special circumstances, our president must comply with such request.

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The names, titles and outside occupations, if any, of the directors as of April 15, 2019 and the respective years in which they took office are set forth below.

Name (Gender)	Age	Title	Outside Occupation	Position Held Since
JongKap KIM (Male)	67	President, Chief Executive Officer and Standing Director	None	April 13, 2018
Lee, Jung-Hee (Male)	64	Standing Director and Member of the Audit Committee	None	August 13, 2018
Kim, Hoe-Chun (Male)	58	Senior Executive Vice President for Business Management, Standing Director	None	July 16, 2018
Kim, Dong-Sub (Male)	59	Senior Executive Vice President for Business Operations, Standing Director	None	July 16, 2018
Park, Hyung-Duck (Male)	58	Senior Executive Vice President for Strategy & Finance, Chief Financial Officer, Standing Director	None	July 16, 2018
Lim, Hyun-Seung (Male)	58	Senior Executive Vice President for Nuclear Power Generations, Standing Director	None	July 16, 2018
Kim, Sung-Arm (Male)	59	Senior Executive Vice President for Power Grid, Standing Director	None	March 4, 2019
Kim, Tai-Yoo (Male)	68	Non-Standing Director and Chairman of the Board of Directors	Emeritus Professor of Engineering College, Seoul National University	October 10, 2018
Kim, Chang-Joon (Male)	74	Non-Standing Director	Chairman of the Sport for All subcommittee, Korean Sport and Olympic Committee	March 19, 2018
Yang, Bong-Ryull (Male)	67	Non-Standing Director	None	April 4, 2018
Kim, Jwa-Kwan (Male)	59	Non-Standing Director	Professor of Environmental Engineering, Catholic University of Pusan	April 4, 2018
Jung, Yeon-Gil (Male)	52	Non-Standing Director and Member of the Audit	Professor of New Materials Engineering, Changwon	April 4, 2018

		Committee	University, Energy Policy Consultant of the Ministry of Trade, Industry and Energy	
Noh, Geum-Sun (Female)	57	Non-Standing Director and Member of the Audit Committee	None	June 12, 2018
Choi, Seung-Kook (Male)	53	Non-Standing Director	Director of Solar and Wind Energy Cooperative Association	June 12, 2018
Park, Cheol-Su (Male)	50	Non-Standing Director	Head of Self-Support Center in Naju Director of the Naju Social Economy Network	June 12, 2018

JongKap KIM has been our President and CEO since April 13, 2018. Prior to his current position, he served as the Chief Executive Officer of Siemens Korea, the Chief Executive Officer of SK Hynix, a Commissioner of Korean Intellectual Property Office, and a Vice Minister of Ministry of Trade, Industry and Energy. Mr. Kim received a Ph. D. in public administration from Sungkyunkwan University, M.A. in economics from Indiana University and M.B.A. from New York University.

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Lee, Jung-Hee has been our Standing Director since August 13, 2018. Mr. Lee previously served as a visiting professor of Law School of Chonnam National University, a committee member of Presidential Committee on Judicial Reform and the Senior Vice President of Korean Bar Association. Mr. Lee received a L.L.B. from Chonnam National University.

Kim, Hoe-Chun has been our Standing Director since July 16, 2018. Mr. Kim also currently serves as our Senior Vice President for Business Management and previously served as the Executive Vice President & Chief HR Officer and the Vice President of Corporate Planning Department. Mr. Kim received a Korean Executive MBA from Helsinki School of Economics.

Kim, Dong-Sub has been our Standing Director since July 16, 2018. Mr. Kim also currently serves as our Senior Executive Vice President for Business Operations and previously served as the Executive Vice President & Chief Technology Officer and the Vice President of KEPCO Research Institute. Mr. Kim received a Ph.D. of engineering in technology policy from Yonsei University.

Park, Hyung-Duck has been our Standing Director since July 16, 2018. Mr. Park also currently serves as our Senior Executive Vice President for Strategy and Finance and Chief Financial Officer. Mr. Park previously served as the Vice President at Regional Headquarters KEPCO Gyeonggi and the Vice President of Sales and Marketing Department. Mr. Park received an Executive MBA in utilities management from Helsinki School of Economics.

Lim, Hyun-Seung has been our Standing Director since July 16, 2018. Mr. Lim also currently serves as our Senior Executive Vice President for Nuclear Power Generations and previously served as the Vice President of UAE Nuclear Project Department in KEPCO and the Vice President of Global Nuclear Project Department. Mr. Lim received a B.ME from Sungkyunkwan University.

Kim, Sung-Arm has been our Standing Director since March 4, 2019. Mr. Kim also currently serves as our Senior Executive Vice President for Power Grid and previously served as the Vice President at Regional Headquarters KEPCO Namseoul and the Vice President of Transmission and Substation Construction Department. Mr. Kim received a B.S. in electrical engineering from Hongik University.

Kim, Tai-Yoo has been our Non-Standing Director since October 10, 2018. Mr. Kim is currently Emeritus Professor of Engineering College at Seoul National University. Mr. Kim previously served as the Information Science Technology Advisor of Cheongwadae, Office of President. Mr. Kim received a B.S. in mining and minerals engineering from Seoul National University and a Ph. D. in mineral and energy economics from Colorado School of Mines.

Kim, Chang-Joon has been our Non-Standing Director since March 19, 2018. Mr. Kim is currently chairman of the Sport for All subcommittee of the Korean Sport and Olympic Committee. Mr. Kim previously served as a member of the Electricity Regulatory Commission (KOREC). Mr. Kim received a B.S. in veterinary science at Chonnam National University.

Yang, Bong-Ryull has been our Non-Standing Director since April 4, 2018. Mr. Yang previously served as the Ambassador of the Republic of Korea to Malaysia and the Vice President of Public Affairs in Gwangju Institute of Science and Technology. Mr. Yang received a B.A. in politics at Seoul National University and a Ph.D. in business administration from Gwangju University.

Kim, Jwa-Kwan has been our Non-Standing Director since April 4, 2018. Mr. Kim is currently Professor of Environmental Engineering at Catholic University of Pusan. Mr. Kim previously served as a visiting professor at the Seoul National University Graduate School of Environmental Studies. Mr. Kim received a B.S. in environmental

engineering from Pukyong National University and a Ph.D. in public administration from Seoul National University.

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Jung, Yeon-Gil has been our Non-Standing Director since April 4, 2018. Mr. Jung is currently Professor of New Materials Engineering at Changwon University and the Energy Policy Consultant of the Ministry of Trade, Industry and Energy. Mr. Jung previously served as vice-chairman of the Korean Ceramic Society. Mr. Jung received a B.S. and a Ph.D in material engineering from Hanyang University.

Noh, Geum-Sun has been our Non-Standing Director since June 12, 2018. Ms. Noh is a certified public accountant and previously served as the President of EOS Partners, the Executive Auditor of National Pension Service and co-representative of Mirae Accounting Firm. Ms. Noh received a B.S. in nursing from Seoul National University.

Choi, Seung-Kook has been our Non-Standing Director since June 12, 2018. Mr. Choi currently serves as the Director of Solar and Wind Energy Cooperative Association. Mr. Choi previously served as a co-representative of Korea NGO s Energy Network. Mr. Choi received a B.A. in sociology from Hanyang University and a M.A. in urban administration from the University of Seoul.

Park, Cheol-Su has been our Non-Standing Director since June 12, 2018. Mr. Park currently serves as the head of Self-Support Center in Naju and the director of Naju Social Economy Network. Mr. Park received a B.A. in English literature from Gwangju University and a M.A. in public administration from Chonnam National University.

The business address of our directors is 55 Jeollyeok-ro, Naju-si, Jeollanam-do, 58322, Korea.

Audit Committee

Under the Act on the Management of Public Institutions, which took effect as of April 1, 2007, we are designated as a market-oriented public enterprise and, as such, are required to establish an audit committee in lieu of the pre-existing board of auditors upon expiration of the term of the last remaining member of the board of auditors. In September 2007, we amended our Articles of Incorporation to establish, in lieu of the pre-existing board of auditors, an audit committee meeting the requirements under the Sarbanes-Oxley Act. Under the Act on the Management of Public Institutions, the Korean Commercial Code and the amended Articles of Incorporation, we are required to maintain an audit committee consisting of three members, of which not less than two members are required to be non-standing directors. The roles and responsibilities of our audit committee members are to perform the functions of an audit committee meeting the requirements under the Sarbanes-Oxley Act. Our audit committee was established on December 8, 2008.

Lee, Jung-Hee, a standing director, and Noh, Geum-Sun and Jung, Yeon-Gil, both non-standing directors, are currently members of our audit committee. All such members of the audit committee are independent within the meaning of the Korea Stock Exchange listing standards, the regulations promulgated under the Korean Commercial Code and the New York Stock Exchange listing standards.

Item 6.B. Compensation

The aggregate amount of remuneration paid to our standing and non-standing directors in the aggregate consist of (i) salaries and wages paid to standing and non-standing directors, which amounted to Won 1,346 million in aggregate in 2018, and (ii) accrued retirement and severance benefits for standing directors, which amounted to Won 24 million in 2018. Under the Act on the Management of Public Institution, our executive officers consist of the president and the standing and non-standing directors. Standing directors, except the standing director who concurrently serves as a member of our audit committee, take executive positions with our company while the other directors, including non-standing directors, do not. We do not have any other officer who is in charge of a principal business unit, division or function, any other officer who performs a policy making function or any other person who performs similar policy

making functions for us.

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Item 6.C. Board Practices

Under the Act on the Management of Public Institutions and our Articles of Incorporation, for appoints made after April 1, 2007, the term of office for our president is three years and the term of our office for our directors (whether standing or non-standing but not the president) is two years. Our president and directors may be reappointed for one or more additional terms of one year. In order to be reappointed, the president must be evaluated on the basis of his management performance; a standing director, on the basis of the performance of the duties for which he was elected to perform, or if the standing director has executed an incentive bonus contract, on the basis of his performance under the contract; and a non-standing director, on the basis of his performance of the duties for which he was elected to perform.

Our board currently does not maintain a compensation committee. See Item 16G. Corporate Governance. However, we currently maintain an audit committee meeting the requirements of the Sarbanes-Oxley Act to perform the roles and responsibilities of the compensation committee. Prior to the establishment of the audit committee on December 8, 2008 pursuant to the Act on the Management of Public Institutions, we maintained a board of auditors, which performed the roles and responsibilities required of an audit committee under the Sarbanes-Oxley Act, including the supervision of the financial and accounting audit by the independent registered public accountants.

Our president s management contract includes benefits upon termination of his employment. The amount for termination benefits payable equals the average value of compensation for one month times the number of years the president is employed by us, provided that the president is only eligible for termination benefits after more than one year of continuous service.

The termination benefits for our standing directors are determined in accordance with our internal regulations for executive compensation. Standing directors are eligible for benefits only upon termination of employment or death following one year of continuous service.

See also Item 16G. Corporate Governance for a further description of our board practices.

Item 6.D. Employees

As of December 31, 2018, we and our generation subsidiaries had a total of 46,377 regular employees, almost all of whom are employed within Korea. Approximately 10.5% of our regular employees (including employees of our generation subsidiaries) are located at our head office.

The following table sets forth the number of and other information relating to our regular employees, not including directors or senior management, as of December 31, 2018.

	KEPCO	KHNP	KOSEP	KOMIPO	KOWEPO	KOSPO	EWP	Total
Regular Employees								
Administrative	5,015	1,049	269	308	274	279	395	7,589
Engineers	11,605	9,529	1,904	2,119	1,900	1,709	2,055	30,821
Others	5,652	1,200	237	241	255	376	6	7,967
Total	22,272	11,778	2,410	2,668	2,429	2,364	2,456	46,377

Head Office Employees	1,695	1,273	401	352	392	378	372	4,863
% of total	7.6%	10.8%	16.6%	13.2%	16.1%	16.0%	15.1%	10.5%
Members of Labor Union	16,592	7,361	1,746	1,651	1,627	1,553	1,653	32,183
% of total	74.5%	62.5%	72.4%	61.9%	67.0%	65.7%	67.3%	69.4%

We and each of our generation subsidiaries have separate labor unions. Approximately 69.4% of our and our generation subsidiaries employees in the aggregate are members of these labor unions, each of which negotiates

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a collective bargaining agreement for its members each year. Under applicable Korean law, an employee-employer cooperation committee comprised of an equal number of representatives of management and labor (which shall be no less than three and no more than ten representatives from each of management and labor) is required to be established. Accordingly, an employee-employer cooperation committee composed of eight representatives of management and eight representatives of labor has been established at us and at each of our generation subsidiaries. The committee meets periodically to discuss various labor issues.

Since our formation in 1981, our businesses had not been interrupted by any work stoppages or strikes except in early 2002, when employees belonging to our five non-nuclear generation subsidiaries went on strike for six weeks to protest the Government s decision to privatize such non-nuclear generation subsidiaries according to the Restructuring Plan, which privatization plan has since been suspended indefinitely. See Item 3.D. Risk Factors Risks Relating to KEPCO The Government may adopt policy measures to substantially restructure the Korean electric power industry or our operational structure, which may have a material adverse effect on our business, operations and profitability.

We believe our relations with our employees are generally good.

Item 6.E. Share Ownership

None of our directors and members of our administrative, supervisory or management bodies own more than 0.1% of our common stock.

ITEM 7. *MAJOR SHAREHOLDERS AND RELATED PARTY TRANSACTIONS*

Item 7.A. Major Shareholders

The following table sets forth certain information relating to certain owners of our capital stock as of February 7, 2019, the date we last closed our shareholders registry:

Title of Class	Identity of Person or Group	Shares Owned	Percentage of Class[1] (%)
Common stock	Government	116,841,794	18.2
	Korea Development Bank[2]	211,235,264	32.9
	Subtotal	328,077,058	51.1
	National Pension Corporation	46,063,396	7.2
	Employee Stock Ownership Association	184,253	0.0
	Directors as a group	750	0.0
	Public (non-Koreans)	179,864,932	28.0
	Common shares	151,719,934	23.6
	American depositary shares	28,144,998	4.4
	Public (Koreans)	87,773,688	13.7
	Total	641,964,077	100.0

Notes:

(1) Percentages are based on issued shares of common stock.
(2) Korea Development Bank is a Government-controlled entity.
All of our shareholders have equal voting rights. See Item 10.B. Memorandum and Articles of Incorporation Description of Capital Stock Voting Rights.

Item 7.B. Related Party Transactions

We are engaged in a variety of transactions with our affiliates. We have related party transactions with Government-controlled entities such as Korea Gas Corporation, our consolidated subsidiaries and our equity

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investees. In addition, we engage in related party transactions with Korea Development Bank, one of our major shareholders. See Note 50 of the Notes to our consolidated financial statements included in this annual report for a description of transaction and balances with our related parties.

In the past three years, our related party transactions principally consisted of purchases of LNG from Korea Gas Corporation and long-term borrowings from Korea Development Bank. In 2016, 2017 and 2018, we and our generation subsidiaries purchased LNG from Korea Gas Corporation in the aggregate amount of Won 3,633 billion, Won 3,246 billion and Won 5,191billion, respectively. As of December 31, 2018, we had long-term borrowings from Korea Development Bank in the aggregate amount of Won 169 billion.

We also engage in extensive transactions with our consolidated generation subsidiaries, including the purchase of electricity from them through Korea Power Exchange, sales of electricity to them, payment and receipt of commissions for services and receivables and payables transactions. These are eliminated in the consolidation process. We also provide guarantees for certain of our affiliates. See Item 5.F. Tabular Disclosure of Contractual Obligations Overdraft and Others. We also have certain relationships with the Korea Power Exchange. See Item 4.B. Business Overview Purchase of Electricity Cost-based Pool System.

For a further description of our transactions with our affiliates, see Note 50 of the Notes to our consolidated financial statements included in this annual report.

Item 7.C. Interests of Experts and Counsel

Not Applicable

ITEM 8. *FINANCIAL INFORMATION*

Item 8.A. Consolidated Statements and Other Financial Information

We prepare our consolidated financial statements in compliance with requirements under Item 18. Financial Statements.

Legal Proceedings

As of December 31, 2018, we and our subsidiaries were engaged in 570 lawsuits as a defendant and 174 lawsuits as a plaintiff. As of the same date, the total amount of damages claimed against us and our subsidiaries was Won 674 billion, for which we have made a provision of Won 78 billion as of December 31, 2018, and the total amount claimed by us and our subsidiaries was Won 793 billion as of December 31, 2018. While the outcome of any of these lawsuits cannot presently be determined with certainty, our management currently believes that the final results from these lawsuits will not have a material adverse effect on our liquidity, financial position or results of operations.

The following are potentially significant claims pertaining to us and our subsidiaries.

In September 2013, Hyundai Engineering & Construction Co., Ltd. (Hyundai E&C), SK Engineering & Construction Co., Ltd. and GS Engineering & Construction Co., Ltd. filed a lawsuit against KHNP seeking from KHNP extra contractual payments in the total amount of Won 204 billion on grounds of design change under the construction contract relating to Shin-Hanul #1 and #2 units. In November 2016, the court ruled against KHNP, and KHNP has paid Won 217 billion of the claimed amounts in full and has subsequently appealed the ruling. The lawsuit is currently

pending in the Supreme Court of Korea.

In December 2013, the Supreme Court of Korea ruled that regular bonuses fall under the category of ordinary wages on the condition that those bonuses are paid regularly and uniformly, and that any agreement which excludes such regular bonuses from ordinary wage is invalid. One of the key rulings provides that bonuses

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that are given to employees (i) on a regular and continuous basis and (ii) calculated according to the actual number of days worked (iii) that are not incentive-based must be included in the calculation of ordinary wages. The Supreme Court further ruled that in spite of invalidity of such agreements, employees shall not retroactively claim additional wages incurred due to such court decision, in case that such claims bring to employees unexpected benefits which substantially exceeds the wage level agreed by employers and employees and cause an unpredicted increase in expenditures for their company, which would lead the company to material managerial difficulty or would be a threat to the existence of the company. In that case, the claim is not acceptable since it is unjust and is in breach of the principle of good faith. As a result of such ruling by the Supreme Court of Korea, we and our subsidiaries became subject to a number of lawsuits filed by various industry-wide and company-specific labor unions based on claims that ordinary wage had been paid without including certain items that should have been included as ordinary wage. In July 2016, the court ruled against us, and in accordance with the court s ruling, in August 2016 we paid Won 55.1 billion to the employees for three years of back pay plus interest. As of December 31, 2018, however, 51 lawsuits were pending against our subsidiaries for an aggregate claim amount of Won 152 billion, for which our subsidiaries set aside an aggregate amount of Won 39 billion to cover any potential future payments of additional ordinary wage in relation to the related lawsuits. All cases are currently on-going at various stages of proceedings. We cannot presently assure you that the courts will not ultimately rule against our subsidiaries in these lawsuits, or that the amount of our reserves against these lawsuits will be sufficient to cover the amounts actually payable under court rulings. Any of these developments would adversely affect our results of operations.

During the period from 2014 to 2018, certain residential customers filed class action lawsuits against us based on the claim that electricity tariffs, determined under the progressive rate structure, were excessive. As of December 31, 2018, we were subject to 14 such lawsuits brought by approximately 10,000 plaintiffs with an aggregate claim amount of Won 5.3 billion. Of these 14 lawsuits, five cases are currently pending in the third round of proceedings (for which we won all of the first and second rounds of proceedings) and four cases are currently pending in the second round of proceedings (for which we won all of the first rounds of proceedings, except for one case). Five cases are currently pending in the first round of proceedings.

In addition, our generation subsidiaries, currently and from time to time, are involved in lawsuits incidental to the conduct of their business. A significant number of such lawsuits are based on the claim that the construction and operation of the electricity generation units owned by our generation subsidiaries have impaired neighboring fish farms. For example, in May 2012, a group of merchants and fishermen in the Jeolla region have sued KHNP for damages from pollutants released by a generation unit. The case is still pending. Our generation subsidiaries normally pay compensation to the members of fishery associations near our power plant complex for expected losses and damages arising from the construction and operation of their power plants in advance. Despite such compensation paid by us, a claim may still be filed against our generation subsidiaries challenging the compensation paid by us.

The nuclear power plant at Wolsong #1 unit began operations in 1982 and ended its operations in 2012 pursuant to its 30-year operating license. In February 2015, the Nuclear Safety and Security Commission (NSSC) evaluated the safety of operating Wolsong #1 unit and approved its extended operation until November 2022. However, a civic group filed a lawsuit to annul such decision, and in February 2017, the Seoul Administrative Court ruled against the NSSC. The NSSC appealed this decision, and the civic group has filed an injunction to suspend the operation of the Wolsong #1 unit. The civic group s injunction was denied in July 2017. KHNP, which operated the unit pursuant to the NSSC s initial decision, has joined this lawsuit. On June 15, 2018, the board of directors of KHNP decided to (i) retire Wolsong #1 unit earlier than planned due to its economic inefficiency and (ii) discontinue the construction of Chunji #1 and #2 as well as Daejin #1 and #2 units. As of December 31, 2018, impairment loss in connection with the property, plant and equipment of Wolsong #1 unit was Won 570,408 million and the provision for decommissioning costs of Wolsong #1 increased by Won 28,196 million, as the timing of actual cash outflows was accelerated due to the shortened operating period. As of December 31, 2018, impairment loss in connection with the property, plant and

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equipment of Chunji #1 and #2 as well as Daejin #1 and #2 units amounted to Won 38,886 million. Although the board of directors did not make any decisions regarding Shin-Hanul #3 and #4 units, which are new nuclear plants under construction, we cannot assure you that the construction of these units will not be discontinued. As of December 31, 2018, impairment loss in connection with the property, plant and equipment of Shin-Hanul #3 and #4 units was Won 132,725 million. There are ten other nuclear generation units whose life under their initial operating license will expire in the next ten years, or by 2029. We may find it more difficult to have the life of other nuclear units extended as well. Furthermore, in June 2016, Greenpeace and 559 Korean nationals brought a lawsuit against the NSSC to revoke the permit the NSSC granted to KHNP in relation to the construction of Shin-Kori #5 and #6 nuclear generation units. Although the lawsuit was dismissed in February 2019, we cannot assure you that there will not be new challenges to prohibit the construction of new nuclear units in the future, whereby we may experience a loss of revenues and an increase in our overall fuel costs (as nuclear fuel is the cheapest compared to coal, LNG or oil) as a result of such prohibition, which could adversely affect our results of operation and financial condition.

We and our subsidiaries are also involved in the following arbitrations, among others.

SAP Korea Ltd brought a breach of contract claim against us and KEPCO KDN Co., Ltd., one of our subsidiaries, in relation to the enterprise resource planning software serviced by SAP Korea. In that connection, arbitration was filed in the International Chamber of Commerce International Court of Arbitration. We have not recognized any losses because the probability of economic benefit outflow is remote and the related amount cannot be reasonably determined.

Hyundai Samsung Joint Venture, one of our subcontractors, filed an arbitration case against us at the London Court of International Arbitration in 2016 in relation to certain disagreements involving the United Arab Emirates nuclear power plant construction project, but as of December 31, 2018, we have not recognized any losses because the probability of economic benefit outflow is remote and the related amount cannot be reasonably determined.

Hyundai E&C, GS Engineering & Construction Corp. and Hansol SeenTec Co., Ltd. filed an arbitration case against us at the Korea Commercial Arbitration Board to request payment for additional construction costs. As of December 31, 2018, we have recognized the litigation provisions of Won 204,787 million in relation to this arbitration case and made the payment according to the results of this arbitration.

Halla Corporation filed an arbitration case against us at the Korea Commercial Arbitration Board to request payment for additional construction costs, and we filed an arbitration case against Halla Corporation to request penalty payment for the delayed construction work. As of December 31, 2018, we have recognized Won 19,754 million of provision estimated to be required to fulfill our obligations in relation to this arbitration.

Enzen, one of our subcontractors, filed an arbitration case against us over a contractual dispute in connection with the electric power IT modernization project in Kerala, India. We have not recognized any losses because the probability of economic benefit outflow is remote and the related amount cannot be reasonably determined.

From 2017 to 2018, the Korea Customs Service (KCS) conducted an investigation on a group of individuals and companies suspected of illegally importing North Korean coal. KOSEP was subject to a written investigation in 2018, as it had procured coal from a direct supplier that, in turn, purchased the coal from one of the traders who was suspected of such illegal activity. The transaction between KOSEP and the direct supplier was denominated in U.S. dollars. Neither KOSEP nor its direct supplier were found to have committed any wrongdoing. KCS concluded the investigation in August 2018 and ultimately accused three individuals and three companies (none of which included KOSEP or its direct supplier) of document forgery and violation of applicable customs and compliance law. Prosecutors have pressed charges against these individuals and companies, and the trial is still ongoing. Neither KOSEP nor its direct supplier were implicated. However, we cannot assure you that this investigation and/or related events will not have any material adverse effect on us, our reputation, our common shares or our American depositary shares.

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On November 9, 2018, certain of our former executive and employees have been convicted in a district court on charges for receiving bribes. The individuals have appealed, and the appeal is currently ongoing. As part of our efforts to prevent recurrence of similar cases, we have implemented the following measures:

Implementing web training program on integrity for all employees,

Strengthening integrity and anti-corruption evaluation systems for high-ranking officers and reflecting such results in performance evaluations, and

Increasing the punishment and penalties for employee corruption.

We do not believe such claims or proceedings, individually or in the aggregate, have had or will have a material adverse effect on us and our generation subsidiaries. However, we cannot assure you that this will be the case in the future, given the possibility that we may become subject to more legal and arbitral proceedings arising from changes in the environmental laws and regulations as they become applicable to us and our generation subsidiaries, and the related growth in demand for more compensation by actual and potential affected parties. Further, we cannot assure you that the above convictions and/or related events will not have an adverse effect on our reputation as well as the price of our common shares and our American depositary shares.

Dividend Policy

For our dividend policy, see Item 10.B. Memorandum and Articles of Incorporation Description of Capital Stock Dividend Rights. For a description of the tax consequences of dividends paid to our shareholders, see Item 10.E. Taxation Korean Taxes Shares or ADSs Dividends on the Shares of Common Stock or ADSs and Item 10.E. Taxation U.S. Federal Income Tax Consideration for U.S. Persons Tax Consequences with Respect to Common Stock and ADSs Distributions on Common Stock or ADSs.

Item 8.B. Significant Changes

Not Applicable

ITEM 9. ***THE OFFER AND LISTING***
Item 9.A. Offer and Listing Details

Notes

We have issued the following registered notes and debentures, which are traded principally in the over-the-counter market:

7.95% Zero-To-Full Debentures, due April 1, 2096 (the 7.95% Debentures);

6% Debentures due December 1, 2026, (the 6% Debentures);

7% Debentures due February 1, 2027 (the 7% Debentures); and

6-3/4% Debentures due August 1, 2027 (the 6-3/4% Debentures, and together with the 7.95% Debentures, the 6% Debentures and the 7% Debentures, the Registered Debt Securities).

Sales prices for the Registered Debt Securities are not regularly reported on any United States securities exchange or other United States securities quotation service.

Share Capital

The principal trading market for our common stock is the Korea Exchange. Our common stock is also listed on the New York Stock Exchange in the form of ADSs. The ADSs have been issued by Citibank, N.A. as depositary and are listed on the New York Stock Exchange under the symbol KEP. One ADS represents one-half of one share of our common stock. As of February 7, 2019, the date we last closed our shareholders registry, 56,289,996 ADSs representing 4.4% shares of our common stock were outstanding.

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Common Stock

Shares of our common stock are listed on the KRX KOSPI Market of the Korea Exchange. The table below shows the high and low closing prices on the KRX KOSPI Market of the Korea Exchange for our common stock since 2014.

Period	Price	
	High	Low
	(In Won)	
2014		
First Quarter	37,800	33,400
Second Quarter	41,900	37,050
Third Quarter	48,200	36,800
Fourth Quarter	49,450	40,350
2015		
First Quarter	46,000	39,150
Second Quarter	48,500	42,450
Third Quarter	52,200	46,300
Fourth Quarter	53,300	47,500
2016		
First Quarter	60,600	49,800
Second Quarter	63,000	57,400
Third Quarter	62,900	54,000
Fourth Quarter	54,500	43,200
2017		
First Quarter	48,750	40,350
Second Quarter	46,700	40,800
Third Quarter	45,500	38,200
Fourth Quarter	41,100	37,350
2018		
First Quarter	37,750	30,850
Second Quarter	37,750	32,000
Third Quarter	33,300	28,700
Fourth Quarter	34,350	23,850
October	29,350	23,850
November	30,800	26,600
December	34,350	29,750
2019		
First Quarter	35,800	29,900
January	35,450	32,550
February	34,950	33,000
March	35,800	29,900
April (through April 18)	30,350	28,750

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ADSs

The table below shows the high and low closing prices on the New York Stock Exchange for the outstanding ADSs since 2014. Each ADS represents one-half of one share of our common stock.

Period	Closing Price per ADS	
	High	Low
	(In US$)	
2014		
First Quarter	17.75	15.51
Second Quarter	20.56	17.66
Third Quarter	22.44	18.17
Fourth Quarter	22.87	18.90
2015		
First Quarter	21.01	18.26
Second Quarter	22.53	19.29
Third Quarter	22.13	19.45
Fourth Quarter	23.31	20.28
2016		
First Quarter	21.01	18.26
Second Quarter	26.90	24.67
Third Quarter	28.31	24.38
Fourth Quarter	24.34	18.48
2017		
First Quarter	21.35	17.53
Second Quarter	20.80	17.82
Third Quarter	20.38	16.73
Fourth Quarter	18.22	16.60
2018		
First Quarter	17.83	14.28
Second Quarter	17.43	14.34
Third Quarter	14.70	12.62
Fourth Quarter	14.96	10.52
October	13.06	10.52
November	13.61	11.79
December	14.96	13.27
2019		
First Quarter	15.75	13.01
January	15.70	14.39
February	15.64	14.65
March	15.75	13.01
April (through April 18)	13.20	12.54

Item 9.B. Plan of Distribution

Not Applicable

Item 9.C. Markets

The Korea Exchange

The Korea Exchange began its operations in 1956, originally under the name of the Korea Stock Exchange. On January 27, 2005, pursuant to the Korea Securities and Futures Exchange Act, the Korea Exchange was

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officially created through the consolidation of the Korea Stock Exchange, the Korea Futures Exchange, the KOSDAQ Stock Market, Inc., or KOSDAQ, and the KOSDAQ Committee within the Korea Securities Dealers Association, which was in charge of the management of the KOSDAQ. The KRX KOSPI Market of the Korea Exchange, formerly the Korea Stock Exchange, has a single trading floor located in Seoul. The Korea Exchange is a limited liability company, the shares of which are held by (i) securities companies and futures companies that were the members of the Korea Stock Exchange or the Korea Futures Exchange and (ii) the shareholders of the KOSDAQ.

As of March 29, 2019, the aggregate market value of equity securities listed on the KOSPI of the Korea Exchange was approximately Won 1,417,246 billion. The average daily trading volume of equity securities for the first quarter of 2019 was approximately 386 million shares with an average transaction value of Won 5,377 billion.

The Korea Exchange has the power in some circumstances to suspend trading of shares of a given company or to de-list a security. The Korea Exchange also restricts share price movements. All listed companies are required to file accounting reports annually, semi-annually and quarterly and to release immediately all information that may affect trading in a security.

The Government has in the past exerted, and continues to exert, substantial influence over many aspects of the private sector business community which can have the intention or effect of depressing or boosting the market. In the past, the Government has informally both encouraged and restricted the declaration and payment of dividends, induced mergers to reduce what it considers excess capacity in a particular industry and induced private companies to publicly offer their securities.

The Korea Exchange publishes the Korea Composite Stock Price Index, or KOSPI, every ten seconds, which is an index of all equity securities listed on the KRX KOSPI Market of the Korea Exchange. On January 1, 1983, the method of computing KOSPI was changed from the Dow Jones method to the aggregate value method. In the new method, the market capitalizations of all listed companies are aggregated, subject to certain adjustments, and this aggregate is expressed as a percentage of the aggregate market capitalization of all listed companies as of the base date, January 4, 1980.

Movements in KOSPI in the past five years are set out in the following table:

	Opening	High	Low	Closing
2014	1,967.2	2,082.6	1,886.9	1,915.6
2015	1,926.4	2,173.4	1,829.8	1,961.3
2016	1,918.8	2,068.7	1,835.3	2,026.5
2017	2,026.2	2,558.0	2,026.2	2,467.5
2018	2,479.7	2,598.2	1,996.1	2,041.0
2019 (through April 18)	2,010.0	2,248.6	1,993.7	2,213.8

Source: The Korea Exchange

Shares are quoted ex-dividend on the first trading day of the relevant company s accounting period; since the calendar year is the accounting period for the majority of listed companies, this may account for the drop in KOSPI between its closing level at the end of one calendar year and its opening level at the beginning of the following calendar year.

With certain exceptions, principally to take account of a share being quoted ex-dividend and ex-rights, upward and downward movements in share prices of any category of shares on any day are limited under the

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rules of the Korea Exchange to 30% of the previous day s closing price of the shares, rounded down as set out below:

Previous Day s Closing Price (Won)	Rounded Down to (Won)
less than 5,000	5
5,000 to less than 10,000	10
10,000 to less than 50,000	50
50,000 to less than 100,000	100
100,000 to less than 500,000	500
500,000 or more	1,000

As a consequence, if a particular closing price is the same as the price set by the fluctuation limit, the closing price may not reflect the price at which persons would have been prepared, or would be prepared to continue, if so permitted, to buy and sell shares. Orders are executed on an auction system with priority rules to deal with competing bids and offers.

Due to deregulation of restrictions on brokerage commission rates, the brokerage commission rate on equity securities transactions may be determined by the parties, subject to commission schedules being filed with the Korea Exchange by the securities companies. In addition, a securities transaction tax will generally be imposed on the transfer of shares or certain securities representing rights to subscribe for shares. A special agricultural and fishery tax of 0.15% of the sales prices will also be imposed on transfer of these shares and securities on the Korea Exchange. See Item 10.E. Taxation Korean Taxes.

The number of companies listed on the KRX KOSPI Market of the Korea Exchange since 2012, the corresponding total market capitalization at the end of the periods indicated and the average daily trading volume for those periods are set forth in the following table:

		Total Market Capitalization on the Last Day for Each Period		Average Daily Trading Volume, Value		
Year	Number of Listed Companies	(Millions of Won)	(Thousands of U.S. dollars)[1]	(Thousands of Shares)	(Millions of Won)	(Thousands of U.S. dollars)[1]
2014	773	1,192,252,867	1,084,655,082	278,082	3,983,580	3,624,072
2015	770	1,242,832,089	1,060,436,936	455,256	5,351,734	4,566,326
2016	779	1,308,440,373	1,082,697,868	376,772	4,523,043	3,742,692
2017	774	1,605,820,912	1,498,806,153	340,463	5,335,418	4,979,856
2018	788	1,343,971,857	1,202,014,003	397,972	6,548,622	5,856,920
2019 (through April 18)	791	1,467,185,238	1,291,422,619	392,280	5,384,142	4,739,144

Source: The Korea Exchange

Note:

(1) Converted at the market average exchange rate as announced by Seoul Money Brokerage Services, Ltd. in Seoul at the end of the periods indicated.

The Korean securities markets are principally regulated by the Financial Services Commission and the Financial Investment Services and Capital Markets Act. The law imposes restrictions on insider trading and price manipulation, requires specified information to be made available by listed companies to investors and establishes rules regarding margin trading, proxy solicitation, takeover bids, acquisition of treasury shares and reporting requirements for shareholders holding substantial interests.

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Protection of Customer s Interest in Case of Insolvency of Financial Investment Companies with a Brokerage License

Under Korean law, the relationship between a customer and a financial investment company with a brokerage license in connection with a securities sell or buy order is deemed to be consignment, and the securities acquired by a consignment agent (i.e., the financial investment company with a brokerage license) through such sell or buy order are regarded as belonging to the customer insofar as the customer and the consignment agent s creditors are concerned. Therefore, in the event of bankruptcy or reorganization procedures involving a financial investment company with a brokerage license, the customer of such financial investment company is entitled to the proceeds of the securities sold by such financial investment company.

When a customer places a sell order with a financial investment company with a brokerage license which is not a member of the Korea Exchange and this financial investment company places a sell order with another financial investment company with a brokerage license which is a member of the Korea Exchange, the customer is still entitled to the proceeds of the securities sold received by the non-member company from the member company regardless of the bankruptcy or reorganization of the non-member company.

Likewise, when a customer places a buy order with a non-member company and the non-member company places a buy order with a member company, the customer has the legal right to the securities received by the non-member company from the member company because the purchased securities are regarded as belonging to the customer insofar as the customer and the non-member company s creditors are concerned.

Under the Financial Investment Services and Capital Markets Act, the Korea Exchange is obliged to indemnify any loss or damage incurred by a counterparty as a result of a breach by its members. If a financial investment company with a brokerage license which is a member of the Korea Exchange breaches its obligation in connection with a buy order, the Korea Exchange is obliged to pay the purchase price on behalf of the breaching member.

As the cash deposited with a financial investment company with a brokerage license is regarded as belonging to such financial investment company, which is liable to return the same at the request of its customer, the customer cannot take back deposited cash from the financial investment company with a brokerage license if a bankruptcy or reorganization procedure is instituted against such financial investment company and, therefore, can suffer from loss or damage as a result. However, the Depositor Protection Act provides that Korean Deposit Insurance Corporation will, upon the request of the investors, pay investors up to Won 50 million per depositor per financial institution in case of the such financial investment company s bankruptcy, liquidation, cancellation of securities business license or other insolvency events (collectively, the Insolvency Events). Pursuant to the Financial Investment Services and Capital Markets Act, subject to certain exceptions, financial investment companies with a brokerage license are required to deposit the cash received from their customers with the Korea Securities Finance Corporation, a special entity established pursuant to the Financial Investment Services and Capital Markets Act. Set-off or attachment of cash deposits by financial investment companies with a brokerage license is prohibited. The premiums related to this insurance under the Depositor Protection Act are paid by financial investment companies with a brokerage license.

Item 9.D. Selling Shareholders

Not Applicable

Item 9.E. Dilution

Not Applicable

Item 9.F. Expenses of the Issue

Not Applicable

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ITEM 10.*ADDITIONAL INFORMATION*

Item 10.A. Share Capital

Not Applicable

Item 10.B. Memorandum and Articles of Incorporation

Set forth below is information relating to our capital stock, including brief summaries of material provisions of our Articles of Incorporation, the KEPCO Act, the Financial Investment Services and Capital Markets Act, the Korean Commercial Code and certain related laws of Korea, all currently in effect. The following summaries are qualified in their entirety by reference to our Articles of Incorporation and the applicable provisions of the KEPCO Act, Financial Investment Services and Capital Markets Act, the Korean Commercial Code, the Act on the Management of Public Institutions and certain related laws of Korea. On November 11, 2016, we amended our Articles of Incorporation to strike references to acting directors (while keeping references to Standing Directors), as acting directors have not been appointed since 2003 and the system of acting directors was deemed obsolete.

Objects and Purposes

We are a statutory juridical corporation established under the KEPCO Act for the purpose of ensuring stabilization of the supply and demand of electric power, and further contributing toward the sound development of the national economy through expediting development of electric power resources and carrying out proper and effective operation of the electricity business. The KEPCO Act and our Articles of Incorporation contemplate that we engage in the following activities:

1. development of electric power resources;

2. generation, transmission, transformation and distribution of electricity and other related business activities;

3. research and development of technology related to the businesses mentioned in items 1 and 2;

4. overseas businesses related to the businesses mentioned in items 1 through 3;

5. investments or contributions related to the businesses mentioned in items 1 through 4;

6. businesses incidental to items 1 through 5;

7. Development and operation of certain real estate held by us to the extent that:

    a.

it is necessary to develop certain real estate held by us due to external factors, such as relocation, consolidation, conversion to indoor or underground facilities or deterioration of our substation or office; or

b. it is necessary to develop certain real estate held by us to accommodate development of relevant real estate due to such real estate being incorporated into or being adjacent to an area under planned urban development; and

8. other activities entrusted by the Government.

Our registered name is Hankook Chollryuk Kongsa in Korean and Korea Electric Power Corporation in English. Our registration number in the commercial registry office is 114671-0001456.

Directors

Under the KEPCO Act and our Articles of Incorporation, our board of directors consists of our president, standing directors and non-standing directors. A majority of the board members constitutes a voting quorum, and resolutions will be passed by a majority of the board members. Directors who have an interest in certain agenda proposed to the board may not vote on such issues.

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The standards of remuneration for our officers, including directors, shall be determined by a resolution of the board of directors, provided that the maximum amount of remuneration to be paid to our officers shall be determined by shareholder resolution and provided that the remuneration standards for the president and standing directors shall be determined by board resolution in accordance with the guideline thereon established by the minister of the Ministry of Economy and Finance through review and resolution of our management committee. Directors who have an interest may not participate in the meeting of the board of directors for determining the remuneration for officers.

Neither the KEPCO Act nor our Articles of Incorporation have provisions relating to (i) borrowing powers exercisable by the directors and how such borrowing powers can be varied, (ii) retirement or non-retirement of directors under an age limit requirement, or (iii) the number of shares required for a director s qualification.

Share Capital

Currently, our authorized share capital is 1,200,000,000 shares, which consists of shares of common stock and shares of non-voting preferred stock, par value Won 5,000 per share. Under our Articles of Incorporation, we are authorized to issue up to 150,000,000 non-voting preferred shares. As of February 7, 2019, the last day on which our shareholders registry was closed for purposes of identifying shareholders of record, 641,964,077 common shares were issued and no non-voting preferred shares have been issued. All of the issued and outstanding common shares are fully-paid and non-assessable and are in registered form. Share certificates are issued in denominations of 1, 5, 10, 50, 100, 500, 1,000 and 10,000 shares.

Description of Capital Stock

Dividend Rights

Under the KEPCO Act, we are authorized to pay preferential dividends on our shares held by public shareholders as opposed to those held by the Government. Dividends to public shareholders are distributed in proportion to the number of shares of the relevant class of capital stock owned by each public shareholder following approval by the shareholders at a general meeting of shareholders. Korea Development Bank may receive dividends in proportion to the numbers of our shares held by them. Under the Korean Commercial Code and our Articles of Incorporation, we will pay full annual dividends on newly issued shares.

Under our Articles of Incorporation, holders of non-voting preferred shares (of which there are currently none) are entitled to receive an amount not less than 8% of their par value as determined by a resolution of the board of directors at the time of their issuance. However, stock dividends shall be paid based on par value and may not exceed the amount equivalent to a half of the total amount of profit available for dividend payment.

We declare our dividend annually at the annual general meeting of shareholders which is held within three months after the end of the fiscal year. The annual dividend is paid to the shareholders on record as of the end of the fiscal year preceding the annual shareholders meeting. Annual dividends may be distributed either in cash or in our shares. However, a dividend of shares must be distributed at par value, and dividends in shares may not exceed one-half of the annual dividend.

Under the Korean Commercial Code and our Articles of Incorporation, we do not have an obligation to pay any annual dividend unclaimed for five years from the payment date.

The KEPCO Act provides that we shall not pay an annual dividend unless we have made up any accumulated deficit and set aside as a legal reserve an amount equal to 20.0% or more of our net profit until our accumulated reserve

reaches one-half of our stated capital.

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Distribution of Free Shares

In addition to dividends in the form of shares to be paid out of retained or current earnings, the Korean Commercial Code permits us to distribute to our shareholders an amount transferred from our capital surplus or legal reserve to stated capital in the form of free shares.

Voting Rights

Holders of our common shares are entitled to one vote for each common share, except that voting rights with respect to any common shares held by us or by a corporate shareholder, more than one-tenth of whose outstanding capital stock is directly or indirectly owned by us, may not be exercised. Any person (with certain exceptions) who holds more than 3% of our issued and outstanding shares cannot exercise voting rights with respect to the shares in excess of this 3% limit. See Limitation on Shareholdings. Pursuant to the Korean Commercial Code, cumulative voting is permissible in relation to the appointment of directors. Under the Korean Commercial Code, a cumulative vote can be requested by the shareholders of a corporation representing at least 1% of the total voting shares of such corporation if the relevant shareholders meeting is intended to elect more than two seats of the board of directors and the request for cumulative voting is made to the management of the corporation in writing at least six weeks in advance of the shareholders meeting. Under this new voting method, each shareholder will have multiple voting rights corresponding to the number of directors to be appointed in such voting and may exercise all such voting rights to elect one director. Shareholders are entitled to vote cumulatively unless the Articles of Incorporation expressly prohibit cumulative voting. Our current Articles of Incorporation do not prohibit cumulative voting. Except as otherwise provided by law or our Articles of Incorporation, a resolution can be adopted at a general meeting of shareholders by affirmative majority vote of the voting shares of the shareholders present or represented at a meeting, which must also represent at least one-fourth of the voting shares then issued and outstanding. The holders of our non-voting preferred shares (other than enfranchised preferred shares (as described below)) are not entitled to vote on any resolution or to receive notice of any general meeting of shareholders unless the agenda of the meeting includes consideration of a resolution on which such holders are entitled to vote. If we are unable to pay any dividend to holders of non-voting preferred shares as provided in our Articles of Incorporation, the holders of non-voting preferred shares will become enfranchised and will be entitled to exercise voting rights until such dividends are paid. The holders of these enfranchised preferred shares have the same rights as holders of our common shares to request, receive notice of, attend and vote at a general meeting of shareholders. Pursuant to the KEPCO Act and our Articles of Incorporation, the appointment of standing directors, the president and standing statutory auditor are subject to shareholder approval.

Under the Korean Commercial Code, for the purpose of electing our statutory auditor, a shareholder (together with certain related persons) holding more than 3% of the total shares having voting rights may not exercise voting rights with respect to shares in excess of such 3% limit.

The Korean Commercial Code provides that the approval by holders of at least two-thirds of those shares having voting rights present or represented at a meeting, where such shares also represent at least one-third of the total issued and outstanding shares having voting rights, is required in order to, among other things:

amend our Articles of Incorporation;

remove a director or statutory auditor;

effect any dissolution, merger, consolidation or spin-off of us;

transfer the whole or any significant part of our business;

effect the acquisition by us of all of the business of any other company;

effect the acquisition by us of the business of another company that may have a material effect on our business;

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reduce capital; or

issue any new shares at a price lower than their par value.

Under our Articles of Incorporation, an approval by the Ministry of Trade, Industry and Energy is required in order to amend the Articles of Incorporation. Any change to our authorized share capital requires an amendment to our Articles of Incorporation.

In addition, in the case of amendments to our Articles of Incorporation or any merger or consolidation of us or in certain other cases which affect the rights or interests of the non-voting preferred shares a resolution must be adopted by a meeting of the holders of non-voting preferred shares approving such event. This resolution may be adopted if approval is obtained from holders of at least two-thirds of those non-voting preferred shares present or represented at such meeting and such non-voting preferred shares also represent at least one-third of our total issued and outstanding non-voting preferred shares.

A shareholder may exercise his voting rights by proxy. The proxy shall present the power of attorney prior to the start of the general meeting of shareholders. Under the Financial Investment Services and Capital Markets Act and our Articles of Incorporation, no one other than us may solicit a proxy from shareholders.

Subject to the provisions of the deposit agreement, holders of our American Depositary Shares (ADSs) are entitled to instruct the depositary, whose agent is the record holder of the underlying common shares, how to exercise voting rights relating to those underlying common shares.

Preemptive Rights and Issuance of Additional Shares

Authorized but unissued shares may be issued at such times and, unless otherwise provided in the Korean Commercial Code, upon such terms as our board of directors may determine. The new shares must be offered on uniform terms to all our shareholders who have preemptive rights and who are listed on the shareholders register as of the record date. Subject to the limitations described under Limitation on Shareholdings below and with certain other exceptions, all our shareholders are entitled to subscribe for any newly issued shares in proportion to their existing shareholdings. Under the Korean Commercial Code, we may vary, without shareholder approval, the terms of such preemptive rights for different classes of shares. Public notice of the preemptive rights to new shares and their transferability must be given not less than two weeks (excluding the period during which the shareholders register is closed) prior to the record date. Our board of directors may determine how to distribute shares for which preemptive rights have not been exercised or where fractions of shares occur.

Our Articles of Incorporation provide that new shares that are (1) publicly offered pursuant to the Financial Investment Services and Capital Markets Act, (2) issued to members of our employee stock ownership association, (3) represented by depositary receipts, (4) issued through offering to public investors, or (5) issued to investors in kind under the State Property Act may be issued pursuant to a resolution of the board of directors to persons other than existing shareholders, who in such circumstances will not have preemptive rights.

Under our Articles of Incorporation, we may issue convertible bonds or bonds with warrants each up to an aggregate principal amount of Won 2,000 billion and Won 1,000 billion, respectively, to persons other than existing shareholders. However, the aggregate principal amount of convertible bonds and bonds with warrants so issued to persons other than existing shareholders may not exceed Won 2,000 billion.

Under the Financial Investment Services and Capital Markets Act and our Articles of Incorporation, members of our employee stock ownership association, whether or not they are our shareholders, have a preemptive right, subject to certain exceptions, to subscribe for up to 20.0% of any shares publicly offered pursuant to the Financial Investment Services and Capital Markets Act. This right is exercisable only to the extent that the total number of shares so acquired and held by members of our employee stock ownership association does not exceed 20.0% of the total number of shares then outstanding.

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Liquidation Rights

In the event of our liquidation, the assets remaining after payment of all debts, liquidation expenses and taxes will be distributed among shareholders in proportion to the number of shares held. Holders of our non-voting preferred shares have no preference in liquidation.

Rights of Dissenting Shareholders

In certain limited circumstances (including, without limitation, the transfer of the whole or any significant part of our business or the merger, or consolidation upon a split-off of us with another company), dissenting holders of shares have the right to require us to purchase their shares. To exercise such right, shareholders must submit a written notice of their intention to dissent to us prior to the general meeting of shareholders or the class meeting of holders of non-voting preferred shares, as the case may be. Within 20 days after the date on which the relevant resolution is passed at such meeting, such dissenting shareholders must request us in writing to purchase their shares. We are obligated to purchase the shares of dissenting shareholders within one month after the expiration of such 20-day period. The purchase price for such shares must be determined through negotiation between the dissenting shareholders and us. Under the Financial Investment Services and Capital Markets Act, if we cannot agree on a price through negotiation, the purchase price will be the average of (1) the weighted average of the daily share price on the Korea Exchange for a two-month period before the date of adoption of the relevant board resolution, (2) the weighted average of the daily share price on the Korea Exchange for the one month period before such date and (3) the weighted average of the daily share price on the Korea Exchange for the one week period before such date. However, if we or dissenting shareholders who requested us to purchase their shares oppose such purchase price, the determination of a purchase price may be filed with a court. Holders of ADSs will not be able to exercise dissenter s rights unless they have withdrawn the underlying Common Stock and become our direct shareholders.

Transfer of Shares

Under the Korean Commercial Code, the transfer of shares is effected by delivery of share certificates, but in order to assert shareholders rights against us, the transferee must have his name and address registered on our register of shareholders. For this purpose, shareholders are required to file one s name, address and seal with our transfer agent. Under our Articles of Incorporation, non-resident shareholders must appoint an agent authorized to receive notices on their behalf in Korea and file a mailing address in Korea. From September 16, 2019, when the Act on Electronic Registration of Stocks, Bonds, Etc. will become effective, all of our shares are expected to be electronically registered on an electronic registry and the physical share certificates issued prior thereto are expected to lose effect, with the transfer of electronically registered stocks to be made by electronic registration of such transfer between accounts.

These requirements do not apply to the holders of ADSs. Under current Korean regulations, the Korea Securities Depository, foreign exchange banks (including domestic branches of foreign banks), financial investment companies with a dealing, brokerage or collective investment license and internationally recognized foreign custodians are authorized to act as agents and provide related services for foreign shareholders. Our transfer agent is Kookmin Bank, located at 26, Gukjegeumyung-ro 8-gil, Yeongdeungpo-gu, Seoul, Korea. Certain foreign exchange controls and securities regulations apply to the transfer of our shares by non-residents of Korea or non-Koreans. See Item 9. The Offer and Listing.

Acquisition of Our Own Shares

Under the Korean Commercial Code, we may acquire our own shares through (1) purchases on a stock exchange or (2) purchase of the shares in proportion to the number of shares held by each shareholder on equal terms and

conditions, by a resolution at a Shareholders meeting. The aggregate amount of the acquisition price shall not exceed the excess of our net assets, on a non-consolidated basis, over the sum of (1) our stated capital,

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(2) the total amount of our capital surplus reserve and earned surplus reserve which have accumulated up to the end of the previous fiscal year, (3) our earned surplus required to be accumulated for the then current fiscal year and (4) our net assets stated in the balance sheet as being increased as a result of the evaluation of the assets and liabilities in accordance with our accounting principles without being set off against any unrealized losses. In addition, under the Korean Commercial Code, we may not acquire our own shares if our net assets may fall short of the aggregate amount of the item (1) to (4) above, on a non-consolidated basis, as of the conclusion of the relevant business year of us. In general, our subsidiaries 50% or more of whose shares are owned by us may not acquire our shares.

General Meeting of Shareholders

The ordinary general meeting of our shareholders is held within three months after the end of each fiscal year, and subject to board resolution or court approval, an extraordinary general meeting of our shareholders may be held as necessary or at the request of shareholders holding an aggregate of 1.5% or more of our outstanding common shares for at least six consecutive months. Under the Korean Commercial Code, an extraordinary general meeting of shareholders may be convened at the request of our audit committee, subject to a board resolution or court approval. Holders of non-voting preferred shares may only request a general meeting of shareholders once the non-voting preferred shares have become enfranchised as described under Description of Capital Stock Voting Rights above. Written notices setting forth the date, place and agenda of the meeting must be given to shareholders at least two weeks prior to the date of the general meeting of shareholders. However, pursuant to the Korean Commercial Code and our Articles of Incorporation, with respect to holders of less than 1% of the total number of our issued and outstanding shares which are entitled to vote, notice may be given by placing at least two public notices at least two weeks in advance of the meeting in at least two daily newspapers published in Seoul or by placing a public notice in the electrical disclosure system of the Financial Supervisory Service or the Korea Exchange, at least two weeks in advance of the meeting. Currently, for giving such notice, we use an electronic disclosure system available for access at a website maintained by the Financial Supervisory Service (known as the Data Analysis, Retrieval and Transfer System, or DART). Shareholders not on the shareholders register as of the record date are not entitled to receive notice of the general meeting of shareholders or attend or vote at such meeting. Holders of the enfranchised preferred shares on the shareholders register as of the record date are entitled to receive notice of, and to attend and vote at, the general meetings. Otherwise, holders of non-voting preferred shares are not entitled to receive notice of general meetings of shareholders or vote at such meetings but may attend such meetings.

The general meeting of shareholders is held in Naju, Jeollanam-do.

Register of Shareholders and Record Dates

Our transfer agent, Kookmin Bank, maintains the register of our shareholders at its office in Seoul, Korea. It registers transfers of our shares on the register of shareholders upon presentation of the share certificates.

The record date for annual dividends is December 31. For the purpose of determining the holders of shares entitled to annual dividends, the register of shareholders may be closed from January 1 to January 31 of each year. Further, the Korean Commercial Code and our Articles of Incorporation permit us at least two weeks public notice to set a record date and/or close the register of shareholders for not more than three months for the purpose of determining the shareholders entitled to certain rights pertaining to our shares. The trading of our shares and the delivery of certificates in respect of them may continue while the register of shareholders is closed.

Annual Report

At least one week prior to the annual general meeting of shareholders, our annual report and audited consolidated financial statements must be made available for inspection at our principal office and at all branch

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offices. Copies of annual reports, the audited non-consolidated financial statements and any resolutions adopted at the general meeting of shareholders will be available to our shareholders.

Under the Financial Investment Services and Capital Markets Act, we must file with the Financial Services Commission and the Korea Exchange an annual report within 90 days after the end of our fiscal year, a half-year report within 45 days after the end of the first six months of our fiscal year and quarterly reports within 45 days after the end of the first three months and nine months of our fiscal year. Following our adoption of IFRS starting in January 1, 2011 pursuant to regulatory requirements for listed companies in Korea, we are required to file half-year and quarterly reports containing interim financial statements and notes thereto on a consolidated basis as well as on a separate basis.

Limitation on Shareholdings

No person other than the Government, our employee stock ownership association and persons who obtain an approval from the Financial Services Commission may hold for its account more than 3% of our total issued and outstanding shares. In calculating shareholdings for this purpose, shares held by your spouse and your certain relatives or by your certain affiliates (such spouses, relatives and affiliates are together referred to as Affiliated Holders) are deemed to be held by you. If you hold our shares in violation of this 3% limit, you are not entitled to exercise the voting rights or preemptive rights of our shares in excess of such 3% limit and the Financial Services Commission may order you to take necessary corrective action. In addition, the KEPCO Act currently requires that the Government, directly or through Korea Development Bank, own not less than 51% of our capital. For other restrictions on shareholdings, see Item 9. The Offer and Listing.

Change of Control

The KEPCO Act requires that the Government, directly or pursuant to the Korea Development Bank Act, through Korea Development Bank, own not less than 51% of our capital.

Disclosure of Share Ownership

Under the Financial Investment Services and Capital Markets Act, any person whose direct or beneficial ownership of a listed company s shares with voting rights, equity-related debt securities including convertible bonds, bonds with warrants, exchangeable bonds, certificates representing the rights to subscribe for common shares, derivatives-linked securities and depository receipts of the aforementioned securities (collectively referred to as Equity Securities), together with the Equity Securities directly or beneficially owned by certain related persons or by any person acting in concert with the person, accounts for 5% or more of our total outstanding Equity Securities is required to report the status and purpose (in terms of whether the purpose of shareholding is to participate in the management of the issuer) of the holdings and the material contents of the agreements relating to the Equity Securities and other matters prescribed by the Presidential Decree under the Financial Investment Services and Capital Markets Act to the Financial Services Commission of Korea and the Korea Exchange within five business days after reaching the 5% ownership interest threshold.

In addition, any change (i) in the purpose of the shareholding or in the ownership, (ii) the major terms and conditions of agreements relating to Equity Securities owned (such as trust agreements and collateral agreements) to the extent the number of relevant Equity Securities is 1% or more of the total outstanding Equity Securities, or (iii) the type of ownership (direct ownership or holding) to the extent the number of relevant Equity Securities is 1% or more of the total outstanding Equity Securities, must be reported to the Financial Services Commission of Korea and the Korea Exchange within five business days from the date of such change (or by the tenth day of the month following the

month in which the change occurs, in the case of a person with no intent to seek management control). Notwithstanding the foregoing, certain professional investors designated by the Financial Services Commission may report such matters to the Financial Services Commission and the Korea Exchange by the tenth day of the month immediately following the end of the quarter in which such 5.0% ownership interest is reached or the change occurs.

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When filing a report to the Financial Services Commission and the Korea Exchange in accordance with the reporting requirements described above, a copy of such report must be sent to the relevant listed company. Violation of these reporting requirements may subject a person to sanctions such as prohibition on the exercise of voting rights with respect to the Equity Securities for which the reporting requirement was violated or fines or imprisonment. Furthermore, the Financial Services Commission may order the disposal of the Equity Securities for which the reporting requirement was violated or may impose administrative fine.

A person reporting to the Financial Services Commission and the Korea Exchange that his purpose of holding the Equity Securities is to participate in the management of the listed company is prohibited from acquiring additional Equity Securities of the listed company and exercising voting rights during the period commencing from the date on which the event triggering the reporting requirements occurs to the fifth day from the date on which the report is made.

Item 10.C. Material Contracts

None.

Item 10.D. Exchange Controls

General

The Foreign Exchange Transaction Act and the Presidential Decree and regulations under that Act and Decree, or collectively the Foreign Exchange Transaction Laws, regulate investment in Korean securities by non-residents and issuance of securities outside Korea by Korean companies. Non-residents may invest in Korean securities pursuant to the Foreign Exchange Transaction Laws. The Financial Services Commission has also adopted, pursuant to its authority under the Financial Investment Services and Capital Markets Act, regulations that regulate investment by foreigners in Korean securities and issuance of securities outside Korea by Korean companies.

Subject to certain limitations, the Ministry of Economy and Finance has the authority to take the following actions under the Foreign Exchange Transaction Laws: (i) if the Government deems it necessary on account of war, armed conflict, natural disaster or grave, sudden and significant changes in domestic or foreign economic circumstances or similar events or circumstances, the Ministry of Economy 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, safe-keep or sell any instruments of payment to the Bank of Korea or certain other governmental agencies or financial institutions, or effective from July 18, 2017, impose an obligation on resident creditors to collect and recover debts owed by non-resident debtors,, and (ii) if the Government concludes that the international balance of payments and international financial markets are experiencing or are likely to experience significant disruption or that the movement of capital between Korea and other countries are likely to adversely affect the Korean Won, exchange rates or other macroeconomic policies, the Ministry of Economy and Finance may take action to require any person who intends to effect or effects a capital transaction to deposit all or a portion of the instruments of payment acquired in such transactions with the Bank of Korea or certain other governmental agencies or financial institutions.

Government Review of Issuances of Debt Securities and ADSs and Report for Payments

In order for us to issue debt securities of any series outside of the Republic, we are required to file a report with our designated foreign exchange bank or the Ministry of Economy and Finance on the issuance of such debt securities, depending on the issuance amount. The Ministry of Economy and Finance may at its discretion direct us to take measures as necessary to avoid undue exchange rate fluctuations before it accepts such report. Furthermore, in order for us to make payments of principal of or interest on the debt securities of any series and

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other amounts as provided in an indenture and such debt securities, we are required to present relevant documents to the designated foreign exchange bank at the time of each actual payment. The purpose of such presentation is to ensure that the actual remittance is consistent with the terms of the transaction reported to our designated foreign exchange bank or the Ministry of Economy and Finance.

In order for us to offer for purchase shares of our common stock held in treasury in the form of ADSs or issue shares of our common stock represented by the ADSs, we are required to file a prior report of such offer or issuance with our designated foreign exchange bank or the Ministry of Economy and Finance, depending on the offering amount. The Ministry of Economy and Finance may at its discretion direct us to take measures as necessary to avoid undue exchange rate fluctuations before it accepts such report. No further Governmental approval is necessary for the initial offering and issuance of the ADSs.

In order for a depositary to acquire any existing shares of our common stock from holders of these shares of common stock (other than from us) for the purpose of issuance of depositary receipts representing these shares of common stock, the depositary would be required to obtain our consent for the number of shares to be deposited in any given proposed deposit which exceeds the difference between (1) the aggregate number of shares deposited by us or with our consent for the issuance of ADSs (including deposits in connection with the initial and all subsequent offerings of ADSs and stock dividends or other distributions related to these ADSs) and (2) the number of shares on deposit with the depositary at the time of such proposed deposit. We may not grant this consent for the deposit of shares of our common stock in the future, if our consent is required. Therefore, a holder of ADSs who surrenders ADSs and withdraws shares of our common stock may not be permitted subsequently to deposit such shares and obtain ADSs.

In addition, we are also required to notify the Ministry of Economy and Finance upon receipt of the full proceeds from the offering of ADSs. No additional Governmental approval is necessary for the offering and issuance of ADSs.

Reporting Requirements for Holders of Substantial Interests

Under the Financial Investment Services and Capital Markets Act, any person whose direct beneficial ownership of a listed company s Equity Securities, together with the Equity Securities beneficially owned by certain related persons or by any person acting in concert with such person, accounts for 5% or more of our total outstanding Equity Securities is required to report the status and purpose (namely, whether the purposes of the share ownership is to participate in the management of the issuer) of the holdings and the material contents of the agreements relating to the Equity Securities and other matters prescribed by the Presidential Decree under the Financial Investment Services and Capital Markets Act to the Financial Services Commission and the Korea Exchange within five business days after reaching the 5% ownership interest and any change in ownership interest subsequent to the report which equals or exceeds 1.0% of the total outstanding Equity Securities is required to be reported to the Financial Services Commission and the Korea Exchange within five business days from the date of the change.

In addition, any change (i) in the purpose of the shareholding or in the ownership, (ii) the major terms and conditions of agreements relating to Equity Securities owned (such as trust agreements and collateral agreements) to the extent the number of relevant Equity Securities is 1% or more of the total outstanding Equity Securities, or (iii) the type of ownership (direct ownership or holding) to the extent the number of relevant Equity Securities is 1% or more of the total outstanding Equity Securities, must be reported to the Financial Services Commission of Korea and the Korea Exchange within five business days from the date of such change (or by the tenth day of the month following the month in which the change occurs, in the case of a person with no intent to seek management control). Notwithstanding the foregoing, certain professional investors designated by the Financial Services Commission may report such matters to the Financial Services Commission and the Korea Exchange by the tenth day of the month immediately following the end of the quarter in which such 5.0% ownership interest is reached or the change occurs.

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When filing a report to the Financial Services Commission and the Korea Exchange in accordance with the reporting requirements described above, a copy of such report must be sent to the relevant listed company. Violation of these reporting requirements may subject a person to sanctions such as prohibition on the exercise of voting rights with respect to the Equity Securities for which the reporting requirement was violated or fines or imprisonment. Furthermore, the Financial Services Commission may order the disposal of the Equity Securities for which the reporting requirement was violated or may impose administrative fine.

A person reporting to the Financial Services Commission and the Korea Exchange that his purpose of holding the Equity Securities is to participate in the management of the listed company is prohibited from acquiring additional Equity Securities of the listed company and exercising voting rights during the period commencing from the date on which the event triggering the reporting requirements occurs to the fifth day from the date on which the report is made.

In addition to the reporting requirements described above, any person whose direct or beneficial ownership of our voting stock and/or depository receipts for our voting stock accounts for 10.0% or more of the total issued and outstanding voting stock, whom we refer to as a major shareholder, must file a report to the Securities and Futures Commission and to the Korea Exchange within five business days after the date on which the person reached such shareholding limit. In addition, such person must file a report to the Securities and Futures Commission and to the Korea Exchange regarding any subsequent change in his/her shareholding. Such report on subsequent change in shareholding must be filed within five business days of the occurrence of any such change. Violation of these reporting requirements may subject a person to criminal sanctions such as fines and imprisonment.

Restrictions Applicable to ADSs

No Governmental approval is necessary for the sale and purchase of ADSs in the secondary market outside Korea or for the withdrawal of shares of our common stock underlying ADSs and the delivery inside Korea of the withdrawn shares. However, a foreigner who intends to acquire shares must obtain an Investment Registration Card from the Financial Supervisory Service as described below. The acquisition of shares by a foreigner must be reported by the foreigner or his standing proxy in Korea immediately to the Governor of the Financial Supervisory Service.

Special Reporting Requirement for Companies Whose Securities Are Listed on Foreign Exchanges

Under the regulations of the Financial Services Commission and the Korea Exchange, (i) if a company listed on the Korea Exchange has submitted a public disclosure of material matters to a foreign financial investment supervisory authority pursuant to the laws of the foreign jurisdiction, then it must submit a copy of the public disclosure and a Korean translation thereof to the Financial Services Commission of Korea and the Korea Exchange, and (ii) if a company listed on the Korea Exchange is approved for listing on a foreign stock market or determined to be de-listed from the foreign stock market or actually listed on, or de-listed from, a foreign stock market, then it must submit a copy of any document, which it submitted to or received from the relevant foreign government, foreign financial investment supervisory authority or the foreign stock market, and a Korean translation thereof to the Financial Services Commission of Korea and the Korea Exchange.

Persons who have acquired shares of our common stock as a result of the withdrawal of shares of common stock underlying ADSs may exercise their preemptive rights for new shares, participate in free distributions and receive dividends on shares of our common stock without any further governmental approval.

Restrictions Applicable to Common Stock

Under the Foreign Exchange Transaction Laws and the Regulations on Financial Investment Business (together, the Investment Rules), foreigners are permitted to invest, subject to certain exceptions and

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procedural requirements, in all shares of Korean companies unless prohibited by specific laws. Foreign investors may trade shares listed on the Korea Exchange only through the Korea Exchange except for certain limited circumstances. These circumstances include, among others, (1) odd-lot trading of shares, (2) acquisition of shares by a foreign company as a result of a merger, (3) acquisition or disposal of shares in connection with a tender offer, (4) acquisition of shares by exercise of warrant, conversion right under convertible bonds, exchange right under exchangeable bonds or withdrawal right under depositary receipts issued outside of Korea by a Korean company, such shares being Converted Shares, (5) acquisition of shares through exercise of rights under securities issued outside of Korea, (6) acquisition of shares as a result of inheritance, donation, bequest or exercise of shareholders rights (including preemptive rights or rights to participate in free distributions and receive dividends), (7) over-the-counter transactions between foreigners of a class of shares for which a ceiling on aggregate acquisition by foreigners (as explained below) exists and has been reached or exceeded, (8) acquisition of shares by direct investment under the Foreign Investment Promotion Law, (9) acquisition and disposal of shares on an overseas stock exchange market, if such shares are simultaneously listed on the KRX KOSPI Market or the KRX KOSDAQ Market of the Korea Exchange and such overseas stock exchange, and (10) arm s length transactions between foreigners in the event all such foreigners belong to an investment group managed by the same person. For over-the-counter transactions of shares listed on the Korea Exchange outside the Korea Exchange between foreigners of a class of shares for which a ceiling on aggregate acquisition by foreigners exists and has been reached or exceeded, a financial investment company with a brokerage license in Korea must act as an intermediary. Odd-lot trading of shares listed on the Korea Exchange outside the Korea Exchange must involve a financial investment company with a dealing license in Korea as the other party. Foreign investors are prohibited from engaging in margin transactions with respect to shares subject to a ceiling on acquisition by foreigners.

The Investment Rules require a foreign investor who wishes to invest in or dispose of shares on the Korea Exchange (including Converted Shares) to register his/her identity with the Financial Supervisory Service prior to making any such investment or disposal unless he/she had previously registered. However, such registration requirement does not apply to foreign investors who acquire Converted Shares with the intention of selling them within three months from the date they were acquired. Upon registration, the Financial Supervisory Service will issue to the foreign investor an Investment Registration Card which must be presented each time the foreign investor opens a brokerage account with a financial investment company or financial institution in Korea. Foreigners eligible to obtain an Investment Registration Card include any foreign nationals who are individuals (with residence abroad for six months or more), foreign governments, foreign municipal authorities, foreign public institutions, international financial institutions or similar international organizations, corporations incorporated under foreign laws and any person in any additional category designated by the Decree of the Financial Services and Capital Markets Act. All Korean branches of a foreign corporation as a group are treated as a separate foreigner from the head office of the foreign corporation. However, a foreign branch of a Korean securities company, a foreign corporation or a depositary issuing depositary receipts may obtain one or more Investment Registration Cards in its name in certain circumstances as described in the relevant regulations.

Upon a foreign investor s purchase of shares through the Korea Exchange, no separate report by the investor is required because the Investment Registration Card system is designed to control and oversee foreign investment through a computer system. However, a foreign investor s acquisition or sale of shares outside the Korea Exchange (as discussed above) must be reported by the foreign investor or his standing proxy to the Governor of the Financial Supervisory Service at the time of each acquisition or sale. However, a foreign investor must ensure that any acquisition or sale by it of shares outside the Korea Exchange in the case of trades in connection with a tender offer, odd-lot trading of shares or trades of a class of shares for which the aggregate foreign ownership limit has been reached or exceeded, is reported to the Governor of the Financial Supervisory Service by the Korea Securities Depository, financial investment companies with a dealing or brokerage license or securities finance companies engaged to facilitate such transactions. In the event a foreign investor desires to acquire or sell shares outside the

Korea Exchange and the circumstances in connection with such sale or acquisition do not fall within the exceptions made for certain limited circumstances described above, then the foreign investor must obtain the prior approval of the Governor. In addition, in the event a foreign investor

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acquires or sells shares outside the Korea Exchange, a prior report to the Governor of the Financial Supervisory Service may also be required in certain circumstances. A foreign investor may appoint one or more standing proxies from among the Korea Securities Depository, foreign exchange banks (including domestic branches of foreign banks), financial investment companies with a dealing, brokerage or collective investment license and certain eligible foreign custodians which will exercise shareholders rights or perform any matters related to the foregoing activities if the foreign investor does not perform these activities himself. However, a foreign investor may be exempted from complying with these standing proxy rules with the approval of the Governor of the Financial Supervisory Service in cases deemed inevitable by reason of conflict between the laws of Korea and those of the home country of the foreign investor.

Certificates evidencing shares of Korean companies must be kept in custody with an eligible custodian in Korea, the Korea Securities Depository, foreign exchange banks (including domestic branches of foreign banks), financial investment companies with a dealing, brokerage or collective investment license and certain eligible foreign custodians are eligible to be a custodian of shares for a non-resident or foreign investor. A foreign investor must ensure that his custodian deposits his shares with the Korea Securities Depository. Generally, a foreign investor may not permit any person, other than his/her standing proxy, to exercise rights relating to his shares or perform any tasks related thereto on his behalf. However, a foreign investor may be exempted from complying with this deposit requirement with the approval of the Governor of the Financial Supervisory Service in circumstances where compliance is made impracticable, including cases where such compliance would contravene the laws of the home country of the foreign investor.

Under the Investment Rules, with certain exceptions, a foreign investor may acquire shares of a Korean company without being subject to any single or aggregate foreign investment ceiling. However, certain designated public corporations are subject to a 40.0% ceiling on acquisitions of shares by foreigners in the aggregate and a ceiling on acquisitions of shares by a single foreign investor provided in the Articles of Incorporation of such corporations. Of the Korean companies listed on the Korea Exchange, we are so designated. The Financial Services Commission may impose other restrictions as it deems necessary for the protection of investors and the stabilization of the Korean securities and derivatives market. Generally, the ownership of Converted Shares constitutes foreign ownership for purposes of such aggregate foreign ownership limit. However, the acquisition of Converted Shares is one of the exceptions under which foreign investors may acquire shares of designated corporations in excess of the 40.0% ceiling.

In addition to the aggregate foreign investment ceiling set by the Financial Services Commission under authority of the Financial Investment Services and Capital Markets Act, our Articles of Incorporation set a 3% ceiling on acquisition by a single investor (whether domestic or foreign) of the shares of our common stock. Any person (with certain exceptions) who holds more than 3% of our issued and outstanding shares cannot exercise voting rights with respect to our shares in excess of this 3% limit.

The ceiling on aggregate investment by foreigners applicable to us may be exceeded in certain limited circumstances, including as a result of acquisition of:

shares by a depositary issuing depositary receipts representing such shares (whether newly issued shares or outstanding shares);

Converted Shares;

shares from the exercise of shareholders rights; or

shares by gift, inheritance or bequest.

A foreigner who has acquired shares in excess of any ceiling described above may not exercise his voting rights with respect to the shares exceeding such limit and the Financial Services Commission may take necessary corrective action against him.

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Under the Foreign Exchange Transaction Laws, a foreign investor who intends to acquire shares must designate a foreign exchange bank at which he must open a foreign currency account and a Won account exclusively for stock investments. No approval is required for remittance into Korea and deposit of foreign currency funds in the foreign currency account. Foreign currency funds may be transferred from the foreign currency account at the time required to place a deposit for, or settle the purchase price of, a stock purchase transaction to a Won account opened at a securities company. Funds in the foreign currency account may be remitted abroad without any governmental approval.

Dividends on shares of our common stock are paid in Won. No governmental approval is required for foreign investors to receive dividends on, or the Won proceeds of the sale of, any shares to be paid, received and retained in Korea. Dividends paid on, and the Won proceeds of the sale of, any shares held by a non-resident of Korea must be deposited either in a Won account with the investor s securities company or the investor s Won account. Funds in the investor s Won account may be transferred to his foreign currency account or withdrawn for local living expenses, provided that any withdrawal of local living expenses in excess of a certain amount should be reported to the Governor of the Financial Supervisory Service. Funds in the investor s Won account may also be used for future investment in shares or for payment of the subscription price of new shares obtained through the exercise of preemptive rights.

Financial investment companies with a securities dealing, brokerage or collective investment license are allowed to open foreign currency accounts with foreign exchange banks exclusively for accommodating foreign investors stock investments in Korea. Through these accounts, these securities companies and asset management companies may enter into foreign exchange transactions on a limited basis, such as conversion of foreign currency funds and Won funds, either as a counterparty to or on behalf of foreign investors without the foreign investors having to open their own accounts with foreign exchange banks.

Item 10.E. Taxation

Korean Taxes

The following summary describes the material Korean tax consequences of ownership of the Registered Debt Securities and ADSs. Persons considering the purchase of the Registered Debt Securities or ADSs should consult their own tax advisors with regard to the application of the Korean income tax laws to their particular situations as well as any tax consequences arising under the laws of any other taxing jurisdiction. Reference is also made to a tax treaty between the Republic and the United States entitled Convention Between the United States of America and the Republic of Korea for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income and the Encouragement of International Trade and Investment, signed on June 4, 1976 and entered into force on October 20, 1979.

The following summary of Korean tax considerations applies to you so long as you are not:

a resident of Korea;

a corporation having its head office, principal place of business or place of effective management in Korea; or

engaged in a trade or business in Korea through a permanent establishment or a fixed base to which the relevant income is attributable or with which the relevant income is effectively connected.

Registered Debt Securities

Taxation of Interest

Pursuant to the Special Tax Treatment Control Law (STTCL), when we make payments of interest to you on the Registered Debt Securities, no amount will be withheld from such payments for, or on account of, any

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income taxes of any kind imposed, levied, withheld or assessed by Korea or any political subdivision or taxing authority thereof or therein, provided that Registered Debt Securities are deemed to be foreign currency-denominated bonds issued outside of Korea for the purpose of 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 the interest on the Registered Debt Securities would be 14% of income for a non-resident without a permanent establishment in Korea. In addition, local income tax would be imposed at the rate of 10.0% of the income tax or corporation tax (which would increase the total tax rate to 15.4%), unless reduction is available under an applicable income tax treaty. If you are a qualified resident in a country that has entered into a tax treaty with Korea, you may qualify for an exemption or a reduced rate of Korean withholding tax. See the discussion under Shares or ADSs Tax Treaties below for an additional explanation on treaty benefits.

In order to obtain the benefits of an exemption or a reduced withholding tax rate under a tax treaty, you must submit to us, prior to the interest payment date, such evidence of tax residence as may be required by the Korean tax authorities in order to establish your entitlement to the benefits of the applicable tax treaty.

Furthermore, Korean tax laws require the beneficial owner to submit an application for entitlement to a preferential tax rate together with evidence of tax residence (including a certificate of tax residence of the beneficial owner issued by a competent authority of the country of tax residence of the beneficial owner) to a withholding obligor paying Korean source income in order to benefit from the available reduced tax rate pursuant to the relevant tax treaty. Under Korean tax laws and subject to certain exceptions, an overseas investment vehicle (which is defined as an organization established in a foreign jurisdiction that manages funds collected through investment solicitation by acquiring, disposing or otherwise investing in proprietary targets and then distributes the proceeds thereof to investors) (the Overseas Investment Vehicle) must obtain an application for a preferential tax rate from the beneficial owner and forward it to the withholding obligor along with an overseas investment vehicle report (prepared by the Overseas Investment Vehicle) which includes a detailed statement on the beneficial owner.

Due to recent amendment to the Korean tax laws, which applies for fiscal years beginning on or after January 1, 2020, Overseas Investment Vehicles may be regarded as beneficial owners of Korean sourced income in certain situations. Pursuant to such amendment, Overseas Investment Vehicles may be treated as beneficial owners of Korean source income if one of the following conditions are met: (i) the Overseas Investment Vehicle is subject to taxation in the jurisdiction in which it resides and there is no intentional tax avoidance purpose to establishing the Overseas Investment Vehicle in the jurisdiction; (ii) the Overseas Investment Vehicle is deemed as the beneficial owner under a tax treaty; or (iii) the Overseas Investment Vehicle is unable to confirm its list of beneficial owners investing in the Overseas Investment Vehicle (if only a portion of the beneficial owners are confirmed, applies with respect to the remaining unconfirmed list of beneficial owners). Overseas Investment Vehicles that are not regarded as foreign corporations for purposes of the Korean tax law may be recognized as beneficial owners if one of the above conditions (ii) or (iii) are met. Further, Overseas Investment Vehicles that meet condition (iii) would be subject to the default statutory withholding tax rate under the Korean tax laws and the treaty withholding rates under relevant tax treaties would not apply even though the Overseas Investment Vehicles are deemed to be beneficial owners of Korean source income.

Taxation of 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 a Registered Debt Security to another non-resident (except where a non-resident sells Registered Debt Securities to another non-resident who has a permanent establishment in Korea, if any). In addition, capital gains realized from the transfer of Registered Debt Securities outside Korea by non-residents

with or without permanent establishments in Korea are currently exempt from taxation by virtue of the STTCL, provided that the issuance of such Registered Debt Securities is deemed to be an overseas issuance

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of foreign currency-denominated bonds under the STTCL. If you sell or otherwise dispose of a Registered Debt Security through other ways than those mentioned above, any gain realized on the transaction will be taxable at ordinary Korean withholding tax rates (which is the lesser of 22.0% (including local income tax) of the net gain or 11.0% (including local income tax) of the gross sale proceeds, subject to the production of satisfactory evidence of the acquisition cost of such Registered Debt Securities and certain direct transaction costs attributable to the disposal of such Registered Debt Securities), unless an exemption is available under an applicable income tax treaty. See the discussion under Shares or ADSs Tax Treaties below for an additional explanation on treaty benefits.

Inheritance Tax and Gift Tax

If you die while you are the holder of Registered Debt Securities, the subsequent transfer of the Registered Debt Securities by way of succession will be subject to Korean inheritance tax. Similarly, if you transfer Registered Debt Securities as a gift, the donee will be subject to Korean gift tax and you may be required to pay the gift tax if the donee fails to do so.

At present, Korea has not entered into any tax treaty relating to inheritance or gift taxes.

Shares or ADSs

Dividends on the Shares of Common Stock or ADSs

We will deduct Korean withholding tax from dividends (whether in cash or in shares) paid to you at a rate of 22% (inclusive of local income tax). If you are a qualified resident in a country that has entered into a tax treaty with Korea, you may qualify for a reduced rate of Korean withholding tax. See the discussion under Tax Treaties below for an additional explanation on treaty benefits.

In order to obtain the benefits of a reduced withholding tax rate under a tax treaty, you must submit to the Korea Securities Depository, prior to the dividend payment date, such evidence of tax residence as may be required by the Korean tax authorities in order to establish your entitlement to the benefits of the applicable tax treaty. Evidence of tax residence may be submitted to the Korea Securities Depository through the withholding tax agent. If we distribute to you free shares representing a transfer of certain capital reserves or asset revaluation reserves into paid-in capital, such distribution may be subject to Korean withholding tax.

Furthermore, Korean tax laws require the beneficial owner to submit an application for entitlement to a preferential tax rate together with evidence of tax residence (including a certificate of tax residence of the beneficial owner issued by a competent authority of the country of tax residence of the beneficial owner) to a withholding obligor paying Korean source income in order to benefit from the available reduced tax rate pursuant to the relevant tax treaty. Under Korean tax laws and subject to certain exceptions, the Overseas Investment Vehicle must obtain an application for entitlement to a preferential tax rate from the beneficial owner and forward it to the withholding obligor along with an overseas investment vehicle report (prepared by the Overseas Investment Vehicle) which includes a detailed statement on the beneficial owner.

If you hold common shares or ADSs and receive the dividend through an account at the Korea Securities Depository held by a foreign depositary settlement institute, you are not required to submit the application for entitlement to a preferential tax rate. However, evidence of tax residence may need to be submitted to us through such foreign depositary settlement institute.

Taxation of Capital Gains

As a general rule, capital gains earned by non-residents upon the transfer of the common shares or ADSs would be subject to Korean income tax at a rate equal to the lesser of (i) 11.0% (including local income tax) of

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the gross proceeds realized or (ii) 22.0% (including local income tax) of the net realized gain (subject to the production of satisfactory evidence of the acquisition costs and certain direct transaction costs arising out of the transfer of such common shares or ADSs), unless such non-resident is exempt from Korean income taxation under an applicable Korean tax treaty into which Korea has entered with the non-resident s country of tax residence. Please see the discussion under Tax Treaties below for an additional explanation on treaty benefits. Even if you do not qualify for any exemption under a tax treaty, you will not be subject to the foregoing income tax on capital gains if you qualify for the relevant Korean domestic tax law exemptions discussed in the following paragraphs.

You will not be subject to Korean income taxation on capital gains realized upon the transfer of our common stocks or ADSs through the Korea Exchange if you (i) have no permanent establishment in Korea and (ii) did not own or have not owned (together with any shares owned by any entity which you have a certain special relationship with and possibly including the shares represented by the ADSs) 25.0% or more of our total issued and outstanding shares at any time during the calendar year in which the sale occurs and during the five calendar years prior to the calendar year in which the sale occurs.

It should be noted that (i) capital gains earned by you (regardless of whether you have a permanent establishment in Korea) from the transfer of ADSs outside Korea will be exempted from Korean income taxation provided that ADSs are deemed to have been issued overseas under the STTCL, but (ii) if and when an owner of the underlying shares of stock transfers ADSs after conversion of the underlying shares into ADSs, the exemption described in (i) is not applicable.

If you are subject to tax on capital gains with respect to the sale of ADSs, or of shares of common stock which you acquired as a result of a withdrawal, the purchaser or, in the case of the sale of shares of common stock on the Korea Exchange or through an investment dealer or investment broker under the Financial Investment Services and Capital Markets Act, an investment dealer or investment broker is required to withhold Korean tax from the sales price in an amount equal to 11.0% (including local income tax) of the gross realization proceeds and to make payment of these amounts to the Korean tax authority, unless you establish your entitlement to an exemption under an applicable tax treaty or domestic tax law or produce satisfactory evidence of your acquisition cost and transaction costs for the shares of common stock or the ADSs.

However, if you transfer the ADSs following an exchange of the underlying shares of stock owned by you for ADSs to a purchaser who is a non-resident or a foreign company without a permanent establishment in Korea, you are obligated to file an income tax return and pay tax on gain realized from such transfer unless exempt under an applicable tax treaty or domestic law. Further, if you transfer the shares of common stock outside of Korea (excluding a transfer on a foreign exchange) to non-residents or foreign companies without permanent establishments in Korea, you are obligated to file an income tax return and pay income tax on capital gain realized from such transfer unless exempt under an applicable tax treaty or domestic law. If a purchaser or an investment dealer or investment broker, as the case may be, withholds and remits the tax on capital gains derived from transfer of shares of common stock or ADSs, your obligation to file an income tax return and pay income tax will not apply.

In order to obtain the benefit of an exemption from tax pursuant to a tax treaty, you must submit to the purchaser or the investment dealer or the investment broker, or through the ADS depositary, as the case may be, prior to or at the time of payment, such evidence of your tax residence as the Korean tax authorities may require in support of your claim for treaty benefits. Please see the discussion under Tax Treaties below for an additional explanation on claiming treaty benefits. Furthermore, Korean tax laws require the beneficial owner to submit an application for tax exemption together with evidence of tax residence (including a certificate of tax residence of the beneficial owner issued by a competent authority of the country of tax residence of the beneficial owner) to a withholding obligor paying Korean source income in order to benefit from the available exemption pursuant to the relevant tax treaty. Under Korean tax

laws and subject to certain exceptions, the Overseas Investment Vehicle must obtain an application for tax exemption from the beneficial owner and forward it to the

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withholding obligor along with an overseas investment vehicle report (prepared by the Overseas Investment Vehicle) which includes a detailed statement on the beneficial owner.

Tax Treaties

Korea has entered into a number of income tax treaties with other countries (including the United States), which would reduce or exempt Korean withholding tax on dividends on, and capital gains on transfer of, shares of our common stock or ADSs. For example, under the Korea-United States income tax treaty, reduced rates of Korean withholding tax of 16.5% or 11.0% (respectively, including local income tax, depending on your status and shareholding ratio) on dividends and an exemption from Korean withholding tax on capital gains are available to residents of the United States that are beneficial owners of the relevant dividend income or capital gains. However, under Article 17 (Investment of Holding Companies) of the Korea-United States income tax treaty, such reduced rates and exemption do not apply if (i) you are a United States corporation, (ii) by reason of any special measures, the tax imposed on you by the United States with respect to such dividends or capital gains is substantially less than the tax generally imposed by the United States on corporate profits, and (iii) 25.0% or more of your capital is held of record or is otherwise determined, after consultation between competent authorities of the United States and Korea, to be owned directly or indirectly by one or more persons who are not individual residents of the United States. Also, under Article 16 (Capital Gains) of the Korea-United States income tax treaty, the exemption on capital gains does not apply if you are an individual, and (a) you maintain a fixed base in Korea for a period or periods aggregating 183 days or more during the taxable year and your ADSs or shares of common stock giving rise to capital gains are effectively connected with such fixed base or (b) you are present in Korea for a period or periods of 183 days or more during the taxable year.

You should inquire for yourself whether you are entitled to the benefit of an income tax treaty with Korea. It is the responsibility of the party claiming the benefits of an income tax treaty in respect of dividend payments or capital gains to submit to us, the purchaser or the investment dealer or the investment broker, as applicable, a certificate as to his tax residence. In the absence of sufficient proof, we, the purchaser or the investment dealer or the investment broker, as applicable, must withhold tax at the normal rates. Further, in order for you to obtain the benefit of a tax exemption on certain Korean source income (e.g., interest, dividends and capital gains) under an applicable tax treaty, Korean tax laws require you (or your agent) to submit an application for tax exemption (if there is no change in the content of such application, it is not required to submit such application again within a period of three years thereafter) along with a certificate of your tax residence issued by a competent authority of your country of tax residence. Under Korean tax laws and subject to certain exceptions, the Overseas Investment Vehicle must obtain an application for tax exemption from the beneficial owner and forward it to the withholding obligor along with an overseas investment vehicle report (prepared by the Overseas Investment Vehicle) which includes a detailed statement on the beneficial owner. The withholding obligor must submit the application and the report to the relevant tax office by the ninth day of the month following the date of the first payment of such income.

Furthermore, the Korean tax laws require the beneficial owner to submit an application for entitlement to a preferential tax rate (if there is no change in the content of such application, it is not required to submit such application again within a period of three years thereafter) together with evidence of tax residence (including a certificate of tax residence of the beneficial owner issued by a competent authority of the country of tax residence of the beneficial owner) to a withholding obligor paying Korean source income in order to benefit from the available reduced tax rate pursuant to the relevant tax treaty. If you hold the shares of common stock or ADSs and receive the dividend through an account at the Korea Securities Depository held by a foreign depositary settlement institute, you are not required to submit the application for entitlement to a preferential tax rate. However, evidence of tax residence may need to be submitted to us through such foreign depositary settlement institute.

Under Korean tax laws and subject to certain exceptions, the Overseas Investment Vehicle must obtain an application for a preferential tax rate from the beneficial owner and forward it to the withholding obligor along

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with an overseas investment vehicle report (prepared by the Overseas Investment Vehicle) which includes a detailed statement on the beneficial owner.

Inheritance Tax and Gift Tax

If you die while holding an ADS or donate an ADS, it is unclear whether, for Korean inheritance and gift tax purposes, you will be treated as the owner of the shares of common stock underlying the ADSs. If the tax authority interprets depositary receipts as the underlying share certificates, you may be treated as the owner of the shares of common stock and your heir or the donee (or in certain circumstances, you as the donor) will be subject to Korean inheritance or gift tax presently at the rate of 10.0% to 50.0%, depending on the value of the ADSs or shares of common stock.

If you die while holding a share of common stock or donate a share of common stock, your heir or donee (or in certain circumstances, you as the donor) will be subject to Korean inheritance or gift tax at the same rate as indicated above.

At present, Korea has not entered into any tax treaty relating to inheritance or gift taxes.

Securities Transaction Tax

If you transfer shares of common stock on the Stock Market of the Korea Exchange, you will be subject to securities transaction tax at the rate of 0.15% and an agriculture and fishery special surtax at the rate of 0.15% of the sale price of the shares of common stock. If your transfer of the shares of common stock is not made on the Stock Market of the Korea Exchange, subject to certain exceptions you will be subject to securities transaction tax at the rate of 0.5% and will not be subject to an agriculture and fishery special surtax.

Under the Securities Transaction Tax Law, depositary receipts (such as ADSs) constitute share certificates subject to the securities transaction tax. However, a transfer of depositary receipts listed on the New York Stock Exchange, NASDAQ National Market or other qualified foreign exchanges will be exempt from the securities transaction tax although depositary receipts, including ADSs, constitute share certificates subject to the securities transaction tax.

In principle, the securities transaction tax, if applicable, must be paid by the transferor of the shares or rights. When the transfer is effected through the Korea Securities Depository, the Korea Securities Depository is generally required to withhold and pay the tax to the tax authorities. When such transfer is made through an investment dealer or investment broker under the Financial Investment Services and Capital Markets Act only, such investment dealer or investment broker is required to withhold and pay the tax. Where the transfer is effected by a non-resident without a permanent establishment in Korea, other than through the Korea Securities Depository or an investment dealer or investment broker, the transferee is required to withhold the securities transaction tax for payment to the Korean tax authority.

U.S. Federal Income Tax Considerations for U.S. Persons

The following is a summary of certain U.S. federal income tax consequences for beneficial owners of the Registered Debt Securities, common stock and ADSs that are U.S. Persons (as defined below). For purposes of this summary, you are a U.S. Person if you are any of the following for U.S. federal income tax purposes:

an individual citizen or resident of the United States;

a corporation, or other entity treated as a corporation for U.S. federal income tax purposes, created or organized in or under the laws of the United States, any state thereof or the District of Columbia;

an estate the income of which is subject to U.S. federal income taxation regardless of its source; or

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a trust if (1) it is subject to the primary supervision of a court within the United States and one or more United States persons have the authority to control all substantial decisions of the trust or (2) it has a valid election in effect under applicable United States Treasury regulations to be treated as a United States person.

This summary is based on current law, which is subject to change (perhaps retroactively), is for general purposes only and should not be considered tax advice. This summary does not represent a detailed description of the U.S. federal income tax consequences and does not address the effects of the Medicare contribution tax on net investment income or foreign, state, local or other tax considerations that may be relevant to you in light of your particular circumstances. The discussion set forth below is applicable to you if (i) you are a resident of the United States for purposes of the current income tax treaty between the United States and Korea (the Treaty), (ii) your Registered Debt Securities, common stock or ADSs are not, for purposes of the Treaty, effectively connected with a permanent establishment in Korea and (iii) you otherwise qualify for the full benefits of the Treaty. Except where noted, this summary deals only with Registered Debt Securities, common stock or ADSs held as capital assets, and it does not represent a detailed description of the U.S. federal income tax consequences applicable to you if you are subject to special treatment under the U.S. federal income tax laws (including if you are a dealer in securities or currencies, a financial institution, a regulated investment company, a real estate investment trust, an insurance company, a tax-exempt organization, a person holding the Registered Debt Securities, common stock or ADSs as part of a hedging, integrated or conversion transaction, constructive sale or straddle, a person owning 10.0% or more of our stock (by vote or value), a trader in securities that elects to use a mark-to-market method of accounting for your securities holdings, a person liable for the alternative minimum tax, a person required to accelerate the recognition of any item of gross income with respect to the Registered Debt Securities, common stock or ADSs as a result of such income being recognized on an applicable financial statement, a partnership or other pass-through entity (or an investor therein), or a U.S. Person whose functional currency is not the U.S. dollar). We cannot assure you that a change in law will not alter significantly the tax considerations that we describe in this summary.

If a partnership (or other entity treated as a partnership for U.S. federal income tax purposes) holds the Registered Debt Securities, common stock or ADSs, the tax treatment of a partner will generally depend upon the status of the partner and the activities of the partnership. If you are a partner of a partnership holding our Registered Debt Securities, common stock, or ADSs, you should consult your tax advisor.

Because of the 100-year maturity of the One Hundred Year 7.95% Zero-to-Full Debentures, due April 1, 2096 (the ZTF Debentures), it is not certain whether the ZTF Debentures will be treated as debt for U.S. federal income tax purposes. The discussion below assumes that the ZTF Debentures (as well as the other Registered Debt Securities) will be treated as debt, except that a summary of the consequences to you if the ZTF Debentures were not treated as debt is provided under Tax Consequences with Respect to Registered Debt Securities Generally ZTF Debentures Treated as Equity below.

The discussion of the tax consequences of ownership of common stock and ADSs below, is based, in part, upon representations made by the depositary to us and assumes that the deposit agreement, and all other related agreements, will be performed in accordance with their terms.

You should consult your own tax advisor concerning the particular U.S. federal income tax consequences to you of the ownership of the Registered Debt Securities, common stock and ADSs, as well as the consequences to you arising under the laws of any other taxing jurisdiction.

Tax Consequences with Respect to Registered Debt Securities Generally

Payments

Except as provided below with regard to original issue discount (as defined below) on the ZTF Debentures, interest on a Registered Debt Security will generally be taxable to you as ordinary income at the time it is paid or

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accrued in accordance with your method of accounting for tax purposes. Principal payments on an amortizing Registered Debt Security generally will constitute a tax-free return of capital to you.

Although interest payments to you are currently exempt from Korean taxation provided that Registered Debt Securities are deemed to be foreign currency-denominated bonds issued outside of Korea for the purpose of the STTCL (see Korean Taxes Registered Debt Securities Taxation of Interest, above), if the Korean law providing for the exemption is repealed, then, in addition to interest payments on the Registered Debt Securities and original issue discount on the ZTF Debentures, you will be required to include in income any additional amounts paid and any Korean tax withheld from interest payments notwithstanding that you in fact did not receive such withheld tax. You may be entitled to deduct or credit such Korean tax (up to the Treaty rate), subject to applicable limitations in the Internal Revenue Code of 1986, as amended (the Code). Your election to deduct or credit foreign taxes will apply to all of your foreign taxes for a particular taxable year. Interest income on a Registered Debt Security (including additional amounts and any Korean taxes withheld in respect thereof) and original issue discount on a ZTF Debenture generally will constitute foreign source income and generally will be considered passive category income for purposes of computing the foreign tax credit. You will generally be denied a foreign tax credit for Korean taxes imposed with respect to the Registered Debt Securities where you do not meet a minimum holding period requirement during which you are not protected from risk of loss. The rules governing the foreign tax credit are complex. Investors are urged to consult their tax advisors regarding the availability of the foreign tax credit under their particular circumstances.

Original Issue Discount

The ZTF Debentures were issued with original issue discount (OID) for U.S. federal income tax purposes equal to the difference between (i) the sum of all scheduled amounts payable on the ZTF Debentures (including the interest payable on such ZTF Debentures) and (ii) the issue price of the ZTF Debentures. The issue price of each ZTF Debenture is the first price at which a substantial amount of the ZTF Debentures was sold to the public (other than to an underwriter, broker, placement agent or wholesaler). If you hold ZTF Debentures, then (subject to the discussion in Bond Premium below) you generally must include OID in gross income (as ordinary income) in advance of the receipt of cash attributable to that income, regardless of your method of accounting. However, you generally will not be required to include separately in income cash payments received on the ZTF Debentures, even if denominated as interest.

The amount of OID includible in income by the holder of a ZTF Debenture is the sum of the daily portions of OID with respect to the ZTF Debenture for each day during the taxable year or portion of the taxable year in which such holder held such ZTF Debenture, or accrued OID (for a discussion relevant to subsequent purchasers, see Market Discount and Bond Premium, below). The daily portion is determined by allocating to each day in any accrual period a pro rata portion of the OID allocable to that accrual period. The accrual period for a ZTF Debenture may be of any length and may vary in length over the term of the ZTF Debenture, provided that each accrual period is no longer than one year and each scheduled payment of principal or interest occurs on the first day or the final day of an accrual period. The amount of OID allocable to any accrual period other than the final accrual period is an amount equal to the product of the ZTF Debenture s adjusted issue price at the beginning of such accrual period and its yield to maturity (determined on the basis of compounding at the close of each accrual period and properly adjusted for the length of the accrual period). OID allocable to a final accrual period is the difference between the amount payable at maturity and the adjusted issue price at the beginning of the final accrual period. The adjusted issue price of a ZTF Debenture at the beginning of any accrual period is equal to its issue price increased by the accrued OID for each prior accrual period (for subsequent purchasers, determined without regard to the amortization of any acquisition or bond premium, as described below) and reduced by any payments previously made on such ZTF Debenture. Under these rules, you will have to include in income increasingly greater amounts of OID in successive accrual periods. We are required to provide information returns stating the amount of OID accrued on ZTF Debentures held of record by persons other

than corporations and other exempt holders.

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As discussed above, although interest payments to you are currently exempt from Korean taxation provided that Registered Debt Securities are deemed to be foreign currency-denominated bonds issued outside of Korea for the purpose of the STTCL (see Korean Taxes Registered Debt Securities Taxation of Interest, above), if the Korean law providing for the exemption is repealed, then Korean withholding tax may be imposed at times that differ from the times at which you are required to include interest or OID in income for U.S. federal income tax purposes and this disparity may limit the amount of foreign tax credit available.

Market Discount

If you purchased a Registered Debt Security other than a ZTF Debenture for an amount that is less than its stated redemption price at maturity, or, in the case of a ZTF Debenture, its adjusted issue price, the amount of the difference will be treated as market discount for U.S. federal income tax purposes, unless that difference is less than a specified de minimis amount. Under the market discount rules, you will be required to treat any payment, other than qualified stated interest (as defined in the Code), on, or any gain on the sale, exchange, retirement or other disposition of, a Registered Debt Security as ordinary income to the extent of the market discount that you have not previously included in income and are treated as having accrued on the Registered Debt Security at the time of its payment or disposition. In addition, you may be required to defer, until the maturity of the Registered Debt Security or its earlier disposition in a taxable transaction, the deduction of all or a portion of the interest expense on any indebtedness attributable to the Registered Debt Security.

Any market discount will be considered to accrue ratably during the period from the date of acquisition to the maturity date of the Registered Debt Security, unless you elect to accrue on a constant interest method. Your election to accrue market discount on a constant interest method is to be made for the taxable year in which you acquired the Registered Debt Security, applies only to that Registered Debt Security and cannot be revoked. You may elect to include market discount in income currently as it accrues, on either a ratable or constant interest method, in which case the rule described above regarding deferral of interest deductions will not apply. Your election to include market discount in income currently, once made, applies to all market discount obligations acquired by you on or after the first taxable year to which your election applies and may not be revoked without the consent of the Internal Revenue Service (the IRS). You should consult your own tax advisor before making this election.

Bond Premium

If you purchased a ZTF Debenture for an amount that is greater than its adjusted issue price but equal to or less than the sum of all amounts payable on the ZTF Debenture after the purchase date, you will be considered to have purchased that ZTF Debenture at an acquisition premium. Under the acquisition premium rules, the amount of OID that you must include in gross income with respect to a ZTF Debenture for any taxable year will be reduced by the portion of the acquisition premium properly allocable to that year.

If you purchased a Registered Debt Security for an amount in excess of the sum of all amounts payable on the Registered Debt Security after the purchase date other than qualified stated interest, you will be considered to have purchased the Registered Debt Security at a premium and, if such Registered Debt Security is a ZTF Debenture, you will not be required to include any OID in income. You generally may elect to amortize the premium over the remaining term of the Registered Debt Security on a constant yield method as an offset to interest when includible in income under your regular accounting method. In the case of instruments that provide for alternative payment schedules, bond premium is calculated by assuming that (a) you will exercise or not exercise options in a manner that maximizes your yield, and (b) we will exercise or not exercise options in a manner that minimizes your yield (except that we will be assumed to exercise call options in a manner that maximizes your yield). If you do not elect to amortize bond premium, that premium will decrease the gain or increase the loss you would otherwise recognize on

disposition of a Registered Debt Security. Your election to amortize premium on a constant yield method will also apply to all debt obligations held or subsequently acquired by you on or after the first day of the first taxable year to which the election applies. You may not

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revoke the election without the consent of the IRS. You should consult your own tax advisor before making this election.

Sale, Exchange and Retirement of Registered Debt Securities

When you sell, exchange or retire a Registered Debt Security, you will recognize gain or loss equal to the difference between the amount you receive (not including an amount equal to any accrued qualified stated interest, which will be taxable as ordinary income to the extent not previously included in income) and your adjusted tax basis in the Registered Debt Security. Your tax basis in a Registered Debt Security other than a ZTF Debenture will generally be your cost of obtaining the Registered Debt Security increased by any market discount included in income and reduced by payments of principal you receive and any bond premium that you elect to amortize. Your adjusted tax basis in a ZTF Debenture will, in general, be your cost therefor, increased by any market discount and OID previously included in income and reduced by any cash payments on the ZTF Debenture and any bond premium that you elect to amortize. Your gain or loss realized on selling, exchanging or retiring a Registered Debt Security will generally be treated as United States source income. Consequently, you may not be able to use the foreign tax credit arising from any Korean tax imposed on the disposition of Registered Debt Securities unless such credit can be applied (subject to applicable limitations) against tax due on other income treated as derived from foreign sources. Except as described above with respect to market discount, your gain or loss will be capital gain or loss and will generally be long-term capital gain or loss if, at the time of the sale, exchange or retirement of a Registered Debt Security, you have held the Registered Debt Security for more than one year. If you are an individual and the Registered Debt Security being sold, exchanged or retired is a capital asset that you held for more than one year, you may be eligible for reduced rates of taxation on any capital gain recognized. Your ability to deduct capital losses is subject to limitations.

ZTF Debentures Treated as Equity

If the ZTF Debentures were treated as equity for U.S. federal income tax purposes, amounts actually or deemed paid with respect to the ZTF Debentures would be deemed dividends for U.S. federal income tax purposes to the extent paid out of our current or accumulated earnings and profits (as determined for U.S. federal income tax purposes).

You would include the amounts actually or deemed paid by us on the ZTF Debentures (before reduction for Korean withholding tax, if any) as dividend income when actually or constructively paid by us. Section 305 of the Code, which would apply to the ZTF Debentures if they were treated as equity for U.S. federal income tax purposes, requires current accrual of dividends under principles similar to the accrual of OID. Amounts treated as dividends will not be eligible for the dividends received deduction generally allowed to U.S. corporations.

Tax Consequences with Respect to Common Stock and ADSs

In general, for U.S. federal income tax purposes, holders of ADSs will be treated as the owners of the underlying common stock that is represented by such ADSs. Accordingly, deposits or withdrawals of common stock by holders of ADSs will not be subject to U.S. federal income tax.

Distributions on Common Stock or ADSs

The gross amount of distributions (other than certain distributions of common stock or rights to subscribe for common stock) to holders of common stock or ADSs (including amounts withheld in respect of Korean withholding taxes) will be taxable dividends to such holders, to the extent paid out of our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Such income (including withheld taxes) will be includable in the gross income of a holder as ordinary income on the day actually or constructively received by the holder, in the case

of common stock, or by the depositary, in the case of ADSs. Such dividends will not be eligible for the dividends received deduction allowed to corporations under the Code.

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With respect to non-corporate U.S. Persons, certain dividends paid by a qualified foreign corporation and received by such holders may be subject to reduced rates of taxation. A qualified foreign corporation includes a foreign corporation that is eligible for the benefits of an income tax treaty with the United States, if such treaty contains an exchange of information provision and the United States Treasury Department had determined that the treaty is satisfactory for purposes of the legislation. The United States Treasury Department has determined that the Treaty, which contains an exchange of information provision, is (in the absence of additional guidance) satisfactory for these purposes. In addition, we believe we are eligible for the benefits of the Treaty. However, a foreign corporation is also treated as a qualified foreign corporation with respect to dividends paid by that corporation on shares (or ADSs backed by such shares) that are readily tradable on an established securities market in the United States. Shares of our common stock will generally not be considered readily tradable for these purposes. However, United States Treasury Department guidance indicates that our ADSs, which are listed on the New York Stock Exchange, are readily tradable on an established securities market in the United States. There can be no assurance that our ADSs will be considered readily tradable on an established securities market in later years. Non-corporate U.S. Persons that do not meet a minimum holding period requirement during which they are not protected from a risk of loss or that elect to treat the dividend income as investment income pursuant to Section 163(d)(4) of the Code will not be eligible for the reduced rates of taxation regardless of our status as a qualified foreign corporation. In addition, the rate reduction will not apply to dividends if the recipient of a dividend is obligated to make related payments with respect to positions in substantially similar or related property. This disallowance applies even if the minimum holding period has been met. Holders should consult their own tax advisors regarding the application of the foregoing rules to their particular circumstances.

The amount of any dividend paid in Won will equal the United States dollar value of the Won received calculated by reference to the exchange rate in effect on the date the dividend is received by the holder, in the case of common stock, or by the depositary, in the case of ADSs, regardless of whether the Won are converted into U.S. dollars. If the Won received as a dividend are not converted into U.S. dollars on the date of receipt, a holder will have a basis in the Won equal to their U.S. dollar value on the date of receipt. Any gain or loss realized on a subsequent conversion or other disposition of the Won will be treated as United States source ordinary income or loss. The amount of any distribution of property other than cash will be the fair market value of such property on the date of distribution.

The maximum rate of withholding tax on dividends paid to you pursuant to the Treaty is 16.5%. You will be required to properly demonstrate your entitlement to the reduced rate of withholding under the Treaty (see Korean Taxes Shares or ADSs Tax Treaties). Subject to certain conditions and limitations, Korean withholding taxes (up to the Treaty rate) will be treated as foreign taxes eligible for credit against your U.S. federal income tax liability. For purposes of calculating the foreign tax credit, dividends paid on the common stock or ADSs will be treated as foreign source income and will generally constitute passive category income. Further, in certain circumstances, if you have held common stock or ADSs for less than a specified minimum period during which you are not protected from risk of loss, or are obligated to make payments related to the dividends, you will not be allowed a foreign tax credit for foreign taxes imposed on dividends paid on common stock or ADSs. The rules governing the foreign tax credit are complex. Investors are urged to consult their tax advisors regarding the availability of the foreign tax credit under their particular circumstances including the possible adverse impact on creditability to the extent you are entitled to a refund of any Korean tax withheld or a reduced rate of withholding.

To the extent that the amount of any distribution exceeds our current and accumulated earnings and profits for a taxable year, as determined under U.S. federal income tax principles, the distribution will first be treated as a tax- free return of capital, causing a reduction in the adjusted basis of the common stock or ADSs (thereby increasing the amount of gain, or decreasing the amount of loss, to be recognized by the investor on a subsequent disposition of the common stock or ADSs), and the balance in excess of adjusted basis will be taxed as capital gain recognized on a sale or exchange of property. Consequently, such distributions in excess of our current and accumulated earnings and

profits would not give rise to foreign source income and you generally would not be able to use the foreign tax credit arising from any Korean withholding tax imposed on such distributions unless

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such credit can be applied (subject to applicable limitations) against U.S. tax due on other foreign source income in the appropriate category for foreign tax credit purposes. However, we do not expect to keep earnings and profits in accordance with U.S. federal income tax principles. Therefore, you should expect that a distribution will generally be treated as a dividend (as discussed above).

Distributions of common stock or rights to subscribe for common stock that are received as part of a pro rata distribution to all of our shareholders generally will not be subject to U.S. federal income tax. Consequently such distributions will not give rise to foreign source income and you generally will not be able to use the foreign tax credit arising from any Korean withholding tax unless such credit can be applied (subject to applicable limitations) against U.S. tax due on other income derived from foreign sources. The basis of the new common stock or rights so received will be determined by allocating your basis in the old common stock between the old common stock and the new common stock or rights received, based on their relative fair market value on the date of distribution. However, the basis of the rights will be zero if (i) the fair market value of the rights is less than 15% of the fair market value of the old common stock at the time of distribution, unless the taxpayer timely elects to determine the basis of the old common stock and of the rights by allocating between the old common stock and the rights the adjusted basis of the old common stock or (ii) the rights are not exercised and thus expire.

Sale, Exchange or Other Disposition of ADSs or Common Stock

Upon the sale, exchange or other disposition of ADSs or common stock, you generally will recognize capital gain or loss equal to the difference between the amount realized upon the sale, exchange or other disposition and your adjusted tax basis in the ADSs or common stock. The capital gain or loss will be long-term capital gain or loss if at the time of sale, exchange or other disposition, the ADSs or common stock have been held by you for more than one year. Under current law, long-term capital gains of individuals are, under certain circumstances, taxed at lower rates than items of ordinary income. The deductibility of capital losses is subject to limitations. Any gain or loss recognized by you will generally be treated as U.S. source gain or loss. Consequently, you may not be able to use the foreign tax credit arising from any Korean tax imposed on the disposition of ADSs or common stock unless such credit can be applied (subject to applicable limitations) against tax due on other income treated as derived from foreign sources.

You should note that any Korean securities transaction tax will not be treated as a creditable foreign tax for U.S. federal income tax purposes, although you may be entitled to deduct such taxes, subject to applicable limitations under the Code.

Passive Foreign Investment Company Rules

Based upon the past and projected composition of our income and assets and the valuation of our assets, we do not believe that we were a passive foreign investment company (a PFIC) for 2018, and we do not expect to be a PFIC in 2019 or to become one in the foreseeable future, although there can be no assurance in this regard. If, however, we become a PFIC, such characterization could result in adverse U.S. tax consequences to you if you are a U.S. investor. For example, if we become a PFIC, our U.S. investors may become subject to increased tax liabilities under U.S. tax laws and regulations and will become subject to burdensome reporting requirements. Our PFIC status is determined on an annual basis and depends on the composition of our income and assets. Specifically, we will be classified as a PFIC for U.S. tax purposes if either: (i) 75% or more of our gross income in a taxable year is passive income, or (ii) the average percentage of our assets by value in a taxable year which produce or are held for the production of passive income (which generally includes cash) is at least 50%. We cannot assure you that we will not be a PFIC for 2019 or any future taxable year.

Information Reporting and Backup Withholding

In general, information reporting requirements will apply to principal, interest, OID and premium payments on Registered Debt Securities and dividend payments in respect of the common stock or ADSs or the proceeds

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received on the sale, exchange or redemption of the Registered Debt Securities, common stock or ADSs paid within the United States (and in certain cases, outside of the United States) to holders other than certain exempt recipients, and a backup withholding tax may apply to such amounts if you fail to provide an accurate taxpayer identification number or certification of exempt status or fail to report interest and dividends required to be shown on your U.S. federal income tax returns. The amount of any backup withholding from a payment to you will be allowed as a refund or a credit against your U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Item 10.F. Dividends and Paying Agents

Not Applicable

Item 10.G. Statements by Experts

Not Applicable

Item 10.H. Documents on Display

We are subject to the information requirements of the Exchange Act, and, in accordance therewith, are required to file reports, including annual reports on Form 20-F, and other information with the U.S. Securities and Exchange Commission. You may inspect and copy these materials, including this annual report and the exhibits thereto, at SEC s Public Reference Room 100 Fifth Street, N.E., Washington, D.C. 20549. Please call the Commission at 1-800-SEC-0330 for further information on the public reference rooms. As a foreign private issuer, we are also required to make filings with the Commission by electronic means. Any filings we make electronically will be available to the public over the Internet at the Commission s web site at http://www.sec.gov.

Item 10.I. Subsidiary Information

Not Applicable

ITEM 11. ***QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK***

Our primary market risk exposures are to fluctuations in exchange rates, interest rates and fuel prices. We are exposed to foreign exchange risk related to foreign currency-denominated liabilities. As of December 31, 2018, 17.7% of our long-term debt (including the current portion but excluding issue discounts and premium), without taking into consideration of swap transactions, was denominated in foreign currencies, principally U.S. dollars. However, a substantial portion of our revenues is denominated in Won. As a result, changes in exchange rates, particularly between the Won and the U.S. dollar, significantly affect us due to our significant amounts of foreign currency-denominated debt and the effect of such changes on the amount of funds required by us to make interest and principal payments on such debt. In order to reduce the impact of foreign exchange rate fluctuations on our results of operations, we have recently been reducing and plan to continue to reduce the proportion of our debt which is denominated in foreign currencies.

We are also exposed to foreign exchange risk related to our purchases of fuel since we obtain substantially all of our fuel materials (other than anthracite coal) directly or indirectly from sources outside Korea. Prices for such fuel materials are quoted based on prices stated in, and in many cases are paid for in, currencies other than Won. In 2018, fuel costs represented 33.5% of our sales.

We are exposed to interest rate risk due to significant amounts of debt. Upward fluctuations in interest rates increase the cost of additional debt and the interest cost of outstanding floating rate borrowings. We are also exposed to fluctuations in prices of fuel materials. In 2018, for electricity generation, uranium accounted for

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31.9% of our fuel requirements, coal accounted for 53.2%, LNG accounted for 11.2%, oil accounted for 1.4%, and others accounted for 2.3%, measured in each case by the amount of electricity we generated. In 2017, for electricity generation, uranium accounted for 34.8% of our fuel requirements, coal accounted for 53.3%, LNG accounted for 8.7%, oil accounted for 1.2% and others accounted for 2.0%, measured in each case by the amount of electricity we generated.

For additional discussions of our market risks, see Item 3.D. Risk Factors and Item 5.B. Liquidity and Capital Resources Liquidity.

We have entered into various swap contracts to hedge exchange rate risks arising from foreign currency-denominated debts. Details of currency swap contracts outstanding as of December 31, 2018 are as follows:

Type	Counterparty	Contract Year	Settlement Year	Contract amounts		Contract interest rate		Contract Exchange Rate
				Pay	Receive	Pay	Receive	
				(KRW in millions, USD, CHF, HKD, AUD, EUR, SEK and other foreign currencies in thousands)				
Trading	Credit Suisse	2014	2019	KRW 118,632	CHF 100,000	2.98%	1.50%	1,186.32
	Standard Chartered	2014	2019	KRW 114,903	CHF 100,000	4.00%	1.50%	1,149.03
	Standard Chartered	2014	2029	KRW 102,470	USD 100,000	3.14%	3.57%	1,024.70
	Societe Generale	2014	2024	KRW 105,017	USD 100,000	4.92%	5.13%	1,050.17
	KEB Hana Bank	2015	2024	KRW 107,970	USD 100,000	4.75%	5.13%	1,079.70
	Credit Agricole	2015	2024	KRW 94,219	USD 86,920	4.85%	5.13%	1,083.97
	Citibank	2012	2022	KRW 112,930	USD 100,000	2.79%	3.00%	1,129.30
	JP Morgan	2012	2022	KRW 112,930	USD 100,000	2.79%	3.00%	1,129.30
	Bank of America	2012	2022	KRW 112,930	USD 100,000	2.79%	3.00%	1,129.30
	Shinhan Bank	2016	2022	KRW 112,930	USD 100,000	2.79%	3.00%	1,129.30
	HSBC	2012	2022	KRW 111,770	USD 100,000	2.89%	3.00%	1,117.70
	KEB Hana Bank	2012	2022	KRW 111,770	USD 100,000	2.87%	3.00%	1,117.70
	Standard Chartered	2012	2022	KRW 111,770	USD 100,000	2.89%	3.00%	1,117.70
	Deutsche Bank	2012	2022	KRW 55,885	USD 50,000	2.79%	3.00%	1,117.70
	HSBC	2014	2019	KRW 105,260	USD 100,000	2.48%	2.38%	1,052.60
	Standard Chartered	2014	2019	KRW 105,260	USD 100,000	2.48%	2.38%	1,052.60
	Korea Development Bank	2016	2019	KRW 105,260	USD 100,000	2.48%	2.38%	1,052.60
	Nomura	2015	2025	KRW 111,190	USD 100,000	2.60%	3.25%	1,111.90
	Korea Development Bank	2015	2025	KRW 111,190	USD 100,000	2.62%	3.25%	1,111.90
	Woori Bank	2015	2025	KRW 55,595	USD 50,000	2.62%	3.25%	1,111.90
	KEB Hana Bank	2015	2025	KRW 55,595	USD 50,000	2.62%	3.25%	1,111.90
	Woori Bank	2017	2027	KRW 111,610	USD 100,000	2.25%	3.13%	1,116.10
	Korea Development Bank	2017	2027	KRW 111,610	USD 100,000	2.31%	3.13%	1,116.10

KEB Hana Bank	2017	2027	KRW 111,610	USD 100,000	2.31%	3.13%	1,116.10
Korea Development Bank	2018	2028	KRW 108,600	HKD 800,000	2.69%	3.35%	135.75
Shinhan Bank	2018	2028	KRW 115,387	HKD 850,000	2.66%	3.35%	135.75
Korea Development Bank	2018	2023	KRW 170,280	USD 150,000	2.15%	3.75%	1,135.20
Woori Bank	2018	2023	KRW 170,280	USD 150,000	2.18%	3.75%	1,135.20
KEB Hana Bank	2018	2023	KRW 113,520	USD 100,000	2.17%	3.75%	1,135.20
Shinhan Bank	2018	2023	KRW 227,040	USD 200,000	2.17%	3.75%	1,135.20

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Type	Counterparty	Contract Year	Settlement Year	Contract amounts Pay	Contract amounts Receive	Contract interest rate Pay	Contract interest rate Receive	Contract Exchange Rate
				(KRW in millions, USD, CHF, HKD, AUD, EUR, SEK and other foreign currencies in thousands)				
Cash flow hedge	HSBC	2014	2020	KRW 99,901	AUD 100,000	3.52%	5.75%	999.01
	HSBC	2014	2020	KRW 100,482	AUD 100,000	3.48%	5.75%	1,004.82
	Standard Chartered	2013	2020	USD 117,250	AUD 125,000	3M Libor+ 1.25%	5.75%	0.94
	Standard Chartered	2014	2020	KRW 126,032	USD 117,250	3.55%	3M Libor+ 1.25%	1,074.90
	Korea Development Bank	2017	2020	KRW 114,580	USD 100,000	1.75%	2.38%	1,145.80
	KEB Hana Bank	2017	2020	KRW 114,580	USD 100,000	1.75%	2.38%	1,145.80
	Export-Import Bank of Korea	2017	2020	KRW 114,580	USD 100,000	1.75%	2.38%	1,145.80
	JP Morgan	2014	2019	KRW 107,190	USD 100,000	3M Libor+ 3.25%	2.75%	1,071.90
	Morgan Stanley	2014	2019	KRW 107,190	USD 100,000	3M Libor+ 3.25%	2.75%	1,071.90
	Deutsche Bank	2014	2019	KRW 107,190	USD 100,000	3M Libor+ 3.25%	2.75%	1,071.90
	Korea Development Bank	2016	2021	KRW 121,000	USD 100,000	2.15%	2.50%	1,210.00
	Morgan Stanley	2016	2021	KRW 121,000	USD 100,000	3M Libor+ 2.10%	2.50%	1,210.00
	BNP Paribas	2016	2021	KRW 121,000	USD 100,000	3M Libor+ 2.10%	2.50%	1,210.00
	Nomura	2017	2037	KRW 52,457	EUR 40,000	2.60%	1.70%	1,311.42
	Nomura	2017	2037	KRW 59,423	SEK 450,000	2.62%	2.36%	132.05
	Credit Agricole	2013	2019	KRW 118,343	CHF 100,000	3.47%	1.63%	1,183.43
	Morgan Stanley	2013	2019	KRW 59,172	CHF 50,000	3.40%	1.63%	1,183.43
	Nomura	2013	2019	KRW 59,172	CHF 50,000	3.47%	1.63%	1,183.43
	Standard Chartered	2014	2019	KRW 104,490	USD 100,000	2.77%	2.63%	1,044.90
	Credit Agricole	2014	2019	KRW 104,490	USD 100,000	2.77%	2.63%	1,044.90
	Morgan Stanley	2014	2019	KRW 104,490	USD 100,000	2.70%	2.63%	1,044.90
	Korea Development Bank	2018	2023	KRW 320,880	USD 300,000	2.03%	3.75%	1,069.60
	KEB Hana Bank	2018	2021	KRW 212,960	USD 200,000	2.10%	3.00%	1,064.80
	Korea Development Bank	2018	2021	KRW 212,960	USD 200,000	2.10%	3.00%	1,064.80
	Credit Agricole	2014	2020	KRW 110,680	USD 100,000	2.29%	2.50%	1,106.80
	Societe Generale	2014	2020	KRW 55,340	USD 50,000	2.16%	2.50%	1,106.80

KEB Hana Bank	2014	2020	KRW 55,340	USD 50,000	2.16%	2.50%	1,106.80
KEB Hana Bank	2014	2020	KRW 55,340	USD 50,000	2.21%	2.50%	1,106.80
Standard Chartered	2014	2020	KRW 55,340	USD 50,000	2.21%	2.50%	1,106.80
HSBC	2014	2020	KRW 55,340	USD 50,000	2.21%	2.50%	1,106.80
Nomura	2014	2020	KRW 55,340	USD 50,000	2.21%	2.50%	1,106.80
BNP Paribas	2014	2020	KRW 55,340	USD 50,000	2.21%	2.50%	1,106.80
HSBC	2014	2020	KRW 55,340	USD 50,000	2.21%	2.50%	1,106.80
KEB Hana Bank	2017	2022	KRW 226,600	USD 200,000	1.94%	2.63%	1,133.00
Korea Development Bank	2017	2022	KRW 113,300	USD 100,000	1.94%	2.63%	1,133.00
Nomura	2017	2022	KRW 113,300	USD 100,000	1.95%	2.63%	1,133.00
Woori Bank	2017	2022	KRW 56,650	USD 50,000	1.95%	2.63%	1,133.00
Kookmin Bank	2017	2022	KRW 56,650	USD 50,000	1.95%	2.63%	1,133.00
Korea Development Bank	2018	2023	KRW 169,335	USD 150,000	2.26%	3.88%	1,128.90
Woori Bank	2018	2023	KRW 169,335	USD 150,000	2.26%	3.88%	1,128.90
Credit Agricole	2018	2023	KRW 112,890	USD 100,000	2.26%	3.88%	1,128.90
KEB Hana Bank	2018	2023	KRW 56,445	USD 50,000	2.26%	3.88%	1,128.90
Kookmin Bank	2018	2023	KRW 56,445	USD 50,000	2.26%	3.88%	1,128.90

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Under these currency swap contracts, we recognized net valuation gain of Won 145 billion in 2018.

Details of interest rate contracts outstanding as of December 31, 2018 are as follows:

Type	Counterparty	Contract Year	Settlement Year	Contract Amount (KRW in millions, USD in thousands)	Contract Interest Rate Per Annum	
					Pay	Receive
Trading	KEB Hana Bank	2017	2022	KRW 100,000	2.01%	3M CD+0.24%
	KEB Hana Bank	2017	2022	KRW 100,000	2.06%	3M CD+0.27%
	Nomura[(1)]	2017	2037	KRW 30,000	2.05%	3.08%
	KEB Hana Bank	2017	2021	KRW 200,000	2.45%	3M CD+0.32%
	Nomura[(2)]	2018	2038	KRW 30,000	2.56%	3.75%
	KEB Hana Bank	2018	2023	KRW 200,000	2.15%	3M CD+0.19%
	KEB Hana Bank	2018	2023	KRW 200,000	2.17%	3M CD+0.19%
	KEB Hana Bank	2018	2023	KRW 150,000	2.03%	3M CD+0.21%
	Societe Generale	2017	2022	KRW 200,000	3M Libor+3.44%	3.77%
	Export-Import Bank of Korea	2015	2031	USD 15,893	2.67%	6M USD Libor
	ING Bank	2015	2031	USD 7,861	2.67%	6M USD Libor
	BNP Paribas	2015	2031	USD 7,861	2.67%	6M USD Libor
Cash flow hedge	BNP Paribas	2009	2027	USD 92,120	4.16%	6M USD Libor
	KFW	2009	2027	USD 92,120	4.16%	6M USD Libor
	Credit Agricole	2018	2033	USD 92,686	3.98% ~ 4.10%	6M USD Libor
	SMBC	2018	2033	USD 121,205	4.05% ~ 4.18%	6M USD Libor
	Mizuho Bank	2016	2019	USD 36,890	1.56%	1.65%
	SMBC	2016	2019	USD 36,890	1.56%	1.65%
	Export-Import Bank of Korea	2016	2036	USD 2,564	3.00%	4.99%

Notes:

(1) 2.05% of the contract interest rate for paying is applied for five years from the date of issuance, and 3M CD + 0.10% is applied thereafter.
(2) 2.56% of the contract interest rate for paying is applied for five years from the date of issuance, and 3M CD + 0.10% is applied thereafter.

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Under these interest rate swap contracts, we recognized net valuation loss of Won 2,949 million in 2018.

We engage in transactions denominated in foreign currencies and consequently become exposed to fluctuations in exchange rates. The carrying amounts of our foreign currency-denominated monetary assets and monetary liabilities as of December 31, 2017 and 2018 were as follows:

	Assets		Liabilities	
Type	**2017**	**2018**	**2017**	**2018**
	(In thousands of USD, EUR, GBP and other foreign currencies)			
AED	5,693	10,513	2,049	5,890
AUD	145	143	652,259	717,712
BDT	60,208	71,575	1,001	1,175
BWP	797	1,214		
CAD	82	96	171	4
CHF			400,004	400,000
CNY	13,007		26,140	26,140
EUR	5,708	337	68,003	105,673
GBP	3		2,327	1
HKD				1,650,000
IDR	167,775	60,568		206,935
INR	1,228,259	1,228,795	227,078	183,963
JOD	1,624	2,764	5	5
JPY	799,501	35,935	21,624,128	390,921
KZT	359	319		
MGA	2,762,572	3,318,447	319,581	170,641
NOK			482	
PHP	189,261	709,285	125,431	66,985
PKR	251,190	305,542	4,676	3,588
SAR	1,191	2,024	44	
SEK			449,002	450,000
USD	1,653,858	1,422,510	8,321,335	8,103,602
UYU	12,955	39,898	10,586	4,253
ZAR	361	170	4	4
MMK		25,208		
GHS		25,794		

The following analysis sets forth the sensitivity of our consolidated net income before income taxes (our pre-tax income) to changes in exchange rates, interest rates, electricity rates and fuel costs. For purposes of this section, we and our related parties are deemed one entity. The range of changes in such risk categories represents our view of the changes that are reasonably possible over a one-year period, although it is difficult to predict such changes as a result of adverse economic developments in Korea. See Item 3.D. Risk Factors Risks Relating to Korea and the Global Economy Unfavorable financial and economic conditions in Korea and globally may have a material adverse impact on us. The following discussion only addresses material market risks faced by us and does not discuss other risks which we face in the normal course of business, including country risk, credit risk and legal risk. Unless otherwise specified, all calculations are made under IFRS.

If Won depreciates against U.S. dollar and all other foreign currencies held by us by 10% and all other variables are held constant from their levels as of December 31, 2018, we estimate that our unrealized foreign exchange translation losses will increase by Won 888 billion in 2019. Such sensitivity analysis is conducted for monetary assets and liabilities denominated in foreign currencies other than functional currency as of December 31, 2017 and 2018, without taking into consideration of swap transactions. To manage our foreign currency risk related to foreign currency-denominated receivables and payables, we have a policy of entering into

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currency forward agreements. In addition, to manage our foreign currency risk related to foreign currency-denominated expected sales transactions and purchase transactions, we enter into cross-currency swap agreements.

We are exposed to interest rate risk due to our borrowings with floating interest rates. If interest rates increase by 1%p on all of our borrowings and debentures bearing variable interest and all other variables are held constant as of December 31, 2018, we estimate that our income before income taxes will decrease by Won 24 billion (not reflecting the fact that a portion of such interest may be capitalized under IFRS) in 2019. Such sensitivity analysis does not take into consideration interest rate swap transactions. To manage our interest rate risks, we, in addition to maintaining an appropriate mix of fixed and floating rate loans, have entered into certain interest rate swap agreements.

We are exposed to electricity rates risk due to the rate regulation by the Government, which considers the effect of electricity rate changes on the national economy. If the electricity rate rises by 1% and all other variables are held constant as of December 31, 2018, we estimate that our income before income taxes will increase by Won 568 billion in 2019.

We are exposed to fuel price risks due to the heavy influence of fuel costs on our sales and cost of sales. If the fuel prices of anthracite and bituminous coal, oil, LNG and others used for generation by us and our generation subsidiaries rise by 1% and all other variables are held constant as of December 31, 2018, we estimate that our income before income taxes will decrease by Won 201 billion in 2019.

The above discussion and the estimated amounts generated from the sensitivity analyzes referred to above include forward-looking statements, which assume for analytical purposes that certain market conditions may occur. Accordingly, such forward-looking statements should not be considered projections by us of future events or losses.

See Note 48 of the notes to our consolidated financial statements included in this annual report for further related information.

ITEM 12. DESCRIPTION OF SECURITIES OTHER THAN EQUITY SECURITIES

Item 12.A. Debt Securities

Of the four debt securities issued by us that are registered under the Exchange Act as set forth in the cover page of this annual report, the One Hundred Year 7.95% Zero-to-Full Debentures due April 1, 2096, were guaranteed by Korea Development Bank. However, such guarantee expired on April 1, 2016 by reason of the expiration of a put option period applicable to such debentures in accordance with the terms of such debentures.

Korea Development Bank, a statutory bank for the Korean government, is 100% beneficially owned by the Korean government. The voting rights in our equity interest held by Korea Development Bank are effectively exercised by the Korean government.

The guarantee by Korea Development Bank of our above-mentioned registered debt securities was itself a security registered under the Securities Act. Korea Development Bank is a Schedule B issuer and periodically files registration statements with the Commission. These registration statements typically include financial statements prepared in accordance with the applicable generally accepted accounting principles, currently the Korean International Financial Reporting Standards, and audited in accordance with generally accepted auditing standards in the Republic of Korea.

Item 12.B. Warrants and Rights

Not applicable.

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Item 12.C. Other Securities

Not applicable.

Item 12.D. American Depositary Shares

Under the terms of the Deposit Agreement in respect of our ADSs, the holder and beneficiary owners of ADSs, any party depositing or withdrawing or surrendering ADSs or ADRs, whichever applicable, may be required to pay the following fees and charges to Citibank, N.A. acting as depositary for our ADSs:

Item	Services	Fees
1	Taxes and other governmental charges	As applicable
2	Registration of transfer of common shares generally on our shareholders register, any institution authorized under the applicable law to effect book-entry transfers of securities (including Korea Securities Depositary), or any entity that presently carries out the duties of registrar for the common shares, and applicable to transfers of common shares to the name of the Depositary or its nominee on the making of deposits or withdrawals	A fee of US$1.50 or less per ADS
3	Cable, telex and facsimile transmission expenses	As applicable
4	Expenses incurred by the Depositary in the conversion of foreign currency	As applicable
5	Execution and delivery of ADRs and the surrender of ADRs	Fee of US$0.05 or less per ADS
6	Cash distribution made by the Depositary or its agent	Fee of US$0.02 or less per ADS
7	Fee for the distribution of proceeds of sales of securities or rights for distribution other than cash, common shares or rights to subscribe for shares, distribution in shares or distribution in rights to subscribe for shares	Lesser of (i) the fee for the execution and delivery of ADRs referred to above which would have been charged as a result of the deposit by the holders of securities or common shares received in exercise of rights distributed to them, but which securities or rights are instead sold by the Depositary and the net proceeds distributed and (ii) the amount of such proceeds
8	Depositary services performed in administering the ADRs (which fee shall be assessed against holders of ADSs as of the record date or dates and shall be payable at the sole discretion of the Depositary by billing such holders or by deducting such charge from one or more cash dividends or other cash distributions)	Fee of US$0.02 or less per ADS per calendar year

Depositary fees payable upon the issuance and cancellation of ADSs are typically paid to the depositary by the brokers (on behalf of their clients) receiving the newly-issued ADSs from the depositary and by the brokers (on behalf of their clients) delivering the ADSs to the depositary for cancellation. The brokers in turn charge these transaction fees to their clients.

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Depositary fees payable in connection with distributions of cash or securities to ADS holders and the depositary services fee are charged by the depositary to the holders of record of ADSs as of the applicable ADS record date. The depositary fees payable for cash distributions are generally deducted from the cash being distributed. In the case of distributions other than cash (i.e., stock dividends, rights offerings), the depositary charges the applicable fee to the ADS record date holders concurrent with the distribution. In the case of ADSs registered in the name of the investor (whether certificated or un-certificated in direct registration), the depositary sends invoices to the applicable record date ADS holders. In the case of ADSs held in brokerage and custodian accounts via the central clearing and settlement system, the Depository Trust Company (DTC), the depositary generally collects its fees through the systems provided by DTC (whose nominee is the registered holder of the ADSs held in DTC) from the brokers and custodians holding ADSs in their DTC accounts. The brokers and custodians who hold their clients ADSs in DTC accounts in turn charge their clients accounts the amount of the fees paid to the depositary.

In the event of refusal to pay the depositary fees, the depositary may, under the terms of the Deposit Agreement, refuse the requested service until payment is received or may set-off the amount of the depositary fees from any distribution to be made to the ADS holder.

The fees and charges the ADS holders may be required to pay may vary over time and may be changed by us and by the depositary. The ADS holders will receive prior notice of such changes.

Depositary Payments for the Fiscal Year 2018

The following table sets forth our expenses incurred in 2018, which were reimbursed by Citibank, N.A. in the aggregate:

		(In thousands of U.S. dollars)
Reimbursement of legal fees	US$	99
Reimbursement of accounting fees		247
Contributions towards our investor relations and other financing efforts (including investor conferences, non-deal roadshows and market information services)		702
Other		163
Total	US$	1,211

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PART II

ITEM 13. *DEFAULTS, DIVIDEND ARREARAGES AND DELINQUENCIES*

Not applicable.

ITEM 14. *MATERIAL MODIFICATIONS TO THE RIGHTS OF SECURITY HOLDERS AND USE OF PROCEEDS*

Not applicable.

ITEM 15. *CONTROLS AND PROCEDURES*

Disclosure Control

Under the supervision and with the participation of our management, including our chief executive officer and chief financial officer, we have evaluated the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Exchange Act) as of December 31, 2018. There are inherent limitations to the effectiveness of any system of disclosure controls and procedures, including the possibility of human error and the circumvention or overriding of the controls and procedures. Accordingly, even effective disclosure controls and procedures can provide only reasonable assurance of achieving their control objectives. Based upon our evaluation, our chief executive officer and chief financial officer concluded that the design and operation of our disclosure controls and procedures as of December 31, 2018 were effective to provide reasonable assurance that information required to be disclosed by us in the reports we file and submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the applicable rules and forms, and that it is accumulated and communicated to our management, including our chief executive officer and chief financial officer, as appropriate to allow timely decision regarding required disclosure.

Management s Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act, for our company. Under the supervision and with the participation of our management, including our chief executive officer and chief financial officer, we have evaluated the effectiveness of our internal control over financial reporting as of December 31, 2018 based on the framework established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013). Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements in accordance with generally accepted accounting principles and includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of a company s assets, (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with generally accepted accounting principles, and that a company s receipts and expenditures are being made only in accordance with authorizations of a company s management and directors, and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of a company s assets that could have a material effect on the consolidated financial statements.

Because of its inherent limitations, a system of internal control over financial reporting can provide only reasonable assurance with respect to consolidated financial statement preparation and presentation and may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

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Following the overhaul in May 2013 by the Committee of Sponsoring Organization of the Treadway (COSO) of the COSO Framework relating to internal controls and adoption of the 2013 Integrated Framework of the Committee of Sponsoring Organizations of the Treadway Commission (the COSO Framework (2013)), we have, effective January 1, 2014, adopted the COSO Framework (2013) and incorporated it into our internal control system for us and our subsidiaries in order to comply with the Sarbanes Oxley Act and to standardize our internal control system. As required by Section 404 of the Sarbanes-Oxley Act of 2002 and related rules as promulgated by the Securities and Exchange Commission, management assessed the effectiveness of our internal control over financial reporting as of December 31, 2018 using criteria established by the COSO Framework (2013). Based on this evaluation, our management concluded that our internal control over financial reporting was effective as of December 31, 2018 based on the criteria established by the COSO Framework (2013).

Audit Report of the Independent Registered Public Accounting Firm

KPMG Samjong Accounting Corp. has issued an audit report on the effectiveness of our internal control over financial reporting as of December 31, 2018, which is included elsewhere in this annual report.

Changes in Internal Controls

There were no changes in our internal control over financial reporting that occurred during the year ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. Our adoption of the COSO Framework (2013) did not have, and is not reasonably likely to have, any material effect on our internal control over financial reporting.

We operate an integrated ERP system for a transparent and efficient management of the core ERP components, including personnel, accounting, procurement, construction and facilities maintenance. In addition, we also operate a strategic enterprise management system that includes business warehouse, management information and business planning and simulation systems. We continue to upgrade and improve the ERP system, which is being used as our core information infrastructure.

ITEM 16.*[RESERVED]*

ITEM 16.A. AUDIT COMMITTEE FINANCIAL EXPERT

Our board of directors has determined that we have at least one audit committee financial expert as such term is defined by the regulations of the Securities and Exchange Commission issued pursuant to Section 407 of the Sarbanes-Oxley Act of 2002. Our audit committee financial expert is Noh, Geum-Sun. Such member is independent within the meaning of the Korea Stock Exchange listing standards, the regulations promulgated under the Enforcement Decree of the Korean Commercial Code and the New York Stock Exchange listing standards.

ITEM 16.B. CODE OF ETHICS

We have adopted a code of ethics for our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions as required under Section 406 of the Sarbanes-Oxley Act of 2002, together with an insider reporting system in compliance with Section 301 of the Sarbanes-Oxley Act. The code of ethics is available on our website www.kepco.co.kr. We have not granted any waiver, including an implicit waiver, from a provision of the code of ethics to any of the above-mentioned officers during our most recently

completed fiscal year.

ITEM 16.C. PRINCIPAL AUDITOR FEES AND SERVICES

The following table sets forth the aggregate fees billed for each of the years ended December 31, 2017 and 2018 for professional services rendered by our principal auditors for such year, for various types of services and

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a brief description of the nature of such services. KPMG Samjong Accounting Corp., a Korean independent registered public accounting firm, was our principal auditors for the year ended December 31, 2018 and we currently expect Ernst & Young Hanyoung Corp. to serve as our principal auditors for the year ended December 31, 2019.

Type of Services	Aggregate Fees Billed During 2017	2018	Nature of Services
	(In millions of Won)		
Audit Fees	3,051	3,884	Audit service including interim review service for KEPCO and its subsidiaries.
Audit-Related Fees	410	315	Comfort letter services.
Tax Fees	67	105	Tax return and consulting advisory service.
All Other Fees	2		All other services which do not meet the three categories above.
Total	3,530	4,304	

United States law and regulations in effect since May 6, 2003 generally require all service of the principal auditors to be pre-approved by an independent audit committee or, if no such committee exists with respect to an issuer, by the entire board of directors. We have adopted the following policies and procedures for consideration and approval of requests to engage our principal auditors to perform audit and non-audit services. If the request relates to services that would impair the independence of our principal auditors, the request must be rejected. If the service request relates to audit and permitted non-audit services for us and our subsidiaries, it must be forwarded to our audit committee and receive pre-approval.

In addition, United States law and regulations permit the pre-approval requirement to be waived with respect to engagements for non-audit services aggregating no more than five percent of the total amount of revenues we paid to our principal auditors, if such engagements were not recognized by us at the time of engagement and were promptly brought to the attention of our audit committee or a designated member thereof and approved prior to the completion of the audit.

ITEM 16.D. EXEMPTIONS FROM THE LISTING STANDARDS FOR AUDIT COMMITTEE

Not applicable.

ITEM 16.E. PURCHASES OF EQUITY SECURITIES BY THE ISSUER AND AFFILIATED PURCHASERS

Neither we nor any affiliated purchaser, as defined in Rule 10b-18(a)(3) of the Exchange Act, purchased any of our equity securities during the period covered by this annual report.

ITEM 16.F. CHANGE IN REGISTRANT S CERTIFYING ACCOUNTANT

Not applicable.

ITEM 16.G. CORPORATE GOVERNANCE

We are committed to high standards of corporate governance. We are in compliance with the corporate governance provisions of the KEPCO Act, the Act on the Management of Public Institutions, the Korean Commercial Code, the Financial Investment Services and Capital Markets Act of Korea and the Listing Rules of the Korea Exchange. We, like all other companies in Korea, must comply with the corporate governance

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provisions under the Korean Commercial Code, except to the extent the KEPCO Act and the Act on the Management of Public Institutions otherwise require. Our corporate governance is also affected by various regulatory guidelines, including those promulgated by the Ministry of Economy and Finance. In addition, as a company listed on the Korea Exchange, we are subject to the Financial Investment Services and Capital Markets Act of Korea, unless the Financial Investment Services and Capital Markets Act of Korea otherwise provides.

The Act on the Management of Public Institutions

General Provisions

On April 1, 2007, the Act on the Management of Public Institutions took effect by abolishing and replacing the Government-invested Enterprise Management Basic Act, which was enacted in 1984. Unless stated otherwise therein, the Act on the Management of Public Institutions takes precedence over any other laws and regulations in the event of inconsistency. On April 2, 2007, pursuant to this Act the minister of the Ministry of Economy and Finance designated us as a market-oriented public enterprise as defined under this Act, and we became subject to this Act accordingly. We incorporated the applicable provisions of this Act into our Articles of Incorporation by amendment thereto in September 2007.

The Act on the Management of Public Institutions sets out the rules for corporate governance for entities that are subject to this Act, including the appointment of their respective president and directors. Under this Act as it applies to us as a market-oriented public enterprise , (i) a senior non-standing director as appointed by the minister of the Ministry of Economy and Finance becomes the chairman of our board of directors following the review and resolution of the Public Agencies Operating Committee; (ii) our president and our standing directors who concurrently serve as members of our audit committee are appointed by the President of the Republic upon the motion of the Ministry of Trade, Industry and Energy (in the case of our president) or of the Ministry of Economy and Finance (in the case of standing directors who concurrently serve as members of our audit committee), following the nomination by such enterprise s director nomination committee, the review and resolution of the Public Agencies Operating Committee pursuant to the Act on the Management of Public Institutions and an approval at the general meeting of our shareholders; (iii) our standing directors other than the president and those who also serve as audit committee members must be appointed by our president with the approval at the general meeting of our shareholders from a pool of candidates recommended by our director nomination committee; and (iv) our non-standing directors must be appointed by the minister of the Ministry of Economy and Finance following the review and resolution of the Public Agencies Operating Committee from a pool of candidates recommended by the director nomination committee, and must have ample knowledge and experience in business management.

The Public Agencies Operating Committee is established pursuant to the Act on the Management of Public Institutions and is comprised of one chairperson who is the Minister of the Ministry of Economy and Finance and the following members: (i) one Vice Minister-level public official from the Office for Government Policy Coordination as nominated by the minister of the Office for Government Policy Coordination; (ii) one Vice Minister, Deputy Administrator or an equivalent public official of the related administrative agency as prescribed by Presidential Decree; (iii) one Vice Minister, Deputy Administrator, or an equivalent public official of the competent agency who does not fall under subclause (ii); and (iv) 11 or fewer persons commissioned by the President based on the recommendation of the Minister of the Ministry of Economy and Finance from among persons in various fields including law, economy, press, academia, labor, who have good knowledge and experience in the operation and business administration of public institutions as well as good reputation for impartiality.

Our director nomination committee, which is also known as the Committee for Recommendation of Executive Officers, is comprised of non-standing directors and members appointed by the board of directors. The number of

members ranges from five to 15 persons and must be decided by a resolution of the board of directors; provided that, the number of members appointed by the board of directors must be less than half of the total number of members of our director nomination committee.

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Under the Act on the Management of Public Institutions and our Articles of Incorporation, the term of office is three years for our president and two years for our directors (standing and non-standing) other than our president. Our directors (including the president) may be reappointed for one or more additional terms of one year. In order to be reappointed, the president must be evaluated on the basis of his management performance; a standing director, on the basis of the performance of the duties for which he was elected to perform, or if the standing director has executed an incentive bonus contract, on the basis of his performance under the contract; and a non-standing director, on the basis of his performance of the duties for which he was elected to perform.

Under the Act on the Management of Public Institutions and our Articles of Incorporation, a recommendation from the director nomination committee is required for the appointment of our executive officers, except in the case of reappointments. The director nomination committee consists of five to fifteen members, including private-sector members appointed by the board of directors. Non-standing directors must comprise at least a majority of the director nomination committee. One of the private-sector members must be able to represent our opinion and must not be currently employed by us. As required under the Act on the Management of Public Institutions, we established an audit committee. At least two-thirds of the audit committee members must be non-standing directors, and at least one committee member must be an expert in finance or accounting. According to the Act on the Management of Public Institutions, our president s term cannot be terminated unless done so by the President of the Republic pursuant to the Act on the Management of Public Institutions or upon an event as specified in our Articles of Incorporation.

As required under Act on the Management of Public Institutions, we submit to the Government by October 31 every year a report on our medium- to long-term management goals. Under the Act on the Management of Public Institutions, we are also required to give separate public notice of important management matters, such as our budget and financial statements, status of directors and annual reports. In addition, for purposes of providing a comparison of the management performances of government agencies, we are required to post on a designated website a notice on a standard form detailing our management performance. Following consultation with the minister of the Ministry of Trade, Industry and Energy and the review and resolution of the operating committee, the Ministry of Economy and Finance must examine the adequacy and competency of government agencies and establish plans on merger, abolishment, restructuring and privatization of public agencies. In such case, the minister of the Ministry of Trade, Industry and Energy must execute these plans and submit a performance report to the Ministry of Economy and Finance.

Application of the Act to Our Generation Subsidiaries

On January 24, 2011, the Ministry of Economy and Finance changed the designation of our six generation subsidiaries from other public institutions to market-oriented public enterprises , each as defined in the Act on the Management of Public Institutions, and all of our generation subsidiaries accordingly amended their respective articles of incorporation in 2011 to be in compliance with this Act. As other public institutions , our generation subsidiaries previously were not subject to the same regulations under the Act on the Management of Public Institutions applicable to us with regards to corporate governance matters such as the appointment and dismissal of directors and the composition of the boards of directors. However, as market-oriented public enterprises , our generation subsidiaries are currently subject to the same such regulations that are applicable to us.

Specifically, prior to such designation, (i) our president appointed the presidents and the statutory auditors of our generation subsidiaries; (ii) the selection of non-standing directors of each such subsidiary was subject to approval by our president; (iii) the president of each such subsidiary entered into a management contract with our president; and (iv) our evaluation committee conducted performance evaluation of such subsidiaries. However, following such designation, akin to the appointment process applicable to us, (i) the President of the Republic appoints the presidents and standing directors of our generation subsidiaries that concurrently serve as members of the audit committees;

(ii) the selection of non-standing directors of these subsidiaries is subject to approval by the minister of the Ministry of Economy and Finance; (iii) the president of each such generation subsidiary is

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required to enter into a management contract directly with the minister of the Ministry of Trade, Industry and Energy; and the Public Agencies Operating Committee conducts performance evaluation of such subsidiaries.

Our Control over the Generation Subsidiaries

Designation of our generation subsidiaries as market-oriented public enterprises was intended to promote responsible management by and improve operational efficiency of government-affiliated electricity companies by fostering competition among them so as to provide improved service to the general public. Such designation also has had the effect of the Government exercising greater direct control over the appointment of the governing body of our generation subsidiaries (in ways that are similar how the Government exercises such control over us as our majority shareholder as well as our regulator).

In addition, the Government has imposed a number of regulations that further affect the respective operational boundaries between us and our generation subsidiaries, including as follows:

In August 2010, in furtherance of the Act on the Management of Public Institutions, the Ministry of Economy and Finance announced the Proposal for the Improvement in the Structure of the Electric Power Industry, which was designed to promote responsible management by and improve operational efficiency of government-affiliated electricity companies by fostering competition among them. Key initiatives of the proposal included the following: (i) maintain the current structure of having six generation subsidiaries and designate the six generation subsidiaries as market-oriented public enterprises under the Act on the Management of Public Institutions in order to foster competition among the generation subsidiaries and promote efficiency in their operations, and (ii) clarify the scope of the business of us and the six generation subsidiaries (namely, that we shall manage the financial structure and governance of the six generation subsidiaries and nuclear power plant and overseas resources development projects, while the six generation subsidiaries will have greater autonomy with respect to construction and management of generation units and procurement of fuel, among others).

In January 2011, the Ministry of Economy and Finance created a joint cooperation unit consisting of officers and employees selected from the five thermal power generation subsidiaries in order to reduce inefficiencies in areas such as fuel transportation, inventories, materials and equipment and construction, etc. and allow the thermal power generation subsidiaries to continue utilizing the benefits of economy of scale after split off of our generation business units into separate subsidiaries. The purpose of the joint cooperation unit was to give greater autonomy to the generation subsidiaries with regard to power plant construction and management and fuel procurements, and thereby enhance efficiency in operating power plants. The main functions of the joint cooperation unit are as follows: (i) maintain inventories of bituminous coal through volume exchanges and joint purchases, (ii) reduce shipping and demurrage expenses through joint operation and distribution of dedicated vessels, (iii) reduce costs by sharing information on generation material inventories and (iv) sharing human resources among the five thermal power generation subsidiaries for construction projects, among other things.

In June 2016, the Government announced the Proposal for Adjustment of Functions of Public Institutions (Energy Sector) for the purpose of streamlining the operations of government-affiliated energy companies by discouraging them from engaging in overlapping or similar businesses with each other, reducing non-core

assets and activities and improving management and operational efficiency. The initiatives contemplated in this proposal that would affect us and our generation subsidiaries include the following: (i) the generation companies should take on greater responsibilities in overseas resource exploration and production projects as these involve procurement of fuels necessary for electricity generation while fostering cooperation among each other through closer coordination, (ii) KHNP should take a greater role in export of nuclear technology, and (iii) the current system of retail sale of electricity to end-users should be liberalized to encourage more competition.

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However, notwithstanding these developments, we, also a government-controlled entity, remain as the sole shareholder of our generation subsidiaries and continue to exercise significant control over them in such capacity as the sole shareholder well as through other practical means as further described below.

First, as the sole shareholder, we continue to have the right, under the Act on the Management of Public Institutions, to approve or disapprove the appointment of key members of the governing body of our generation subsidiaries (namely, the president and the standing directors) by way of a vote at the general shareholders meeting before such appointments are ultimately approved and made by the President of the Republic (in the case of the presidents and standing directors concurrently serving as audit committee members of the generation subsidiaries) or by the president of each generation subsidiary (in the case of other standing directors of such generation subsidiary). Our right to exercise such voting right as a shareholder is also protected by the Commercial Code of Korea.

Second, in practice we retain significant control over our generation subsidiaries through the following means:

- We are the sole purchaser of electricity produced by the generation subsidiaries and continue to have near monopoly in terms of transmitting and distributing electricity in Korea. Accordingly, we continue to have significant influence over our generation subsidiaries in the electricity industry.

- Our president holds regular meetings (known as CEO Meetings) with the presidents of our generation subsidiaries for which our president determines whether and when to convene such meetings, sets the agenda for such meetings and chairs such meetings. Since significant issues that jointly affect us and our generation subsidiaries are often discussed and decided at these meetings, the leadership role exercised by our president in such meetings is significant in setting the policies and direction for us and our generation subsidiaries as a whole.

- We maintain and operate the Affiliated Company Management Team within the parent company organizational structure. The purpose of this team is to support and coordinate the management of the generation subsidiaries. Activities of the Affiliated Company Management Team include preparation of the CEO meetings, deliberation on major issues to be discussed at CEO Meetings, convening a general meeting of shareholders of the generation subsidiaries and coordination on the decision-making process for the general meeting of shareholders of the generation subsidiaries.

Ultimately, our control over our generation subsidiaries is derived from the fact that the Government owns the majority of our shares and effectively controls us as the supervisor and regulator in a heavily regulated industry, and in effect also exercises the same degree of control over our generation subsidiaries through our sole share ownership over our generation subsidiaries as well as its statutory power of direct appointment of the governing bodies of our generation subsidiaries. In effect, we are acting as an intermediate holding company in a vertical control structure involving the Government, us and our generation subsidiaries, where the Government holds the ultimate control over both us and our generation subsidiaries and exercises its control over our generation subsidiaries in part through us acting as the sole shareholder and the parent company.

Differences in Korean/New York Stock Exchange Corporate Governance Practices

We are a foreign private issuer (as such term is defined in Rule 3b-4 under the Exchange Act), and our ADSs are listed on the New York Stock Exchange, or NYSE. Under Section 303A of the NYSE Listed Company Manual,

NYSE-listed companies that are foreign private issuers are permitted to follow home country practice in lieu of the corporate governance provisions specified by the NYSE with limited exceptions. Under the NYSE Listed Company Manual, we as a foreign private issuer are required to disclose significant differences between NYSE s corporate governance standards and those we follow under Korean law. The following summarizes some significant ways in which our corporate governance practices differ from those followed by U.S. companies listed on the NYSE under the listing rules of the NYSE.

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Majority of Independent Directors on the Board

Under the NYSE listing rules, U.S. companies listed on the NYSE must have a board, the majority of which is comprised of independent directors satisfying the requirements of independence as set forth in Rule 10A-3 under the Exchange Act. No director qualifies as independent unless the board of directors affirmatively determines that the director has no material relationship with the listed company (either directly or as a partner, shareholder or officer of an organization that has a relationship with us). The NYSE rules include detailed tests for determining director independence. As a foreign private issuer, we are exempt from this requirement. Under the Act on the Management of Public Institutions, more than one-half of our directors must be non-standing directors. For a discussion on qualifications of non-standing directors, see Item 6.A. Directors and Senior Management Board of Directors. Under the Act on the Management of Public Institutions, a non-standing director is appointed by the Ministry of Economy and Finance following the review and resolution of the Public Agencies Operating Committee from a pool of candidates recommended by the director nomination committee, and must have ample knowledge and experience in business management. Government officials that are not part of the teaching staff in national and public schools are ineligible to become our non-standing directors.

Executive Session

Under the NYSE listing rules, non-management directors of U.S. companies listed on the NYSE are required to meet on a regular basis without management present and independent directors must meet separately at least once per year. While no such requirement currently exists under applicable Korean law, listing standards or our Articles of Incorporation, executive sessions were held from time to time in 2018 in order to promote the exchange of diverse opinions by non-standing directors.

Audit Committee

Under the NYSE listing rules, listed companies must have an audit committee that has a minimum of three members, and all audit committee members must satisfy the requirements of independence set forth in Section 303A.02 of the NYSE Listed Company Manual and Rule 10A-3 under the Exchange Act. Our audit committee members meet the requirements of independence set forth in Section 303A.02 of the NYSE Listed Company Manual and Rule 10A-3 under the Exchange Act. The audit committee must be directly responsible for the appointment, compensation, retention and oversight of the work of the independent registered public accountants. Our audit committee performs the roles and responsibilities required of an audit committee under the Sarbanes-Oxley Act, including the supervision of the audit by the independent registered public accountants. Under the Korea Exchange listing rules and the Korean Commercial Code, a large listed company must also establish an audit committee of which at least two-thirds of its members must be non-standing directors and whose chairman must be a non-standing director. Under the Act on the Management of Public Institutions, the Korean Commercial Code, the amended Articles of Incorporation and the Korea Exchange listing rules, we are required to maintain an audit committee consisting of three members, of which not less than two members are required to be non-standing directors. Our audit committee is in compliance with the foregoing requirements under the Act on the Management of Public Institutions, the Korean Commercial Code, the amended Articles of Incorporation and the Korea Exchange listing rules.

Nomination/Corporate Governance Committee

Under the NYSE listing rules, U.S. companies listed on the NYSE must have a nomination/corporate governance committee composed entirely of independent directors. In addition to identifying individuals qualified to become board members, this committee must develop and recommend to the board a set of corporate governance principles. Under the Act on the Management of Public Institutions, we are required to have a director nomination committee

which consists of non-standing directors and ad hoc members appointed by our Board of Directors. Our standing directors and executives as well as governmental officials that are not part of the teaching staff in national and public schools are ineligible to become a member of our director nomination committee. There is no requirement to establish a corporate governance committee under applicable Korean law.

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Pursuant to the NYSE listing standards, non-management directors must meet on a regular basis without management present and independent directors must meet separately at least once per year. No such requirement currently exists under applicable Korean law.

Compensation Committee

Under the NYSE listing rules, U.S. companies listed on the NYSE are required to have a compensation committee which is composed entirely of independent directors. In January 2013, the SEC approved amendments to the listing rules of NYSE and NASDAQ regarding the independence of compensation committee members and the appointment, payment and oversight of compensation consultants. The listing rules were adopted as required by Section 952 of the Dodd-Frank Act and rule 10C-1 of the Exchange Act, which direct the national securities exchanges to prohibit the listing of any equity security of a company that is not in compliance with the rule s compensation committee director and advisor independence requirements. Certain elements of the listing rules became effective on July 1, 2013 and companies listed on the NYSE must comply with such listing rules by the earlier of the company s first annual meeting after January 15 or October 31, 2014.

No such requirement currently exists under applicable Korean law or listing standards, and we currently do not have a compensation committee.

Corporate Governance Guidelines and Code of Business Conduct and Ethics

Under the NYSE listing rules, U.S. companies listed on the NYSE are required to establish corporate governance guidelines and to adopt a code of business conduct and ethics for directors, officers and employees, and promptly disclose any waivers of the code for directors or executive officers. As a foreign private issuer, we are exempt from this requirement. Pursuant to the requirements of the Sarbanes-Oxley Act, we have adopted a code of ethics applicable to our President & Chief Executive Officer and all other directors and executive officers including the Chief Financial Officer and the Chief Accounting Officer, as well as all financial, accounting and other officers that are involved in the preparation and disclosure of our consolidated financial statements and internal control of financial reporting pursuant to Section 404 of the Sarbanes-Oxley Act. We have also adopted an insider reporting system in compliance with Section 301 of the Sarbanes-Oxley Act. The code of ethics applicable to our executive officers and financial officers are available on www.kepco.co.kr.

Shareholder Approval of Equity Compensation Plans

Under the NYSE listing rules, shareholders of U.S. companies listed on the NYSE are required to approve all equity compensation plans. Under Korean law and regulations, stock options can be granted to employees to the extent expressly permitted by the articles of incorporation. We currently do not have any equity compensation plans.

Annual Certification of Compliance

Under the NYSE listing rules, a chief executive officer of a U.S. company listed on the NYSE must annually certify that he or she is not aware of any violation by the company of NYSE corporate governance standards. As a foreign private issuer, we are not subject to this requirement. However, in accordance with rules applicable to both U.S. companies and foreign private issuers, we are required to promptly notify the NYSE in writing if any executive officer becomes aware of any material noncompliance with the NYSE corporate governance standards applicable to us. In addition, foreign private issuers, including us, are required to submit to the NYSE an annual written affirmation relating to compliance with Sections 303A.06 and 303A.11 of the NYSE listed company manual, which are the NYSE corporate governance standards applicable to foreign private issuers. All written affirmations must be executed in the

form provided by the NYSE, without modification. An annual written affirmation is required to be submitted to the NYSE within 30 days of filing with the SEC our annual report on Form 20-F. We have been in compliance with this requirement in all material respects and plan to submit such affirmation within the prescribed time line.

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Whistle Blower Protection

On May 25, 2011, the SEC adopted final rules to implement whistleblower provisions of the Dodd-Frank Act, which are applicable to foreign private issuers with securities registered under the U.S. securities laws. The final rules provide that any eligible whistleblower who voluntarily provides the SEC with original information that leads to the successful enforcement of an action brought by the SEC under U.S. securities laws must receive an award of between 10 and 30 percent of the total monetary sanctions collected if the sanctions exceed US$1,000,000. An eligible whistleblower is defined as someone who provides information about a possible violation of the securities laws that he or she reasonably believes has occurred, is ongoing, or is about to occur. The possible violation does not need to be material, probably or even likely, but the information must have a facially plausible relationship to some securities law violation ; frivolous submissions would not qualify. The final rules also prohibit retaliation against the whistleblower. While the final rules do not require employees to first report allegations of wrongdoing through a company s corporate compliance system, they do seek to incentivize whistleblowers to utilize internal corporate compliance first by, among other things, (i) giving employees who first report information internally the benefit of the internal reporting date for purposes of the SEC program so long as the whistleblower submits the same information to the SEC within 120 days of the initial disclosure; (ii) clarifying that the SEC will consider, as part of the criteria for determining the amount of a whistleblower s award, whether the whistleblower effectively utilized the company s corporate compliance program or hindered the function of the program; and (iii) crediting a whistleblower who reports internally first and whose company passes the information along to the SEC, which would mean the whistleblower could receive a potentially higher award for information gathered in an internal investigation initiated as a result of the whistleblower s internal report.

In addition, the final rules address concerns that the whistleblower rules incentivize officers, directors and those with legal, audit, compliance or similar responsibilities to abuse these positions by making whistleblower complaints to the SEC with respect to information they obtained in these roles by generally providing that information obtained through a communication subject to attorney-client privilege or as a result of legal representation would not be eligible for a whistleblower award unless disclosure would be permitted by attorney conduct rules. Accordingly, officers and directors, auditors and compliance personnel and other persons in similar roles would not be eligible to receive awards for information received in these positions unless (x) they have a reasonable basis to believe that (1) disclosure of the information is necessary to prevent the entity from engaging in conduct that is likely to cause substantial injury to the financial interests of the entity or investors; or (2) the entity is engaging in conduct that will impede an investigation of the misconduct, for example, destroying documents or improperly influencing witnesses; or (y) 120 days have passed since the whistleblower provided the information to senior responsible persons at the entity or 120 days have passed since the whistleblower received the information at a time when these people were already aware of the information.

In Korea, under the Financial Investment Services and Capital Markets Act, anyone may provide or furnish the Financial Services Commission or the Securities and Futures Commission with information on unfair trading or any other violation of the Financial Investment Services and Capital Markets Act. The Financial Services Commission shall keep the identity of the whistleblower confidential, and any institution, organization or company to which the whistleblower belongs may not treat the whistleblower unfavorably, directly or indirectly. In addition, the Financial Services Commission may also reward the whistleblower within the limit of the budget of the Financial Services Commission.

ITEM 16.H. MINE SAFETY DISCLOSURE

Not applicable.

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PART III

ITEM 17. FINANCIAL STATEMENTS

Not applicable.

ITEM 18. FINANCIAL STATEMENTS

Reference is made to Item 19. Exhibits for a list of all financial statements filed as part of this annual report.

ITEM 19. EXHIBITS

(a) Financial Statements filed as part of this Annual Report

See Index to Financial Statements on page F-1 of this annual report.

(b) Exhibits filed as part of this Annual Report

See Index of Exhibits beginning on page E-1 of this annual report.

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INDEX OF EXHIBITS

1.1	Articles of Incorporation, as last amended on November 11, 2016 (in English)*
2.1	Form of Deposit Agreement**
8.1	List of Subsidiaries
12.1	Certifications of our Chief Executive Officer required by Rule 13a-14(a) of the Exchange Act (Certifications under Section 302 of the Sarbanes-Oxley Act of 2002)
12.2	Certifications of our Chief Financial Officer required by Rule 13a-14(a) of the Exchange Act (Certifications under Section 302 of the Sarbanes-Oxley Act of 2002)
13.1	Certifications of our Chief Executive Officer required by Rule 13a-14(b) and Section 1350 of Chapter 63 of the United States Code (18 U.S.C. 1350) (Certifications under Section 906 of the Sarbanes-Oxley Act of 2002)
13.2	Certifications of our Chief Financial Officer required by Rule 13a-14(b) and Section 1350 of Chapter 63 of the United States Code (18 U.S.C. 1350) (Certifications under Section 906 of the Sarbanes-Oxley Act of 2002)
15.1	The Korea Electric Power Corporation Act, as amended on March 21, 2017 (in English)
15.2	Enforcement Decree of the Korea Electric Power Corporation Act, as amended on August 31, 2016 (in English)*
15.3	The Act on the Management of Public Institutions, as amended on October 31, 2017 (in English)
15.4	Enforcement Decree of the Act on the Management of Public Institutions, as amended on September 28, 2018 (in English)
101.1	Interactive Data Files (XBRL-Related Documents)

* Incorporated by reference to the Registrant s annual report on Form 20-F (No. 001-13372) previously filed on April 28, 2017.

** Incorporated by reference to the Registrant s Registration Statement on Form F-6 with respect to the ADSs, registered under Registration No. 333-196703.

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SIGNATURES

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this Annual Report on its behalf.

KOREA ELECTRIC POWER CORPORATION

By:	/s/ JongKap KIM
Name:	JongKap KIM
Title:	President and Chief Executive Officer
Date:	April 30, 2019

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Consolidated Statements of Changes in Equity for the Years Ended December 31, 2016, 2017 and 2018	F-9
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REPORT OF INDEPENDENT REGISTERED PUBLIC

ACCOUNTING FIRM ON CONSOLIDATED FINANCIAL STATEMENTS

To the Shareholders and Board of Directors of

Korea Electric Power Corporation:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated statements of financial position of Korea Electric Power Corporation and subsidiaries (the Company) as of December 31, 2017 and 2018, the related consolidated statements of comprehensive income (loss), changes in equity and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2018, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2018, in conformity with International Financial Reporting Standards as issued by the International Accounting Standards Board.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company s internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated April 30, 2019 expressed an unqualified opinion on the effectiveness of the Company s internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company s management. Our responsibility is to express an opinion on the Company s consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG Samjong Accounting Corp.

We have served as the Company s auditor since 2013.

Seoul, Korea

April 30, 2019

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM ON

INTERNAL CONTROL OVER FINANCIAL REPORTING

To the Shareholders and Board of Directors of

Korea Electric Power Corporation:

Opinion on Internal Control Over Financial Reporting

We have audited Korea Electric Power Corporation and subsidiaries (the Company) internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the criteria established in Internal Control Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated statements of financial position of the Company as of December 31, 2017 and 2018, the related consolidated statements of comprehensive income (loss), changes in equity and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements), and our report dated April 30, 2019 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company s management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management s Annual Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company s internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company s internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly

reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company s assets that could have a material effect on the financial statements.

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Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ KPMG Samjong Accounting Corp.

Seoul, Korea

April 30, 2019

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Consolidated Statements of Financial Position

As of December 31, 2017 and 2018

	Note	2017	2018
		In millions of won	
Assets			
Current assets			
Cash and cash equivalents	5,6,7,48	2,369,739	1,358,345
Current financial assets, net	5,9,12,13,14,15,48	1,958,357	2,359,895
Trade and other receivables, net	5,8,17,23,48,49,50	7,928,972	7,793,592
Inventories, net	16	6,002,086	7,188,253
Income tax refund receivables	44	100,590	143,214
Current non-financial assets	18	753,992	878,888
Assets held-for-sale	45	27,971	22,881
Total current assets		19,141,707	19,745,068
Non-current assets			
Non-current financial assets, net	5,6,9,10,11,12,13,14,15,48	2,038,913	2,113,613
Non-current trade and other receivables, net	5,8,17,48,49,50	1,754,797	1,819,845
Property, plant and equipment, net	21,30,52	150,882,414	152,743,194
Investment properties, net	22,30	284,714	159,559
Goodwill	19	2,582	2,582
Intangible assets other than goodwill, net	24,30,49	1,187,121	1,225,942
Investments in associates	4,20	3,837,421	4,064,820
Investments in joint ventures	4,20	1,493,275	1,813,525
Deferred tax assets	44	919,153	1,233,761
Non-current non-financial assets	18	246,818	327,152
Total non-current assets		162,647,208	165,503,993
Total Assets	4	181,788,915	185,249,061

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Consolidated Statements of Financial Position, Continued

As of December 31, 2017 and 2018

	Note	2017	2018
		In millions of won	
Liabilities			
Current liabilities			
Trade and other payables, net	5,25,27,48,50	5,999,521	6,405,395
Current financial liabilities, net	5,14,26,48,50	9,194,552	7,981,879
Income tax payables	44	508,402	285,420
Current non-financial liabilities	23,31,32	5,584,308	5,574,041
Current provisions	29,48	2,137,498	1,594,798
Total current liabilities		23,424,281	21,841,533
Non-current liabilities			
Non-current trade and other payables, net	5,25,27,48,50	3,223,480	2,941,696
Non-current financial liabilities, net	5,14,26,48,50	45,980,899	53,364,911
Non-current non-financial liabilities	31,32	8,072,434	8,160,033
Employee benefits liabilities, net	28,48	1,483,069	1,645,069
Deferred tax liabilities	44	10,415,397	9,617,309
Non-current provisions	29,48	16,224,714	16,585,748
Total non-current liabilities		85,399,993	92,314,766
Total Liabilities	4	108,824,274	114,156,299
Equity			
Contributed capital	1,33,48		
Share capital		3,209,820	3,209,820
Share premium		843,758	843,758
		4,053,578	4,053,578
Retained earnings	34		
Legal reserves		1,604,910	1,604,910
Voluntary reserves		34,833,844	35,906,267
Unappropriated retained earnings		16,931,804	14,007,942
		53,370,558	51,519,119
Other components of equity	37		
Other capital surplus		1,233,793	1,234,825
Accumulated other comprehensive loss		(271,457)	(358,570)

Other equity		13,294,973	13,294,973
		14,257,309	14,171,228
Equity attributable to owners of the controlling company		71,681,445	69,743,925
Non-controlling interests	19, 36	1,283,196	1,348,837
Total Equity		72,964,641	71,092,762
Total Liabilities and Equity		181,788,915	185,249,061

See accompanying notes to the consolidated financial statements.

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Consolidated Statements of Comprehensive Income (Loss)

For the years ended December 31, 2016, 2017 and 2018

	Note	2016	2017	2018
		In millions of won, except per share information		
Sales	4,38,48,50			
Sales of goods		55,379,487	55,772,548	57,897,804
Sales of construction services	23	4,026,857	3,212,184	1,742,391
Sales of services		356,743	351,157	392,867
		59,763,087	59,335,889	60,033,062
Cost of sales	16,28,46,50			
Cost of sales of goods		(41,237,372)	(48,454,036)	(55,976,628)
Cost of sales of construction services		(3,755,144)	(3,047,396)	(1,638,869)
Cost of sales of services		(557,037)	(597,423)	(592,224)
		(45,549,553)	(52,098,855)	(58,207,721)
Gross profit		14,213,534	7,237,034	1,825,341
Selling and administrative expenses	28,39,46,50	(2,639,232)	(2,762,855)	(2,627,890)
Other income	40	840,184	869,118	969,894
Other expenses	40	(188,624)	(180,055)	(231,330)
Other gains (losses), net	41	70,498	156,627	(621,124)
Operating profit (loss)	4	12,296,360	5,319,869	(685,109)
Finance income	5,14,42	791,543	1,530,618	796,870
Finance expenses	5,14,43	(2,437,087)	(3,127,952)	(2,470,743)
Profit (loss) related to associates, joint ventures and subsidiaries	4,20			
Share in profit of associates and joint ventures		224,435	241,537	473,269
Gain on disposal of investments in associates and joint ventures		52	609	5,079
Gain on disposal of investments in subsidiaries				73
Share in loss of associates and joint ventures		(243,361)	(323,225)	(110,168)
Loss on disposal of investments in associates and joint ventures		(2,935)		(2,183)
Impairment loss on investments in associates and joint ventures	20	(115,539)	(27,238)	(7,907)
		(137,348)	(108,317)	358,163

Profit (loss) before income tax		10,513,468	3,614,218	(2,000,819)
Income tax benefit (expense)	44	(3,365,141)	(2,172,824)	826,321
Profit (loss) for the period		7,148,327	1,441,394	(1,174,498)

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Consolidated Statements of Comprehensive Income (Loss), Continued

For the years ended December 31, 2016, 2017 and 2018

	Note	2016	2017	2018
		In millions of won, except per share information		
Other comprehensive income (loss)	5,14,28,34,37			
Items that will not be reclassified subsequently to profit or loss:				
Remeasurements of defined benefit liability, net of tax	28,34	(75,926)	170,337	(108,169)
Share in other comprehensive income (loss) of associates and joint ventures, net of tax	34	(2,515)	10,067	(1,153)
Net change in fair value of equity Investments at fair value through other comprehensive loss	37			(34,185)
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	37	61,279	(7,098)	
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	5,14,37	28,414	20,868	211
Foreign currency translation of foreign operations, net of tax	37	41,360	(134,196)	(20,717)
Share in other comprehensive income (loss) of associates and joint ventures, net of tax	37	(54,914)	(154,694)	57,088
Other comprehensive loss, net of tax		(2,302)	(94,716)	(106,925)
Total comprehensive income (loss) for the period		7,146,025	1,346,678	(1,281,423)
Profit or loss attributable to:				
Owners of the controlling company	47	7,048,581	1,298,720	(1,314,567)
Non-controlling interests		99,746	142,674	140,069
		7,148,327	1,441,394	(1,174,498)
Total comprehensive income (loss) attributable to:				
Owners of the controlling company		7,041,557	1,230,194	(1,426,477)
Non-controlling interests		104,468	116,484	145,054
		7,146,025	1,346,678	(1,281,423)
Earnings (loss) per share (in won)	47			
Basic and diluted earnings (loss) per share		10,980	2,023	(2,048)

See accompanying notes to the consolidated financial statements.

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Consolidated Statements of Changes in Equity

For the years ended December 31, 2016, 2017 and 2018

	Equity attributable to owners of the controlling company					
	Contributed capital	Retained earnings	Other components of equity	Subtotal	Non-controlling Interests	Total equity
	In millions of won					
Balance at January 1, 2016	4,053,578	48,187,241	14,393,648	66,634,467	1,308,008	67,942,475
Total comprehensive income (loss) for the period						
Profit for the period		7,048,581		7,048,581	99,746	7,148,327
Items that will not be reclassified subsequently to profit or loss:						
Remeasurements of defined benefit liability, net of tax		(69,330)		(69,330)	(6,596)	(75,926)
Share in other comprehensive income (loss) of associates and joint ventures, net of tax		(2,532)		(2,532)	17	(2,515)
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			61,275	61,275	4	61,279
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax			27,075	27,075	1,339	28,414
Foreign currency translation of foreign operations, net of tax			31,406	31,406	9,954	41,360
Share in other comprehensive income (loss) of associates and joint ventures, net of tax			(54,918)	(54,918)	4	(54,914)

Transactions with owners of the Company, recognized directly in equity						
Dividends paid		(1,990,089)		(1,990,089)	(99,982)	(2,090,071)
Issuance of shares of capital by subsidiaries and others			1,750	1,750	14,809	16,559
Equity transaction within consolidation scope other than issuance of share capital			36,008	36,008	12,299	48,307
Changes in consolidation scope					3,705	3,705
Dividends paid (hybrid bond)					(16,455)	(16,455)
Balance at December 31, 2016	4,053,578	53,173,871	14,496,244	71,723,693	1,326,852	73,050,545

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Consolidated Statements of Changes in Equity, Continued

For the years ended December 31, 2016, 2017 and 2018

	Equity attributable to owners of the controlling company					
	Contributed capital	Retained earnings	Other components of equity	Subtotal	Non-controlling Interests	Total equity
			In millions of won			
Balance at January 1, 2017	4,053,578	53,173,871	14,496,244	71,723,693	1,326,852	73,050,545
Total comprehensive income (loss) for the period						
Profit for the period		1,298,720		1,298,720	142,674	1,441,394
Items that will not be reclassified subsequently to profit or loss:						
Remeasurements of defined benefit liability, net of tax		158,991		158,991	11,346	170,337
Share in other comprehensive income of associates and joint ventures, net of tax		10,065		10,065	2	10,067
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			(7,102)	(7,102)	4	(7,098)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax			19,614	19,614	1,254	20,868
Foreign currency translation of foreign operations, net of tax			(95,103)	(95,103)	(39,093)	(134,196)
Share in other comprehensive income (loss) of associates and joint ventures, net of tax			(154,991)	(154,991)	297	(154,694)

Transactions with owners of the Company, recognized directly in equity						
Dividends paid		(1,271,089)		(1,271,089)	(70,252)	(1,341,341)
Issuance of shares of capital by subsidiaries and others			(1,378)	(1,378)	18,381	17,003
Changes in consolidation scope					7,337	7,337
Dividends paid (hybrid bond)					(15,856)	(15,856)
Repayment of hybrid bond					(99,750)	(99,750)
Others			25	25		25
Balance at December 31, 2017	4,053,578	53,370,558	14,257,309	71,681,445	1,283,196	72,964,641

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Consolidated Statements of Changes in Equity, Continued

For the years ended December 31, 2016, 2017 and 2018

	Equity attributable to owners of the controlling company					
	Contributed capital	Retained earnings	Other components of equity	Subtotal	Non-controlling Interests	Total equity
	In millions of won					
Balance at January 1, 2018	4,053,578	53,370,558	14,257,309	71,681,445	1,283,196	72,964,641
Effect of change in accounting policy		71,928	(76,851)	(4,923)		(4,923)
Restated balance at January 1, 2018	4,053,578	53,442,486	14,180,458	71,676,522	1,283,196	72,959,718
Total comprehensive income (loss) for the period						
Profit (loss) for the period		(1,314,567)		(1,314,567)	140,069	(1,174,498)
Items that will not be reclassified subsequently to profit or loss:						
Remeasurements of defined benefit liability, net of tax		(100,495)		(100,495)	(7,674)	(108,169)
Share in other comprehensive income (loss) of associates and joint ventures, net of tax		(1,153)		(1,153)		(1,153)
Net change in fair value of equity investments at fair value through other comprehensive income			(34,125)	(34,125)	(60)	(34,185)
Items that are or may be reclassified subsequently to profit or loss:						
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax			(1,140)	(1,140)	1,351	211
Foreign currency translation of foreign operations, net of tax			(32,086)	(32,086)	11,369	(20,717)
			57,089	57,089	(1)	57,088

Share in other comprehensive income (loss) of associates and joint ventures, net of tax						
Transactions with owners of the Company, recognized directly in equity						
Dividends paid		(507,152)		(507,152)	(92,741)	(599,893)
Issuance of shares of capital by subsidiaries and others			1,032	1,032	17,183	18,215
Changes in consolidation scope					9,530	9,530
Dividends paid (hybrid bond)					(13,385)	(13,385)
Balance at December 31, 2018	4,053,578	51,519,119	14,171,228	69,743,925	1,348,837	71,092,762

See accompanying notes to the consolidated financial statements.

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Consolidated Statements of Cash Flows

For the years ended December 31, 2016, 2017 and 2018

	2016	2017	2018
		In millions of won	
Cash flows from operating activities			
Profit (loss) for the period	7,148,327	1,441,394	(1,174,498)
Adjustments for:			
Income tax expense (benefit)	3,365,141	2,172,824	(826,321)
Depreciation	8,881,273	9,660,039	9,905,856
Amortization	79,715	113,672	118,938
Employee benefit expense	373,753	391,360	360,575
Bad debt expense	37,815	126,326	57,468
Interest expense	1,752,868	1,789,552	1,868,458
Loss on sale of financial assets	9	2,343	1
Loss on disposal of property, plant and equipment	4,996	70,514	60,704
Loss on abandonment of property, plant, and equipment	426,519	424,091	481,176
Impairment loss on property, plant and equipment		51,067	710,162
Impairment loss on intangible assets	3,945	20	8,112
Loss on disposal of intangible assets	158	183	43
Increase to provisions	1,782,732	1,690,120	1,056,994
Loss (gain) on foreign currency translation, net	253,468	(902,878)	243,378
Gain on valuation of financial assets at fair value through profit or loss			(8,495)
Loss on valuation of financial assets at fair value through profit or loss			6,616
Valuation and transaction loss (gain) on derivative instruments, net	(231,630)	1,043,628	(300,500)
Share in loss (income) of associates and joint ventures, net	18,926	81,688	(363,101)
Gain on disposal of financial assets	(1,482)	(1,130)	(1,838)
Gain on disposal of property, plant and equipment	(74,035)	(48,316)	(98,077)
Gain on disposal of intangible assets		(564)	(12)
Gain on disposal of investments in associates and joint ventures	(52)	(609)	(5,079)
Loss on disposal of investments in associates and joint ventures	2,935		2,183
Impairment loss on investments in associates and joint ventures	115,539	27,238	7,907
Gain on disposal of investments in subsidiaries			(72)
Interest income	(241,778)	(206,143)	(223,767)
Dividend income	(9,446)	(11,477)	(12,777)
Impairment loss on available-for-sale financial assets	86,703	2,713	
Others, net	66,260	16,679	81,317
	16,694,332	16,492,940	13,129,849
Changes in:			
Trade receivables	200,529	(218,328)	246,755

Non-trade receivables	(68,322)	(31,807)	154,580
Accrued income	69,151	577,838	(484,718)
Other receivables	10,093	(1,271)	(61,961)
Other current assets	(259,492)	37,576	(148,509)
Inventories	(1,439,545)	(1,373,438)	(1,771,550)
Other non-current assets	(2,792)	(46,079)	(54,148)
Trade payables	141,994	342,126	478,744
Non-trade payables	(8,379)	(214,704)	(292,912)
Accrued expenses	(153,172)	(715,305)	(361,204)
Other payables		292	
Other current liabilities	284,417	(126,323)	250,112
Other non-current liabilities	809,699	763,958	287,488
Investments in associates and joint ventures (dividends received)	75,407	106,983	175,175
Provisions	(1,527,129)	(1,390,606)	(1,132,969)
Payments of employee benefit obligations	(53,477)	(69,489)	(89,253)
Plan assets	(312,125)	(325,080)	(330,064)
	(2,233,143)	(2,683,657)	(3,134,434)

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Consolidated Statements of Cash Flows, Continued

For the years ended December 31, 2016, 2017 and 2018

	2016	2017	2018
		In millions of won	
Cash generated from operating activities	21,609,516	15,250,677	8,820,917
Dividends received (financial assets at fair value through other comprehensive income)	10,294	10,590	11,182
Interest paid	(2,041,379)	(1,886,303)	(1,895,898)
Interest received	240,878	173,226	194,221
Income taxes paid	(3,298,757)	(2,298,296)	(450,290)
Net cash from operating activities	16,520,552	11,249,894	6,680,132
Cash flows from investing activities			
Proceeds from disposals of associates and joint ventures	46,644	10,542	1,617
Acquisition of associates and joint ventures	(113,222)	(206,753)	(319,425)
Proceeds from disposals of property, plant and equipment	207,960	85,801	234,138
Acquisition of property, plant and equipment	(12,028,789)	(12,535,958)	(12,266,870)
Proceeds from disposals of intangible assets	430	1,072	13
Acquisition of intangible assets	(124,422)	(143,887)	(110,587)
Proceeds from disposals of financial assets	10,876,017	5,296,680	2,419,259
Acquisition of financial assets	(8,130,621)	(4,786,717)	(2,841,651)
Increase in loans	(206,092)	(218,698)	(188,675)
Collection of loans	117,561	120,967	100,010
Increase in deposits	(468,734)	(397,078)	(299,564)
Decrease in deposits	161,166	110,383	259,930
Proceeds from disposals of assets held-for-sale			18,716
Receipt of government grants	32,878	55,533	30,416
Net cash inflow from changes in consolidation scope	3,754		2,141
Other cash inflow (outflow) from investing activities, net	(20,400)	1,414	(53,769)
Net cash used in investing activities	(9,645,870)	(12,606,699)	(13,014,301)
Cash flows from financing activities			
Proceeds from (repayment of) short-term borrowings, net	(49,604)	370,328	(183,660)
Proceeds from long-term borrowings and debt securities	2,302,060	10,098,067	14,251,586
Repayment of long-term borrowings and debt securities	(7,750,047)	(8,198,882)	(8,095,590)
Payment of finance lease liabilities	(118,215)	(122,919)	(134,454)
Settlement of derivative instruments, net	73,246	33,434	60,907
Change in non-controlling interest	10,538	23,582	20,113
Repayment of hybrid bond		(99,750)	
Dividends paid (hybrid bond)	(16,455)	(15,856)	(17,658)

Dividends paid	(2,088,429)	(1,340,387)	(599,391)
Other cash outflow from financing activities, net	(570)	(2,023)	(175)
Net cash from (used in) financing activities	(7,637,476)	745,594	5,301,678
Net decrease in cash and cash equivalents before effect of exchange rate fluctuations	(762,794)	(611,211)	(1,032,491)
Effect of exchange rate fluctuations on cash held	31,082	(70,403)	21,097
Net decrease in cash and cash equivalents	(731,712)	(681,614)	(1,011,394)
Cash and cash equivalents at January 1	3,783,065	3,051,353	2,369,739
Cash and cash equivalents at December 31	3,051,353	2,369,739	1,358,345

See accompanying notes to the consolidated financial statements.

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KOREA ELECTRIC POWER CORPORATION AND SUBSIDIARIES

Notes to the Consolidated Financial Statements

December 31, 2018

1. Reporting Entity (Description of the controlling company)

Korea Electric Power Corporation (KEPCO) was incorporated on January 1, 1982 in accordance with the Korea Electric Power Corporation Act (the KEPCO Act) to engage in the generation, transmission and distribution of electricity and development of electric power resources in the Republic of Korea. KEPCO also provides power plant construction services. KEPCO s stock was listed on the Korea Stock Exchange on August 10, 1989 and KEPCO listed its Depository Receipts (DR) on the New York Stock Exchange on October 27, 1994. KEPCO s head office is located in Naju, Jeollanam-do.

As of December 31, 2018, KEPCO s share capital amounts to 3,209,820 million and KEPCO s shareholders are as follows:

	Number of shares	Percentage of ownership
Government of the Republic of Korea	116,841,794	18.20%
Korea Development Bank	211,235,264	32.90%
Foreign investors	173,769,250	27.07%
Other	140,117,769	21.83%
	641,964,077	100.00%

In accordance with the Restructuring Plan enacted on January 21, 1999 by the Ministry of Trade, Industry and Energy, KEPCO spun off its power generation divisions on April 2, 2001, resulting in the establishment of six power generation subsidiaries.

2. Basis of Preparation

The consolidated financial statements of Korea Electric Power Corporation and subsidiaries (the Company) were authorized for issuance by the Board of Directors on February 22, 2019.

(1) Statement of compliance

These consolidated financial statements have been prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB).

(2) Basis of measurement

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

- financial assets at fair value through profit or loss
- financial assets at fair value through other comprehensive income
- derivative financial instruments 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

(3) Functional and presentation currency

These consolidated financial statements are presented in Korean won (Won), which is KEPCO s functional and presentation currency.

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(4) Use of estimates and judgments

The preparation of the consolidated financial statements in conformity with 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.

The followings are the key assumptions and other key sources of estimation uncertainty at the end of the reporting period, that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year.

(i) Unbilled revenue

Energy delivered but not metered nor billed is estimated at the reporting date based on consumption statistics and selling price estimates. Determination of the unbilled revenues at the end of the reporting period is sensitive to the estimated consumptions and prices based on statistics. Unbilled revenue recognized as of December 31, 2017 and 2018 are 1,672,385 million and 1,671,117 million, respectively.

(ii) Early shutdown of Wolsong unit 1 nuclear power plant and changes in new nuclear power plants construction

The 30-year designed life of Wolsong unit 1 nuclear power plant of the Company had expired on November 20, 2012. On February 27, 2015, however, approval from the Nuclear Safety and Security Commission (NSSC) was received to continue its operation until November 20, 2022.

According to the Eighth Basic Plan for Electricity Supply and Demand announced by the Ministry of Trade, Industry and Energy in 2017, Wolsong unit 1 nuclear power plant was expected to go through a comprehensive evaluation for the feasibility of continuous operation including economic efficiency and acceptability of household and community in 2018 in order to decide whether to shut down early. On June 15, 2018, the board of directors of Korea Hydro & Nuclear Power Co., Ltd. (KHNP), a subsidiary of KEPCO, has decided to shut down the Wolsong unit 1 on the grounds that its deficit was increasing and its economic efficiency was low due to the unoptimistic utilization rate. In addition, KHNP has also decided to discontinue the construction of Cheonji unit 1 and 2 and Daejin unit 1 and 2 pursuant to the government policy. For this reason, the Company recognized impairment loss and other expenses as described in note 21, note 40 and note 53.

Among the new nuclear power plants under construction, Shin-Hanul unit 3 and 4, for which approval for power generation business was previously obtained, are not included in the decision to suspend construction of the board of directors of KHNP. However, considering the decision to shut down Wolsong unit 1 and suspended construction of Cheonji unit 1 and 2 and Daejin unit 1 and 2, it is highly likely that the construction of Shin-Hanul unit 3 and 4 will be suspended according to the government s policy. For this reason, the Company recognized impairment loss as described in note 21 and note 53, as the Company believes that there was a significant change in its operating environment during the year ended December 31, 2018.

The Korean government plans to refund to the Company for reasonable expenditures incurred in relation to the phase-out of nuclear power plants in accordance with the energy transformation policy established by Korean

government. In doing so, after discussions with relevant government agencies and upon approval by the Congress, the Korean government is considering to use available resource including utilizing relevant fund to make the refund. Also, Korean government has stated that it plans to establish relevant legal basis of providing refund including utilizing available resource, if necessary.

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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 20 Investments in Associates and Joint Ventures

Note 21 Property, Plant and Equipment

Note 23 Construction Services Contracts

Note 48 Risk Management

Information about assumptions and estimation uncertainties that have a significant risk of resulting in a material adjustment within the next financial year is included in the following notes:

Note 28 Employment Benefits

Note 44 Income Taxes

(5) Changes in accounting policies

The Company has initially applied IFRS 9 Financial Instruments and IFRS 15 Revenue from Contracts with Customers from January 1, 2018.

Due to the transition methods chosen by the Company in applying these standards, comparative information throughout these financial statements has not been restated to reflect the requirements of the new standards.

(i) IFRS 9 Financial Instruments

IFRS 9 sets out requirements for recognizing and measuring financial assets, financial liabilities and certain contracts to buy or sell non-financial items. This standard replaces existing guidance in IAS 39 Financial Instruments: Recognition and Measurement .

The Company has taken an exemption not to restate comparative information for prior periods upon adoption of IFRS 9. Accordingly, the information presented for 2017 and 2016 has not been restated and differences in the carrying amounts of financial instruments resulting from the adoption of IFRS 9 are recognized in retained earnings and other components in equity at January 1, 2018.

Classification and measurement of financial assets and financial liabilities

IFRS 9 contains three principal classification categories for financial assets: measured at amortized cost, FVOCI and FVTPL. The classification of financial assets under IFRS 9 is generally based on the business model in which a financial assets is managed and its contractual cash flow characteristics. Under IFRS 9, derivatives embedded in contracts where the host is a financial asset in the scope of the standard are never separated. Instead, the hybrid financial instrument as a whole is assessed for classification.

The adoption of IFRS 9 has not had a significant effect on the Company s accounting policies related to financial liabilities and derivative financial instruments (for derivatives that are used as hedging instruments).

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The following table reconciles the carrying amounts of financial assets under IAS 39 to the carrying amounts under IFRS 9 on transition to IFRS 9 on January 1, 2018.

Original classification under IAS 39	New classification under IFRS 9	Original carrying amount under IAS 39	New carrying amount under IFRS 9
		In millions of won	
Financial assets at FVTPL	FVTPL	111,512	111,512
Loans and receivables	Amortized cost	15,203,663	14,405,570
Loans and receivables	FVTPL		791,324
Available-for-sale financial assets	FVOCI	699,833	471,903
Available-for-sale financial assets	FVTPL		227,930
Held-to-maturity investments	Amortized cost	3,144	3,144
Total financial assets (excluding derivative instruments)		16,018,152	16,011,383

Impairment of financial assets

IFRS 9 replaces the incurred loss model in IAS 39 with an expected credit loss (ECL) model. The new impairment model applies to financial assets measured at amortized cost and debt investments at FVOCI, but not to investments in equity instruments.

The Company has used an exemption not to restate comparative information for prior periods with respect to classification and measurement (including impairment) requirements. Differences in the carrying amounts of financial assets resulting from the adoption of IFRS 9 are recognized in other components of equity and retained earnings as at January 1, 2018 as follows:

Type	Equity attributable to owners of the controlling company		Non-controlling interests	Total equity
	Retained earnings	Other components of equity		
	In millions of won			
Reclassification of cumulative gain or loss of available-for-sale financial assets	76,851	(76,851)		
Remeasurement of expected credit loss				
Trade and other receivables	(6,769)			(6,769)
Income tax effect	1,846			1,846
Total	71,928	(76,851)		(4,923)

The detailed accounting policies under IFRS 9 are described in note 3.(21).

(ii) IFRS 15 Revenue from Contracts with Customers

IFRS 15 Revenue from Contracts with Customers replaced IAS 18 Revenue , IAS 11 Construction Contracts , SIC-31 Revenue-Barter Transactions Involving Advertising Services , IFRIC 13 Customer Loyalty Programs , IFRIC 15 Agreements for the Construction of Real Estate and IFRIC 18 Transfers of Assets from Customers .

Under IFRS 15, revenue is recognized when a customer obtains control of the goods or services. Determining the timing of the transfer of control at a point in time or over time requires judgment.

The Company has retrospectively applied this standard and recognized the cumulative effect of the adoption of IFRS 15 at the date of initial application (January 1, 2018) and has retrospectively applied IFRS 15 to only those contracts that were not completed as of the date of initial application (January 1, 2018). Accordingly, the Company has not restated the comparative periods.

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IFRS 15 did not have a significant impact on the Company s consolidated financial statements at the date of initial application (January 1, 2018). For additional information about the Company s accounting policies relating to revenue recognition, see note 3.(7).

(iii) IFRIC 22 Foreign Currency Transactions and Advance Consideration

The Company has adopted IFRIC 22 Foreign Currency Transactions and Advance Consideration since January 1, 2018. IFRIC 22 Foreign Currency Transactions and Advance Consideration clarifies the date of the transaction for the purpose of determining the exchange rate to use on initial recognition of the related asset, expense or income, when an entity has received or paid advance consideration in a foreign currency. Upon adoption of the interpretation, there is no significant impact on the Company s consolidated financial statements.

(iv) Amendments to IAS 40 Investment Property

The Company has adopted amendments to IAS 40 Investment Property since January 1, 2018. Amendments to IAS 40 Investment Property clarify when an entity should transfer a property asset to, or from, investment property. Upon adoption of the amendments, there is no significant impact on the Company s consolidated financial statements.

(6) Standards issued but not yet effective

A number of new standards are effective for annual periods beginning after January 1, 2018 and earlier application is permitted; however, the Company has not early adopted the new or amended standards in preparing these consolidated financial statements.

(i) IFRS 16 Leases

General information

IFRS 16 replaces existing leases guidance, including IAS 17 Leases , IFRIC 4 Determining whether an Arrangement contains a Lease , SIC-15 Operating Leases Incentives and SIC-27 Evaluating the Substance of Transactions Involving the Legal Form of a Lease .

The Company plans to apply IFRS 16 retrospectively with the cumulative effect of initially applying the standard recognized at the date of initial application on January 1, 2019. Therefore, the cumulative effect of adopting IFRS 16 will be recognized as an adjustment to the opening balance of retained earnings (or other component of equity, as appropriate) at January 1, 2019, with no restatement of comparative information.

For a contract that is, or contains, a lease, and the Company shall account for each lease component within the contract as a lease separately from non-lease components of the contract. A lessee recognizes a right-of-use asset representing its right to use the underlying asset and a lease liability representing its obligation to make lease payments. There are recognition exemptions for short-term leases and leases of low-value items. In addition, as a practical expedient, a lessee may elect, by class of underlying asset, not to separate non-lease components from lease components, and instead account for each lease component and any associated non-lease components as a single lease

component.

Lessor accounting remains similar to the existing guidance IAS 17 Leases i.e. lessors continue to classify leases as finance or operating leases.

Identifying a lease

The Company assesses whether the contract is, or contains, a lease at inception of a contract and also shall identify whether the contract is, or contains, a lease at the date of initial application.

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The definition of this new standard is mainly related to the control model. This standard classifies a lease contract and a service contract based on whether the identified asset is controlled by the customer. If the customer has all of the following rights, right-of-use is transferred to the customer.

- Right to obtain substantially all of the economic benefits from use of the identified asset
- Right to direct the use of the identified asset

The Company is still evaluating whether certain agreements related to the use of vessels, real estate and facilities contain leases that shall be accounted for in accordance with IFRS 16 as of the authorization date for issuance of these consolidated financial statements.

Lessee accounting

The adoption of IFRS 16 will change the accounting of operating leases, which was previously not included in the consolidated statements of financial position under IAS 17, and at the date of initial application of IFRS 16, the Company shall account for all leases, except for short-term leases and leases of low-value items, as follows:

- recognizes the present value of the lease payments that are not paid at the date of initial recognition in the consolidated statements of financial position as right-of-use asset and lease liabilities
- recognizes the depreciation charge for right-of-use asset and interest expense on the lease liability in the consolidated statements of comprehensive income
- classifies cash payments for the principal portion (financial activities) and for the interest portion (operating activities) in the consolidated statements of cash flows

Lessor accounting

Under IFRS 16, a lessor continues to classify each of its leases as either a finance leases or an operating leases. However, under IFRS 16, a lessor shall disclose additional information such as the nature of the lessor s leasing activities and how the lessor manages the risk associated with any rights it retains in underlying assets.

The Company has been analyzing the impact of the adoption of IFRS 16 on its consolidated financial statements. However, it is practically difficult to provide reasonable estimates of the impact until the Company has completed such analysis.

3. Significant Accounting Policies

The significant accounting policies applied by the Company in preparation of its consolidated financial statements are included below. Except as described in note 2.(5), the Company applied the following significant accounting policies consistently for all periods presented.

(1) Basis of consolidation

The consolidated financial statements are the financial statements of a group in which the assets, liabilities, equity, income, expenses and cash flows of the parent and its subsidiaries are presented as those of a single economic entity. Subsidiaries are controlled by the Company. The Company 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.

Income and expense of a subsidiary acquired or disposed of during the year are included in the consolidated statement of comprehensive income from the effective date of acquisition and up to the effective date of disposal, as appropriate. Total comprehensive income of subsidiaries is attributed to the owners of the Company and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

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When necessary, adjustments are made to the financial statements of subsidiaries to bring their accounting policies into line with those of the Company.

Transactions within the Company are eliminated during the consolidation.

Changes in the Company s ownership interests in a subsidiary that do not result in the Company losing control over the subsidiary are accounted for as equity transactions. The carrying amounts of the Company s interests and the non-controlling interests are adjusted to reflect the changes in their relative interests in the subsidiary. Any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognized directly in equity and attributed to owners of the Company.

When the Company loses control of a subsidiary, the income or loss on disposal is calculated as the difference between (i) the aggregate of the fair value of the consideration received and the fair value of any retained interest and (ii) the previous carrying amount of the assets (including goodwill), and liabilities of the subsidiary and any non-controlling interests. When assets of the subsidiary are carried at revalued amounts or fair values and the related cumulative gain or loss has been recognized in other comprehensive income and accumulated in equity, the amounts previously recognized in other comprehensive income and accumulated in equity are accounted for as if the Company had directly disposed of the relevant assets (i.e. reclassified to income or loss or transferred directly to retained earnings). The fair value of any investment retained in the former subsidiary at the date when control is lost is recognized as the fair value on initial recognition for subsequent accounting under IFRS 9 Financial Instruments or, when applicable, the cost on initial recognition of an investment in an associate or a jointly controlled entity.

(2) Business combinations

A business combination is accounted for by applying the acquisition method, unless it is a combination involving entities or businesses under common control.

The consideration transferred in a business combination is measured at fair value, which is calculated as the sum of the acquisition-date fair values of the assets transferred by the Company, liabilities incurred by the Company to the former owners of the acquiree and the equity interests issued by the Company in exchange for control of the acquiree. Acquisition-related costs are generally recognized in income or loss as incurred.

At the acquisition date, the identifiable assets acquired and the liabilities assumed are recognized at their fair value at the acquisition date, except that:

- deferred tax assets or liabilities and liabilities or assets related to employee benefit arrangements are recognized and measured in accordance with IAS 12 Income Taxes and IAS 19 Employee Benefits respectively;

- assets (or disposal groups) that are classified as held for sale in accordance with IFRS 5 Non-current Assets Held for Sale are measured in accordance with that standard.

Goodwill is measured as the excess of the sum of the consideration transferred, the amount of any non-controlling interests in the acquiree, and the fair value of the acquirer s previously held equity interest in the acquiree (if any) over the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed. If, after

reassessment, net of the acquisition-date amounts of the identifiable assets acquired and liabilities assumed exceeds the sum of the consideration transferred, the amount of any non-controlling interests in the acquiree and the fair value of the acquirer s previously held interest in the acquiree (if any), the excess is recognized immediately in income or loss as a bargain purchase gain.

Non-controlling interest that is present on acquisition day and entitles the holder to a proportionate share of the entity s net assets in an event of liquidation, may be initially measured either at fair value or at the non-controlling interest s proportionate share of the recognized amounts of the acquiree s identifiable net assets. The choice of measurement can be elected on a transaction-by-transaction basis. Other types of non-controlling interests are measured at fair value or, when applicable, on the basis specified in other

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IFRSs. When the consideration transferred by the Company in a business combination includes assets or liabilities resulting from a contingent consideration arrangement, the contingent consideration is measured at its acquisition-date fair value and included as part of the consideration transferred in a business combination. Changes in the fair value of the contingent consideration that qualify as measurement period adjustments are adjusted retrospectively, with corresponding adjustments against goodwill. Measurement period adjustments are adjustments that arise from additional information obtained during the measurement period (which cannot exceed one year from the acquisition date) about facts and circumstances that existed at the acquisition date.

The subsequent accounting for changes in the fair value of the contingent consideration that do not qualify as measurement period adjustments depends on how the contingent consideration is classified. Contingent consideration that is classified as equity is not re-measured at subsequent reporting dates and its subsequent settlement is accounted for within equity. Contingent consideration that is classified as an asset or a liability is re-measured at subsequent reporting dates in accordance with IFRS 9 Financial Instruments , or with IAS 37 Provisions, Contingent Liabilities and Contingent Assets as appropriate, with the corresponding gain or loss being recognized in income or loss.

When a business combination is achieved in stages, the Company s previously held equity interest in the acquiree is re-measured to fair value at the acquisition date (i.e. the date when the Company obtains control) and the resulting gain or loss, if any, is recognized in income or loss. Amounts arising from interests in the acquiree prior to the acquisition date that have previously been recognized in other comprehensive income are reclassified to income or loss where such treatment would be appropriate if that interest were disposed of.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Company reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period (see above), or additional assets or liabilities are recognized, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognized at that date.

The assets and liabilities acquired under business combinations under common control are recognized at the carrying amounts recognized previously in the consolidated financial statements of the ultimate parent. The difference between consideration transferred and carrying amounts of net assets acquired is recognized as part of share premium.

(3) Investments in associates

An associate is an entity over which the Company has significant influence and that is neither a subsidiary nor an interest in a joint venture. Significant influence is the power to participate in the financial and operating policy decisions of the investee but does not control or joint control over those policies. If the Company holds 20% ~ 50% of the voting power of the investee, it is presumed that the Company has significant influence.

The results and assets and liabilities of associates are incorporated in these consolidated financial statements using the equity method of accounting. If the investment is classified as held for sale, in which case it is accounted for in accordance with IFRS 5 Non-current Assets Held for Sale , any retained portion of an investment in associates that has not been classified as held for sale shall be accounted for using the equity method until disposal of the portion that is classified as held for sale takes place. After the disposal takes place, the Company shall account for any retained interest in associates in accordance with IFRS 9 Financial Instruments unless the retained interest continues to be an associates, in which case the entity uses the equity method.

Under the equity method, an investment in an associate is initially recognized in the consolidated statement of financial position at cost and adjusted thereafter to recognize the Company s share of the income or loss

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and other comprehensive income of the associate. When the Company s share of losses of an associate exceeds the Company s interest in that associate (which includes any long-term interests that, in substance, form part of the Company s net investment in the associate), the Company discontinues recognizing its share of further losses. Additional losses are recognized only to the extent that the Company has incurred legal or constructive obligations or made payments on behalf of the associate.

Any excess of the cost of acquisition over the Company s share of the net fair value of the identifiable assets, liabilities and contingent liabilities of an associate recognized at the date of acquisition is recognized as goodwill, which is included within the carrying amount of the investment. Any excess of the Company s share of the net fair value of the identifiable assets, liabilities and contingent liabilities over the cost of acquisition, after reassessment, is recognized immediately in income or loss.

Upon disposal of an associate that results in the Company losing significant influence over that associate, any retained investment is measured at fair value at that date and the fair value is regarded as its fair value on initial recognition as a financial asset in accordance with IFRS 9. The difference between the previous carrying amount of the associate attributable to the retained interest and its fair value is included in the determination of the gain or loss on disposal of the associate.

In addition, the Company accounts for all amounts previously recognized in other comprehensive income in relation to that associate on the same basis as would be required if that associate had directly disposed of the related assets or liabilities. Therefore, if a gain or loss previously recognized in other comprehensive income by that associate would be reclassified to income or loss on the disposal of the related assets or liabilities, the Company reclassifies the gain or loss from equity to income or loss (as a reclassification adjustment) when it loses significant influence over that associate.

The requirements of IAS 28 Investments in Associates and Joint Ventures are applied to determine whether it is necessary to recognize any impairment loss with respect to the Company s investment in an associate. When necessary, the entire carrying amount of the investment (including goodwill) is tested for impairment in accordance with IAS 36 Impairment of Assets as a single asset by comparing its recoverable amount (higher of value in use and fair value less costs to sell) with its carrying amount, any impairment loss recognized forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized in accordance with IAS 36 to the extent that the recoverable amount of the investment subsequently increases.

When the Company transacts with its associate, incomes and losses resulting from the transactions with the associate are recognized in the Company s consolidated financial statements only to the extent of interests in the associate that are not related to the Company.

(4) Joint arrangements

A joint arrangement is an arrangement of which two or more parties have joint control. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require the unanimous consent of the parties sharing control. Joint arrangements are classified into two types joint operations and joint ventures. A joint operation is a joint arrangement whereby the parties that have joint control of the arrangement (i.e. joint operators) have rights to the assets, and obligations for the liabilities, relating to the arrangement. A joint venture is a joint arrangement whereby the parties that have joint control of the arrangement (i.e. joint ventures) have rights to the net assets of the arrangement.

If the Company is a joint operator, the Company is to recognize and measure the assets and liabilities (and recognize the related revenues and expenses) in relation to its interest in the arrangement in accordance with relevant IFRSs applicable to the particular assets, liabilities, revenues and expenses. If the joint arrangement is a joint venture, the Company is to account for that investment using the equity method accounting in accordance with IAS 28 Investment in Associates and Joint Ventures (refer to note 3.(3)), except when the Company is applicable to the IFRS 5 Non-current Assets Held for Sale .

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(5) Non-current assets held for sale

Non-current assets and disposal groups are classified as held for sale if their carrying amount will be recovered principally through a sale transaction rather than through continuing use. This condition is regarded as met only when the sale is highly probable and the non-current asset (or disposal group) is available for immediate sale in its present condition. Management must be committed to the sale, which should be expected to qualify for recognition as a completed sale within one year from the date of classification.

When the Company is committed to a sale plan involving loss of control of a subsidiary, all of the assets and liabilities of that subsidiary are classified as held for sale when the criteria described above are met, regardless of whether the Company will retain a non-controlling interest in its former subsidiary after the sale.

Non-current assets (and disposal groups) classified as held for sale are measured at the lower of their previous carrying amount and fair value less costs to sell.

(6) Goodwill

The Company measures goodwill which acquired in a business combination at the amount recognized at the date on which it obtains control of the acquiree (acquisition date) less any accumulated impairment losses. Goodwill acquired in a business combination is allocated to each CGU that is expected to benefit from the synergies arising from the business acquired.

The Company assesses at the end of each reporting period and whenever there is an indication that the asset may be impaired. An impairment loss is recognized if the carrying amount of an asset or a CGU exceeds its recoverable amount. Impairment losses are recognized in profit or loss.

Any impairment identified at the CGU level will first reduce the carrying value of goodwill and then be used to reduce the carrying amount of the other assets in the CGU on a pro rata basis. Except for impairment losses in respect of goodwill which are never reversed, an impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset s carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortization, if no impairment loss had been recognized.

(7) Revenue from Contracts with Customers

The Company recognizes revenue by applying 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). The Company recognizes revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services, excluding amounts collected on behalf of third parties. Also, the Company recognizes revenue when the Company satisfies a performance obligation by transferring a promised good or service to a customer.

(i) Identify the performance obligations in the contract

The Company is engaged in the generation, transmission and distribution of electricity and development of electric power resources, and electricity sales revenue accounts for 93.8% of consolidated revenue for the year ended December 31, 2018.

Under IFRS 15, supplying electricity is a series of distinct goods or services identified as a single performance obligation. The Company is also engaged in contracts with customers for transmission and distribution, provision of power generation byproducts, EPC business, O&M, etc. that are identified as separate performance obligations for each contract.

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(ii) Variable consideration

The Company may be subject to a variation of consideration paid by the customer due to the progressive electricity billing system, discounts on electricity bills for policy purposes, penalties and delinquent payment, etc. The Company estimates an amount of variable consideration by using the expected value method that the Company expects to better predict the amount of consideration to which it will be entitled, and includes in the transaction price some or all of an amount of variable consideration only to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved.

(iii) Performance obligations satisfied over time

The Company satisfies its performance obligations for contracts such as EPC business, O&M, etc. over time. The Company recognizes revenue based on the percentage-of-completion on a reasonable basis.

The Company recognizes revenue over time if one of the following criteria is met:

(a) the customer simultaneously receives and consumes the benefits provided by the Company s performance as the entity performs;

(b) the Company s performance creates or enhances an asset that the customer controls as the asset is created or enhanced; or

(c) the Company s performance does not create an asset with an alternative use to the entity and the entity has an enforceable right to payment for performance completed to date.

(8) Leases

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

(i) The Company as lessor

Amounts due from lessees under finance leases are recognized as receivables at the amount of the Company s net investment in the leases. Finance lease income is allocated to accounting periods so as to reflect a constant periodic rate of return on the Company s net investment outstanding in respect of the leases.

Rental income from operating leases is recognized on a straight-line basis over the term of the relevant lease. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognized on a straight-line basis over the lease term.

(ii) The Company as lessee

Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

Assets held under finance leases are initially recognized as assets of the Company at their fair value at the inception of the lease or, if lower, at the present value of the minimum lease payments. The corresponding liability to the lessor is included in the statement of financial position as a finance lease obligation.

Lease payments are apportioned between finance expenses and reduction of the lease obligation so as to achieve a constant rate of interest on the remaining balance of the liability. Finance expenses are recognized immediately in income or loss, unless they are directly attributable to qualifying assets, in which case they are capitalized in accordance with the Company s general policy on borrowing costs. Contingent rentals are recognized as expenses in the periods in which they are incurred.

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Operating lease payments are recognized as an expense on a straight-line basis over the lease term, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed. Contingent rentals arising under operating leases are recognized as an expense in the period in which they are incurred.

In the event that lease incentives are received to enter into operating leases, such incentives are recognized as a liability. The aggregate benefit of incentives is recognized as a reduction of rental expense on a straight-line basis, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed.

(iii) Determining whether an arrangement contains a lease

At inception of an arrangement, the Company determines whether the arrangement is or contains a lease.

At inception or on reassessment of an arrangement that contains a lease, the Company separates payments and other consideration required by the arrangement into those for the lease and those for other elements on the basis of their relative fair values. If the Company concludes for a finance lease that it is impracticable to separate the payments reliably, then an asset and a liability are recognized at an amount equal to the fair value of the underlying asset.

(9) Foreign currencies

Transactions in foreign currencies are translated to the respective functional currencies of the Company 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.

Exchange differences are recognized in profit or loss in the period in which they arise except for:

Exchange differences on foreign currency borrowings relating to assets under construction for future productive use, which are included in the cost of those assets when they are regarded as an adjustment to interest costs on those foreign currency borrowings;

Exchange differences on transactions entered into in order to hedge certain foreign currency risks (refer to note 3.(23) Derivative financial instruments, including hedge accounting); and

Exchange differences on monetary items receivable from or payable to a foreign operation for which settlement is neither planned nor likely to occur (therefore forming part of the net investment in the foreign operation), which are recognized initially in other comprehensive income and reclassified from equity to income or loss on disposal or partial disposal of the net investment.

For the purpose of presenting financial statements, the assets and liabilities of the Company s foreign operations are expressed in Korean won using exchange rates prevailing at the end of the reporting period. Income and expense items

are translated at the average exchange rates for the period, unless exchange rates fluctuated significantly during that period, in which case the exchange rates at the dates of the transactions are used. Exchange differences arising, if any, are recognized in other comprehensive income and accumulated in equity.

When a foreign operation is disposed of, the relevant amount in the translation is transferred to profit or loss as part of the gain or loss on disposal.

(10) Borrowing costs

The Company 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

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incurred. A qualifying asset is an asset that requires a substantial period of time to get ready for its intended use or sale.

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization.

All other borrowing costs are recognized in income or loss in the period in which they are incurred.

(11) Government grants and income related to transfer of assets from customers

Government grants are not recognized unless there is reasonable assurance that the Company will comply with the grant s conditions and that the grant will be received.

Benefit from a government loan at a below-market interest rate is treated as a government grant, measured as the difference between proceeds received and the fair value of the loan based on prevailing market interest rates.

(i) If the Company received grants related to assets

Government grants whose primary condition is that the Company purchase, construct or otherwise acquire long-term assets are deducted in calculating the carrying amount of the asset. The grant is recognized in profit or loss over the life of a depreciable asset as a reduced depreciation expense.

(ii) If the Company received grants related to income

Government grants which are intended to compensate the Company for expenses incurred are recognized as other income (government grants) in profit or loss over the periods in which the Company recognizes the related costs as expenses.

The Company recovers a substantial amount of the cost related to its electric power distribution facilities from customers through the transfer of assets, while the remaining portion is recovered through electricity sales from such customers in the future. As such, the Company believes there exists a continued service obligation to the customers when the Company receives an item of property, equipment, or cash for constructing or acquiring an item of property or equipment, in exchange for supplying electricity to customers. The Company defers the amounts received, which are subsequently recognized as other income on a straight-line basis over the estimated service period which does not exceed the transferred asset s useful life.

(12) Employee benefits

When an employee has rendered service to the Company during a period, the Company recognizes the contribution payable to a defined contribution plan in exchange for that service as a liability (accrued expense).

For defined benefit pension plans and other post-employment benefits, the net periodic pension expense is actuarially determined by Pension Actuarial System developed by independent actuaries using the projected unit credit method. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows

using interest rates of high-quality corporate bonds that are denominated in the currency in which the benefits will be paid and that have terms to maturity approximating the terms of the related pension liability. However, if there is not a deep market, market yields on government bonds are used.

Net defined benefit liability s measurement is composed of actuarial gains and losses, return on plan assets excluding net interest on net defined benefit liability, and any change in the effect of the asset ceiling, excluding net interest, which are immediately recognized in other comprehensive income. The actuarial gains or losses recognized in other comprehensive income which will not be reclassified into net profit or loss for later periods are immediately recognized in retained earnings. Past service cost will be recognized as expenses upon the earlier of the date of change or reduction to the plan, or the date of recognizing termination benefits.

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The retirement benefit obligation recognized in the statement of financial position represents the present value of the defined benefit obligation as adjusted for unrecognized actuarial gains and losses and unrecognized past service cost, and as reduced by the fair value of plan assets. Any asset resulting from this calculation is limited to unrecognized actuarial losses and past service cost, plus the present value of available refunds and reductions in future contributions to the plan.

(13) 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.

Current tax assets and liabilities are offset only if, the Company:

(a) has a legally enforceable right to set off the recognized amounts; and

(b) intends either to settle on a net basis, or to realize the asset and settle the liability simultaneously.

(ii) Deferred tax

Deferred tax is recognized, using the asset-liability method, in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. A deferred tax liability is recognized for all taxable temporary differences. A deferred tax asset is recognized for all deductible temporary differences to the extent that it is probable that taxable profit will be available against which they can be utilized. However, deferred tax is not recognized for the following temporary differences: taxable temporary differences arising on the initial recognition of goodwill, or the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting profit or loss nor taxable income.

The measurement of deferred tax liabilities and deferred tax assets reflects the tax consequences that would follow from the manner in which the Company expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities. Deferred tax assets or deferred tax liabilities on investment properties measured at fair value, unless any contrary evidence exists, are measured using the assumption that the carrying amount of the property will be recovered entirely through sale.

The Company 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 Company 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. The Company recognizes a deferred tax asset for all deductible temporary differences arising from investments in subsidiaries and associates, 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.

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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. The measurement of deferred tax liabilities and deferred tax assets reflects the tax consequences that would follow from the manner in which the Company expects, at the end of the reporting period to recover or settle the carrying amount of its assets and liabilities.

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.

(iii) Current and deferred tax for the year

Current and deferred tax are recognized in income or loss, except when they relate to items that are recognized in other comprehensive income or directly in equity, in which case, the current and deferred tax are also recognized in other comprehensive income or directly in equity respectively. Where current tax or deferred tax arises from the initial accounting for a business combination, the tax effect is included in the accounting for the business combination.

(14) 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.

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 Company 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, 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. For loaded nuclear fuel related to long-term raw materials and spent nuclear fuels related to asset retirement costs, the Company uses the unit-of-production method to measure and recognize depreciation expenses.

The estimated useful lives of the Company s property, plant and equipment are as follows:

	Useful lives (years)
Buildings	8 ~ 40
Structures	8 ~ 50
Machinery	2 ~ 32
Vehicles	3 ~ 8
Loaded heavy water	30

Asset retirement costs	18, 30, 40, 60
Finance lease assets	6 ~ 32
Ships	9
Others	4 ~ 15

A component that is significant compared to the total cost of property, plant and equipment is depreciated over its separate useful life.

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Depreciation methods, residual values and useful lives of property, plant and equipment are reviewed at the end of each reporting period and if change is deemed appropriate, it is treated as a change in accounting estimate. As a result of such annual review, useful lives of certain structures and machinery were changed during the year ended December 31, 2018. Depreciation expenses decreased by ₩ 25,985 million for the year ended December 31, 2018. Depreciation expenses are expected to decrease by ₩ 157,333 million and ₩ 170,471 million for the years ending December 31, 2019 and 2020, respectively, and to increase by ₩ 353,789 million for the years after December 31, 2020.

Property, plant and equipment are derecognized on disposal, or when no future economic benefits are expected from its use or disposal. Gains or losses arising from derecognition of a property, plant and equipment, measured as the difference between the net disposal proceeds and the carrying amount of the asset, are recognized in income or loss when the asset is derecognized.

(15) Investment property

Property held for the purpose of earning rentals or benefiting from capital appreciation is classified as investment property. Investment property is initially measured at its cost. Transaction costs are included in the initial measurement. Subsequently, investment property is carried at depreciated cost less any accumulated impairment losses.

Subsequent costs are recognized in the carrying amount of investment property at cost or, if appropriate, as separate items if it is probable that future economic benefits associated with the item will flow to the Company 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.

Investment property except for land, are depreciated on a straight-line basis over 8 ~ 40 years as estimated useful lives.

The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimate accounted for on a prospective basis.

An investment property is derecognized upon disposal or when the investment property is permanently withdrawn from use and no future economic benefits are expected from the disposal. Any gain or loss arising on derecognition of the property (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in income or loss in the period in which the property is derecognized.

(16) Intangible assets

(i) Intangible assets acquired separately

Intangible assets with finite useful lives that are acquired separately are carried at cost less accumulated amortization and accumulated impairment losses. Amortization is recognized on a straight-line basis over their estimated useful lives. The estimated useful life and amortization method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for on a prospective basis. Intangible assets with indefinite useful lives that are acquired separately are carried at cost less accumulated impairment losses.

(ii) Research and development

Expenditure on research activities is recognized as an expense in the period in which it is incurred.

An internally-generated intangible asset arising from development (or from the development phase of an internal project) is recognized if, and only if, all of the following have been demonstrated:

The technical feasibility of completing the intangible asset so that it will be available for use or sale;

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The intention to complete the intangible asset and use or sell it;

The ability to use or sell the intangible asset;

How the intangible asset will generate probable future economic benefits;

The availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset; and

The ability to measure reliably the expenditure attributable to the intangible asset during its development.

The amount initially recognized for internally-generated intangible assets is the sum of the expenditure incurred from the date when the intangible asset first meets the recognition criteria listed above. When the development expenditure does not meet the criteria listed above, an internally-generated intangible asset cannot be recognized and the expenditure is recognized in income or loss in the period in which it is incurred.

Internally-generated intangible assets are reported at cost less accumulated amortization and accumulated impairment losses.

The estimated useful lives and amortization methods of the Company s intangible assets are as follows:

	Useful lives (years)	**Amortization methods**
Usage rights for donated assets	10 ~ 20	Straight line
Software	4, 5	Straight line
Industrial rights	5 ~ 10	Straight line
Development expenses	5	Straight line
Leasehold rights	10	Straight line
Mining right		Unit of production
Others	3 ~ 50 or Indefinite	Straight line

(iii) Intangible assets acquired in a business combination

Intangible assets that are acquired in a business combination are recognized separately from goodwill are initially recognized at their fair value at the acquisition date.

Subsequent to initial recognition, intangible assets acquired in a business combination are reported at cost less accumulated amortization and accumulated impairment losses, on the same basis as intangible assets that are acquired separately.

(iv) Derecognition of intangible assets

An intangible asset is derecognized on disposal, or when no future economic benefits are expected from its use or disposal. Gains or losses arising from derecognition of an intangible asset are 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.

(17) Greenhouse gas emissions rights (allowances) and obligations

In connection with Enforcement of Allocation and Trading of Greenhouse Gas Emissions Allowances, the Company applies the following accounting policies for greenhouse gas emissions rights and obligations.

(i) Greenhouse gas emissions rights

Greenhouse gas emissions rights consist of the allowances received free of charge from the government and the ones purchased. The cost of the greenhouse gas emissions rights includes expenditures arising directly from the acquisition and any other costs incurred during normal course of the acquisition.

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Greenhouse gas emissions rights are held by the Company to fulfill the legal obligation and recorded as intangible assets. To the extent that the portion to be submitted to the government within one year from the end of reporting period, the greenhouse gas emissions rights are classified as current assets. Greenhouse gas emissions rights recorded as intangible assets are initially measured at cost and substantially remeasured at cost less accumulated impairment losses.

Greenhouse gas emissions rights are derecognized on submission to the government or when no future economic benefits are expected from its use or disposal.

(ii) Greenhouse gas emissions obligations

Greenhouse gas emissions obligations are the Company s present legal obligation to submit the greenhouse gas emissions allowances to the government and recognized when an outflow of resources is probable and a reliable estimate can be made of the amount of the obligation. Greenhouse gas emissions obligations are measured as the sum of the carrying amount of the allocated rights that will be submitted to the government and the best estimate of expenditure required to settle the obligation at the end of the reporting period for any excess emission.

(18) Impairment of non-financial assets other than goodwill

At the end of each reporting period, the Company reviews the carrying amounts of its tangible and intangible assets with definite useful lives to determine whether there is any indication that those assets may have been impaired. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). Where it is not possible to estimate the recoverable amount of an individual asset, the Company estimates the recoverable amount of the cash-generating unit to which the asset belongs. Where a reasonable and consistent basis of allocation can be identified, corporate assets are also allocated to individual cash-generating units, or otherwise they are allocated to the smallest group of cash-generating units for which a reasonable and consistent allocation basis can be identified.

Intangible assets with indefinite useful lives and intangible assets not yet available for use are tested for impairment at least annually, and whenever there is an indication that the asset may be impaired.

Recoverable amount is the higher of fair value less costs to sell and value in use. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset (or a cash-generating unit) is estimated to be less than its carrying amount, the carrying amount of the asset (or the cash-generating unit) is reduced to its recoverable amount. An impairment loss is recognized immediately in profit or loss, unless the relevant asset is carried at a revalued amount, in which case the impairment loss is treated as a revaluation decrease.

When an impairment loss subsequently reverses, the carrying amount of the asset (or a cash-generating unit) is increased to the revised estimate of its recoverable amount, to the extent the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset (or cash-generating unit) in prior years. A reversal of an impairment loss is recognized immediately in profit or loss, unless the relevant asset is carried at a revalued amount, in which case the reversal of the impairment loss is treated as

a revaluation increase.

(19) Inventories

Inventories are measured at the lower of cost and net realizable value. Cost of inventories for inventories in transit are measured by using specific identification method. Cost of inventories, except for those in transit, are measured under the weighted average method and consists of the purchase price, cost of conversion and other costs incurred in bringing the inventories to their present location and condition.

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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.

(20) Provisions

Provisions are recognized when the Company 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.

(i) Provision for employment benefits

The Company determines the provision for employment benefits as the incentive payments based on the results of the individual performance evaluation or management assessment.

(ii) Provision for decommissioning costs of nuclear power plants

The Company records the fair value of estimated decommissioning costs as a liability in the period in which the Company incurs a legal obligation associated with retirement of long-lived assets that result from acquisition, construction, development and/or normal use of the assets. Accretion expense consists of period-to-period changes in the liability for decommissioning costs resulting from the passage of time and revisions to either the timing or the amount of the original estimate of undiscounted cash flows.

(iii) Provision for disposal of spent nuclear fuel

Under the Radioactive Waste Management Act, the Company is levied to pay the spent nuclear fuel fund for the management of spent nuclear fuel. The Company recognizes the provision of present value of the payments.

(iv) Provision for low and intermediate radioactive wastes

Under the Radioactive Waste Management Act, the Company recognizes the provision for the disposal of low and intermediate radioactive wastes in best estimate of the expenditure required to settle the present obligation.

(v) Provision for Polychlorinated Biphenyls (PCBs)

Under the regulation of Persistent Organic Pollutants Management Act, enacted in 2007, the Company is required to remove PCBs, a toxin, from the insulating oil of its transformers by 2025. As a result of

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the enactments, the Company is required to inspect the PCBs contents of transformers and dispose of PCBs in excess of safety standards under the legally settled procedures. The Company s estimates and assumptions used to determine fair value can be affected by many factors, such as the estimated costs of inspection and disposal, inflation rate, discount rate, regulations and the general economy.

(vi) Provisions for power plant regional support program

Power plant regional support programs consist of scholarship programs to local students, local economy support programs, local culture support programs, environment development programs, and local welfare programs. The Company recognizes the provision in relation to power plant regional support program.

(vii) Provisions for transmission and transformation facilities-neighboring areas support program

The Company has present obligation to conduct transmission and transformation facilities-neighboring areas support program under Act on assistance to transmission and transformation facilities-neighboring areas. The Company recognizes the provision of estimated amount to fulfill the obligation.

(viii) Renewable Portfolio Standard (RPS) provisions

RPS program is required to generate a specified percentage of total electricity to be generated in the form of renewable energy and provisions are recognized for the governmental regulations to require the production of energies from renewable energy sources such as solar, wind and biomass.

(21) Financial instruments

The Company recognizes financial assets and financial liabilities in the statement of financial position when the Company becomes a party to the contractual provisions of the instrument. Upon initial recognition, financial assets and financial liabilities are measured at their fair value plus, in the case of a financial asset or financial liabilities not at fair value through profit or loss, transaction costs that are directly attributable to the asset s acquisition or issuance.

(i) Classification and measurement of financial assets

The Company classifies financial assets into three principal categories; measured at amortized cost, fair value through other comprehensive income (FVOCI) and fair value through profit or loss (FVTPL) based on the business model in which assets are managed and their cash flow characteristics. The company assesses the hybrid financial instrument in which derivatives embedded as whole for classification.

	Cash flow characteristics	
Business model	**Solely payments of principal and**	**Other than SPPI**

	interest (SPPI)	
To collect contractual cash flows	Amortized cost	
Both collecting contractual cash flows and selling financial assets	FVOCI(*1)	FVTPL(*2)
To sell financial assets	FVTPL	

(*1) To eliminate or reduce an accounting mismatch, the Company may elect to recognize the amount of change in fair value in profit or loss.

(*2) On initial recognition of an equity investment that is not held for trading, the Company may irrevocably elect to present subsequent changes in the investment s fair value in OCI.

A financial asset is measured at amortized cost if it meets both of the following conditions and is not designated as at FVTPL: 1) it is held within a business model whose objective is to hold assets to

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collect contractual cash flows; and 2) its contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

A financial asset is measured at FVOCI if it meets both of the following conditions and is not designated as at FVTPL: 1) it is held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets; and 2) its contractual terms of the financial asset give rise on specified dates to cash flow that are solely payments of principal and interest on the principal amount outstanding.

All financial assets not classified as measured at amortized cost or FVOCI as described above are measured at FVTPL. On initial recognition of equity investment that is not held for trading, the Company may irrevocably elect to present subsequent changes in fair value in OCI, and will not reclassify (recycle) those items in OCI to profit or loss subsequently.

(ii) Classification and measurement of financial liabilities

Financial liabilities are classified as FVTPL or other financial liabilities.

A financial liability is classified as at FVTPL if it is classified as held-for-trading, it is a derivative or it is designated as such on initial recognition. Financial liabilities at FVTPL are measured at fair value and net gains and losses, including any interest expense, are recognized in profit or loss.

A non-derivative financial liability that is not classified as at FVTPL is classified as other financial liabilities. Other financial liabilities are measured initially at its fair value minus transaction costs that are directly attributable to the acquisition or issue. Other financial liabilities are subsequently measured at amortized cost using the effective interest method.

(iii) Impairment: Financial assets and contract assets

The Company applies a forward-looking expected credit loss (ECL) model for debt instruments, lease receivables, contractual assets, loan commitments and financial guarantee contracts.

The Company recognizes loss allowances measured on either of the 12-month or lifetime ECL based on the extent of increase in credit risk since inception as shown in the below table.

	Classification		Loss allowances
Stage 1	Credit risk has not increased significantly since the initial recognition	12-month ECL:	ECLs that resulted from possible default events within the 12 months after the reporting date
Stage 2	Credit risk has increased significantly since the initial recognition	Lifetime ECL:	ECL that resulted from all possible default events over the expected life of a financial instrument
Stage 3	Credit-impaired		

Under IFRS 9, the Company always measures the loss allowance at an amount equal to lifetime expected credit losses for trade receivables or contract assets that result from transactions that are within the scope of IFRS 15 and that do not contain a significant financing component in accordance with IFRS 15 and if the trade receivables or contract assets include a significant financing component, the Company may choose as its accounting policy to measure the loss allowance at an amount equal to lifetime expected credit losses.

The Company has chosen to measure the loss allowance at an amount equal to lifetime expected credit losses for the trade receivables, contract assets and lease receivables that contain a significant financing component.

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(iv) Derecognition

The Company derecognizes a financial asset when the contractual rights to the cash flows from the financial asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all of the risks and rewards of ownership of the financial asset are transferred or in which the Company neither transfers nor retains substantially all of the risks and rewards of ownership and it does not retain control of the financial asset. The Company enters into transactions whereby it transfers assets recognized in its statement of financial position, but retains either all or substantially all of the risks and rewards of the transferred assets. In these cases, the transferred assets are not derecognized.

The Company derecognizes a financial liability when it contractual obligations are discharged or cancelled, or expire. On derecognition of a financial liability, the difference between the carrying amount extinguished and the consideration paid (including any non-cash assets transferred or liabilities assumed) is recognized in profit or loss.

(22) Service Concession Arrangements

The Company recognizes revenues from construction services and operating services related to service concession arrangements in accordance with IFRS 15 Revenue from Contracts with Customers .

The Company recognizes a financial asset to the extent that it has an unconditional contractual right to receive cash or another financial asset for the construction services and an intangible asset to the extent that it receives a right (license) to charge users of the public service. Borrowing costs attributable to the arrangement are recognized as an expense in the period in which they are incurred unless the Company has a contractual right to receive an intangible asset (a right to charge users of the public service). In this case, borrowing costs attributable to the arrangement are capitalized during the construction phase of the arrangement.

(23) Derivative financial instruments, including hedge accounting

The Company enters into a variety of derivative financial instruments to manage its exposure to interest rate and foreign exchange rate risk, including foreign exchange forward contracts, interest rate swaps and cross currency swaps and others.

Derivatives are initially recognized at fair value. Subsequent to initial recognition, derivatives are measured at fair value. The resulting gain or loss is recognized in income or loss immediately unless the derivative is designated and effective as a hedging instrument, in such case the timing of the recognition in income or loss depends on the nature of the hedge relationship.

A derivative with a positive fair value is recognized as a financial asset; a derivative with a negative fair value is recognized as a financial liability. A derivative is presented as a non-current asset or a non-current liability if the remaining maturity of the instrument is more than 12 months and it is not expected to be realized or settled within 12 months. Other derivatives are presented as current assets or current liabilities.

(i) Separable embedded derivatives

Derivatives embedded in other financial instruments or other host contracts are treated as separate derivatives when their risks and characteristics are not closely related to those of the host contracts and when the host contracts are not

measured at FVTPL.

An embedded derivative is presented as a non-current asset or a non-current liability if the remaining maturity of the hybrid instrument to which the embedded derivative is part of, is more than 12 months and it is not expected to be realized or settled within 12 months. All other embedded derivatives are presented as current assets or current liabilities.

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(ii) Hedge accounting

The Company designates certain hedging instruments, which include derivatives, embedded derivatives and non-derivatives in respect of foreign currency risk, as either fair value hedges or cash flow hedges. Hedges of foreign exchange risk on firm commitments are accounted for as cash flow hedges.

At the inception of the hedge relationship, the entity documents the relationship between the hedging instrument and the hedged item, along with its risk management objectives and its strategy for undertaking various hedge transactions. Furthermore, at the inception of the hedge and on an ongoing basis, the Company documents whether the hedging instrument is highly effective in offsetting changes in fair values or cash flows of the hedged item.

(iii) Fair value hedges

Changes in the fair value of derivatives that are designated and qualify as fair value hedges are recognized in income or loss immediately, together with any changes in the fair value of the hedged asset or liability that are attributable to the hedged risk. The changes in the fair value of the hedging instrument and the change in the hedged item attributable to the hedged risk relating to the hedged items are recognized in the consolidated statements of comprehensive income.

Hedge accounting is discontinued when the Company revokes the hedging relationship, when the hedging instrument expires or is sold, terminated, or exercised, or when it no longer qualifies for hedge accounting. The fair value adjustment to the carrying amount of the hedged item arising from the hedged risk is amortized as income or loss as of that date.

(iv) Cash flow hedges

The effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges is recognized in other comprehensive income. The gain or loss relating to the ineffective portion is recognized immediately in income or loss, and is included in the finance income and expense .

Amounts previously recognized in other comprehensive income and accumulated in equity are reclassified to income or loss in the periods when the hedged item is recognized in income or loss, in the same line of the consolidated statement of comprehensive income as the recognized hedged item. However, when the forecast transaction that is hedged results in the recognition of a non-financial asset or a non-financial liability, the gains and losses previously accumulated in equity are transferred from equity and included in the initial measurement of the cost of the non-financial asset or non-financial liability.

Hedge accounting is discontinued when the Company revokes the hedging relationship, when the hedging instrument expires or is sold, terminated, or exercised, or it no longer qualifies for hedge accounting. Any gain or loss accumulated in equity at that time remains in equity and is recognized when the forecast transaction is ultimately recognized in income or loss. When a forecast transaction is no longer expected to occur, the gain or loss accumulated in equity is recognized immediately in income or loss.

4. Segment, Geographic and Other Information

(1) Segment determination and explanation of the measurements

The Company s operating segments are its business components that generate discrete financial information that is reported to and regularly reviewed by the Company s the chief operating decision maker, the Chief Executive Officer, for the purpose of resource allocation and assessment of segment performance. The Company s reportable segments are Transmission and distribution , Electric power generation (Nuclear) , Electric power generation (Non-nuclear) , Plant maintenance & engineering service and Others ; others mainly represent the business unit that manages the Company s foreign operations.

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Segment operating profit (loss) is determined the same way that consolidated operating profit is determined under IFRS without any adjustment for corporate allocations. The accounting policies used by each segment are consistent with the accounting policies used in the preparation of the consolidated financial statements. Segment assets and liabilities are determined based on separate financial statements of the entities instead of on a consolidated basis. There are various transactions between the reportable segments, including sales of property, plant and equipment and so on, that are conducted on an arms-length basis at market prices that would be applicable to an independent third-party. For subsidiaries which are in a different segment from that of its immediate parent company, their carrying amount in separate financial statements is eliminated in the consolidating adjustments in the tables below. In addition, consolidation adjustments in the table below include adjustments of the amount of investment in associates and joint ventures from the cost basis amount reflected in segment assets to that determined using equity method in the consolidated financial statements.

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(2) Financial information of the segments for the years ended December 31, 2016, 2017 and 2018, respectively, are as follows:

2016									
Total segment revenue	Intersegment revenue	Revenue from external customers	Depreciation and amortization	Interest income	Interest expense	Profit (loss) related to associates and joint ventures	Employee benefit expense	Loss on abandonment of property, plant and equipment	Increase in provisions, net
In millions of won									
59,862,284	1,890,489	57,971,795	3,226,700	80,882	844,200	(128,402)	162,326	424,356	711,430
11,168,579	11,129,385	39,194	3,130,820	33,111	474,590	(1,082)	70,582		576,223
21,394,223	20,561,044	833,179	2,523,306	24,171	359,607	(8,342)	79,846	2,133	276,619
2,618,388	2,190,207	428,181	98,843	10,672	2,156	478	86,268		221,301
567,836	77,098	490,738	26,817	115,928	97,926		1,050	30	168
(35,848,223)	(35,848,223)		(45,498)	(22,986)	(25,611)		(26,319)		(3,009)
59,763,087		59,763,087	8,960,988	241,778	1,752,868	(137,348)	373,753	426,519	1,782,732

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2017

Total segment revenue	Intersegment revenue	Revenue from external customers	Depreciation and amortization	Interest income	Interest expense	Profit (loss) related to associates and joint ventures	Employee benefit expense	Loss on abandonment of property, plant, and equipment	Increase in provisions, net
				In millions of won					
59,486,766	2,044,160	57,442,606	3,466,410	49,987	737,971	(105,166)	158,738	384,595	885,195
9,415,752	9,359,468	56,284	3,267,510	21,034	487,503	3,637	80,809		801,800
22,795,816	21,885,251	910,565	2,954,375	18,860	486,176	(6,718)	94,075	39,335	171,457
2,621,440	2,211,716	409,724	109,001	10,801	2,967	(70)	87,344	161	219,382
655,062	138,352	516,710	36,001	130,003	103,782		861		(967)
(35,638,947)	(35,638,947)		(59,586)	(24,542)	(28,847)		(30,467)		(386,747)
59,335,889		59,335,889	9,773,711	206,143	1,789,552	(108,317)	391,360	424,091	1,690,120

2018

Total segment revenue	Intersegment revenue	Revenue from external customers	Depreciation and amortization	Interest income	Interest expense	Profit related to associates and joint ventures	Employee benefit expense	Loss on abandonment of property, plant, and equipment	Increase in provisions, net
				In millions of won					
59,676,952	1,393,120	58,283,832	3,555,158	77,925	708,329	287,268	144,180	424,774	580,931

8,858,717	8,833,787	24,930	3,088,019	30,422	503,161	9,946	76,467	38,886	520,167
25,204,085	24,389,816	814,269	3,269,023	29,313	577,441	58,993	91,140	17,516	(227,234)
2,526,126	2,170,959	355,167	114,030	12,505	4,126	1,956	77,526		174,785
996,300	441,436	554,864	55,513	117,878	119,037		1,742		356
(37,229,118)	(37,229,118)		(56,949)	(44,276)	(43,636)		(30,480)		7,989
60,033,062		60,033,062	10,024,794	223,767	1,868,458	358,163	360,575	481,176	1,056,994

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(3) Information related to segment assets and segment liabilities as of and for the years ended December 31, 2017 and 2018 are as follows:

	2017			
Segment	**Segment assets**	**Investments in associates and joint ventures**	**Acquisition of non-current assets**	**Segment liabilities**
		In millions of won		
Transmission and distribution	106,540,154	3,366,309	6,606,512	50,757,798
Electric power generation (Nuclear)	55,011,096	11,843	2,083,967	29,252,816
Electric power generation (Non-nuclear)	47,938,084	1,904,224	3,250,524	26,337,295
Plant maintenance & engineering service	3,273,959	48,320	145,779	1,176,627
Others	7,798,400		569,447	3,013,743
Segment totals	220,561,693	5,330,696	12,656,229	110,538,279
Consolidation adjustments:				
Elimination of inter-segment amounts	(39,517,829)		23,616	(5,239,156)
Equity method adjustment	754,314			
Deferred taxes	2,215			5,339,450
Others	(11,478)			(1,814,299)
	(38,772,778)		23,616	(1,714,005)
Consolidated totals	181,788,915	5,330,696	12,679,845	108,824,274

	2018			
Segment	**Segment assets**	**Investments in associates and joint ventures**	**Acquisition of non-current assets**	**Segment liabilities**
		In millions of won		
Transmission and distribution	107,486,379	3,671,897	6,323,504	53,404,610
Electric power generation (Nuclear)	55,792,704	43,038	2,187,077	30,484,104
Electric power generation (Non-nuclear)	49,296,392	2,114,203	3,435,222	27,558,156
Plant maintenance & engineering service	3,431,068	49,207	111,393	1,200,390
Others	7,816,885		382,978	3,165,286
Segment totals	223,823,428	5,878,345	12,440,174	115,812,546
Consolidation adjustments:				
Elimination of inter-segment amounts	(41,026,970)		(62,717)	(5,055,737)

Equity method adjustment	964,234			
Deferred taxes	2,131			(621)
Others	1,486,238			3,400,111
	(38,574,367)		(62,717)	(1,656,247)
Consolidated totals	185,249,061	5,878,345	12,377,457	114,156,299

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(4) Geographic information

Electric sales, the main operations of the Company, are conducted in the Republic of Korea where the controlling company is located. The following information on revenue from external customers and non-current assets is determined by the location of the customers and of the assets:

	Revenue from external customers			Non-current assets(*2)		
Geographical unit	**2016**	**2017**	**2018**	**2016**	**2017**	**2018**
			In millions of won			
Domestic	55,310,011	55,652,807	57,799,991	148,297,677	153,436,810	157,037,428
Overseas(*1)	4,453,076	3,683,082	2,233,071	4,474,699	4,497,535	3,299,346
	59,763,087	59,335,889	60,033,062	152,772,376	157,934,345	160,336,774

(*1) Middle East and other Asian countries make up the majority of overseas revenue and non-current assets. Since the overseas revenue or non-current assets attributable to particular countries are not material, they are not disclosed individually.

(*2) Amount excludes financial assets and deferred tax assets.

(5) Information on significant customers

There is no individual customer comprising more than 10% of the Company s revenue for the years ended December 31, 2016, 2017 and 2018.

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5. Classification of Financial Instruments

(1) Classification of financial assets as of December 31, 2017 and 2018 are as follows:

	2017					
	Financial assets at fair value through profit or loss	Loans and receivables	Available-for-sale financial assets	Held-to-maturity investments	Derivative assets (applying hedge accounting)	Total
	In millions of won					
Current assets						
Cash and cash equivalents		2,369,739				2,369,739
Current financial assets						
Held-to-maturity investments				5		5
Derivative assets	12,923				12	12,935
Other financial assets		1,945,417				1,945,417
Trade and other receivables		7,928,972				7,928,972
	12,923	12,244,128		5	12	12,257,068
Non-current assets						
Non-current financial assets						
Available-for-sale financial assets			699,833			699,833
Held-to-maturity investments				3,139		3,139
Derivative assets	9,097				10,594	19,691
Other financial assets	111,512	1,204,738				1,316,250
Trade and other receivables		1,754,797				1,754,797
	120,609	2,959,535	699,833	3,139	10,594	3,793,710
	133,532	15,203,663	699,833	3,144	10,606	16,050,778

	2018				
	Financial assets at fair value through profit or loss	Financial assets at fair value through other comprehensive income	Financial assets at amortized cost	Derivative assets (applying hedge accounting)	Total
	In millions of won				
Current assets					
Cash and cash equivalents			1,358,345		1,358,345
Current financial assets					

Current financial assets at fair value through profit or loss	313,893				313,893
Current financial assets at amortized costs			11,956		11,956
Current derivative assets	13,936			28,171	42,107
Other financial assets			1,991,939		1,991,939
Trade and other receivables			7,793,592		7,793,592
	327,829		11,155,832	28,171	11,511,832
Non-current assets					
Non-current financial assets					
Non-current financial assets at fair value through profit or loss	607,042				607,042
Non-current financial assets at fair value through other comprehensive income		399,495			399,495
Non-current financial assets at amortized costs			2,086		2,086
Non-current derivative assets	23,695			36,533	60,228
Other financial assets			1,044,762		1,044,762
Trade and other receivables			1,819,845		1,819,845
	630,737	399,495	2,866,693	36,533	3,933,458
	958,566	399,495	14,022,525	64,704	15,445,290

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(2) Classification of financial liabilities as of December 31, 2017 and 2018 are as follows:

	2017			
	Financial liabilities at fair value through profit or loss	Financial liabilities recognized at amortized cost	Derivative liabilities (applying hedge accounting)	Total
	In millions of won			
Current liabilities				
Borrowings		1,165,985		1,165,985
Debt securities		7,957,300		7,957,300
Derivative liabilities	51,090		20,177	71,267
Trade and other payables		5,999,521		5,999,521
	51,090	15,122,806	20,177	15,194,073
Non-current liabilities				
Borrowings		2,434,624		2,434,624
Debt securities		43,189,483		43,189,483
Derivative liabilities	99,839		256,953	356,792
Trade and other payables		3,223,480		3,223,480
	99,839	48,847,587	256,953	49,204,379
	150,929	63,970,393	277,130	64,398,452

	2018			
	Financial liabilities at fair value through profit or loss	Financial liabilities recognized at amortized cost	Derivative liabilities (applying hedge accounting)	Total
	In millions of won			
Current liabilities				
Borrowings		1,172,624		1,172,624
Debt securities		6,788,824		6,788,824
Derivative liabilities	13,706		6,725	20,431
Trade and other payables		6,405,395		6,405,395
	13,706	14,366,843	6,725	14,387,274
Non-current liabilities				
Borrowings		3,258,015		3,258,015
Debt securities		49,815,164		49,815,164
Derivative liabilities	85,304		206,428	291,732
Trade and other payables		2,941,696		2,941,696
	85,304	56,014,875	206,428	56,306,607

	99,010	70,381,718	213,153	70,693,881

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(3) Classification of comprehensive income (loss) from financial instruments for the years ended December 31, 2016, 2017 and 2018 are as follows:

		2016	2017	2018
		In millions of won		
Cash and cash equivalents	Interest income	61,380	35,474	40,704
Financial assets at fair value through profit or loss	Interest income			21,713
	Gain on valuation of derivatives			34,117
	Gain on transaction of derivatives			39,114
	Gain on valuation of financial assets			1,879
	Gain on disposal of financial assets			1,837
Financial assets at fair value through profit or loss	Interest income		290	
	Gain (loss) on valuation of derivatives	113,671	(214,100)	
	Loss on transaction of derivatives	(8,039)	(37,266)	
	Gain on valuation of financial assets		12	
Financial assets at fair value through other comprehensive income	Dividends income			12,777
Available-for-sale financial assets	Dividends income	9,446	11,477	
	Impairment loss on available-for-sale financial assets	(86,703)	(2,713)	
	Gain (loss) on disposal of available-for-sale financial assets	1,473	(1,213)	
Financial assets at amortized cost	Interest income			89
Held-to-maturity investments	Interest income	97	82	
Loans and receivables	Interest income	25,106	30,014	21,925
Trade and other receivables	Interest income	102,237	102,727	90,390
Short-term financial instruments	Interest income	45,763	29,412	41,025
Long-term financial	Interest income	7,195	8,144	7,920

instruments				
Other financial assets	Interest income			1
Derivative assets (applying hedge accounting)	Gain (loss) on valuation of derivatives (profit or loss)	145,458	(41,129)	69,799
	Gain on valuation of derivatives (equity, before tax)(*)	50,047	2,453	8,600
	Gain (loss) on transaction of derivatives	(13,994)	(58,299)	34,152
Financial liabilities at fair value through profit or loss	Loss on valuation of derivatives			(4,650)
	Gain on transaction of derivatives			36,046
Financial liabilities at fair value through profit or loss	Gain (loss) on valuation of derivatives	23,225	(179,879)	
	Gain (loss) on transaction of derivatives	17,045	(27,175)	
Financial liabilities carried at amortized cost	Interest expense of borrowings and debt securities	(1,202,065)	(1,240,727)	(1,320,516)
	Loss on retirement of financial liabilities	(23,000)	(5)	
	Interest expense of trade and other payables	(68,375)	(57,160)	(42,830)
	Interest expense of others	(482,428)	(491,665)	(505,112)
	Gain (loss) on foreign currency transactions and translations	(290,485)	1,075,215	(356,159)
Derivative liabilities (applying hedge accounting)	Gain (loss) on valuation of derivatives (profit or loss)	5,714	(439,559)	53,937
	Gain (loss) on valuation of derivatives (equity, before tax)(*)	(3,297)	29,431	(15,029)
	Gain (loss) on transaction of derivatives	(51,450)	(46,221)	37,985

(*) Items are included in other comprehensive income or loss. All other income and gain amounts listed above are included in finance income, and all expense and losses listed above are included in finance expenses in the consolidated statements of comprehensive income or loss.

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6. Restricted Deposits

Restricted deposits as of December 31, 2017 and 2018 are as follows:

		2017	2018
		In millions of won	
Cash and cash equivalents	Escrow accounts	53	
	Deposits for government project	15,365	12,747
	Collateral provided for borrowings	79,569	100,998
	Collateral provided for lawsuit	2	3
	Deposits for transmission regional support program	2,320	4,337
	Decommissioning costs of nuclear power plants		604
Short-term financial instruments	Bidding guarantees	119	
	Restriction on withdrawal related to win-win growth program for small and medium enterprises	34,000	34,000
Current financial assets at fair value through profit or loss	Decommissioning costs of nuclear power plants		29,451
Non-current financial assets at fair value through profit or loss	Decommissioning costs of nuclear power plants		498,555
Financial assets at fair value through profit or loss	Decommissioning costs of nuclear power plants	108,512	
Non-current available-for-sale financial asset	Decommissioning costs of nuclear power plants	214,156	
Long-term financial instruments	Escrow accounts		69
	Guarantee deposits for checking account	2	
	Guarantee deposits for banking accounts at oversea branches	302	315
	Decommissioning costs of nuclear power plants	337,234	245,896
	Funds for developing small and medium enterprises(*)	200,000	200,000
		991,634	1,126,975

(*) Deposits for small and medium enterprise at IBK and others for construction of Bitgaram Energy Valley and support for the high potential businesses as of December 31, 2017 and 2018.

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7. Cash and Cash Equivalents

Cash and cash equivalents as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Cash	132	138
Other demand deposits	968,966	927,650
Short-term deposits classified as cash equivalents	559,239	211,424
Short-term investments classified as cash equivalents	841,402	219,133
	2,369,739	1,358,345

8. Trade and Other Receivables

(1) Trade and other receivables as of December 31, 2017 and 2018 are as follows:

	2017			
	Gross amount	Allowance for doubtful accounts	Present value discount	Book value
	In millions of won			
Current assets				
Trade receivables	7,499,285	(173,583)		7,325,702
Other receivables	614,212	(9,199)	(1,743)	603,270
	8,113,497	(182,782)	(1,743)	7,928,972
Non-current assets				
Trade receivables	449,191		(414)	448,777
Other receivables	1,380,983	(68,809)	(6,154)	1,306,020
	1,830,174	(68,809)	(6,568)	1,754,797
	9,943,671	(251,591)	(8,311)	9,683,769

	2018			
	Gross amount	Allowance for doubtful accounts	Present value discount	Book value
	In millions of won			

Current assets				
Trade receivables	7,303,065	(215,775)		7,087,290
Other receivables	728,560	(20,231)	(2,027)	706,302
	8,031,625	(236,006)	(2,027)	7,793,592
Non-current assets				
Trade receivables	415,318	(93)	(448)	414,777
Other receivables	1,496,464	(84,495)	(6,901)	1,405,068
	1,911,782	(84,588)	(7,349)	1,819,845
	9,943,407	(320,594)	(9,376)	9,613,437

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(2) Other receivables as of December 31, 2017 and 2018 are as follows:

	2017			
	Gross amount	Allowance for doubtful accounts	Present value discount	Book value
	In millions of won			
Current assets				
Non-trade receivables	314,256	(9,199)		305,057
Accrued income	54,002			54,002
Deposits	228,317		(1,743)	226,574
Finance lease receivables	13,067			13,067
Others	4,570			4,570
	614,212	(9,199)	(1,743)	603,270
Non-current assets				
Non-trade receivables	112,983	(59,117)		53,866
Accrued income	182			182
Deposits	331,071		(6,154)	324,917
Finance lease receivables	849,554			849,554
Others	87,193	(9,692)		77,501
	1,380,983	(68,809)	(6,154)	1,306,020
	1,995,195	(78,008)	(7,897)	1,909,290

	2018			
	Gross amount	Allowance for doubtful accounts	Present value discount	Book value
	In millions of won			
Current assets				
Non-trade receivables	298,587	(19,940)		278,647
Accrued income	102,023			102,023
Deposits	228,466		(2,027)	226,439
Finance lease receivables	84,688	(291)		84,397
Others	14,796			14,796
	728,560	(20,231)	(2,027)	706,302
Non-current assets				
Non-trade receivables	136,432	(77,475)		58,957
Deposits	376,211		(6,901)	369,310
Finance lease receivables	898,658	(842)		897,816
Others	85,163	(6,178)		78,985

	1,496,464	(84,495)	(6,901)	1,405,068
	2,225,024	(104,726)	(8,928)	2,111,370

(3) Trade and other receivables are classified as loans and receivables, and are measured using the effective interest method. No interest is accrued for trade receivables related to electricity for the duration between the billing date and the payment due dates. But once trade receivables are overdue, the Company imposes a monthly interest rate of 1.5% on the overdue trade receivables. The Company holds deposits of three months expected electricity usage for customers requesting temporary usage and customers with delinquent payments.

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(4) Aging analysis of trade receivables as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Trade receivables: (not overdue)	7,698,604	7,419,648
Trade receivables: (overdue, not impaired)	7,117	
Less than 60 days	7,117	
Trade receivables: (impairment reviewed)	242,755	298,735
Less than 60 days		2,525
60 ~ 90 days	39,070	37,266
90 ~ 120 days	17,502	16,033
120 days ~ 1 year	55,242	46,204
Over 1 year	130,941	196,707
	7,948,476	7,718,383
Less: allowance for doubtful accounts	(173,583)	(215,868)
Less: present value discount	(414)	(448)
	7,774,479	7,502,067

At the end of each reporting period, the Company assesses whether the credit to trade receivables is impaired. The Company recognizes loss allowances for trade receivables individually when there is any objective evidence that trade receivables are impaired and significant, and classifies the trade receivables that are not individually assessed as the trade receivables subject to be assessed on a collective basis. Also, from January 1, 2018, the Company recognizes loss allowances based on an expected credit loss (ECL) model.

(5) Aging analysis of other receivables as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Other receivables: (not overdue)	1,810,075	2,075,601
Other receivables: (overdue, not impaired)	47,532	
Less than 60 days	47,532	
Other receivables: (impairment reviewed)	137,588	149,423
Less than 60 days		24,782
60 ~ 90 days	44	1,007

90 ~ 120 days	1,017	10,997
120 days ~ 1 year	11,042	23,991
Over 1 year	125,485	88,646
	1,995,195	2,225,024
Less: allowance for doubtful accounts	(78,008)	(104,726)
Less: present value discount	(7,897)	(8,928)
	1,909,290	2,111,370

At the end of each reporting period, the Company assesses whether the credit to other receivables is impaired. The Company recognizes loss allowances for other receivables individually when there is any objective evidence that trade receivables are impaired and significant, and classifies the trade receivables that are not individually assessed as the trade receivables subject to be assessed on a collective basis. Also, from January 1, 2018, the Company recognizes loss allowances based on an expected credit loss (ECL) model.

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(6) Changes in the allowance for doubtful accounts for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016		2017		2018	
	Trade receivables	Other receivables	Trade receivables	Other receivables	Trade receivables	Other receivables
	In millions of won					
Beginning balance	51,956	91,746	71,985	87,661	173,583	78,008
Effect of change in accounting policy					6,641	128
Loss allowance as at January 1, 2018 under IFRS 9					180,224	78,136
Bad debt expense	38,719	233	126,714	1,778	41,498	17,817
Write-off	(18,939)	(928)	(32,995)	(3,129)	(7,696)	(244)
Reversal		(5,489)		(2,166)	(1,726)	(143)
Others	249	2,099	7,879	(6,136)	3,568	9,160
Ending balance	71,985	87,661	173,583	78,008	215,868	104,726

9. Financial Assets at Fair Value through Profit or Loss

(1) Financial assets at fair value through profit or loss as of December 31, 2018 are as follows:

	2018	
	Current	Non-current
	In millions of won	
Financial assets at fair value through profit or loss(*3)		
Beneficiary securities(*1)	100	320,148
Cooperative(*1)		5,052
Other(*2)	313,793	83,586
	313,893	408,786
Financial assets designated as at fair value through profit or loss(*3)		
Debt with embedded derivatives(*2)		187,483
Other		10,773
		198,256
	313,893	607,042

(*1) For the year ended December 31, 2017, the Company had designated the financial assets as available-for-sale (note 2.(5)).

(*2) For the year ended December 31, 2017, the Company had designated the financial assets as long-term/short-term financial instrument (note 2.(5)).

(*3) As of December 31, 2018, the Company invested 528,006 million exclusively for payment of decommissioning costs of nuclear power plants.

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10. Financial Assets at Fair Value through Other Comprehensive Income

(1) Changes in financial assets at fair value through other comprehensive income

	2018						
	Beginning balance	Effect of change in accounting policy(*)	Acquisition	Disposal	Valuation	Impairment	Others	Ending balance
	In millions of won							
Listed	274,453			(1)	(63,007)		(1,389)	210,056
Unlisted	197,450				(12,070)		4,059	189,439
	471,903			(1)	(75,077)		2,670	399,495
Current financial assets at fair value through other comprehensive income								
Non-current financial assets at fair value through other comprehensive income	471,903			(1)	(75,077)		2,670	399,495

(*) As described in note 2.(5), these financial assets were classified as available-for-sale as of December 31, 2017.

(2) Financial assets at fair value through other comprehensive income as of December 31, 2018 are as follows:

	2018				
	Shares	Ownership	Acquisition cost	Book value	Fair value
			In millions of won		
Listed					
Korea District Heating Corp.	2,264,068	19.55%	173,201	129,051	129,051
Ssangyong Motor Co., Ltd.	38,568	0.03%	428	153	153
Korea Line Corp.	18	0.00%	1		
Namkwang Engineering & Construction Co., Ltd.	121	0.00%	15	1	1
Bumyang Construction Co., Ltd.	35	0.00%	2		
ELCOMTEC Co., Ltd.	32,875	0.04%	217	61	61
PAN ocean Co., Ltd.	1,492	0.00%	14	7	7
Dongbu Corporation	955	0.02%	12	7	7
KSP Co., Ltd.	22,539	0.08%	24	32	32
STX Heavy Industries Co., Ltd.	5,057	0.13%	191	29	29

Codes Combine Co., Ltd.	291	0.00%	1	1	1
PT Adaro Energy Tbk	480,000,000	1.50%	71,554	44,790	44,790
Energy Fuels Inc.	1,711,814	1.91%	16,819	5,435	5,435
Baralaba Coal Company Limited	99,763	0.07%	18,445		
Denison Mines Corp.	58,284,000	10.42%	84,134	30,122	30,122
Fission 3.0(*6)	75,000	0.14%		13	13
Fission Uranium Corp.	800,000	0.16%	785	354	354
			365,843	210,056	210,056
Unlisted(*1)					
Intellectual Discovery Co., Ltd.	1,000,000	8.81%	5,000	954	954
Hwan Young Steel Co., Ltd.	10,916	0.14%	1,092	97	97
SAMBO AUTO. Co., Ltd.	15,066	0.02%	38	38	38
Mobo Co., Ltd.	504	0.00%	14	14	14
Dae Kwang Semiconductor Co., Ltd.	589	0.07%	6	6	6
Sanbon Department Store	828	0.01%	124	3	3

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	Shares	Ownership	2018 Acquisition cost	Book value	Fair value
			In millions of won		
Miju Steel Mfg. Co., Ltd.	1,097	0.23%	50	50	50
Sungwon Co., Ltd.(*7)	117	0.07%	15	15	15
Hana Civil Engineering Co., Ltd.	23	0.00%	1	1	1
KC Development Co., Ltd.	839	0.02%	6	6	6
IMHWA Corp.	329	0.11%	5	5	5
DALIM Special Vehicle Co., Ltd.	58	0.08%	10	10	10
ASA JEONJU Co., Ltd.	34,846	1.34%	697	69	69
Moonkyung Silica Co., Ltd.	42	0.56%			
Sungkwang Timber Co., Ltd.	9	0.34%	4	4	4
Yongbo Co., Ltd.	61	0.20%	3	3	3
HJ Steel Co., Ltd.	218	0.07%	2	2	2
KS Remicon Co., Ltd.	12	0.04%	3	3	3
Joongang Platec Co., Ltd.	3,591	0.75%	72	35	35
Pyungsan SI Ltd.	434	0.01%	9	9	9
Samgong Development Co., Ltd.	12	0.01%	7	7	7
Joongang Development Co., Ltd.	540	0.12%	8	8	8
AJS Co., Ltd.	12,906	0.23%	32	32	32
SHIN-E B&P Co., Ltd.	119	0.13%	10		
MSE Co., Ltd.	429	0.13%	9	9	9
Ilrim Nano Tec Co., Ltd.	1,520	0.07%	15	15	15
Youngjin Hi-Tech Co., Ltd.	2,512	0.25%	126	21	21
Buyoung Co., Ltd.	270	0.00%	3	3	3
Ilsuk Co., Ltd.	152	0.17%	10	10	10
Dongyang Telecom Co., Ltd.	1,760	0.01%	11	11	11
Jongwon Remicon Co., Ltd.	31	0.18%	13	13	13
Zyle Daewoo Motor Sales Co., Ltd.	22	0.00%			
Daewoo Development Co., Ltd.	8	0.00%			
Seyang Inc.	537	0.05%	27	27	27
Seungri Enterprise Co., Ltd.	93	0.05%	3	3	3
Onggane Food Co., Ltd	5	0.07%	1	1	1
Shin-E P&C Co., Ltd.	1,569	0.64%	111	3	3
Ejung Ad Co., Ltd.	132	0.09%	3	3	3
Solvus Co., Ltd.	1,056	0.04%	3	3	3
Myung Co., Ltd.	89	0.05%	2	2	2
Shinil Engineering Co., Ltd.	887	0.06%	3	3	3
Biwang Industry Co., Ltd	406	0.04%	2	2	2
Huimun Co., Ltd.	263	0.26%	4	4	4
Young Sung Co., Ltd.	89	0.40%	26	26	26
Yuil Industrial Electronics Co., Ltd.	804	0.32%	15	15	15
DN TEK Inc.	12,401	0.29%	61	5	5
Kwang Jin Structure Co., Ltd.	3,072	0.60%	31	31	31
Woojin Industry Corporation	3	0.00%	16	16	16
Kwang Sung Industry Co., Ltd.	325	0.35%	7	7	7
Futech Mold Co., Ltd.	274	0.27%	14	14	14

Woojoo Environment Ind. Co., Ltd.	101	0.11%	13	13	13
Hyungji Esquire Co., Ltd.	61	0.02%	22	22	22
Kolmar Pharma Co., Ltd.	1,426	0.01%	52	3	3
Morado Co., Ltd.	209	0.04%	2	2	2
Myung Sung Tex Co., Ltd.	20	0.00%	2	2	2
Kwang Sung Co., Ltd.	610	0.53%	31	31	31
Seen Business and Technology co., Ltd. (formerly, EverTechno. Co., Ltd.)	29,424	0.73%	148	7	7
Autowel Co.,Ltd.	260	0.38%	14	14	14

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	Shares	Ownership	2018 Acquisition cost	Book value	Fair value
				In millions of won	
Woobang Construction Co., Ltd.	8	0.00%	8	8	8
Shin Pyung Co., Ltd.	6	0.03%	3	3	3
JMC Heavy Industries Co., Ltd.	2,724	0.10%	27	2	2
Najin Steel Co., Ltd.	37	0.06%	5	5	5
Sinkwang Industry Co., Ltd.	1,091	1.68%	5	5	5
Crystal Co., Ltd.	22	0.07%	2	2	2
Elephant & Friends Co., Ltd.	563	0.61%	3	3	3
Mireco Co., Ltd.	109	0.25%	11	11	11
L&K Industry Co., Ltd.	1,615	0.60%	24	24	24
JO Tech Co., Ltd.	1,263	0.62%	25	25	25
Kendae Printing Co., Ltd.	422	0.60%	21	21	21
Dauning Co., Ltd.	231	0.41%	6	6	6
Korea Trecision Co., Ltd.	22	0.45%	5	5	5
Ace Track Co., Ltd.	3,130	1.08%	219	59	59
Yoo-A Construction Co., Ltd.	105	0.20%	11	11	11
Dung Hwan Co., Ltd.	531	0.02%	5	5	5
Hurim Biocell Co., Ltd.	1,021	0.00%	5	5	5
Smart Power Co., Ltd.	133,333	4.35%	200	200	200
Sunjin Power Tech Co., Ltd.	4,941	0.92%	247	32	32
Haseung Industries Co., Ltd.	55	0.62%	28	28	28
Beer Yeast Korea Inc.	1,388	0.43%	7	7	7
Korea Bio Red Ginseng Co., Ltd.	194	0.09%	10	10	10
B CON Co., Ltd.	96	1.16%	6	6	6
SsangMa Machine Co., Ltd.	4	0.05%	1	1	1
Ace Integration Co., Ltd	105	0.09%	24	24	24
AceInti Agricultural Co., Ltd.	16	0.02%	5	5	5
KyungDong Co., Ltd.	130	0.01%	1	1	1
ChunWon Development Co., Ltd.	193	0.19%	39	39	39
WonIl Co., Ltd.	999	0.15%	50	50	50
SungLim Industrial Co., Ltd.	29	0.03%	1	1	1
Korea Minerals Co., Ltd.	191	0.05%	134	1	1
HyoDong Development Co., Ltd.	119	0.15%	24	24	24
Haspe Tech Co., Ltd.	652	0.55%	20	20	20
JoHyun Co., Ltd.	350	1.56%	18	18	18
KC Co., Ltd.	5,107	0.17%	26	26	26
SeongJi Industrial Co., Ltd.	41	0.05%	1	1	1
Dong Yang Metal Co., Ltd.	2,951	1.97%	161	147	147
Seyang Precision Ind. Co., Ltd.	829	0.23%	41	41	41
Dooriwon Food System Co., Ltd.	13	0.27%	1	1	1
ShinShin Co., Ltd	339	1.12%	17	17	17
Kitorang Co., Ltd.	165	0.24%	49	49	49
Sung Kwang Co., Ltd.	23	0.37%	6	6	6
Shinheung petrol. Co. Ltd.	699	0.14%	35	35	35
Force TEC Co., Ltd.	3,501	0.02%	18	18	18

Samsung Tech Co., Ltd.	486	1.28%	97	36	36
Tae Hyung Co., Ltd.	28	0.43%	20	20	20
Samyangplant Co., Ltd.	323	0.60%	16	16	16
Younil Metal Co., Ltd.	41	0.21%	21	21	21
Myungjin Tech Co., Ltd.	20	0.54%	4	4	4
Hankook Precision Ind Co., Ltd.	110	0.06%	11	11	11
Borneo International Furniture Co., Ltd.(*4)	4,000	0.16%	97	13	13
CJ Paradise Co., Ltd	24	0.02%	12	12	12
Han Young Technology Company Co., Ltd.	35	0.00%			

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	Shares	Ownership	2018 Acquisition cost	Book value	Fair value
			In millions of won		
STX Offshore & Shipbuilding Co., Ltd	8,622	0.25%	1,078	1,078	1,078
Ptotronics Co., Ltd.	843	0.42%	84	6	6
NFT Co., Ltd.	136	0.40%	8	8	8
Echoroba Co., Ltd.	157	0.02%	3	3	3
Hyundaitech Co., Ltd.	1,363	0.87%	27	27	27
Dasan Material Co. Ltd.	29	0.04%	22	22	22
Fish World Co., Ltd.	47	0.21%	2	2	2
SG Shinsung Engineering and Construction Co., Ltd.	10	0.00%	6	6	6
Samdo Industry Electric Co., Ltd.	48	0.02%	1	1	1
Taejung Industries Co., Ltd.	9,268	0.30%	5	5	5
Shinsei Trading Co., Ltd.	64	0.72%	6	6	6
Dynamic Co., Ltd.	111	0.19%	3	3	3
Green Alchemy Co., Ltd.	38,202	1.48%	191	17	17
Youone TBM Engineering & Construction Co., Ltd.	615	0.27%	31	31	31
KM Leatech	1,648	0.98%	8	8	8
Wonil T&I Co., Ltd.	229	0.17%	23	23	23
Semist Co., Ltd.	555	0.80%	3	3	3
DS POWER Co., Ltd.	580,000	2.34%	2,900	916	916
Sewon Bus Co., Ltd	12	0.00%			
Enertec Co., Ltd.	7,937	0.19%	44	44	44
Sangji Co., Ltd.	20	0.26%	4	4	4
Bellie Doughnuts Co., Ltd.	64	0.07%	4	4	4
Possbell Engineering Co., Ltd.	36	0.64%	1	1	1
AIRTECH Information communication Co., Ltd	2,379	0.60%	12	12	12
CST co., ltd.	4,998	0.28%	100	100	100
TN Inc.	1,416	2.00%	71	71	71
Shin kwang Industrial Co., Ltd.	884	0.35%	55	55	55
Kiscom Co., Ltd.	1,493	0.04%	1	1	1
Seil Electronics Co., Ltd.	2,285	0.41%	286	286	286
Wonil laser Co., Ltd	157	0.37%	16	16	16
Pyung Hwa Industrial Co., Ltd.	3,388	3.00%	85	85	85
Navanakorn Electric Co., Ltd.(*2)	4,442,800	26.93%	17,216	17,126	17,126
PT. Kedap Sayaaq	671	10.00%	18,540		
Set Holding(*3)	1,100,220	2.50%	229,255	161,983	161,983
PT. Cirebon Energi Prasarana	22,420	10.00%	2,612	2,507	2,507
KODE NOVUS 1 LLC(*5)		10.00%			
Choheung packing Co., Ltd.	61	0.13%	12	12	12
Jaewoo Co., Ltd.	359	0.24%	11	11	11
Wooyang HC Co., Ltd(*8)	1,375	0.01%	159	159	159
Sungsan Parts Co., Ltd.	629	0.80%	63	63	63
KMT Co., Ltd.	1,411	0.93%	21	21	21

TheYeonriji Co., Ltd.	116	0.10%	6	6	6
Flusys Co., Ltd.	9	0.08%	2	2	2
DaeSung Frontier Co., Ltd.	2,203	1.11%	221	221	221
DongSeo Electronics Co., Ltd.	323	0.07%	16	16	16
Daewoo Display Co., Ltd.	177	0.03%	5	5	5
Yeong-gwang Remicon Co., Ltd.	15	0.12%	2	2	2
NTS Co., Ltd.	143	0.22%	36	36	36
AID CO., LTD.	1,212	0.57%	36	36	36
Changwon Eco-friendly farming corporation	3	0.01%			

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	Shares	Ownership	2018 Acquisition cost	Book value	Fair value
				In millions of won	
Kumo Hitech Co., Ltd.	6,697	0.53%	100	100	100
Kyung Pyo Industry Co., Ltd.	186	0.76%	19	19	19
Daedong Industry Co., Ltd.	617	0.55%	46	46	46
Doosung Heavy Industries Co., Ltd.	53	0.06%	5	5	5
Jangback Testiles Co., Ltd.	494	5.05%	49	49	49
Samjoo Hightech Co., Ltd.	522	0.08%	3	3	3
Samkwang Chemical Co., Ltd.	204	1.27%	51	51	51
Taekwang Industry Co., Ltd.	1,327	0.48%	93	93	93
Taekwang Precision Co., Ltd.	54	0.47%	54	54	54
SG Corp.	213	0.54%	21	21	21
Shinseung Chemical Industry Co., Ltd.	5	0.01%	60	60	60
KJ Alloy Co., Ltd.	368	0.20%	7	7	7
SM Hi-tech Co., Ltd.	22	0.39%	22	22	22
Keum Mun Industry Co., Ltd.	1,320	0.97%	330	330	330
Puruen Environment Co., Ltd.	967	1.34%	19	19	19
Miretech Co., Ltd.	9,111	0.27%	18	18	18
SIE Co., Ltd.	12	0.02%	1	1	1
Soongwon Ind. Co., Ltd.	150	0.40%	53	53	53
Sejin Hightech Co., Ltd.	17,980	0.16%	18	18	18
Namcheong Corp.	7,096	0.28%	284	284	284
Eun Sung Enterprise Co.	1,131	0.72%	17	17	17
Dongdo Basalt Industry Co., Ltd.	182	1.50%	73	73	73
Shinyoung Textiles Co., Ltd.	523	1.01%	52	52	52
Bugook Cast Iron Co.	135	0.71%	14	14	14
Ilwoo Steel Co., Ltd.	41	0.28%	17	17	17
Dong-un Tech Co., Ltd.	1,159	6.28%	81	81	81
Wongwang Door Corp.	575	1.00%	29	29	29
			284,670	189,439	189,439
			650,513	399,495	399,495

(*1) The Company used initial cost as their fair value because there was not enough information to determine fair value, and the range of the estimated fair value is wide.

(*2) Although the Company holds more than 20% of the equity shares of these investments, the Company cannot exercise significant influence.

(*3) The Company has estimated the fair value of Set Holding by using the discounted cash flow method and has recognized the difference between its fair value and book value as gain or loss on valuation of financial

assets at FVOCI in other comprehensive income or loss during the year ended December 31, 2018.

(*4) The number of shares owned has changed due to capital reduction without refund (3:1), the stock merge (10,000:1) and the stock split (1:2,000) during the year ended December 31, 2018

(*5) As described in note 20, this is reclassified to financial assets at FVOCI due to loss of significant influence of the Company.

(*6) The number of shares owned has changed due to the stock merge (4:1) during the year ended December 31, 2018.

(*7) The number of shares owned has changed due to the stock merge (5:1) during the year ended December 31, 2018.

(*8) The number of shares owned has changed due to the stock merge (10:1) during the year ended December 31, 2018.

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11. Available-for-sale Financial Assets

(1) Changes in available-for-sale financial assets for the years ended December 31, 2017 are as follows:

	2017						
	Beginning balance	Acquisition	Disposal(*1)	Valuation	Impairment	Others	Ending balance
	In millions of won						
Listed	268,171	106		8,156	(97)	(1,883)	274,453
Unlisted	746,561	233,179	(461,423)	(2,908)	(2,616)	(87,413)	425,380
	1,014,732	233,285	(461,423)	5,248	(2,713)	(89,296)	699,833
Short-term available-for-sale financial assets							
Long-term available-for-sale financial assets	1,014,732	233,285	(461,423)	5,248	(2,713)	(89,296)	699,833

(*1) The Company recognized gain and loss on disposal of available-for-sale financial assets amounted to 1,130 million and 2,343 million, respectively, from the partial sales of Hanwha-KOSEP New Renewable Energy Private Special Assets Investment Trust 1 and others for the year ended December 31, 2017.

(2) Available-for-sale financial assets as of December 31, 2017 are as follows:

	2017				
	Shares	Ownership	Acquisition cost	Book value	Fair value
			In millions of won		
Listed					
Korea District Heating Corp.	2,264,068	19.55%	173,201	165,277	165,277
Ssangyong Motor Co., Ltd.	38,568	0.03%	428	197	197
Sungjee Construction. Co., Ltd.	10,530	0.01%	49	8	8
Korea Line Corp.	18	0.00%	1		
Namkwang Engineering & Construction Co., Ltd.	46	0.00%	15		
Bumyang Construction Co., Ltd.(*7)	35	0.00%	2		
ELCOMTEC Co., Ltd.	32,875	0.04%	217	72	72
PAN ocean Co., Ltd.	1,492	0.00%	14	8	8
Dongbu Corporation(*6)	955	0.02%	12	10	10
KSP Co., Ltd.	6,324	0.08%	24	24	24
STX Heavy Industries Co., Ltd.	35,749	0.14%	191	165	165

PT Adaro Energy Tbk	480,000,000	1.50%	71,554	70,531	70,531
Energy Fuels Inc.	1,711,814	2.38%	16,819	3,300	3,300
Baralaba Coal Company Limited	99,763	0.07%	18,445	22	22
Denison Mines Corp.	58,284,000	10.42%	84,134	34,292	34,292
Fission 3.0	300,000	0.14%		15	15
Fission Uranium Corp.	800,000	0.16%	785	532	532
			365,891	274,453	274,453
Unlisted(*1)					
Korea investment Korea EXIM Bank CERs Private Special Asset Investment Trust I	1,758,731,002	14.18%	1,752	571	
Troika Overseas Resource Development Private Equity Firm	13,340,012,100	3.66%	13,340	1,553	
IBK-AUCTUS Green Growth Private Equity Firm	152	6.29%	41	41	
Global Dynasty Overseas Resource Development Private Equity Firm	2,242,437,289	7.46%	2,242	2,242	

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	2017				
	Shares	Ownership	Acquisition cost	Book value	Fair value
			In millions of won		
Intellectual Discovery, Ltd.	1,000,000	8.81%	5,000	954	
Hanwha-KOSEP New Renewable Energy Private Special Assets Investment Trust 1	4,176,751,013	5.00%	4,328	4,328	
Construction Guarantee(*2)	571	0.02%	601	833	833
Plant & Mechanical Contractors Financial Cooperative of Korea	144	0.03%	126	126	
Fire Guarantee	40	0.01%	20	20	
Korea Software Financial Cooperative	5,186	1.09%	3,301	3,301	
Engineering Financial Cooperative	486	0.05%	60	60	
Electric Contractors Financial Cooperative	1,000	0.04%	216	216	
Korea Specialty Contractor Financial Cooperative	476	0.01%	417	417	
Information & Communication Financial Cooperative	121	0.02%	26	26	
Korea Electric Engineers Association	400	0.24%	40	40	
Samsung investment Investment Pool for Public funds 1(*5)			53,220	53,739	53,739
Korea investment Hanwha KT Master Lease Private Special Investment Trust(*5)			26,586	26,591	26,591
Kyobo Royal-Class Repo Plus Fixed Income 1Y 2nd(*5)			33,000	33,008	33,008
Kyobo Royal-Class Repo Plus Fixed Income 2Y 1st(*5)			50,000	50,399	50,399
Kyobo Royal-Class Repo Plus A1 ABCP 1Y(*5)			50,000	50,419	50,419
Hwan Young Steel Co., Ltd.	10,916	0.14%	1,092	97	
SAMBO AUTO. Co., Ltd.	15,066	0.02%	38	38	
Mobo Co., Ltd.	504	0.00%	14	14	
Dae Kwang Semiconductor Co., Ltd.	589	0.07%	6	6	
Sanbon Department Store	828	0.01%	124	3	
Miju Steel Mfg. Co., Ltd.	99,804	0.23%	50	50	
Sungwon Co., Ltd.	589	0.07%	15	15	
Hana Civil Engineering Co., Ltd.	23	0.00%	1	1	
KC Development Co., Ltd.	839	0.02%	6	6	
IMHWA Corp.	329	0.11%	5	5	
DALIM Special Vehicle Co., Ltd.	58	0.08%	10	10	
ASA JEONJU Co., Ltd.	34,846	1.34%	697	69	
Moonkyung Silica Co., Ltd.	42	0.56%			
Sungkwang Timber Co., Ltd.	9	0.34%	4	4	
Yongbo Co., Ltd.	61	0.20%	3	3	
HJ Steel Co., Ltd.	218	0.07%	2	2	
KS Remicon Co., Ltd.	12	0.04%	3	3	
Joongang Platec Co., Ltd.	3,591	0.75%	72	35	

Pyungsan SI Ltd.	434	0.01%	9	9
Samgong Development Co., Ltd.	12	0.01%	7	7
Joongang Development Co., Ltd.	540	0.12%	8	8
AJS Co., Ltd.	12,906	0.23%	32	32
SHIN-E B&P Co., Ltd.	119	0.13%	10	10
MSE Co., Ltd.	429	0.13%	9	9
Ilrim Nano Tec Co., Ltd.	1,520	0.07%	15	15
Youngjin Hi-Tech Co., Ltd.	2,512	0.25%	126	21
Buyoung Co., Ltd.	270	0.00%	3	3

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	Shares	Ownership	2017 Acquisition cost	Book value	Fair value
			In millions of won		
Ilsuk Co., Ltd.	152	0.17%	10	10	
Dongyang Telecom Co., Ltd.	1,760	0.01%	11	11	
Jongwon Remicon Co., Ltd.	31	0.18%	13	13	
Ace Heat Treating Co., Ltd.	477	1.43%	72	72	
Zyle Daewoo Motor Sales Co., Ltd.	22	0.00%			
Daewoo Development Co., Ltd.	8	0.00%			
Seyang Inc.	537	0.05%	27	27	
Seungri Enterprise Co., Ltd.	93	0.05%	3	3	
Onggane Food Co., Ltd	5	0.07%	1	1	
Shin-E P&C Co., Ltd.	12	0.00%	1	1	
Ejung Ad Co., Ltd.	132	0.09%	3	3	
Solvus Co., Ltd.	1,056	0.04%	3	3	
Myung Co., Ltd.	89	0.05%	2	2	
Shinil Engineering Co., Ltd.	887	0.06%	3	3	
Biwang Industry Co., Ltd	406	0.04%	2	2	
Huimun Co., Ltd.	263	0.26%	4	4	
Young Sung Co., Ltd.	89	0.40%	26	26	
Yuil Industrial Electronics Co., Ltd.	804	0.32%	15	15	
DN TEK Inc.	12,401	0.29%	61	5	
Kwang Jin Structure Co., Ltd.	3,072	0.60%	31	31	
Woojin Industry Corporation	3	0.00%	16	16	
Kwang Sung Industry Co., Ltd.	325	0.35%	7	7	
Futech Mold Co., Ltd.	274	0.27%	14	14	
Woojoo Environment Ind. Co., Ltd.	101	0.11%	13	13	
CHONGATTI Agricultural Co., Inc.	57	0.10%	4	4	
Hyungji Esquire Co., Ltd.	55	0.02%	22	22	
Kolmar Pharma Co., Ltd.	1,426	0.01%	52	3	
Morado Co., Ltd.	209	0.04%	2	2	
Myung Sung Tex Co., Ltd.	20	0.00%	2	2	
Kwang Sung Co., Ltd.	610	0.53%	31	31	
EverTechno. Co., Ltd.	29,424	0.73%	148	7	
Autowel Co., Ltd.	260	0.38%	14	14	
Woobang Construction Co., Ltd.	8	0.00%	8	8	
Shin Pyung Co., Ltd.	6	0.03%	3	3	
JMC Heavy Industries Co., Ltd.	2,724	0.10%	27	27	
Najin Steel Co., Ltd.	37	0.06%	5	5	
Sinkwang Industry Co., Ltd.	1,091	1.68%	5	5	
Crystal Co., Ltd.	22	0.07%	2	2	
Elephant & Friends Co., Ltd.	563	0.61%	3	3	
Mireco Co., Ltd.	109	0.25%	11	11	
L&K Industry Co., Ltd.	1,615	0.60%	24	24	
JO Tech Co., Ltd.	1,263	0.62%	25	25	
Kendae Printing Co., Ltd.	422	0.60%	21	21	
Dauning Co., Ltd.	231	0.41%	6	6	

Korea Trecision Co., Ltd.	22	0.45%	5	5
Ace Track Co., Ltd.	3,130	1.08%	219	59
Taebok Machinery Co., Ltd.	109	1.08%	11	11
Yoo-A Construction Co., Ltd.	105	0.20%	11	11
Dung Hwan Co., Ltd.	531	0.02%	5	5
Hurim Biocell Co., Ltd.	113	0.00%	5	5
Sunjin Power Tech Co., Ltd.	4,941	0.92%	247	32
Smart Power Co., Ltd.	133,333	4.83%	200	200

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	Shares	Ownership	2017 Acquisition cost	Book value	Fair value
			In millions of won		
Haseung Industries Co., Ltd.	55	0.62%	28	28	
Beer Yeast Korea Inc.	1,388	0.43%	7	7	
Daeryung Corporation	207	0.19%	10	10	
Korea Bio Red Ginseng Co., Ltd.	194	0.09%	10	10	
ENH Co., Ltd.	1,086	0.19%	54	54	
B CON Co., Ltd.	96	1.16%	6	6	
Chunil Metal Co., Ltd.	11	0.15%	4	4	
SsangMa Machine Co., Ltd.	4	0.05%	1	1	
SinJin Co., Ltd.	233	0.30%	9	9	
Ace Integration Co., Ltd	105	0.09%	24	24	
AceInti Agricultural Co., Ltd.	16	0.02%	5	5	
KyungDong Co., Ltd.	130	0.01%	1	1	
ChunWon Development Co., Ltd.	193	0.19%	39	39	
WonIl Co., Ltd.	999	0.15%	50	50	
SungLim Industrial Co., Ltd.	29	0.03%	1	1	
Korea Minerals Co., Ltd.	191	0.05%	134	1	
HyoDong Development Co., Ltd.	119	0.15%	24	24	
Haspe Tech Co., Ltd.	652	0.55%	20	20	
JoHyun Co., Ltd.	350	1.56%	18	18	
KC Co., Ltd.	5,107	0.17%	3	3	
SeongJi Industrial Co., Ltd.	41	0.05%	1	1	
DongKwang SD, Inc.	524	0.23%	13	13	
Dong Yang Metal Co., Ltd.	2,951	1.97%	15	15	
Seyang Precision Ind. Co., Ltd.	829	0.23%	41	41	
Dooriwon Food System Co., Ltd.	13	0.27%	1	1	
ShinShin Co., Ltd	339	1.12%	17	17	
Kitorang Co., Ltd.	165	0.24%	49	49	
Sung Kwang Co., Ltd.	23	0.37%	6	6	
Hyundai Metal Co., Ltd.	3,757	5.60%	1,416	1,416	
Shinheung petrol. Co. Ltd.	699	0.14%	7	7	
Force TEC Co., Ltd.	3,501	0.02%	18	18	
Haisung TPC Co., Ltd.	10,751	0.24%	54	54	
Samsung Tech Co., Ltd.	486	1.28%	97	97	
Tae Hyung Co., Ltd.	28	0.43%	20	20	
Samyangplant Co., Ltd.	323	0.60%	16	16	
Younil Metal Co., Ltd.	41	0.21%	21	21	
Myungjin Tech Co., Ltd.	20	0.54%	4	4	
Hankook Machine Tools Co., Ltd.	719	0.14%	72	72	
Hankook Precision Ind Co., Ltd.	110	0.06%	11	11	
Borneo International Furniture Co., Ltd.	64,037	0.28%	97	14	
CJ Paradise Co., Ltd	24	0.02%	12	12	
Han Young Technology Company Co., Ltd.	35	0.00%			
Jungdo Aluminium Co., Ltd.	8,527	0.35%	128	128	
Ilheung Metal Co, Ltd.	280	0.83%	28	28	

STX Offshore & Shipbuilding Co., Ltd	8,622	0.25%	1,078	1,078
Ptotronics Co., Ltd.	151	0.07%	2	2
NFT Co., Ltd.	136	0.40%	8	8
Echoroba Co., Ltd.	157	0.02%	3	3
Hyundaitech Co., Ltd.	1,363	0.87%	27	27
Eco Alux Co., Ltd.	239	0.22%	48	48
Daekyung Industry Co., Ltd.	9,112	0.94%	13	13
Dasan Material Co. Ltd.	29	0.04%		

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	Shares	Ownership	2017 Acquisition cost	Book value	Fair value
			In millions of won		
Fish World Co., Ltd.	47	0.21%	2	2	
SG Shinsung Engineering and Construction Co., Ltd.	10	0.00%	6	6	
Samdo Industry Electric Co., Ltd.	48	0.02%	1	1	
Taejung Industries Co., Ltd.	9,268	0.30%	5	5	
Shinsei Trading Co., Ltd.	64	0.72%	1	1	
Dynamic Co., Ltd.	111	0.19%	3	3	
Green Alchemy Co., Ltd.	38,202	1.48%	191	191	
IQ Power Asia Inc.	16,179	0.31%	81	81	
Youone TBM Engineering & Construction Co., Ltd.	227,854	0.27%	31	31	
KM Leatech	1,648	0.98%	8	8	
Wonil T&I Co., Ltd.	229	0.17%	23	23	
Semist Co., Ltd.	555	0.80%	3	3	
DS POWER Co., Ltd.(*8)	580,000	2.34%	2,900	1,223	1,223
Navanakorn Electric Co., Ltd.(*3)	4,442,800	26.93%	17,216	16,410	
PT. Kedap Sayaaq	671	10.00%	18,540		
Set Holding(*4)	1,100,220	2.50%	229,255	171,242	171,242
PT. Cirebon Energi Prasarana	22,420	10.00%	2,612	2,401	
			522,782	425,380	387,454
			888,673	699,833	661,907

(*1) Investments in unlisted equity securities held by the Company for which a quoted market price does not exist in an active market and fair value cannot be measured reliably were measured at cost less impairment, if any.

(*2) The Company has estimated the fair value of the investment in Construction Guarantee based upon the price which would be applied when the investment is returned. The Company has recognized the difference between its fair value and book value as a gain or loss on valuation of available-for-sale financial assets in other comprehensive income or loss during the year ended December 31, 2017.

(*3) Although the Company holds more than 20% of the equity shares of these investments, the Company cannot exercise significant influence.

(*4) The Company has estimated the fair value of Set Holding by using the discounted cash flow method and has recognized the difference between its fair value and book value as gain or loss on valuation of available-for-sale financial assets in other comprehensive income or loss during the year ended December 31, 2017.

(*5) As of December 31, 2017, the Company invested in 214,156 million as beneficiary securities exclusively for payment of decommissioning cost of nuclear power plants. The Company has measured the fair value of the beneficiary securities based on its net asset value.

(*6) The number of shares owned has changed due to the stock merge (9:7) during the year ended December 31, 2017.

(*7) The number of shares increased due to the stock split (5:1).

(*8) As described in note 20, this is reclassified to available-for-sale financial assets due to loss of significant influence of the Company.

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12. Financial Assets at Amortized Cost

Financial assets at amortized cost as of December 31, 2018 are as follows:

	2018				
	Financial assets at amortized cost	Government grants	Allowance for doubtful accounts	Others	Book value
	In millions of won				
Government bonds	3,042				3,042
Financial bonds	11,000				11,000
	14,042				14,042
Current	11,956				11,956
Non-current	2,086				2,086

13. Held-to-maturity Investments

Held-to-maturity investments as of December 31, 2017 are as follows:

	2017				
	Beginning balance	Acquisition	Disposal	Others	Ending balance
	In millions of won				
Government bonds	3,244	250	(350)		3,144
	3,244	250	(350)		3,144
Current	114		(113)	4	5
Non-current	3,130	250	(237)	(4)	3,139

14. Derivatives

(1) Derivatives as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Current	Non-current	Current	Non-current
	In millions of won			
Derivative assets				
Currency forward	45		2,128	12,606
Currency swap	12	15,711	39,979	43,436
Interest rate swap		2,697		2,342
Others(*1)	12,878	1,283		1,844

	12,935	19,691	42,107	60,228
Derivative liabilities				
Currency forward	7,862	1,278	1,956	
Currency swap	61,997	296,098	14,881	233,690
Interest rate swap	1,408	59,416	1,439	58,042
Others(*2)			2,155	
	71,267	356,792	20,431	291,732

(*1) The Company has a put option to sell shares of DS POWER Co., Ltd. and the fair value of the option is recorded in Others .

(*2) The Company has an obligation to settle the convertible preferred stock to financial investors pursuant to the settlement contract with Samcheok Eco Materials Co., Ltd. and the fair value of the obligation is recorded in Others .

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(2) Currency forward contracts which are not designated as hedge instruments as of December 31, 2018 are as follows:

Counterparty	Contract date	Maturity date	Contract amounts		Contract exchange rate (in won)
			Pay	Receive	
	In millions of won and thousands of foreign currencies except contract exchange rate information				
KEB Hana Bank	2014.04.10	2021.07.12	55,120	USD 52,000	1,060.00
KEB Hana Bank	2014.04.28	2021.07.12	50,784	USD 48,000	1,058.00
Bank of America	2014.04.29	2021.07.12	105,400	USD 100,000	1,054.00
KEB Hana Bank	2014.05.09	2021.07.12	104,600	USD 100,000	1,046.00
KEB Hana Bank	2017.12.22	2021.07.12	105,079	USD 100,000	1,050.79
Korea Development Bank	2017.12.27	2021.07.12	104,849	USD 100,000	1,048.49
Mizuho Bank	2018.11.28	2019.01.02	6,768	USD 6,000	1,127.95
Mizuho Bank	2018.12.07	2019.01.11	11,169	USD 10,000	1,116.90
CCB	2018.12.11	2019.01.14	11,280	USD 10,000	1,127.96
Nonghyup Bank	2018.12.17	2019.01.22	11,295	USD 10,000	1,129.45
Korea Development Bank	2018.12.18	2019.01.22	11,279	USD 10,000	1,127.85
Morgan Stanley	2018.12.19	2019.01.23	11,233	USD 10,000	1,123.30
Standard Chartered	2018.12.19	2019.01.24	11,235	USD 10,000	1,123.50
Kookmin Bank	2018.12.20	2019.01.28	11,273	USD 10,000	1,127.25
Woori Bank	2018.12.20	2019.01.28	11,272	USD 10,000	1,127.15
KEB Hana Bank	2018.12.21	2019.01.29	13,459	USD 12,000	1,121.60
Morgan Stanley	2018.12.24	2019.01.30	11,289	USD 10,000	1,128.87
CCB	2018.12.26	2019.01.31	11,246	USD 10,000	1,124.60
Standard Chartered	2018.12.26	2019.01.31	5,624	USD 5,000	1,124.75
Nonghyup Bank	2018.12.27	2019.02.01	5,610	USD 5,000	1,121.90
KEB Hana Bank	2018.12.27	2019.02.01	5,606	USD 5,000	1,121.15
Standard Chartered	2018.12.28	2019.02.07	5,589	USD 5,000	1,117.80
KEB Hana Bank	2018.12.28	2019.02.07	5,584	USD 5,000	1,116.70
Mizuho Bank	2018.12.28	2019.02.07	11,172	USD 10,000	1,117.15
Societe Generale	2018.11.29	2019.01.04	11,206	USD 10,000	1,120.60
ING Bank	2018.12.20	2019.01.15	11,279	USD 10,000	1,127.89
ING Bank	2018.12.26	2019.01.23	11,248	USD 10,000	1,124.77
Nova Scotia	2018.12.07	2019.01.10	14,518	USD 13,000	1,116.80
Mizuho Bank	2018.12.06	2019.01.04	11,167	USD 10,000	1,116.67
Credit Agricole	2018.12.27	2019.01.23	11,208	USD 10,000	1,120.75
Korea Development Bank	2018.12.13	2019.01.10	4,490	USD 4,000	1,122.60
Korea Development Bank	2018.12.24	2019.01.10	13,497	USD 12,000	1,124.74
Korea Development Bank	2018.12.21	2019.01.15	10,103	USD 9,000	1,122.50
Korea Development Bank	2018.12.27	2019.01.23	11,207	USD 10,000	1,120.68
Korea Development Bank	2018.12.28	2019.01.23	13,412	USD 12,000	1,117.64
Societe Generale	2018.12.19	2019.01.21	7,853	USD 7,000	1,121.85
Societe Generale	2018.12.21	2019.01.28	8,974	USD 8,000	1,121.75
MUFG	2018.12.19	2019.01.21	6,730	USD 6,000	1,121.70

MUFG	2018.12.28	2019.02.07	8,929	USD 8,000	1,116.15
Nova Scotia	2018.12.19	2019.01.22	4,486	USD 4,000	1,121.50
Nova Scotia	2018.12.21	2019.01.28	8,976	USD 8,000	1,121.95
Nova Scotia	2018.12.27	2019.01.31	7,832	USD 7,000	1,118.90
Nonghyup Bank	2018.12.28	2019.02.07	10,041	USD 9,000	1,115.70
BNP Paribas	2018.12.28	2019.02.07	8,930	USD 8,000	1,116.30
CCB	2018.12.28	2019.02.07	7,812	USD 7,000	1,116.05

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Counterparty	Contract date	Maturity date	Contract amounts		Contract exchange rate (in won)
			Pay	Receive	
	In millions of won and thousands of foreign currencies except contract exchange rate information				
Credit Agricole	2018.12.28	2019.02.07	7,812	USD 7,000	1,115.95
KEB Hana Bank	2018.12.05	2019.01.07	16,697	USD 15,000	1,113.15
KEB Hana Bank	2018.12.07	2019.01.07	15,672	USD 14,000	1,119.43
Busan Bank	2018.12.28	2019.01.07	6,477	USD 5,800	1,116.70
Nonghyup Bank	2018.12.12	2019.01.07	3,380	USD 3,000	1,126.60
KEB Hana Bank	2018.12.13	2019.01.15	7,849	USD 7,000	1,121.25
Shinhan Bank	2018.12.20	2019.01.22	29,320	USD 26,000	1,127.68
Nonghyup Bank	2018.12.28	2019.02.15	53,666	USD 48,000	1,118.05
Credit Agricole	2018.11.02	2019.02.07	3,039	USD 2,729	1,113.60
Credit Agricole	2018.11.05	2019.02.07	5,564	USD 5,000	1,112.70
Nova Scotia	2018.11.07	2019.02.13	5,567	USD 5,000	1,113.40
Nova Scotia	2018.11.07	2019.02.13	4,458	USD 4,000	1,114.40
Societe Generale	2018.11.29	2019.03.04	5,568	USD 5,000	1,113.50
Societe Generale	2018.11.29	2019.03.04	3,674	USD 3,297	1,114.50
Credit Agricole	2018.12.03	2019.03.05	256	USD 231	1,109.10
Nova Scotia	2018.12.04	2019.03.06	5,522	USD 5,000	1,104.30
Nova Scotia	2018.12.04	2019.03.06	5,527	USD 5,000	1,105.30
Nova Scotia	2018.12.20	2019.03.26	5,589	USD 5,000	1,117.80
Nova Scotia	2018.12.20	2019.03.26	1,751	USD 1,565	1,118.80
Nova Scotia	2018.12.28	2019.04.02	5,565	USD 5,000	1,113.00
Nova Scotia	2018.12.28	2019.04.02	5,569	USD 5,000	1,113.80
Nova Scotia	2018.12.28	2019.04.02	5,576	USD 5,000	1,115.20
Nova Scotia	2018.12.28	2019.04.03	5,553	USD 5,000	1,110.60
Nova Scotia	2018.12.28	2019.04.03	5,558	USD 5,000	1,111.60
Nova Scotia	2018.12.28	2019.04.03	5,563	USD 5,000	1,112.60

(3) Currency swap contracts which are not designated as hedge instruments as of December 31, 2018 are as follows:

Counterparty	Contract year	Contract amount		Contract interest rate		Contract exchange rate (in won)
		Pay	Receive	Pay	Receive	
	In millions of won and thousands of foreign currencies except contract exchange rate information					
Credit Suisse	2014~2019	118,632	CHF 100,000	2.98%	1.50%	1,186.32

Standard Chartered	2014~2019	114,903	CHF 100,000	4.00%	1.50%	1,149.03
Standard Chartered	2014~2029	102,470	USD 100,000	3.14%	3.57%	1,024.70
Societe Generale	2014~2024	105,017	USD 100,000	4.92%	5.13%	1,050.17
KEB Hana Bank	2015~2024	107,970	USD 100,000	4.75%	5.13%	1,079.70
Credit Agricole	2015~2024	94,219	USD 86,920	4.85%	5.13%	1,083.97
Citibank	2012~2022	112,930	USD 100,000	2.79%	3.00%	1,129.30
JP Morgan	2012~2022	112,930	USD 100,000	2.79%	3.00%	1,129.30
Bank of America	2012~2022	112,930	USD 100,000	2.79%	3.00%	1,129.30
Shinhan Bank	2016~2022	112,930	USD 100,000	2.79%	3.00%	1,129.30
HSBC	2012~2022	111,770	USD 100,000	2.89%	3.00%	1,117.70
KEB Hana Bank	2012~2022	111,770	USD 100,000	2.87%	3.00%	1,117.70
Standard Chartered	2012~2022	111,770	USD 100,000	2.89%	3.00%	1,117.70
Deutsche Bank	2012~2022	55,885	USD 50,000	2.79%	3.00%	1,117.70
HSBC	2014~2019	105,260	USD 100,000	2.48%	2.38%	1,052.60

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Counterparty	Contract year	Contract amount		Contract interest rate		Contract exchange rate (in won)
		Pay	Receive	Pay	Receive	
		In millions of won and thousands of foreign currencies except contract exchange rate information				
Standard Chartered	2014~2019	105,260	USD 100,000	2.48%	2.38%	1,052.60
Korea Development Bank	2016~2019	105,260	USD 100,000	2.48%	2.38%	1,052.60
Nomura	2015~2025	111,190	USD 100,000	2.60%	3.25%	1,111.90
Korea Development Bank	2015~2025	111,190	USD 100,000	2.62%	3.25%	1,111.90
Woori Bank	2015~2025	55,595	USD 50,000	2.62%	3.25%	1,111.90
KEB Hana Bank	2015~2025	55,595	USD 50,000	2.62%	3.25%	1,111.90
Woori Bank	2017~2027	111,610	USD 100,000	2.25%	3.13%	1,116.10
Korea Development Bank	2017~2027	111,610	USD 100,000	2.31%	3.13%	1,116.10
KEB Hana Bank	2017~2027	111,610	USD 100,000	2.31%	3.13%	1,116.10
Korea Development Bank	2018~2028	108,600	HKD 800,000	2.69%	3.35%	135.75
Shinhan Bank	2018~2028	115,387	HKD 850,000	2.66%	3.35%	135.75
Korea Development Bank	2018~2023	170,280	USD 150,000	2.15%	3.75%	1,135.20
Woori Bank	2018~2023	170,280	USD 150,000	2.18%	3.75%	1,135.20
KEB Hana Bank	2018~2023	113,520	USD 100,000	2.17%	3.75%	1,135.20
Shinhan Bank	2018~2023	227,040	USD 200,000	2.17%	3.75%	1,135.20

(4) Currency swap contracts which are designated as hedge instruments as of December 31, 2018 are as follows:

Counterparty	Contract year	Contract amount		Contract interest rate		Contract exchange rate (in won)
		Pay	Receive	Pay	Receive	
		In millions of won and thousands of foreign currencies except contract exchange rate information				
HSBC	2014~2020	99,901	AUD 100,000	3.52%	5.75%	999.01
HSBC	2014~2020	100,482	AUD 100,000	3.48%	5.75%	1,004.82
Standard Chartered	2013~2020	USD 117,250	AUD 125,000	3M Libor+1.25%	5.75%	0.94
Standard Chartered	2014~2020	126,032	USD 117,250	3.55%	3M Libor+1.25%	1,074.90
Korea Development Bank	2017~2020	114,580	USD 100,000	1.75%	2.38%	1,145.80
KEB Hana Bank	2017~2020	114,580	USD 100,000	1.75%	2.38%	1,145.80
Export-import bank of Korea	2017~2020	114,580	USD 100,000	1.75%	2.38%	1,145.80
JP Morgan	2014~2019	107,190	USD 100,000	3M Libor+3.25%	2.75%	1,071.90
Morgan Stanley	2014~2019	107,190	USD 100,000	3M Libor+3.25%	2.75%	1,071.90
Deutsche Bank	2014~2019	107,190	USD 100,000	3M Libor+3.25%	2.75%	1,071.90

Korea Development Bank	2016~2021	121,000	USD 100,000	2.15%	2.50%	1,210.00
Morgan Stanley	2016~2021	121,000	USD 100,000	3M Libor+2.10%	2.50%	1,210.00
BNP Paribas	2016~2021	121,000	USD 100,000	3M Libor+2.10%	2.50%	1,210.00
Nomura	2017~2037	52,457	EUR 40,000	2.60%	1.70%	1,311.42
Nomura	2017~2037	59,423	SEK 450,000	2.62%	2.36%	132.05
Credit Agricole	2013~2019	118,343	CHF 100,000	3.47%	1.63%	1,183.43
Morgan Stanley	2013~2019	59,172	CHF 50,000	3.40%	1.63%	1,183.43
Nomura	2013~2019	59,172	CHF 50,000	3.47%	1.63%	1,183.43
Standard Chartered	2014~2019	104,490	USD 100,000	2.77%	2.63%	1,044.90
Credit Agricole	2014~2019	104,490	USD 100,000	2.77%	2.63%	1,044.90
Morgan Stanley	2014~2019	104,490	USD 100,000	2.70%	2.63%	1,044.90
Korea Development Bank	2018~2023	320,880	USD 300,000	2.03%	3.75%	1,069.60
KEB Hana Bank	2018~2021	212,960	USD 200,000	2.10%	3.00%	1,064.80

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Counterparty	Contract year	Contract amount		Contract interest rate		Contract exchange rate (in won)
		Pay	Receive	Pay	Receive	
		In millions of won and thousands of foreign currencies except contract exchange rate information				
Korea Development Bank	2018~2021	212,960	USD 200,000	2.10%	3.00%	1,064.80
Credit Agricole	2014~2020	110,680	USD 100,000	2.29%	2.50%	1,106.80
Societe Generale	2014~2020	55,340	USD 50,000	2.16%	2.50%	1,106.80
KEB Hana Bank	2014~2020	55,340	USD 50,000	2.16%	2.50%	1,106.80
KEB Hana Bank	2014~2020	55,340	USD 50,000	2.21%	2.50%	1,106.80
Standard Chartered	2014~2020	55,340	USD 50,000	2.21%	2.50%	1,106.80
HSBC	2014~2020	55,340	USD 50,000	2.21%	2.50%	1,106.80
Nomura	2014~2020	55,340	USD 50,000	2.21%	2.50%	1,106.80
BNP Paribas	2014~2020	55,340	USD 50,000	2.21%	2.50%	1,106.80
HSBC	2014~2020	55,340	USD 50,000	2.21%	2.50%	1,106.80
KEB Hana Bank	2017~2022	226,600	USD 200,000	1.94%	2.63%	1,133.00
Korea Development Bank	2017~2022	113,300	USD 100,000	1.94%	2.63%	1,133.00
Nomura	2017~2022	113,300	USD 100,000	1.95%	2.63%	1,133.00
Woori Bank	2017~2022	56,650	USD 50,000	1.95%	2.63%	1,133.00
Kookmin Bank	2017~2022	56,650	USD 50,000	1.95%	2.63%	1,133.00
Korea Development Bank	2018~2023	169,335	USD 150,000	2.26%	3.88%	1,128.90
Woori Bank	2018~2023	169,335	USD 150,000	2.26%	3.88%	1,128.90
Credit Agricole	2018~2023	112,890	USD 100,000	2.26%	3.88%	1,128.90
KEB Hana Bank	2018~2023	56,445	USD 50,000	2.26%	3.88%	1,128.90
Kookmin Bank	2018~2023	56,445	USD 50,000	2.26%	3.88%	1,128.90

(5) Interest rate swap contracts which are not designated as hedge instruments as of December 31, 2018 are as follows:

Counterparty	Contract year	Contract amount In millions of won and thousands of USD	Contract interest rate per annum Pay	Receive
KEB Hana Bank	2017~2022	100,000	2.01%	3M CD+0.24%
KEB Hana Bank	2017~2022	100,000	2.06%	3M CD+0.27%
Nomura(*1)	2017~2037	30,000	2.05%	3.08%
KEB Hana Bank	2017~2021	200,000	2.45%	3M CD+0.32%
Nomura(*2)	2018~2038	30,000	2.56%	3.75%
KEB Hana Bank	2018~2023	200,000	2.15%	3M CD+0.19%
KEB Hana Bank	2018~2023	200,000	2.17%	3M CD+0.19%
KEB Hana Bank	2018~2023	150,000	2.03%	3M CD+0.21%
Societe Generale	2017~2022	200,000	3M Libor+3.44%	3.77%
Export-import bank of Korea	2015~2031	USD 15,893	2.67%	6M USD Libor
ING Bank	2015~2031	USD 7,861	2.67%	6M USD Libor
BNP Paribas	2015~2031	USD 7,861	2.67%	6M USD Libor

(*1) 2.05% of the contract paying interest rate is applied for five years from the date of issuance, and 3M CD+0.10% is applied thereafter.

(*2) 2.56% of the contract paying interest rate is applied for five years from the date of issuance, and 3M CD+0.10% is applied thereafter.

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(6) Interest rate swap contracts which are designated as hedge instruments as of December 31, 2018 are as follows:

Counterparty	Contract year	Contract amount In millions of won and thousands of USD	Contract interest rate per annum Pay	Receive
BNP Paribas	2009~2027	USD 92,120	4.16%	6M USD Libor
KFW	2009~2027	USD 92,120	4.16%	6M USD Libor
Credit Agricole	2018~2033	USD 92,686	3.98%~4.10%	6M USD Libor
SMBC	2018~2033	USD 121,205	4.05%~4.18%	6M USD Libor
Mizuho Bank	2016~2019	USD 36,890	1.56%	1.65%
SMBC	2016~2019	USD 36,890	1.56%	1.65%
Export-import bank of Korea	2016~2036	USD 2,564	3.00%	4.99%

(7) Gain and loss on valuation and transaction of derivatives for the years ended December 31, 2016, 2017 and 2018 are as follows and included in finance income and costs in the consolidated statements of comprehensive income (loss):

	Net income effects of valuation gain (loss)			Net income effects of transaction gain (loss)			Accumulated other comprehensive income (loss) (*)		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
	In millions of won								
Currency forward	15,993	(41,889)	12,632	4,266	(28,223)	23,991			
Currency swap	253,035	(843,747)	145,088	(68,266)	(137,376)	123,670	40,031	26,810	(12,516)
Interest rate swap	8,517	6,909	(2,949)	7,562	(3,362)	(364)	6,719	5,074	6,087
Other derivatives	10,523	4,060	(1,568)						
	288,068	(874,667)	153,203	(56,438)	(168,961)	147,297	46,750	31,884	(6,429)

(*) For the year ended December 31, 2018, the net gain on valuation of derivatives applying cash flow hedge accounting of 211 million, net of tax, is included in other comprehensive income or loss.

15. Other Financial Assets

(1) Other financial assets as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Current	Non-current	Current	Non-current
	In millions of won			
Loans and receivables	244,309	711,069	123,657	639,673
Allowance for doubtful accounts		(8,948)	(12)	(4,940)
Present value discount	(976)	(39,813)	(992)	(38,712)
Long-term / short-term financial instruments(*1)	1,702,084	542,430	1,869,286	448,741
Financial assets at fair value through profit or loss(*1)		111,512		
	1,945,417	1,316,250	1,991,939	1,044,762

(*1) Certain financial assets at fair value previously recognized as other financial assets is reclassified to financial assets at fair value through profit or loss upon the adoption of IFRS 9 Financial Instruments .

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(2) Loans and receivables as of December 31, 2017 and 2018 are as follows:

	2017			
	Face value	Allowance for doubtful accounts	Present value discount	Book value
	In millions of won			
Short-term loans and receivables				
Loans for tuition	33,763		(976)	32,787
Loans for housing	14,126			14,126
Fisheries loan	352			352
Other loans	196,068			196,068
	244,309		(976)	243,333
Long-term loans and receivables				
Loans for tuition	408,803		(39,716)	369,087
Loans for housing	140,452			140,452
Loans for related parties	94,581	(8,948)		85,633
Fisheries loan	960		(97)	863
Other loans	66,273			66,273
	711,069	(8,948)	(39,813)	662,308
	955,378	(8,948)	(40,789)	905,641

	2018			
	Face value	Allowance for doubtful accounts	Present value discount	Book value
	In millions of won			
Short-term loans and receivables				
Loans for tuition	33,333		(992)	32,341
Loans for housing	15,572			15,572
Fisheries loan	320			320
Other loans	74,432	(12)		74,420
	123,657	(12)	(992)	122,653
Long-term loans and receivables				
Loans for tuition	414,893		(38,659)	376,234
Loans for housing	167,723			167,723
Loans for related parties	46,798	(4,930)		41,868
Fisheries loan	640		(53)	587
Other loans	9,619	(10)		9,609
	639,673	(4,940)	(38,712)	596,021

	763,330	(4,952)	(39,704)	718,674

(3) Changes in the allowance for doubtful accounts of loans for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Beginning balance		4,532	8,948
Bad debt expense	4,352	2,465	22
Other	180	1,951	(4,018)
Ending balance	4,532	8,948	4,952

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(4) Long-term and short-term financial instruments as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Current	Non-current	Current	Non-current
	In millions of won			
Time deposits	1,479,034	2	1,602,285	63,358
ABCP	145,000	65,600		
CP	58,050			
CD	10,000		10,000	
RP	10,000	1,634		
Others		475,194	257,001	385,383
	1,702,084	542,430	1,869,286	448,741

16. Inventories

Inventories as of December 31, 2017 and 2018 are as follows:

	2017		
	Acquisition cost	Valuation allowance	Book value
	In millions of won		
Raw materials	3,528,835	(2,829)	3,526,006
Merchandise	107		107
Work-in-progress	138,709	(1,028)	137,681
Finished goods	72,923	(1,517)	71,406
Supplies	1,581,661	(3,940)	1,577,721
Inventories in transit	679,358		679,358
Other inventories	9,807		9,807
	6,011,400	(9,314)	6,002,086

	2018		
	Acquisition cost	Valuation allowance	Book value
	In millions of won		
Raw materials	3,886,739	(2,609)	3,884,130
Work-in-progress	189,907	(1,028)	188,879
Finished goods	50,526		50,526
Supplies	1,858,751	(3,907)	1,854,844
Inventories in transit	1,196,113		1,196,113
Other inventories	13,761		13,761

	7,195,797	(7,544)	7,188,253

The reversals of the allowance for loss on inventory valuation due to increase in the net realizable value of inventory deducted from cost of sales for the years ended December 31, 2016, 2017 and 2018 were 2,473 million, 437 million and 3,723 million, respectively.

The amounts of loss from inventory valuation included in other gains or losses for the years ended December 31, 2016, 2017 and 2018 were 2,683 million, 3,875 million and 1,953 million, respectively.

17. Finance Lease Receivables

(1) Finance lease contracts

The Company entered into a power purchase agreement (PPA) with Jordan Electric Power Company to provide a 373MW level Qatrana gas combined power plant over a 25 year lease term, and accounts for the

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PPA as a finance lease. Also, the Company has fly-ash pipe conduit finance leases with an average lease term of 7 years. In addition, the Company provides 31 energy storage system installation projects and 44 energy efficiency contracts as finance leases with a lease term of 2 to 10 years. Also, the Company entered into a PPA with the Comision Federal de Electricidad in Mexico to provide for 25 years (December 2013 to November 2038) of all electricity generated from the power plant after completion of its construction and collect rates consisting of fixed costs (to recover the capital) and variable costs during the contracted period.

(2) Finance lease receivables as of December 31, 2017 and 2018 are as follows and included in current and non-current trade and other receivables, net, in the consolidated statements of financial position:

	2017		2018	
	Minimum lease payments	Present value of minimum lease payments	Minimum lease payments	Present value of minimum lease payments
	In millions of won			
Less than 1 year	49,542	13,067	124,918	84,688
1 ~ 5 years	381,181	203,990	467,518	223,622
More than 5 years	1,398,449	645,564	1,333,016	675,036
	1,829,172	862,621	1,925,452	983,346
Allowance for doubtful accounts				(1,133)
		862,621		982,213

(3) There are no impaired finance lease receivables as of December 31, 2016 and 2017, and changes in the allowance for doubtful accounts of finance lease receivables for the year ended December 31, 2018 are as follows:

	2018
	In millions of won
Beginning balance	
Bad debt expense	1,133
Write-off	
Other	
Ending balance	1,133

18. Non-Financial Assets

Non-financial assets as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Current	Non-current	Current	Non-current
	In millions of won			
Advance payment	109,743	43,872	156,073	160,628
Prepaid expenses	251,715	90,118	290,944	90,449
Others(*1)	392,534	112,828	431,871	76,075
	753,992	246,818	878,888	327,152

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(*1) Details of others as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Current	Non-current	Current	Non-current
	In millions of won			
Tax refund receivables	89,762	1,940	82,348	1,276
Greenhouse gas emissions rights	135,211		93,749	
Other quick assets(*2)	167,561	110,888	255,774	74,799
	392,534	112,828	431,871	76,075

(*2) The Company has recognized 92,128 million of its rights in connection with the securities of Orano Expansion as non-current non-financial assets as of December 31, 2017 and 2018. The Company recognized an impairment loss of 87,023 million as it was determined that there is objective evidence of impairment related to its equity interest in and loans to Orano Expansion for the year ended December 31, 2018.

19. Consolidated Subsidiaries

(1) Consolidated subsidiaries as of December 31, 2017 and 2018 are as follows:

			Percentage of ownership (%)	
Subsidiaries	Key operation activities	Location	2017	2018
Korea Hydro & Nuclear Power Co., Ltd.	Power generation	KOREA	100.00%	100.00%
Korea South-East Power Co., Ltd.	Power generation	KOREA	100.00%	100.00%
Korea Midland Power Co., Ltd.	Power generation	KOREA	100.00%	100.00%
Korea Western Power Co., Ltd.	Power generation	KOREA	100.00%	100.00%
Korea Southern Power Co., Ltd.	Power generation	KOREA	100.00%	100.00%
Korea East-West Power Co., Ltd.	Power generation	KOREA	100.00%	100.00%
KEPCO Engineering & Construction Company, Inc.(*1)	Architectural engineering for utility plant and others	KOREA	65.77%	65.77%
KEPCO Plant Service & Engineering Co., Ltd.	Utility plant maintenance and others	KOREA	51.00%	51.00%
KEPCO Nuclear Fuel Co., Ltd.	Nuclear fuel	KOREA	96.36%	96.36%
KEPCO KDN Co., Ltd.	Electric power information technology and others	KOREA	100.00%	100.00%
Garolim Tidal Power Plant Co., Ltd.(*2)	Power generation	KOREA	49.00%	49.00%
	Holding company	HONG KONG	100.00%	100.00%

KEPCO International HongKong Ltd.				
KEPCO International Philippines Inc.	Holding company	PHILIPPINES	100.00%	100.00%
KEPCO Gansu International Ltd.	Holding company	HONG KONG	100.00%	100.00%
KEPCO Philippines Holdings Inc.	Holding company	PHILIPPINES	100.00%	100.00%
KEPCO Philippines Corporation	Operation of utility plant	PHILIPPINES	100.00%	100.00%
KEPCO Ilijan Corporation	Construction and operation of utility plant	PHILIPPINES	51.00%	51.00%
KEPCO Lebanon SARL	Operation of utility plant	LEBANON	100.00%	100.00%
KEPCO Neimenggu International Ltd.	Holding company	HONG KONG	100.00%	100.00%
KEPCO Shanxi International Ltd.	Holding company	HONG KONG	100.00%	100.00%
KOMIPO Global Pte Ltd.	Holding company	SINGAPORE	100.00%	100.00%
KEPCO Canada Energy Ltd.	Resources development	CANADA	100.00%	
KEPCO Netherlands B.V.	Holding company	NETHERLANDS	100.00%	100.00%
KOREA Imouraren Uranium Investment Corp.	Holding company	FRANCE	100.00%	100.00%
KEPCO Australia Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
KOSEP Australia Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
KOMIPO Australia Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%

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Subsidiaries	Key operation activities	Location	Percentage of ownership (%) 2017	2018
KOWEPO Australia Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
KOSPO Australia Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
KEPCO Middle East Holding Company	Holding company	BAHRAIN	100.00%	100.00%
Qatrana Electric Power Company	Construction and operation of utility plant	JORDAN	80.00%	80.00%
KHNP Canada Energy, Ltd.	Holding company	CANADA	100.00%	100.00%
KEPCO Bylong Australia Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
Korea Waterbury Uranium Limited Partnership	Resources development	CANADA	79.64%	79.64%
Korea Electric Power Nigeria Ltd.	Operation of utility plant	NIGERIA	100.00%	100.00%
KEPCO Holdings de Mexico	Holding company	MEXICO	100.00%	100.00%
KST Electric Power Company	Construction and operation of utility plant	MEXICO	56.00%	56.00%
KEPCO Energy Service Company	Operation of utility plant	MEXICO	100.00%	100.00%
KEPCO Netherlands S3 B.V.	Holding company	NETHERLANDS	100.00%	100.00%
PT. KOMIPO Pembangkitan Jawa Bali	Operation of utility plant	INDONESIA	51.00%	51.00%
PT. Cirebon Power Service(*2)	Operation of utility plant	INDONESIA	27.50%	27.50%
KOWEPO International Corporation	Operation of utility plant	PHILIPPINES	99.99%	99.99%
KOSPO Jordan LLC	Operation of utility plant	JORDAN	100.00%	100.00%
EWP Philippines Corporation	Holding company	PHILIPPINES	100.00%	100.00%
EWP America Inc.	Holding company	USA	100.00%	100.00%
EWP Renewable Corporation	Holding company	USA	100.00%	100.00%
DG Fairhaven Power, LLC	Power generation	USA	100.00%	100.00%
DG Whitefield, LLC	Power generation	USA	100.00%	100.00%
Springfield Power, LLC	Power generation	USA	100.00%	100.00%
KNF Canada Energy Limited	Holding company	CANADA	96.36%	96.36%
PT KEPCO Resource Indonesia	Holding company	INDONESIA	100.00%	
EWP Barbados 1 SRL	Holding company	BARBADOS	100.00%	100.00%
California Power Holdings, LLC	Power generation	USA	100.00%	100.00%
Gyeonggi Green Energy Co., Ltd.	Power generation	KOREA	62.01%	62.01%
PT. Tanggamus Electric Power	Power generation	INDONESIA	52.50%	52.50%
Gyeongju Wind Power Co., Ltd.	Power generation	KOREA	70.00%	70.00%
KOMIPO America Inc.	Holding company	USA	100.00%	100.00%
EWPRC Biomass Holdings, LLC	Holding company	USA	100.00%	100.00%
KOSEP USA, INC.	Power generation	USA	100.00%	100.00%
PT. EWP Indonesia	Holding company	INDONESIA	99.96%	99.96%
KEPCO Netherlands J3 B.V.	Holding company	NETHERLANDS	100.00%	100.00%
Korea Offshore Wind Power Co., Ltd.	Power generation	KOREA	100.00%	100.00%
Global One Pioneer B.V.	Holding company	NETHERLANDS	100.00%	100.00%
Global Energy Pioneer B.V.	Holding company	NETHERLANDS	100.00%	100.00%

Mira Power Limited(*3)	Power generation	PAKISTAN	76.00%	76.00%
KOSEP Material Co., Ltd.(*4)	Recycling fly ashes	KOREA	86.22%	86.22%
Commerce and Industry Energy Co., Ltd.(*5)	Power generation	KOREA	59.03%	59.03%
KEPCO Singapore Holdings Pte., Ltd.	Holding company	SINGAPORE	100.00%	100.00%
KOWEPO India Private Limited(*6)	Holding company	INDIA	100.00%	
KEPCO KPS Philippines Corp.	Utility plant maintenance and others	PHILIPPINES	51.00%	51.00%
KOSPO Chile SpA	Holding company	CHILE	100.00%	100.00%
PT. KOWEPO Sumsel Operation And Maintenance Services	Utility plant maintenance and others	INDONESIA	95.00%	95.00%
HeeMang Sunlight Power Co., Ltd.	Operation of utility plant	KOREA	100.00%	100.00%
Fujeij Wind Power Company	Operation of utility plant	JORDAN	100.00%	100.00%
KOSPO Youngnam Power Co., Ltd.	Operation of utility plant	KOREA	50.00%	50.00%
HI Carbon Professional Private Special Asset Investment Trust 1	Holding company	KOREA	96.67%	96.67%
Chitose Solar Power Plant LLC	Power generation	JAPAN	80.10%	80.10%

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Subsidiaries	Key operation activities	Location	Percentage of ownership (%) 2017	2018
KEPCO Energy Solution Co. Ltd.	Energy service	KOREA	100.00%	100.00%
Solar School Plant Co., Ltd.	Power generation	KOREA	100.00%	100.00%
KOSPO Power Services Limitada	Utility plant maintenance and others	CHILE	65.00%	65.00%
Energy New Industry Specialized Investment Private Investment Trust	Holding company	KOREA	99.75%	99.01%
KOEN Bylong Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
KOMIPO Bylong Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
KOWEPO Bylong Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
KOSPO Bylong Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
EWP Bylong Pty., Ltd.	Resources development	AUSTRALIA	100.00%	100.00%
KOWEPO Lao International	Utility plant maintenance and others	LAOS	100.00%	100.00%
KEPCO US Inc.	Holding company	USA	100.00%	100.00%
KEPCO Alamosa LLC	Holding company	USA	50.10%	50.10%
Cogentrix Solar Services, LLC	Holding company	USA	50.10%	
Solar Investments I, LLC	Holding company	USA	50.10%	
KEPCO Solar of Alamosa, LLC (formerly, Cogentrix of Alamosa, LLC)	Power generation	USA	50.10%	50.10%
KEPCO-LG CNS Mangilao Holdings LLC	Holding company	USA	70.00%	70.00%
Mangilao Investment LLC	Holding company	USA	70.00%	70.00%
KEPCO-LG CNS Mangilao Solar, LLC	Power generation	USA	70.00%	70.00%
Jeju Hanlim Offshore Wind Co., Ltd.	Power generation	KOREA	70.22%	68.84%
PT. Siborpa Eco Power	Construction and operation of utility plant	INDONESIA	64.71%	55.00%
BSK E-New Industry Fund VII	Holding company	KOREA	81.47%	80.86%
e-New Industry LB Fund 1	Holding company	KOREA	75.92%	75.36%
Songhyun e-New Industry Fund	Holding company	KOREA	80.45%	79.85%
PT. Korea Energy Indonesia	Utility plant maintenance and others	INDONESIA		95.00%
KOLAT SpA	Utility plant maintenance and others	CHILE		100.00%
KEPCO California, LLC	Holding company	USA		100.00%
KEPCO Mojave Holdings, LLC	Holding company	USA		100.00%
Incheon Fuel Cell Co., Ltd.	Power generation	KOREA		60.00%
KOEN Service Co., Ltd.	Facility maintenance and service	KOREA		100.00%
KOMIPO Service Co., Ltd.	Facility maintenance and service	KOREA		100.00%
KOWEPO Service Co., Ltd.	Facility maintenance and service	KOREA		100.00%

KOSPO Service Co., Ltd.	Facility maintenance and service	KOREA	100.00%
EWP Service Co., Ltd.	Facility maintenance and service	KOREA	100.00%
PT. KOMIPO Energy Indonesia	Utility plant maintenance and others	INDONESIA	95.00%

(*1) Considering treasury stocks, the effective percentage of ownership is 66.08%.

(*2) These subsidiaries are included in the consolidated financial statements as the Company obtained the majority of the voting power through the shareholders agreement.

(*3) As of reporting date, the annual reporting period of all subsidiaries is December 31, except for Mira Power Limited which is November 30.

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(*4) The effective percentage of ownership has increased to 86.22% since Long Lasting Value exercised the put option to sell its investment to KOSEP during the year ended December 31, 2017.

(*5) The Company guarantees a certain return on investment related to Commerce and Industry Energy Co., Ltd. for the financial investors. The financial investors have a right to sell their shares to the Company which can be exercised 84 months after the date of investment. Accordingly, the purchase price including the return on investment is classified as a liability.

(*6) KOWEPO India Private Limited was in the process of liquidating its business as of December 31, 2018 and has been reclassified to assets held-for-sale, accordingly.

(2) Subsidiaries newly included in or excluded from consolidation for the year ended December 31, 2018 are as follows:

Subsidiaries included in consolidation during the year ended December 31, 2018.

Subsidiary	Reason
PT. Korea Energy Indonesia	Newly established
KOLAT SpA	Newly established
KEPCO California, LLC	Newly established
KEPCO Mojave Holdings, LLC	Newly established
Incheon Fuel Cell Co., Ltd.	Newly established
KOEN Service Co., Ltd.	Newly established
KOMIPO Service Co., Ltd.	Newly established
KOWEPO Service Co., Ltd.	Newly established
KOSPO Service Co., Ltd.	Newly established
EWP Service Co., Ltd.	Newly established
PT. KOMIPO Energy Indonesia	Newly established

Subsidiaries excluded from consolidation during the year ended December 31, 2018.

Subsidiary	Reason
KEPCO Canada Energy Ltd.	Liquidated
Cogentrix Solar Services, LLC	Liquidated
Solar Investments I, LLC	Liquidated
PT KEPCO Resource Indonesia	Liquidated
KOWEPO India Private Limited	Liquidating

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(3) Summary of financial information of consolidated subsidiaries as of and for the years ended December 31, 2017 and 2018 are as follows:

	2017			
Subsidiaries	**Total assets**	**Total liabilities**	**Sales**	**Profit (loss) for the period**
		In millions of won		
Korea Hydro & Nuclear Power Co., Ltd.	55,011,096	29,252,816	9,415,751	854,346
Korea South-East Power Co., Ltd.	9,879,577	4,844,184	5,387,846	130,371
Korea Midland Power Co., Ltd.	9,893,822	6,148,173	4,167,009	104,591
Korea Western Power Co., Ltd.	9,660,426	5,739,534	4,199,079	110,939
Korea Southern Power Co., Ltd.	9,648,741	5,401,216	4,397,552	98,817
Korea East-West Power Co., Ltd.	8,855,518	4,204,187	4,644,330	217,599
KEPCO Engineering & Construction Company, Inc.	762,166	305,134	490,193	21,222
KEPCO Plant Service & Engineering Co., Ltd.	1,195,086	294,689	1,232,113	135,482
KEPCO Nuclear Fuel Co., Ltd.	792,187	421,088	279,664	4,557
KEPCO KDN Co., Ltd.	524,520	155,715	619,470	48,968
Garolim Tidal Power Plant Co., Ltd.	619	345		(12)
KEPCO International HongKong Ltd.	153,529	1		4,380
KEPCO International Philippines Inc.	102,323	886		47,201
KEPCO Gansu International Ltd.	11,567	493		(29)
KEPCO Philippines Holdings Inc.	127,922	2,621		43,218
KEPCO Philippines Corporation	6,293	114		2,098
KEPCO Ilijan Corporation	474,624	57,801	109,183	66,320
KEPCO Lebanon SARL	1,069	9,281		(219)
KEPCO Neimenggu International Ltd.	165,937			500
KEPCO Shanxi International Ltd.	497,990	193,309		3,796
KOMIPO Global Pte Ltd.	225,411	1,497		21,858
KEPCO Canada Energy Ltd.	132	22		(32)
KEPCO Netherlands B.V.	114,911	49		17,309
KOREA Imouraren Uranium Investment Corp.	151,278	131		1,490
KEPCO Australia Pty., Ltd.	466,654	569		(568)
KOSEP Australia Pty., Ltd.	27,076	333	12,096	1,601
KOMIPO Australia Pty., Ltd.	31,441	4,691	12,096	1,133
KOWEPO Australia Pty., Ltd.	31,586	4,691	12,096	1,232
KOSPO Australia Pty., Ltd.	29,472	4,221	12,096	(2,759)
KEPCO Middle East Holding Company	95,812	90,842		2,913
Qatrana Electric Power Company	460,206	327,401	18,892	23,310
KHNP Canada Energy, Ltd.	51,994	31		(92)
KEPCO Bylong Australia Pty., Ltd.	242,364	277,549		20,271
Korea Waterbury Uranium Limited Partnership	20,886	136		(59)
Korea Electric Power Nigeria Ltd.	238	76	2,164	29
KEPCO Holdings de Mexico	235	30		(20)
KST Electric Power Company	546,242	478,230	120,126	16,154
KEPCO Energy Service Company	1,793	451	6,773	976
KEPCO Netherlands S3 B.V.	46,642	53		2,382

PT. KOMIPO Pembangkitan Jawa Bali	11,261	4,769	20,956	4,666
PT. Cirebon Power Service	2,808	155	7,439	592

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	2017			
Subsidiaries	**Total assets**	**Total liabilities**	**Sales**	**Profit (loss) for the period**
		In millions of won		
KOWEPO International Corporation		8		(2)
KOSPO Jordan LLC	24,077	13,594	7,331	953
EWP Philippines Corporation	1,708	836		(17)
EWP America Inc.(*1)	79,854	67,308	23,543	(9,737)
KNF Canada Energy Limited	1,884	31		(43)
PT KEPCO Resource Indonesia	491			(311)
EWP Barbados 1 SRL	235,096	450		(2,585)
Gyeonggi Green Energy Co., Ltd.	282,408	199,160	95,192	3,203
PT. Tanggamus Electric Power	179,317	160,144	34,281	4,640
Gyeongju Wind Power Co., Ltd.	112,279	82,124	7,219	2,400
KOMIPO America Inc.	10,505	521		2,071
KOSEP USA, INC.	184	9,065		26,997
PT. EWP Indonesia	2,035	23		1,916
KEPCO Netherlands J3 B.V.	122,612	76		12,115
Korea Offshore Wind Power Co., Ltd.	190,195	1,985		(6,997)
Global One Pioneer B.V.	151	38		(80)
Global Energy Pioneer B.V.	309	41		(87)
Mira Power Limited	208,150	163,198		737
KOSEP Material Co., Ltd.	2,751	1,448	3,128	320
Commerce and Industry Energy Co., Ltd.	99,129	87,926	30,577	(749)
KEPCO Singapore Holdings Pte., Ltd.	3,265	4		(24)
KOWEPO India Private Limited	781			(46)
KEPCO KPS Philippines Corp.	6,636	235	6,840	555
KOSPO Chile SpA	133,570	50,109		1,066
PT. KOWEPO Sumsel Operation And Maintenance Services	1,350	279	7,651	659
HeeMang Sunlight Power Co., Ltd.	6,876	3,395	105	(229)
Fujeij Wind Power Company	165,636	156,099		8,836
KOSPO Youngnam Power Co.,Ltd.	412,785	333,302	68,973	939
HI Carbon Professional Private Special Asset Investment Trust 1	3,002			12
Chitose Solar Power Plant LLC	136,098	121,622	7,083	4,100
KEPCO Energy Solution Co. Ltd.	313,401	12,376	5,544	1,325
Solar School Plant Co., Ltd.	201,482	599	67	874
KOSPO Power Services Limitada	3,901	887	11,067	666
Energy New Industry Specialized Investment Private Investment Trust(*3)	506,207	2,118		52
KOEN Bylong Pty., Ltd.	5,875			
KOMIPO Bylong Pty., Ltd.	5,875			
KOWEPO Bylong Pty., Ltd.	5,875			
KOSPO Bylong Pty., Ltd.	5,875			
EWP Bylong Pty., Ltd.	5,875			
KOWEPO Lao International	3,259	1,452	3,624	1,881
KEPCO US Inc.	16,913			

KEPCO Alamosa LLC	33,144	492		(218)
Cogentrix Solar Services, LLC(*2)	84,458	53,116	8,958	(112)

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	2017			
Subsidiaries	**Total assets**	**Total liabilities**	**Sales**	**Profit (loss) for the period**
	In millions of won			
KEPCO-LG CNS Mangilao Holdings LLC	24,131	24,395		(278)
Mangilao Investment LLC	24,131			
KEPCO-LG CNS Mangilao Solar, LLC	24,002	134		(278)
Jeju Hanlim Offshore Wind Co., Ltd.	36			
PT. Siborpa Eco Power	11,562	214		(518)

(*1) Financial information of EWP America Inc. includes that of six other subsidiaries, EWP Renewable Corporation, DG Fairhaven Power, LLC, DG Whitefield, LLC, Springfield Power, LLC, California Power Holdings, LLC, and EWPRC Biomass Holdings, LLC.

(*2) Financial information of Cogentrix Solar Services, LLC includes that of two other subsidiaries, Solar Investments I, LLC and KEPCO Solar of Alamosa, LLC (formerly, Cogentrix of Alamosa, LLC).

(*3) Financial information of Energy New Industry Specialized Investment Private Investment Trust includes that of three other subsidiaries, BSK E-New Industry Fund VII, e-New Industry LB Fund 1 and Songhyun e-New Industry Fund.

	2018			
Subsidiaries	**Total assets**	**Total liabilities**	**Sales**	**Profit (loss) for the period**
	In millions of won			
Korea Hydro & Nuclear Power Co., Ltd.	55,792,704	30,484,104	8,858,717	(137,613)
Korea South-East Power Co., Ltd.	9,997,758	4,948,553	5,521,038	25,736
Korea Midland Power Co., Ltd.	10,839,218	7,088,013	4,368,467	(38,142)
Korea Western Power Co., Ltd.	9,902,752	5,965,410	4,841,261	(28,157)
Korea Southern Power Co., Ltd.	9,810,985	5,463,721	5,539,793	55,439
Korea East-West Power Co., Ltd.	8,744,380	4,092,460	4,933,525	3,345
KEPCO Engineering & Construction Company, Inc.	771,480	310,100	433,701	12,937
KEPCO Plant Service & Engineering Co., Ltd.	1,275,365	296,428	1,239,604	160,791
KEPCO Nuclear Fuel Co., Ltd.	817,416	434,439	230,667	15,835
KEPCO KDN Co., Ltd.	566,807	159,423	622,154	60,016
Garolim Tidal Power Plant Co., Ltd.	608	345		(11)
KEPCO International HongKong Ltd.	140,101	1		3,307
KEPCO International Philippines Inc.	107,948	1,475		52,539
KEPCO Gansu International Ltd.	12,047	515		(24)
KEPCO Philippines Holdings Inc.	188,551	9,775		53,219
KEPCO Philippines Corporation	6,394	213		54
KEPCO Ilijan Corporation	431,444	53,413	99,844	49,631
KEPCO Lebanon SARL	1,509	9,686		413

KEPCO Neimenggu International Ltd.	194,336			20,829
KEPCO Shanxi International Ltd.	519,991	201,732		290
KOMIPO Global Pte Ltd.	250,456	961		11,478
KEPCO Netherlands B.V.	130,460	77		26,550
KOREA Imouraren Uranium Investment Corp.	63,517	171		(89,852)
KEPCO Australia Pty., Ltd.	439,719	14		49
KOSEP Australia Pty., Ltd.	37,057	2,832	20,294	7,315
KOMIPO Australia Pty., Ltd.	39,066	4,659	20,294	7,193
KOWEPO Australia Pty., Ltd.	39,341	4,702	20,294	7,316
KOSPO Australia Pty., Ltd.	36,525	3,585	20,294	9,520
KEPCO Middle East Holding Company	101,201	92,862		3,043
Qatrana Electric Power Company	484,383	326,486	18,766	21,170
KHNP Canada Energy, Ltd.	49,776	35		(26)
KEPCO Bylong Australia Pty., Ltd.	254,398	315,921		(29,573)
Korea Waterbury Uranium Limited Partnership	20,890	142		(74)

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	2018			
Subsidiaries	**Total assets**	**Total liabilities**	**Sales**	**Profit (loss) for the period**
		In millions of won		
Korea Electric Power Nigeria Ltd.	112	39	727	(93)
KEPCO Holdings de Mexico	248	57		(11)
KST Electric Power Company	535,807	457,867	109,735	10,274
KEPCO Energy Service Company	1,940	1,454	5,117	(232)
KEPCO Netherlands S3 B.V.	46,518	38		1,226
PT. KOMIPO Pembangkitan Jawa Bali	11,405	5,472	20,320	3,925
PT. Cirebon Power Service	1,588	273	7,228	177
KOWEPO International Corporation		8		
KOSPO Jordan LLC	16,315	3,432	34,371	1,907
EWP Philippines Corporation	1,684	829		(11)
EWP America Inc.(*1)	72,525	4,903	29,557	(4,483)
KNF Canada Energy Limited	1,801	20		(45)
EWP Barbados 1 SRL	268,033	1,581	688	11,221
Gyeonggi Green Energy Co., Ltd.	293,812	185,043	96,442	25,121
PT. Tanggamus Electric Power	216,321	187,502	26,832	9,338
Gyeongju Wind Power Co., Ltd.	122,303	83,348	21,906	8,803
KOMIPO America Inc.	10,092	572		(885)
KOSEP USA, INC.	1	4,857		4,341
PT. EWP Indonesia	7,444	14		3,138
KEPCO Netherlands J3 B.V.	115,978	77		(104)
Korea Offshore Wind Power Co., Ltd.	216,114	36,377		(8,473)
Global One Pioneer B.V.	162	87		(113)
Global Energy Pioneer B.V.	325	74		(102)
Mira Power Limited	277,525	213,104		(980)
KOSEP Material Co., Ltd.	2,862	1,249	3,240	377
Commerce and Industry Energy Co., Ltd.	92,872	88,009	27,937	(6,091)
KEPCO Singapore Holdings Pte., Ltd.	582	9		(31)
KEPCO KPS Philippines Corp.	7,501	358	4,815	766
KOSPO Chile SpA	139,814	57,502		1,016
PT. KOWEPO Sumsel Operation And Maintenance Services	1,313	394	4,343	(654)
HeeMang Sunlight Power Co., Ltd.	10,915	7,626	146	(192)
Fujeij Wind Power Company	217,796	212,435		(1,033)
KOSPO Youngnam Power Co., Ltd.	413,472	325,589	369,669	8,155
HI Carbon Professional Private Special Asset Investment Trust 1	3,002			12
Chitose Solar Power Plant LLC	115,505	105,079	15,022	872
KEPCO Energy Solution Co. Ltd.	304,103	849	5,584	2,532
Solar School Plant Co., Ltd.	204,282	1,366	1,149	2,033
KOSPO Power Services Limitada	3,045	596	9,610	1,132
Energy New Industry Specialized Investment Private Investment Trust(*2)	66,498	1,014		(1,140)
KOEN Bylong Pty., Ltd.	5,544	26		(10)
KOMIPO Bylong Pty., Ltd.	5,544	26		(25)

KOWEPO Bylong Pty., Ltd.	5,544	26		
KOSPO Bylong Pty., Ltd.	5,544	26		(25)
EWP Bylong Pty., Ltd.	5,544	16		(15)
KOWEPO Lao International	3,800	1,015	2,899	895
KEPCO US Inc.	16,640			6
KEPCO Alamosa LLC	32,346	79	750	(688)
KEPCO Solar of Alamosa, LLC (formerly, Cogentrix of Alamosa, LLC)	64,223	48,819	9,015	200
KEPCO-LG CNS Mangilao Holdings LLC	25,642	27,197		(1,144)

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	2018			
Subsidiaries	**Total assets**	**Total liabilities**	**Sales**	**Profit (loss) for the period**
	In millions of won			
Mangilao Investment LLC	25,641			
KEPCO-LG CNS Mangilao Solar, LLC	25,406	146		(104)
Jeju Hanlim Offshore Wind Co., Ltd.	16,557	328		(925)
PT. Siborpa Eco Power	12,363	141		(1,771)
PT. Korea Energy Indonesia	1,183	60	1,459	223
KOLAT SpA	38,362	474	585	(186)
KEPCO California, LLC	42,171	21		(332)
KEPCO Mojave Holdings, LLC	103,189	65,730		(3,959)
Incheon Fuel Cell Co., Ltd.	23,626	415		(201)
KOEN Service Co., Ltd.	583	31		(48)
KOMIPO Service Co., Ltd.	576	17		(41)
KOWEPO Service Co., Ltd.	750	227		(77)
KOSPO Service Co., Ltd.	576	6		(30)
EWP Service Co., Ltd.	667	97		(30)
PT. KOMIPO Energy Indonesia	2,236			

(*1) Financial information of EWP America Inc. includes that of six other subsidiaries, EWP Renewable Corporation, DG Fairhaven Power, LLC, DG Whitefield, LLC, Springfield Power, LLC, California Power Holdings, LLC, and EWPRC Biomass Holdings, LLC.

(*2) Financial information of Energy New Industry Specialized Investment Private Investment Trust includes that of three other subsidiaries, BSK E-New Industry Fund VII, e-New Industry LB Fund 1 and Songhyun e-New Industry Fund.

(4) Significant restrictions on abilities to subsidiaries are as follows:

Company	**Nature and extent of any significant restrictions**
Gyeonggi Green Energy Co., Ltd.	Acquisition or disposal of assets of more than 35 billion, change in the capacity of cogeneration units (except for the change due to performance improvement of equipment, maintenance) will require unanimous consent of all directors.
KOSPO Youngnam Power Co., Ltd.	Dividends can only be paid when all conditions of the loan agreement are satisfied or prior written consent of financial institutions is obtained. Shares cannot be wholly or partially transferred without prior written consent of financial institutions.
Incheon Fuel Cell Co., Ltd.	Acquisition or disposal of assets of more than 20 billion, change in the capacity of cogeneration units (except for the change due to performance improvement of equipment, maintenance) will require unanimous consent of all directors.

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(5) Details of non-controlling interest prior to intra-group eliminations as of and for the years ended December 31, 2016, 2017 and 2018 are as follows:

Description	KEPCO Ilijan Corporation	KEPCO Plant Service & Engineering Co., Ltd.	KEPCO Engineering & Construction Company, Inc.	Others	Total
		2016	In millions of won		
Percentage of ownership	49.00%	49.00%	33.92%		
Current assets	154,758	553,924	270,553	1,211,510	2,190,745
Non-current assets	403,272	532,497	516,043	2,379,882	3,831,694
Current liabilities	(19,256)	(264,506)	(286,444)	(297,510)	(867,716)
Non-current liabilities	(39,193)	(36,984)	(78,232)	(1,919,924)	(2,074,333)
Net assets	499,581	784,931	421,920	1,373,958	3,080,390
Book value of non-controlling interest	244,794	384,616	143,115	684,093	1,456,618
Sales	116,667	1,214,304	506,012	674,461	2,511,444
Profit for the period	51,552	86,657	17,796	102,170	258,175
Profit for the period attributable to non-controlling interest	25,260	42,462	6,036	26,709	100,467
Cash flows from operating activities	102,546	121,240	18,748	84,086	326,620
Cash flows from investing activities	(117)	79,807	(7,556)	(367,674)	(295,540)
Cash flows from financing activities before dividends to non-controlling interest	(56,863)	(39,911)	(1,634)	877,863	779,455
Dividends to non-controlling interest	(55,705)	(36,139)	(2,539)	(22,054)	(116,437)
Effect of exchange rate fluctuation	1,529	127	(854)	7,216	8,018
Net increase (decrease) of cash and cash equivalents	(8,610)	125,124	6,165	579,437	702,116

Description	KEPCO Ilijan Corporation	KEPCO Plant Service & Engineering Co., Ltd.	KEPCO Engineering & Construction Company, Inc.	Others	Total
		2017	In millions of won		
Percentage of ownership	49.00%	49.00%	33.92%		
Current assets	160,588	623,934	257,529	1,269,175	2,311,226
Non-current assets	314,036	571,152	504,637	2,588,833	3,978,658
Current liabilities	(21,546)	(278,562)	(221,860)	(394,320)	(916,288)
Non-current liabilities	(36,255)	(16,127)	(83,274)	(2,014,925)	(2,150,581)
Net assets	416,823	900,397	457,032	1,448,763	3,223,015

Book value of non-controlling interest	204,243	441,194	155,025	612,245	1,412,707
Sales	109,183	1,232,113	490,193	719,087	2,550,576
Profit for the period	66,320	135,482	21,222	66,419	289,443
Profit for the period attributable to non-controlling interest	32,497	66,386	7,199	20,447	126,529
Cash flows from operating activities	123,534	129,801	62,578	60,021	375,934
Cash flows from investing activities	(5,276)	(193,408)	(8,622)	(409,353)	(616,659)
Cash flows from financing activities before dividends to non-controlling interest	(44,442)	(15,606)	(55,504)	339,432	223,880
Dividends to non-controlling interest	(48,855)	(14,994)	(1,419)	(20,840)	(86,108)
Effect of exchange rate fluctuation	(7,432)	(1,267)	(101)	(24,206)	(33,006)
Net increase (decrease) of cash and cash equivalents	17,529	(95,474)	(3,068)	(54,946)	(135,959)

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Description	KEPCO Ilijan Corporation	2018 KEPCO Plant Service & Engineering Co., Ltd.	KEPCO Engineering & Construction Company, Inc.	Others	Total
			In millions of won		
Percentage of ownership	49.00%	49.00%	33.92%		
Current assets	163,622	628,725	281,390	956,928	2,030,665
Non-current assets	267,822	646,640	490,090	2,760,500	4,165,052
Current liabilities	(16,819)	(270,097)	(248,402)	(559,552)	(1,094,870)
Non-current liabilities	(36,594)	(26,331)	(61,698)	(1,933,583)	(2,058,206)
Net assets	378,031	978,937	461,380	1,224,293	3,042,641
Book value of non-controlling interest	185,235	479,679	156,500	680,963	1,502,377
Sales	99,844	1,239,604	433,701	966,037	2,739,186
Profit for the period	49,631	160,791	12,937	92,457	315,816
Profit for the period attributable to non-controlling interest	24,319	78,788	4,388	28,475	135,970
Cash flows from operating activities	92,822	129,700	81,042	110,448	414,012
Cash flows from investing activities	(4,452)	(123,593)	(50,569)	35,167	(143,447)
Cash flows from financing activities before dividends to non-controlling interest	(53,733)	(33,737)	(14,591)	(374,669)	(476,730)
Dividends to non-controlling interest	(51,626)	(32,414)	(2,839)	(23,452)	(110,331)
Effect of exchange rate fluctuation	2,840	(124)	31	1,304	4,051
Net increase (decrease) of cash and cash equivalents	(14,149)	(60,168)	13,074	(251,202)	(312,445)

(6) Changes in goodwill

(i) Details of goodwill as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Acquisition cost	2,582	2,582
Accumulated impairment		
Carrying book value	2,582	2,582

(ii) There are no changes in goodwill for the years ended December 31, 2017 and 2018.

(7) Disposals of subsidiaries

KEPCO Canada Uranium Investment Limited Partnership was dissolved and the Company liquidated DG Kings Plaza, LLC during the year ended December 31, 2016. Also, the Company liquidated KEPCO Canada Energy Ltd., Cogentrix Solar Services, LLC, Solar Investments I, LLC, and PT KEPCO Resource Indonesia during the year ended December 31, 2018.

(i) The fair value of proceeds from disposal as of December 31, 2016, 2017 and 2018, respectively, are as follows:

	2016	2017	2018
		In millions of won	
Consideration received in cash	898		160
Net assets transferred due to dissolution or liquidation	34,148		
	35,046		160

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(ii) The carrying value of assets and liabilities of subsidiaries as of the date the Company lost its control during the years ended December 31, 2016, 2017 and 2018, respectively, are as follows:

	2016	2017	2018
	In millions of won		
Current assets			
Cash and cash equivalents	898		175
Current financial assets	81		
Trade and other receivables			11
Non-current assets			
Available-for-sale financial assets	34,089		
Current liabilities			
Current financial liabilities	(22)		
Trade and other payables			(28)
	35,046		158

(iii) Gain from disposals of subsidiaries for the years ended December 31, 2016, 2017 and 2018, respectively, are as follows:

	2016	2017	2018
	In millions of won		
Fair value of sale price	35,046		160
Net assets disposed	(35,046)		(158)
Non-controlling interests			
Realization of unrealized gain			70
Other comprehensive income			
Gain from disposals of subsidiaries(*1)			72

(*1) Gain from disposals of subsidiaries is included in the consolidated statements of comprehensive income (loss).

(iv) Net cash flow from sales of subsidiaries for the years ended December 31, 2016, 2017 and 2018, respectively, are as follows:

	2016	2017	2018
	In millions of won		
Consideration received in cash	898		160
Less: cash held by disposed subsidiaries	(898)		(175)

Net cash flow	(15)

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(8) Cash dividends received from subsidiaries for the years ended December 31, 2016, 2017 and 2018, respectively, are as follows:

Subsidiaries	2016	2017	2018
		In millions of won	
Korea Hydro & Nuclear Power Co., Ltd.	635,200	543,072	281,234
Korea South-East Power Co., Ltd.	124,169	106,546	33,928
Korea Midland Power Co., Ltd.	23,073	54,305	26,581
Korea Western Power Co., Ltd.	36,238	66,992	28,996
Korea Southern Power Co., Ltd.	17,849	60,630	25,780
Korea East-West Power Co., Ltd.	67,906	94,430	61,408
KEPCO Engineering & Construction Company, Inc.	5,069	2,765	5,531
KEPCO Plant Service & Engineering Co., Ltd.	39,911	15,607	33,739
KEPCO Nuclear Fuel Co., Ltd.	3,411	3,231	1,077
KEPCO KDN Co., Ltd.	3,392	4,352	13,888
KEPCO International HongKong Ltd.	9,107	4,304	23,314
KEPCO International Philippines Inc.	61,862	44,906	52,507
KEPCO Ilijan Corporation	57,979	50,849	53,900
KEPCO Philippines Holdings Inc.	17,747	26,023	
KEPCO Neimenggu International Ltd.	10,735		
KOMIPO Global Pte Ltd.	10,432		
Qatrana Electric Power Company	8,331	5,939	6,240
KOSPO Jordan LLC	1,095		
KEPCO Energy Service Company	294		
EWP Philippines Corporation			
KEPCO Netherlands S3 B.V.			3,115
PT. KOMIPO Pembangkitan Jawa Bali	3,222	3,188	20,658
KEPCO Netherlands J3 B.V.	12,507		12,090
Gyeongju Wind Power Co., Ltd.	679		
Energy New Industry Specialized Investment Private Investment Trust		291	
HI Carbon Professional Private Special Asset Investment Trust 1		11	11
KOSPO Power Services Limitada		425	993
Cogentrix Solar Services, LLC		344	
KEPCO Netherlands B.V.			17,424
PT. Cirebon Power Service			382
Chitose Solar Power Plant LLC			1,986
	1,150,208	1,088,210	704,782

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20. Investments in Associates and Joint Ventures

(1) Investments in associates and joint ventures as of December 31, 2017 and 2018 are as follows:

	2017				
Investees	**Key operation activities**	**Location**	**Percentage of ownership**	**Acquisition cost**	**Book value**
				In millions of won	
<Associates>					
Korea Gas Corporation(*1)	Importing and wholesaling LNG	KOREA	20.47%	94,500	1,618,868
Korea Electric Power Industrial Development Co., Ltd.	Electricity metering and others	KOREA	29.00%	4,727	21,838
YTN Co., Ltd.	Broadcasting	KOREA	21.43%	59,000	40,606
Cheongna Energy Co., Ltd.	Generating and distributing vapor and hot/cold water	KOREA	43.90%	48,353	8,337
Gangwon Wind Power Co., Ltd.(*2)	Power generation	KOREA	15.00%	5,725	13,855
Hyundai Green Power Co., Ltd.	Power generation	KOREA	29.00%	88,885	114,806
Korea Power Exchange(*5)	Management of power market and others	KOREA	100.00%	127,839	237,631
AMEC Partners Korea Ltd.(*3)	Resources development	KOREA	19.00%	707	215
Hyundai Energy Co., Ltd.(*8)	Power generation	KOREA	30.66%	71,070	
Ecollite Co., Ltd.	Artificial light-weight aggregate	KOREA	36.10%	1,516	
Taebaek Wind Power Co., Ltd.	Power generation	KOREA	25.00%	3,810	5,319
Taeback Guinemi Wind Power Co., Ltd.	Power generation	KOREA	25.00%	3,420	3,089
Pyeongchang Wind Power Co., Ltd.	Power generation	KOREA	25.00%	3,875	4,136
Daeryun Power Co., Ltd.(*3, 9)	Power generation	KOREA	13.13%	25,477	25,113
Changjuk Wind Power Co., Ltd.	Power generation	KOREA	30.00%	3,801	7,515
KNH Solar Co., Ltd.	Power generation	KOREA	27.00%	1,296	2,218
SPC Power Corporation	Power generation	PHILIPPINES	38.00%	20,635	52,283
Gemeng International Energy Co., Ltd.	Power generation	CHINA	34.00%	413,153	649,973
PT. Cirebon Electric Power	Power generation	INDONESIA	27.50%	40,365	97,410
KNOC Nigerian East Oil Co., Ltd.(*4)	Resources development	NIGERIA	14.63%	12	
KNOC Nigerian West Oil Co., Ltd.(*4)	Resources development	NIGERIA	14.63%	12	
PT Wampu Electric Power	Power generation	INDONESIA	46.00%	21,292	29,403
PT. Bayan Resources TBK	Resources development	INDONESIA	20.00%	615,860	451,831
S-Power Co., Ltd.	Power generation	KOREA	49.00%	132,300	116,945

Pioneer Gas Power Limited(*7)	Power generation	INDIA	38.50%	49,831	38,659
Eurasia Energy Holdings	Power generation and resources development	RUSSIA	40.00%	461	
Xe-Pian Xe-Namnoy Power Co., Ltd.	Power generation	LAOS	25.00%	71,481	61,779
Hadong Mineral Fiber Co., Ltd.(*3)	Recycling fly ashes	KOREA	8.33%	50	
Green Biomass Co., Ltd.(*11, 14)	Power generation	KOREA	8.80%	714	208
PT. Mutiara Jawa	Manufacturing and operating floating coal terminal	INDONESIA	29.00%	2,978	
Samcheok Eco Materials Co., Ltd.(*10)	Recycling fly ashes	KOREA	2.35%	686	
Noeul Green Energy Co., Ltd.	Power generation	KOREA	29.00%	1,740	2,067
Naepo Green Energy Co., Ltd.	Power generation	KOREA	41.67%	29,200	20,598
Goseong Green Energy Co., Ltd.(*2)	Power generation	KOREA	1.12%	2,900	2,597
Gangneung Eco Power Co., Ltd.(*2)	Power generation	KOREA	1.61%	2,900	2,583
Shin Pyeongtaek Power Co., Ltd.	Power generation	KOREA	40.00%	43,920	34,903
Heang Bok Do Si Photovoltaic Power Co., Ltd.	Power generation	KOREA	28.00%	194	187
Dongducheon Dream Power Co., Ltd.	Power generation	KOREA	33.61%	111,134	53,233
Jinbhuvish Power Generation Pvt. Ltd.(*2)	Power generation	INDIA	5.16%	9,000	
SE Green Energy Co., Ltd.	Power generation	KOREA	47.76%	3,821	3,476
Daegu Photovoltaic Co., Ltd.	Power generation	KOREA	29.00%	1,230	1,718
Jeongam Wind Power Co., Ltd.	Power generation	KOREA	40.00%	5,580	3,763
Korea Power Engineering Service Co., Ltd.	Construction and service	KOREA	29.00%	290	3,659
Busan Green Energy Co., Ltd.	Power generation	KOREA	29.00%	5,243	7,363
Gunsan Bio Energy Co., Ltd.(*2)	Power generation	KOREA	18.87%	1,000	
Korea Electric Vehicle Charging Service	Electric vehicle charge service	KOREA	28.00%	2,604	1,749
Ulleungdo Natural Energy Co., Ltd.	Renewable power generation	KOREA	29.85%	8,000	6,370

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	2017				
Investees	**Key operation activities**	**Location**	**Percentage of ownership**	**Acquisition cost**	**Book value**
				In millions of won	
Korea Nuclear Partners Co., Ltd.	Electric material agency	KOREA	29.00%	290	383
Tamra Offshore Wind Power Co., Ltd.	Power generation	KOREA	27.00%	8,910	8,560
Korea Electric Power Corporation Fund(*12)	Developing electric enterprises	KOREA	98.09%	51,500	47,974
Energy Infra Asset Management Co., Ltd.(*3)	Asset management	KOREA	9.90%	297	476
Daegu clean Energy Co., Ltd.	Renewable power generation	KOREA	28.00%	140	11
YaksuESS Co., Ltd	Installing ESS related equipment	KOREA	29.00%	210	194
Nepal Water & Energy Development Company Private Limited(*15)	Construction and operation of utility plant	NEPAL	62.13%	33,577	30,498
Gwangyang Green Energy Co., Ltd.	Power generation	KOREA	20.00%	2,000	1,772
PND solar., Ltd	Power generation	KOREA	29.00%	1,250	1,250
				2,240,761	3,837,421
<Joint ventures>					
KEPCO-Uhde Inc.(*6)	Power generation	KOREA	52.80%	11,355	258
Eco Biomass Energy Sdn. Bhd.(*6)	Power generation	MALAYSIA	61.53%	14,439	
Datang Chaoyang Renewable Power Co., Ltd.	Power generation	CHINA	40.00%	27,660	27,262
Shuweihat Asia Power Investment B.V.	Holding company	NETHERLANDS	49.00%	46,037	15,675
Shuweihat Asia Operation & Maintenance Company(*6)	Maintenance of utility plant	CAYMAN	55.00%	30	663
Waterbury Lake Uranium L.P.	Resources development	CANADA	35.76%	26,602	19,781
ASM-BG Investicii AD	Power generation	BULGARIA	50.00%	16,101	21,202
RES Technology AD	Power generation	BULGARIA	50.00%	15,595	14,375
KV Holdings, Inc.	Power generation	PHILIPPINES	40.00%	2,103	1,918
KEPCO SPC Power Corporation(*6)	Construction and operation of utility plant	PHILIPPINES	75.20%	94,579	217,094
Gansu Datang Yumen Wind Power Co., Ltd.	Power generation	CHINA	40.00%	16,621	10,840
	Power generation	CHINA	40.00%	121,928	171,055

Datang Chifeng Renewable Power Co., Ltd.					
Datang KEPCO Chaoyang Renewable Power Co., Ltd.	Power generation	CHINA	40.00%	10,858	11,060
Rabigh Electricity Company	Power generation	SAUDI ARABIA	40.00%	109,743	99,356
Rabigh Operation & Maintenance Company Limited	Maintenance of utility plant	SAUDI ARABIA	40.00%	70	3,987
Jamaica Public Service Company Limited	Power generation	JAMAICA	40.00%	301,910	221,153
KW Nuclear Components Co., Ltd.	Manufacturing	KOREA	45.00%	833	6,703
Busan Shinho Solar Power Co., Ltd.	Power generation	KOREA	25.00%	2,100	4,346
GS Donghae Electric Power Co., Ltd.	Power generation	KOREA	34.00%	204,000	220,727
Global Trade Of Power System Co., Ltd.	Exporting products and technology of small or medium business by proxy	KOREA	29.00%	290	577
Expressway Solar-light Power Generation Co., Ltd.	Power generation	KOREA	29.00%	1,856	2,463
KODE NOVUS I LLC	Power generation	USA	50.00%	19,213	
KODE NOVUS II LLC	Power generation	USA	50.00%	12,756	
Daejung Offshore Wind Power Co., Ltd.	Power generation	KOREA	49.90%	5,190	2,969
Amman Asia Electric Power Company(*6)	Power generation	JORDAN	60.00%	111,476	145,676
KAPES, Inc.(*6)	R&D	KOREA	51.00%	5,629	7,476
Dangjin Eco Power Co., Ltd.	Power generation	KOREA	34.00%	61,540	57,928
Honam Wind Power Co., Ltd.	Power generation	KOREA	29.00%	3,480	4,302
Chun-cheon Energy Co., Ltd.	Power generation	KOREA	29.90%	52,700	48,118
Yeonggwangbaeksu Wind Power Co., Ltd.(*3)	Power generation	KOREA	15.00%	3,000	2,734
Nghi Son 2 Power LLC	Power generation	VIETNAM	50.00%	2,781	183
Kelar S.A(*6)	Power generation	CHILE	65.00%	77,220	67,233
PT. Tanjung Power Indonesia	Power generation	INDONESIA	35.00%	746	1,776
Incheon New Power Co., Ltd.	Power generation	KOREA	29.00%	461	619

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		2017			
Investees	**Key operation activities**	**Location**	**Percentage of ownership**	**Acquisition cost**	**Book value**
				In millions of won	
Seokmun Energy Co., Ltd.	Power generation	KOREA	29.00%	15,370	13,786
Daehan Wind Power PSC	Power generation	JORDAN	50.00%	285	
Barakah One Company(*13)	Power generation	UAE	18.00%	118	626
Nawah Energy Company(*13)	Operation of utility plant	UAE	18.00%	296	258
MOMENTUM	International thermonuclear experimental reactor construction management	FRANCE	33.33%	1	391
Daegu Green Power Co., Ltd.	Power generation	KOREA	29.00%	46,225	42,391
Yeonggwang Wind Power Co., Ltd.	Power generation	KOREA	41.00%	15,375	15,294
Chester Solar IV SpA(*6)	Power generation	CHILE	81.82%	1,700	1,700
Chester Solar V SpA(*6)	Power generation	CHILE	81.82%	525	525
Diego de Almagro Solar SpA(*6)	Power generation	CHILE	81.82%	2,091	2,091
South Jamaica Power Company Limited	Power generation	JAMAICA	20.00%	7,090	6,704
				1,469,978	1,493,275
				3,710,739	5,330,696

(*1) The effective percentage of ownership is 21.57% considering treasury stocks.

(*2) The effective percentage of ownership is less than 20%. However, the Company can exercise significant influence by virtue of its contractual right to appoint directors to the board of directors of the entity, and by strict decision criteria of the Company s financial and operating policy of the board of directors.

(*3) The effective percentage of ownership is less than 20%. However, the Company can exercise significant influence by virtue of its contractual right to appoint a director to the board of directors of the entity.

(*4) The effective percentage of ownership is less than 20%. However, the Company can exercise significant influence by virtue of its contractual right to appoint one out of four members of the steering committee of the entity. Moreover, the Company has significant financial transactions, which can affect its influence on the entity.

(*5) The effective percentage of ownership is 100%. However, the Government regulates the Company s ability to make operating and financial decisions over the entity, as the Government requires maintaining arms-length transactions between KPX and the Company s other subsidiaries. The Company can exercise significant influence

by its right to nominate directors to the board of directors of the entity.

(*6) The effective percentage of ownership is more than 100%. However, according to the shareholders agreement, all critical financial and operating decisions must be agreed to by all ownership parties. For these reasons, the entities are classified as joint ventures.

(*7) As of reporting date, the annual reporting period of all associates and joint ventures ends on December 31, except for Pioneer Gas Power Limited whose reporting period ends on March 31.

(*8) As of December 31, 2017, 15.64% of ownership of Hyundai Energy Co., Ltd. is held by NH Power ll Co., Ltd. and NH Bank. According to the shareholders agreement reached on March 2011, not only does the Company have a call option to acquire the investment in Hyundai Energy Co., Ltd. from NH Power ll Co., Ltd. and NH Bank with a certain rate of return, NH Power ll Co., Ltd. and NH Bank also have put options to dispose of their investment to the Company. In connection with this agreement, the Company applied the equity method on the investment in Hyundai Energy Co., Ltd. with 46.30% of ownership.

(*9) The effective percentage of ownership is 19.45% considering stock purchase options.

(*10) The Company s effective percentage of ownership excluding the redeemable convertible preferred stock is 25.54%.

(*11) The effective percentage of ownership is less than 20% but the Company can exercise significant influence by virtue of its contractual right to appoint a director to the board of directors of the entity and the fact that the dominant portion of the investee s sales transactions is generated from the Company.

(*12) The effective percentage of ownership is more than 50% but the Company does not hold control over relevant business while it exercises significant influence by participating in the Investment Decision Committee. For this reason, the entity is classified as an associate.

(*13) The effective percentage of ownership is less than 20% but the Company has joint control over the entity as decisions on the major activities require the unanimous consent of the parties that collectively control the entity

(*14) The percentage of ownership decreased since the Company did not participate in the capital increase of Green Biomass Co., Ltd. during the period.

(*15) The effective percentage of ownership is more than 50% but the Company does not hold control over the entity according to the shareholders agreement. For this reason, the entity is classified as an associate.

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	2018				
Investees	**Key operation activities**	**Location**	**Percentage of ownership**	**Acquisition cost**	**Book value**
				In millions of won	
<Associates>					
Korea Gas Corporation(*1)	Importing and wholesaling LNG	KOREA	20.47%	94,500	1,701,848
Korea Electric Power Industrial Development Co., Ltd.	Electricity metering and others	KOREA	29.00%	4,727	21,838
YTN Co., Ltd.	Broadcasting	KOREA	21.43%	59,000	40,338
Cheongna Energy Co., Ltd.	Generating and distributing vapor and hot/cold water	KOREA	43.90%	48,353	3,465
Gangwon Wind Power Co., Ltd.(*2)	Power generation	KOREA	15.00%	5,725	13,220
Hyundai Green Power Co., Ltd.	Power generation	KOREA	29.00%	88,885	127,160
Korea Power Exchange(*5)	Management of power market and others	KOREA	100.00%	127,839	251,802
AMEC Partners Korea Ltd.(*3)	Resources development	KOREA	19.00%	707	209
Hyundai Energy Co., Ltd.(*8)	Power generation	KOREA	30.66%	71,070	
Ecollite Co., Ltd.	Artificial light-weight aggregate	KOREA	36.10%	1,516	
Taebaek Wind Power Co., Ltd.	Power generation	KOREA	25.00%	3,810	5,665
Taeback Guinemi Wind Power Co., Ltd.	Power generation	KOREA	25.00%	3,420	2,569
Pyeongchang Wind Power Co., Ltd.	Power generation	KOREA	25.00%	3,875	5,419
Daeryun Power Co., Ltd.(*3)	Power generation	KOREA	9.34%	40,854	26,099
Changjuk Wind Power Co., Ltd.	Power generation	KOREA	30.00%	3,801	8,086
KNH Solar Co., Ltd.	Power generation	KOREA	27.00%	1,296	2,337
SPC Power Corporation	Power generation	PHILIPPINES	38.00%	20,635	57,558
Gemeng International Energy Co., Ltd.	Power generation	CHINA	34.00%	413,153	647,010
PT. Cirebon Electric Power	Power generation	INDONESIA	27.50%	40,365	108,628
KNOC Nigerian East Oil Co., Ltd.(*4)	Resources development	NIGERIA	14.63%	12	
KNOC Nigerian West Oil Co., Ltd.(*4)	Resources development	NIGERIA	14.63%	12	
PT Wampu Electric Power	Power generation	INDONESIA	46.00%	21,292	31,097
PT. Bayan Resources TBK	Resources development	INDONESIA	20.00%	615,860	511,646

S-Power Co., Ltd.	Power generation	KOREA	49.00%	132,300	114,566
Pioneer Gas Power Limited(*7)	Power generation	INDIA	38.50%	49,831	20,395
Eurasia Energy Holdings	Power generation and resources development	RUSSIA	40.00%	461	
Xe-Pian Xe-Namnoy Power Co., Ltd.	Power generation	LAOS	25.00%	84,374	77,165
Hadong Mineral Fiber Co., Ltd.(*3)	Recycling fly ashes	KOREA	8.33%	50	
Green Biomass Co., Ltd.(*10)	Power generation	KOREA	8.80%	714	115
PT. Mutiara Jawa	Manufacturing and operating floating coal terminal	INDONESIA	29.00%	2,978	365
Samcheok Eco Materials Co., Ltd.(*9)	Recycling fly ashes	KOREA	2.35%	686	
Noeul Green Energy Co., Ltd.	Power generation	KOREA	29.00%	1,740	8,015
Naepo Green Energy Co., Ltd.	Power generation	KOREA	41.67%	29,200	
Goseong Green Energy Co., Ltd.(*2)	Power generation	KOREA	1.12%	2,900	2,459
Gangneung Eco Power Co., Ltd.(*2)	Power generation	KOREA	1.61%	2,900	2,495
Shin Pyeongtaek Power Co., Ltd.	Power generation	KOREA	40.00%	72,000	67,600
Heang Bok Do Si Photovoltaic Power Co., Ltd.	Power generation	KOREA	28.00%	194	202
Dongducheon Dream Power Co., Ltd.(*14)	Power generation	KOREA	33.61%	148,105	76,386
Jinbhuvish Power Generation Pvt. Ltd.(*2)	Power generation	INDIA	5.16%	9,000	
SE Green Energy Co., Ltd.	Power generation	KOREA	47.76%	3,821	3,366
Daegu Photovoltaic Co., Ltd.	Power generation	KOREA	29.00%	1,230	2,002
Jeongam Wind Power Co., Ltd.	Power generation	KOREA	40.00%	5,580	4,589
Korea Power Engineering Service Co., Ltd.	Construction and service	KOREA	29.00%	290	4,333
Busan Green Energy Co., Ltd.	Power generation	KOREA	29.00%	5,243	12,537
Gunsan Bio Energy Co., Ltd.(*2)	Power generation	KOREA	18.87%	1,000	
Korea Electric Vehicle Charging Service	Electric vehicle charge service	KOREA	28.00%	2,800	1,593

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	2018				
Investees	**Key operation activities**	**Location**	**Percentage of ownership**	**Acquisition cost**	**Book value**
				In millions of won	
Ulleungdo Natural Energy Co., Ltd.	Renewable power generation	KOREA	29.85%	8,000	4,628
Korea Nuclear Partners Co., Ltd.	Electric material agency	KOREA	29.00%	290	175
Tamra Offshore Wind Power Co., Ltd.	Power generation	KOREA	27.00%	8,910	10,401
Korea Electric Power Corporation Fund(*11)	Developing electric enterprises	KOREA	98.09%	51,500	47,189
Energy Infra Asset Management Co., Ltd.(*3)	Asset management	KOREA	9.90%	297	665
Daegu clean Energy Co., Ltd.	Renewable power generation	KOREA	28.00%	140	17
YaksuESS Co., Ltd	Installing ESS related equipment	KOREA	29.00%	210	460
Nepal Water & Energy Development Company Private Limited(*13)	Construction and operation of utility plant	NEPAL	57.67%	33,577	30,961
Gwangyang Green Energy Co., Ltd.	Power generation	KOREA	20.00%	2,000	1,206
PND solar., Ltd	Power generation	KOREA	29.00%	1,250	1,020
Hyundai Eco Energy Co., Ltd.(*2)	Power generation	KOREA	19.00%	3,610	3,388
YeongGwang Yaksu Wind Electric. Co., Ltd(*2)	Power generation	KOREA	9.63%	533	533
				2,338,421	4,064,820
<Joint ventures>					
KEPCO-Uhde Inc.(*6)	Power generation	KOREA	52.80%	11,355	188
Eco Biomass Energy Sdn. Bhd.(*6)	Power generation	MALAYSIA	61.53%	14,439	
Shuweihat Asia Power Investment B.V.	Holding company	NETHERLANDS	49.00%	44,405	27,251
Shuweihat Asia Operation & Maintenance Company(*6)	Maintenance of utility plant	CAYMAN	55.00%	30	792
Waterbury Lake Uranium L.P.	Resources development	CANADA	34.07%	26,602	19,032
ASM-BG Investicii AD	Power generation	BULGARIA	50.00%	16,101	21,379
RES Technology AD	Power generation	BULGARIA	50.00%	15,595	15,209
KV Holdings, Inc.	Power generation	PHILIPPINES	40.00%	2,103	1,918
KEPCO SPC Power Corporation(*6)	Construction and operation of	PHILIPPINES	75.20%	94,579	208,306

	utility plant				
Gansu Datang Yumen Wind Power Co., Ltd.	Power generation	CHINA	40.00%	16,621	9,981
Datang Chifeng Renewable Power Co., Ltd.	Power generation	CHINA	40.00%	121,928	166,162
Datang KEPCO Chaoyang Renewable Power Co., Ltd.	Power generation	CHINA	40.00%	10,858	39,442
Rabigh Electricity Company	Power generation	SAUDI ARABIA	40.00%	109,743	105,328
Rabigh Operation & Maintenance Company Limited	Maintenance of utility plant	SAUDI ARABIA	40.00%	70	5,834
Jamaica Public Service Company Limited	Power generation	JAMAICA	40.00%	301,910	239,632
KW Nuclear Components Co., Ltd.	Manufacturing	KOREA	45.00%	833	7,708
Busan Shinho Solar Power Co., Ltd.	Power generation	KOREA	25.00%	2,100	4,761
GS Donghae Electric Power Co., Ltd.	Power generation	KOREA	34.00%	204,000	240,591
Global Trade Of Power System Co., Ltd.	Exporting products and technology of small or medium business by proxy	KOREA	29.00%	290	515
Expressway Solar-light Power Generation Co., Ltd.	Power generation	KOREA	29.00%	1,856	2,676
Daejung Offshore Wind Power Co., Ltd.	Power generation	KOREA	49.90%	5,190	2,669
Amman Asia Electric Power Company(*6)	Power generation	JORDAN	60.00%	111,476	177,357
KAPES, Inc.(*6)	R&D	KOREA	51.00%	5,629	9,079
Dangjin Eco Power Co., Ltd.	Power generation	KOREA	34.00%	61,540	19,912

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	2018				
Investees	**Key operation activities**	**Location**	**Percentage of ownership**	**Acquisition cost**	**Book value**
				In millions of won	
Honam Wind Power Co., Ltd.	Power generation	KOREA	29.00%	3,480	4,860
Chun-cheon Energy Co., Ltd.	Power generation	KOREA	29.90%	52,700	42,505
Yeonggwangbaeksu Wind Power Co., Ltd.(*3)	Power generation	KOREA	15.00%	3,000	2,843
Nghi Son 2 Power LLC	Power generation	VIETNAM	50.00%	2,781	
Kelar S.A(*6)	Power generation	CHILE	65.00%	78,060	72,824
PT. Tanjung Power Indonesia	Power generation	INDONESIA	35.00%	746	7,081
Incheon New Power Co., Ltd.	Power generation	KOREA	29.00%	461	579
Seokmun Energy Co., Ltd.	Power generation	KOREA	29.00%	15,370	16,751
Daehan Wind Power PSC	Power generation	JORDAN	50.00%	3,191	1,632
Barakah One Company(*12)	Power generation	UAE	18.00%	118	3,807
Nawah Energy Company(*12)	Operation of utility plant	UAE	18.00%	296	274
MOMENTUM	International thermonuclear experimental reactor construction management	FRANCE	33.33%	1	582
Daegu Green Power Co., Ltd.	Power generation	KOREA	29.00%	46,225	41,110
Yeonggwang Wind Power Co., Ltd.	Power generation	KOREA	41.00%	15,375	15,304
Chester Solar IV SpA(*6)	Power generation	CHILE	81.82%	1,700	1,851
Chester Solar V SpA(*6)	Power generation	CHILE	81.82%	525	474
Diego de Almagro Solar SpA(*6)	Power generation	CHILE	81.82%	2,091	1,663
South Jamaica Power Company Limited	Power generation	JAMAICA	20.00%	16,231	16,124
Daesan Green Energy Co., Ltd.	Power generation	KOREA	35.00%	17,850	17,433
RE Holiday Holdings LLC	Power generation	USA	50.00%	42,948	51,094
RE Pioneer Holdings LLC	Power generation	USA	50.00%	27,891	38,898
RE Barren Ridge 1 Holdings LLC	Power generation	USA	50.00%	28,021	41,415
RE Astoria 2 LandCo LLC	Power generation	USA	50.00%	5,188	5,410
RE Barren Ridge LandCo LLC	Power generation	USA	50.00%	2,187	1,898
Laurel SpA(*6)	Power generation	CHILE	81.82%	1,222	921
KIAMCO KOWEPO Bannerton Hold Co Pty Ltd(*3)	Power generation	AUSTRALIA	12.37%	4,095	3,940
Chile Solar JV SpA	Power generation	CHILE	50.00%	36,654	36,865
Taebaek Gadeoksan Wind Power Co., Ltd.	Power generation	KOREA	46.58%	8,500	8,508
Cheong-Song Noraesan Wind Power Co., Ltd.	Power generation	KOREA	24.76%	2,073	2,073
Chester Solar I SpA(*6)	Power generation	CHILE	81.82%	1,181	1,181
	Power generation	PHILIPPINES	38.00%	47,903	47,903

Solar Philippines Calatagan Corporation		
	1,647,317	1,813,525
	3,985,738	5,878,345

(*1) The effective percentage of ownership is 21.57% considering treasury stocks.

(*2) The effective percentage of ownership is less than 20%. However, the Company can exercise significant influence by virtue of its contractual right to appoint directors to the board of directors of the entity, and by strict decision criteria of the Company s financial and operating policy of the board of directors.

(*3) The effective percentage of ownership is less than 20%. However, the Company can exercise significant influence by virtue of its contractual right to appoint a director to the board of directors of the entity.

(*4) The effective percentage of ownership is less than 20%. However, the Company can exercise significant influence by virtue of its contractual right to appoint one out of four members of the steering committee of the entity. Moreover, the Company has significant financial transactions, which can affect its influence on the entity.

(*5) The effective percentage of ownership is 100%. However, the Government regulates the Company s ability to make operating and financial decisions over the entity, as the Government requires maintaining arms-length transactions between KPX and the Company s other subsidiaries. The Company can exercise significant influence by its right to nominate directors to the board of directors of the entity.

(*6) The effective percentage of ownership is more than 50%. However, according to the shareholders agreement, all critical financial and operating decisions must be agreed to by all ownership parties. For this reason, the entities are classified as joint ventures.

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(*7) As of reporting date, the annual reporting period of all associates and joint ventures ends on December 31, except for Pioneer Gas Power Limited whose reporting period ends on March 31.

(*8) As of December 31, 2018, 15.64% of ownership of Hyundai Energy Co., Ltd. is held by NH Power ll Co., Ltd. and NH Bank. According to the shareholders agreement reached on March 2011, not only does the Company have a call option to acquire the investment in Hyundai Energy Co., Ltd. from NH Power ll Co., Ltd. and NH Bank with a certain rate of return, NH Power ll Co., Ltd. and NH Bank also have put options to dispose of their investment to the Company. In connection with this agreement, the Company applied the equity method on the investment in Hyundai Energy Co., Ltd. with 46.30% of ownership.

(*9) The Company s effective percentage of ownership excluding the redeemable convertible preferred stock is 25.54%.

(*10) The effective percentage of ownership is less than 20% but the Company can exercise significant influence by virtue of its contractual right to appoint a director to the board of directors of the entity and the fact that the dominant portion of the investee s sales transactions is generated from the Company.

(*11) The effective percentage of ownership is more than 50% but the Company does not hold control over relevant business while it exercises significant influence by participating in the Investment Decision Committee. For this reason, the entity is classified as an associate.

(*12) The effective percentage of ownership is less than 20% but the Company has joint control over the entity as decisions on the major activities require the unanimous consent of the parties that collectively control the entity

(*13) The effective percentage of ownership is more than 50% but the Company does not hold control over the entity according to the shareholders agreement. For this reason, the entity is classified as an associate.

(*14) The effective percentage of ownership is 34.01% considering redeemable convertible preferred stock.

(2) The fair value of associates which are actively traded on an open market and have a readily available market value as of December 31, 2017 and 2018 are as follows:

Investees	2017	2018
	In millions of won	
<Associates>		
Korea Electric Power Industrial Development Co., Ltd.	38,667	33,609
Korea Gas Corporation(*)	804,195	910,980
YTN Co., Ltd.	18,855	18,900
SPC Power Corporation	72,616	72,710

PT. Bayan Resources TBK	558,267	1,017,601

(*) The carrying amount of Korea Gas Corporation (KOGAS) is 1,701,848 million as of December 31, 2018 and management has determined that there is objective evidence of impairment. As a result of the impairment test, the Company has not recognized any impairment loss as the value in use is greater than the carrying amount. The recoverable amount of KOGAS based on its value in use is calculated by considering the long-term natural gas supply and demand programs of future cash flows approved by Ministry of Trade, Industry & Energy and the discount rate of 4.80%.

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(3) Changes in investments in associates and joint ventures for the years ended December 31, 2017 and 2018 are as follows:

	2017						
Investees	Beginning balance	Acquisition	Disposal	Dividends received	Share of income (loss)	Other comprehensive income (loss)	Others	Ending balance
	In millions of won							
<Associates>								
Korea Gas Corporation	1,933,877				(242,232)	(72,648)	(129)	1,618,868
Korea Electric Power Industrial Development Co., Ltd.	20,475			(2,061)	3,428	102	(106)	21,838
YTN Co., Ltd.	38,156			(135)	1,095	929	561	40,606
Cheongna Energy Co., Ltd.	12,373				(4,036)			8,337
Gangwon Wind Power Co., Ltd.	13,069			(852)	1,638			13,855
Hyundai Green Power Co., Ltd.	115,998			(8,889)	7,697			114,806
Korea Power Exchange	223,238				8,831		5,562	237,631
AMEC Partners Korea Ltd.	225				(10)			215
Hyundai Energy Co., Ltd.	1,031				(3,498)		2,467	
Ecollite Co., Ltd.								
Taebaek Wind Power Co., Ltd.	4,750				569			5,319
Taeback Guinemi Wind Power Co., Ltd.	3,131				(42)			3,089
Pyeongchang Wind Power Co., Ltd.	3,383				753			4,136
Daeryun Power Co., Ltd.	29,873				(4,762)		2	25,113
Changjuk Wind Power Co., Ltd.	6,930			(111)	696			7,515
KNH Solar Co., Ltd.	2,073				145			2,218
SPC Power Corporation	56,818			(5,562)	4,310	(3,276)	(7)	52,283
Gemeng International	680,065			(13,365)	6,953	(23,680)		649,973

Energy Co., Ltd.							
PT. Cirebon Electric Power	96,658		(550)	10,685	2,232	(11,615)	97,410
KNOC Nigerian East Oil Co., Ltd.				(1,914)	1,536	378	
KNOC Nigerian West Oil Co., Ltd.				(1,712)	1,407	305	
PT Wampu Electric Power	23,188			9,336		(3,121)	29,403
PT. Bayan Resources TBK	402,667			34,122	14,982	60	451,831
S-Power Co., Ltd.	123,912			(6,982)		15	116,945
Pioneer Gas Power Limited	50,740			(11,119)	(1,238)	276	38,659
Eurasia Energy Holdings							
Xe-Pian Xe-Namnoy Power Co., Ltd.	51,544	22,362		(4,264)	(7,863)		61,779
Hadong Mineral Fiber Co., Ltd.				(31)		31	
Green Biomass Co., Ltd.	47			(112)		273	208
PT. Mutiara Jawa							
Samcheok Eco Materials Co., Ltd.							
Noeul Green Energy Co., Ltd.	1,217			850			2,067
Naepo Green Energy Co., Ltd.(*2)	25,438			(1,400)		(3,440)	20,598
Goseong Green Energy Co., Ltd.	2,663			(66)			2,597
Gangneung Eco Power Co., Ltd.	2,646			(63)			2,583
Shin Pyeongtaek Power Co., Ltd.		43,880		(10,998)	(3,617)	5,638	34,903
Heang Bok Do Si Photovoltaic Power Co., Ltd.	181			6			187
DS POWER Co., Ltd.(*4)	7,190			(1,321)		(5,869)	
Dongducheon Dream Power Co., Ltd.(*1,3)	46,876			(10,980)		17,337	53,233
KS Solar Co., Ltd.	604		(613)		9		
Jinbhuvish Power Generation Pvt. Ltd.							
SE Green Energy Co., Ltd.	3,525			(49)			3,476

Daegu Photovoltaic Co., Ltd.	1,700	(349)	367		1,718
Jeongam Wind Power Co., Ltd.	4,000		(237)		3,763
Korea Power Engineering Service Co., Ltd.	2,810	(191)	1,030	10	3,659

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	2017							
Investees	Beginning balance	Acquisition	Disposal	Dividends received	Share of income (loss)	Other comprehensive income (loss)	Others	Ending balance
	In millions of won							
Busan Green Energy Co., Ltd.	13,803		(9,320)		2,884		(4)	7,363
Gunsan Bio Energy Co., Ltd.								
Korea Electric Vehicle Charging Service	1,103	1,008			(362)			1,749
Ulleungdo Natural Energy Co., Ltd.	6,894				(524)			6,370
Korea Nuclear Partners Co., Ltd.	248				135			383
Tamra Offshore Wind Power Co., Ltd.	7,015				1,545			8,560
Korea Electric Power Corporation Fund	50,856				(2,171)	(711)		47,974
Energy Infra Asset Management Co., Ltd.	259				217			476
Daegu clean Energy Co., Ltd.	140				(129)			11
YaksuESS Co., Ltd	196				(2)			194
Nepal Water & Energy Development Company Private Limited	18,667	15,009			(677)	(2,501)		30,498
Gwangyang Green Energy Co., Ltd.		2,000			(228)			1,772
PND solar., Ltd		1,250						1,250
	4,092,252	85,509	(9,933)	(32,065)	(212,629)	(94,337)	8,624	3,837,421
<Joint ventures>								
KEPCO-Uhde Inc.	301				(43)			258
Eco Biomass Energy Sdn. Bhd.								
Datang Chaoyang Renewable Power Co., Ltd.	28,239			(839)	840	(978)		27,262
				(1,707)	4,275	12,457	650	15,675

Shuweihat Asia Power Investment B.V.						
Shuweihat Asia Operation & Maintenance Company	450	(770)	1,055	(172)	100	663
Waterbury Lake Uranium L.P.	21,314		(23)	(949)	(561)	19,781
ASM-BG Investicii AD	21,488	(946)	(150)	810		21,202
RES Technology AD	13,582		1,053	(260)		14,375
KV Holdings, Inc.	2,098		61	(241)		1,918
KEPCO SPC Power Corporation	245,367	(37,443)	42,359	(33,230)	41	217,094
Canada Korea Uranium Limited partnership						
Gansu Datang Yumen Wind Power Co., Ltd.	12,821		(1,299)	(682)		10,840
Datang Chifeng Renewable Power Co., Ltd.	166,535		14,079	(9,559)		171,055
Datang KEPCO Chaoyang Renewable Power Co., Ltd.	10,843		837	(620)		11,060
Rabigh Electricity Company	97,802	(18,112)	35,769	(15,227)	(876)	99,356
Rabigh Operation & Maintenance Company Limited	4,427	(2,130)	2,236	(546)		3,987
Jamaica Public Service Company Limited	249,453			(28,300)		221,153
KW Nuclear Components Co., Ltd.	7,133	(208)	(222)			6,703
Busan Shinho Solar Power Co., Ltd.	3,814	(63)	595			4,346
GS Donghae Electric Power Co., Ltd.	205,948		14,714		65	220,727
Global Trade Of Power System Co., Ltd.	477		100			577
	2,343		120			2,463

Expressway Solar-light Power Generation Co., Ltd.	

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	2017							
Investees	Beginning balance	Acquisition	Disposal	Dividends received	Share of income (loss)	Other comprehensive income (loss)	Others	Ending balance
	In millions of won							
KODE NOVUS I LLC								
KODE NOVUS II LLC								
Daejung Offshore Wind Power Co., Ltd.	3,015	200			(246)			2,969
Amman Asia Electric Power Company	153,857			(12,213)	19,957	(15,925)		145,676
KAPES, Inc.	4,758				2,752		(34)	7,476
Dangjin Eco Power Co., Ltd.	53,253	5,440			(752)	(3)	(10)	57,928
Honam Wind Power Co., Ltd.	4,451			(487)	338			4,302
Chun-cheon Energy Co., Ltd.	50,592				(2,474)			48,118
Yeonggwangbaeksu Wind Power Co., Ltd.	2,689				45			2,734
Nghi Son 2 Power LLC	229	993			(1,039)			183
Kelar S.A		73,040			(633)	(5,175)	1	67,233
PT. Tanjung Power Indonesia	1,946				2,112	(2,281)	(1)	1,776
Incheon New Power Co., Ltd.	563				56			619
Seokmun Energy Co., Ltd.	391	14,790			(1,219)	(176)		13,786
Daehan Wind Power PSC	16				(40)	22	2	
Barakah One Company	116				570	(60)		626
Nawah Energy Company	290				(5)	(27)		258
MOMENTUM	67				321	3		391
Daegu Green Power Co., Ltd.	47,528				(5,133)		(4)	42,391
Yeonggwang Wind Power Co., Ltd.		15,375			(25)	(56)		15,294
Chester Solar IV SpA		1,700						1,700
Chester Solar V SpA		525						525

Diego de Almagro Solar SpA		2,091						2,091
South Jamaica Power Company Limited		7,090					(386)	6,704
	1,418,196	121,244		(74,918)	130,941	(101,175)	(1,013)	1,493,275
	5,510,448	206,753	(9,933)	(106,983)	(81,688)	(195,512)	7,611	5,330,696

(*1) It was determined that there is objective evidence of impairment due to prolonged operating losses. As a result, the Company recognized an impairment loss of 23,798 million in impairment loss on investments in associates and joint ventures for the year ended December 31, 2017.

(*2) It was determined that there is objective evidence of impairment due to prolonged operating losses. As a result, the Company recognized an impairment loss of 3,440 million in impairment loss on investments in associates and joint ventures for the year ended December 31, 2017.

(*3) Others include 41,170 million of assets held-for-sale (note 45).

(*4) Others include 4,438 million of assets held-for-sale (note 45), and also include 1,439 million of available-for-sale financial assets which is reclassified due to loss of significant influence.

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	2018						
Investees	Beginning balance	Acquisition	Disposal	Dividends received	Share of income (loss)	Other comprehensive income (loss)	Others	Ending balance
	In millions of won							
<Associates>								
Korea Gas Corporation	1,618,868				107,952	(24,843)	(129)	1,701,848
Korea Electric Power Industrial Development Co., Ltd.	21,838			(1,872)	2,584	(102)	(610)	21,838
YTN Co., Ltd.	40,606			(180)	545	(186)	(447)	40,338
Cheongna Energy Co., Ltd.	8,337				(4,872)			3,465
Gangwon Wind Power Co., Ltd.	13,855			(2,272)	1,637			13,220
Hyundai Green Power Co., Ltd.	114,806			(8,889)	21,243			127,160
Korea Power Exchange	237,631				16,031		(1,860)	251,802
AMEC Partners Korea Ltd.	215				(6)			209
Hyundai Energy Co., Ltd.								
Ecollite Co., Ltd.								
Taebaek Wind Power Co., Ltd.	5,319			(196)	542			5,665
Taeback Guinemi Wind Power Co., Ltd.	3,089				(520)			2,569
Pyeongchang Wind Power Co., Ltd.	4,136				1,283			5,419
Daeryun Power Co., Ltd.(*5)	25,113				(189)	184	991	26,099
Changjuk Wind Power Co., Ltd.	7,515			(416)	987			8,086
KNH Solar Co., Ltd.	2,218				119			2,337
SPC Power Corporation	52,283			(9,549)	4,235	10,578	11	57,558
Gemeng International Energy Co., Ltd.	649,973			(11,246)	15,156	(6,873)		647,010
PT. Cirebon Electric Power	97,410			(4,432)	9,385	6,265		108,628
KNOC Nigerian East Oil Co., Ltd.					2,615	(471)	(2,144)	
KNOC Nigerian West Oil Co., Ltd.					2,342	(414)	(1,928)	
	29,403				408	1,286		31,097

PT Wampu Electric Power							
PT. Bayan Resources TBK	451,831		(33,651)	74,776	18,690		511,646
S-Power Co., Ltd.	116,945			(2,326)		(53)	114,566
Pioneer Gas Power Limited	38,659			(17,684)	(580)		20,395
Eurasia Energy Holdings							
Xe-Pian Xe-Namnoy Power Co., Ltd.	61,779	12,893		(479)	2,972		77,165
Hadong Mineral Fiber Co., Ltd.							
Green Biomass Co., Ltd.	208			(93)			115
PT. Mutiara Jawa				349	16		365
Samcheok Eco Materials Co., Ltd.							
Noeul Green Energy Co., Ltd.	2,067			5,687		261	8,015
Naepo Green Energy Co., Ltd.(*4)	20,598			(13,511)		(7,087)	
Goseong Green Energy Co., Ltd.	2,597			(138)			2,459
Gangneung Eco Power Co., Ltd.	2,583			(88)			2,495
Shin Pyeongtaek Power Co., Ltd.	34,903	28,080		(2,946)	6,673	890	67,600
Heang Bok Do Si Photovoltaic Power Co., Ltd.	187			15			202
Dongducheon Dream Power Co., Ltd.	53,233	36,971		(13,824)		6	76,386
Jinbhuvish Power Generation Pvt. Ltd.							
SE Green Energy Co., Ltd.	3,476			(110)			3,366
Daegu Photovoltaic Co., Ltd.	1,718		(128)	412			2,002
Jeongam Wind Power Co., Ltd.	3,763			826			4,589
Korea Power Engineering Service Co., Ltd.	3,659		(218)	929		(37)	4,333
Busan Green Energy Co., Ltd.	7,363			5,037		137	12,537
Gunsan Bio Energy Co., Ltd.							
Korea Electric Vehicle Charging Service	1,749	196		(352)			1,593

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	2018							
Investees	Beginning balance	Acquisition	Disposal	Dividends received	Share of income (loss)	Other comprehensive income (loss)	Others	Ending balance
	In millions of won							
Ulleungdo Natural Energy Co., Ltd.	6,370				(1,749)		7	4,628
Korea Nuclear Partners Co., Ltd.	383				(208)			175
Tamra Offshore Wind Power Co., Ltd.	8,560				1,841			10,401
Korea Electric Power Corporation Fund	47,974				(505)	(280)		47,189
Energy Infra Asset Management Co., Ltd.	476				189			665
Daegu clean Energy Co., Ltd.	11				6			17
YaksuESS Co., Ltd	194				266			460
Nepal Water & Energy Development Company Private Limited	30,498				(770)	1,233		30,961
Gwangyang Green Energy Co., Ltd.	1,772				(566)			1,206
PND solar., Ltd	1,250				(230)			1,020
Hyundai Eco Energy Co., Ltd.		3,610			(222)			3,388
YeongGwang Yaksu Wind Electric. Co., Ltd		533						533
	3,837,421	82,283		(73,049)	216,009	14,148	(11,992)	4,064,820
<Joint ventures>								
KEPCO-Uhde Inc.	258				(70)			188
Eco Biomass Energy Sdn. Bhd.								
Datang Chaoyang Renewable Power Co., Ltd.(*3)	27,262				743	1,009	(29,014)	
Shuweihat Asia Power Investment B.V.	15,675		(1,632)	(499)	3,075	10,632		27,251

Shuweihat Asia Operation & Maintenance Company	663	(859)	946	42		792
Waterbury Lake Uranium L.P.	19,781		(3)	(746)		19,032
ASM-BG Investicii AD	21,202	(1,039)	2,236	(1,020)		21,379
RES Technology AD	14,375		812	22		15,209
KV Holdings, Inc.	1,918	(735)	772	(37)		1,918
KEPCO SPC Power Corporation	217,094	(41,601)	44,909	(12,092)	(4)	208,306
Gansu Datang Yumen Wind Power Co., Ltd.	10,840		(818)	(41)		9,981
Datang Chifeng Renewable Power Co., Ltd.	171,055	(18,859)	14,808	(842)		166,162
Datang KEPCO Chaoyang Renewable Power Co., Ltd.(*3)	11,060		582	(1,214)	29,014	39,442
Rabigh Electricity Company	99,356	(29,067)	13,305	22,371	(637)	105,328
Rabigh Operation & Maintenance Company Limited	3,987	(1,147)	2,820	174		5,834
Jamaica Public Service Company Limited	221,153	(4,472)	13,099	9,852		239,632
KW Nuclear Components Co., Ltd.	6,703	(208)	1,213			7,708
Busan Shinho Solar Power Co., Ltd.	4,346	(340)	755			4,761
GS Donghae Electric Power Co., Ltd.	220,727		20,061		(197)	240,591
Global Trade Of Power System Co., Ltd.	577		(62)			515
Expressway Solar-light Power Generation Co., Ltd.	2,463		213			2,676
KODE NOVUS I LLC(*1)				1,374	(1,374)	
KODE NOVUS II LLC(*2)				810	(810)	

Daejung Offshore Wind Power Co., Ltd.	2,969	(300)	2,669

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	2018							
Investees	Beginning balance	Acquisition	Disposal	Dividends received	Share of income (loss)	Other comprehensive income (loss)	Others	Ending balance
	In millions of won							
Amman Asia Electric Power Company	145,676				19,604	12,077		177,357
KAPES, Inc.	7,476				1,543		60	9,079
Dangjin Eco Power Co., Ltd.	57,928				(38,042)	(65)	91	19,912
Honam Wind Power Co., Ltd.	4,302			(348)	906			4,860
Chun-cheon Energy Co., Ltd.	48,118				(5,613)			42,505
Yeonggwangbaeksu Wind Power Co., Ltd.	2,734				109			2,843
Nghi Son 2 Power LLC	183				2,657	(2,840)		
Kelar S.A	67,233				2,732	2,859		72,824
PT. Tanjung Power Indonesia	1,776				3,373	1,928	4	7,081
Incheon New Power Co., Ltd.	619			(41)	1			579
Seokmun Energy Co., Ltd.	13,786				2,965			16,751
Daehan Wind Power PSC		2,288			(1,311)	37	618	1,632
Barakah One Company	626				2,162	1,019		3,807
Nawah Energy Company	258				4	12		274
MOMENTUM	391				195	(4)		582
Daegu Green Power Co., Ltd.	42,391				(1,283)		2	41,110
Yeonggwang Wind Power Co., Ltd.	15,294				10			15,304
Chester Solar IV SpA	1,700				301	(150)		1,851
Chester Solar V SpA	525				(21)	(30)		474
Diego de Almagro Solar SpA	2,091				(299)	(129)		1,663
South Jamaica Power Company Limited	6,704	9,141			(184)	463		16,124
Daesan Green Energy Co., Ltd.		17,850			(417)			17,433
RE Holiday Holdings LLC		42,948		(112)	8,055	203		51,094

RE Pioneer Holdings LLC	27,891		(979)	11,585	401			38,898
RE Barren Ridge 1 Holdings LLC	28,021		(1,114)	13,994	514			41,415
RE Astoria 2 LandCo LLC	5,188		(504)	866	(140)			5,410
RE Barren Ridge LandCo LLC	2,187		(202)	(25)	(62)			1,898
Laurel SpA	1,222			(309)	8			921
KIAMCO KOWEPO Bannerton Hold Co Pty Ltd	4,095			(23)	(132)			3,940
Chile Solar JV SpA	36,654			4,453	(5,278)	1,036		36,865
Taebaek Gadeoksan Wind Power Co., Ltd.	8,500			8				8,508
Cheong-Song Noraesan Wind Power Co., Ltd.	2,073							2,073
Chester Solar I SpA	1,181							1,181
Solar Philippines Calatagan Corporation	47,903							47,903
	1,493,275	237,142	(1,632)	(102,126)	147,092	40,985	(1,211)	1,813,525
	5,330,696	319,425	(1,632)	(175,175)	363,101	55,133	(13,203)	5,878,345

(*1) The Company reclassified its shares of KODE NOVUS I LLC to financial assets at FVOCI during the year ended December 31, 2018 due to non-participation of capital increase that resulted in loss of significant influence.

(*2) The Company sold all of its shares of KODE NOVUS II LLC during the year ended December 31, 2018.

(*3) Datang Chaoyang Renewable Power Co., Ltd. was merged with Datang KEPCO Chaoyang Renewable Power Co., Ltd. during the year ended December 31, 2018.

(*4) It was determined that there is objective evidence of impairment due to prolonged operating losses. As a result, the Company recognized an impairment loss of 7,087 million in impairment loss on investments in associates and joint ventures for the year ended December 31, 2018.

(*5) It was determined that there is objective evidence of impairment due to prolonged operating losses. As a result, the Company recognized an impairment loss of 820 million in impairment loss on investments in associates and joint ventures for the year ended December 31, 2018.

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(4) Summary of financial information of associates and joint ventures as of and for the years ended December 31, 2017 and 2018 are as follows:

Investees	2017 Total assets	Total liabilities	Sales	Profit (loss) for the period
		In millions of won		
<Associates>				
Korea Gas Corporation	37,139,439	28,999,025	22,172,305	(1,205,110)
Korea Electric Power Industrial Development Co., Ltd.	155,033	79,730	334,547	16,126
YTN Co., Ltd.	298,122	108,554	131,080	3,638
Cheongna Energy Co., Ltd.	461,958	448,535	56,533	(9,203)
Gangwon Wind Power Co., Ltd.	94,281	2,243	25,963	11,121
Hyundai Green Power Co., Ltd.	1,150,729	754,846	477,373	26,543
Korea Power Exchange	263,499	25,868	105,107	8,831
AMEC Partners Korea Ltd.	1,135	4	1	(53)
Hyundai Energy Co., Ltd.	474,939	511,486	92,992	(43,317)
Ecollite Co., Ltd.	2,052	352		(121)
Taebaek Wind Power Co., Ltd.	39,227	17,953	7,056	2,312
Taeback Guinemi Wind Power Co., Ltd.	12,369	12		(140)
Pyeongchang Wind Power Co., Ltd.	77,152	60,606	11,907	3,038
Daeryun Power Co., Ltd.	779,258	655,377	156,508	(23,978)
Changjuk Wind Power Co., Ltd.	35,794	10,745	6,981	2,317
KNH Solar Co., Ltd.	24,432	16,215	3,947	628
SPC Power Corporation	137,586		68,149	37,395
Gemeng International Energy Co., Ltd.	6,496,294	4,584,608	1,334,833	21,769
PT. Cirebon Electric Power	903,429	549,212	280,452	38,448
KNOC Nigerian East Oil Co., Ltd.	241,808	329,639		(10,754)
KNOC Nigerian West Oil Co., Ltd.	147,185	227,588		(9,768)
PT Wampu Electric Power	212,095	148,177	779	8,114
PT. Bayan Resources TBK	908,106	556,881	811,515	243,621
S-Power Co., Ltd.	859,633	617,224	489,042	(14,470)
Pioneer Gas Power Limited	339,271	296,898	8,215	(27,796)
Eurasia Energy Holdings	548	978		
Xe-Pian Xe-Namnoy Power Co., Ltd.	858,789	607,462		(16,677)
Hadong Mineral Fiber Co., Ltd.	203	231		(260)
Green Biomass Co., Ltd.	6,379	4,018	2,337	(956)
PT. Mutiara Jawa	27,098	29,670	13,574	3,455
Samcheok Eco Materials Co., Ltd.	23,729	270	15	(541)
Noeul Green Energy Co., Ltd.	127,980	120,852	43,099	2,932
Naepo Green Energy Co., Ltd.	121,375	71,945	5,696	(5,603)
Goseong Green Energy Co., Ltd.	1,081,238	841,330		(5,811)
Gangneung Eco Power Co., Ltd.	186,765	20,344		(3,407)
Shin Pyeongtaek Power Co., Ltd.	175,870	90,662		(4,585)
Heang Bok Do Si Photovoltaic Power Co., Ltd.	2,782	2,120	451	22
Dongducheon Dream Power Co., Ltd.	1,575,175	1,365,845	813,440	(33,740)

Jinbhuvish Power Generation Pvt. Ltd.	66,047	13,640		
SE Green Energy Co., Ltd.	7,278			(103)
Daegu Photovoltaic Co., Ltd.	17,262	11,339	3,714	1,263
Jeongam Wind Power Co., Ltd.	67,427	58,019		(580)
Korea Power Engineering Service Co., Ltd.	15,738	3,121	22,283	3,783

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	2017			
Investees	**Total assets**	**Total liabilities**	**Sales**	**Profit (loss) for the period**
		In millions of won		
Busan Green Energy Co., Ltd.	193,253	167,864	34,280	9,946
Gunsan Bio Energy Co., Ltd.	9,648	16,462		(6,109)
Korea Electric Vehicle Charging Service	14,650	8,404	8,399	(1,295)
Ulleungdo Natural Energy Co., Ltd.	25,842	4,501		(1,758)
Korea Nuclear Partners Co., Ltd.	2,033	711	1,345	465
Tamra Offshore Wind Power Co., Ltd.	163,740	132,036	4,392	(191)
Korea Electric Power Corporation Fund	49,170	265	666	(2,213)
Energy Infra Asset Management Co., Ltd.	5,240	431	5,807	2,203
Daegu clean Energy Co., Ltd.	252	212		(460)
YaksuESS Co., Ltd	7,105	6,437	381	(6)
Nepal Water & Energy Development Company Private Limited	58,121	11,670		(968)
Gwangyang Green Energy Co., Ltd.	20,165	11,393		(1,139)
PND solar., Ltd	10,508	6,729		(406)
<Joint ventures>				
KEPCO-Uhde Inc.	515	7		(86)
Eco Biomass Energy Sdn. Bhd.				
Datang Chaoyang Renewable Power Co., Ltd.	138,463	70,309	17,776	2,149
Shuweihat Asia Power Investment B.V.	32,001	10		(170)
Shuweihat Asia Operation & Maintenance Company	1,220	14	2,580	1,918
Waterbury Lake Uranium L.P.	55,563	250		
ASM-BG Investicii AD	87,110	44,706	12,611	(262)
RES Technology AD	71,595	42,845	7,793	2,164
KV Holdings, Inc.	4,795		671	677
KEPCO SPC Power Corporation	318,911	30,222	186,725	57,364
Gansu Datang Yumen Wind Power Co., Ltd.	81,960	54,859	6,938	(3,253)
Datang Chifeng Renewable Power Co., Ltd.	762,605	334,843	113,329	35,294
Datang KEPCO Chaoyang Renewable Power Co., Ltd.	60,913	33,264	8,442	2,094
Rabigh Electricity Company	2,364,522	1,936,403	287,105	78,948
Rabigh Operation & Maintenance Company Limited	19,992	10,025	22,668	5,668
Jamaica Public Service Company Limited	1,276,279	752,617	946,365	24,601
KW Nuclear Components Co., Ltd.	25,693	10,221	6,486	1,493
Busan Shinho Solar Power Co., Ltd.	47,959	30,573	7,984	2,383
GS Donghae Electric Power Co., Ltd.	2,179,465	1,530,266	351,814	43,180
Global Trade Of Power System Co., Ltd.	3,576	1,586	4,079	365
Expressway Solar-light Power Generation Co., Ltd.	19,143	10,651	3,018	643
KODE NOVUS I LLC	755	108,132	14	(8,117)
KODE NOVUS II LLC	292	47,683		(6,018)
Daejung Offshore Wind Power Co., Ltd.	6,193	243		(493)
Amman Asia Electric Power Company	759,114	516,174	18,034	33,514

KAPES, Inc.	70,679	56,021	129,962	5,397
Dangjin Eco Power Co., Ltd.	163,197	521		(2,182)
Honam Wind Power Co., Ltd.	39,675	24,951	5,961	1,166
Chun-cheon Energy Co., Ltd.	699,652	538,733	164,294	(8,145)

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Investees	2017 Total assets	Total liabilities	Sales	Profit (loss) for the period
		In millions of won		
Yeonggwangbaeksu Wind Power Co., Ltd.	94,810	76,621	11,124	297
Nghi Son 2 Power LLC	741	376		(2,068)
Kelar S.A	613,293	513,101	90,435	17,590
PT. Tanjung Power Indonesia	374,702	369,627	209,923	6,219
Incheon New Power Co., Ltd.	7,194	5,059	2,972	184
Seokmun Energy Co., Ltd.	247,735	200,197	35,135	(3,939)
Daehan Wind Power PSC	928	1,752		(904)
Barakah One Company	17,574,885	17,571,409		(1,358)
Nawah Energy Company	1,459	23		(11)
MOMENTUM	5,028	3,854	11,555	939
Daegu Green Power Co., Ltd.	602,809	531,103	256,359	(17,700)
Yeonggwang Wind Power Co., Ltd.	212,802	176,062		(62)
Chester Solar IV SpA	11,660	9,626	331	151
Chester Solar V SpA	2,081	1,569		(49)
Diego de Almagro Solar SpA	8,266	5,830		(103)
South Jamaica Power Company Limited	153,958	120,436		(755)

Investees	2018 Total assets	Total liabilities	Sales	Profit (loss) for the period
		In millions of won		
<Associates>				
Korea Gas Corporation(*1)	39,689,692	31,186,488	26,185,038	523,480
Korea Electric Power Industrial Development Co., Ltd.	144,425	69,123	325,694	9,987
YTN Co., Ltd.	286,964	98,682	132,382	1,587
Cheongna Energy Co., Ltd.	431,234	428,921	64,594	(11,110)
Gangwon Wind Power Co., Ltd.	89,614	1,805	25,407	10,926
Hyundai Green Power Co., Ltd.	1,127,220	688,738	501,798	66,925
Korea Power Exchange	304,318	52,516	108,571	16,031
AMEC Partners Korea Ltd.	1,113	14		(26)
Hyundai Energy Co., Ltd.	470,818	527,590	101,998	(33,947)
Ecollite Co., Ltd.	1,944	312		(68)
Taebaek Wind Power Co., Ltd.	36,986	14,325	8,233	2,170
Taeback Guinemi Wind Power Co., Ltd.	10,929	653		(2,082)
Pyeongchang Wind Power Co., Ltd.	82,038	60,362	12,615	4,249
Daeryun Power Co., Ltd.	798,569	510,358	62,252	(4,958)
Changjuk Wind Power Co., Ltd.	33,148	6,194	7,929	3,291
KNH Solar Co., Ltd.	22,598	13,942	3,586	439
SPC Power Corporation	225,599	16,819	50,317	37,355
Gemeng International Energy Co., Ltd.	7,155,937	4,420,561	1,921,367	120,558
PT. Cirebon Electric Power	876,069	481,061	274,962	33,144
KNOC Nigerian East Oil Co., Ltd.	78,841	152,017		(398)

KNOC Nigerian West Oil Co., Ltd.	70,437	137,663		(400)
PT Wampu Electric Power	223,009	155,406	13,463	4,624
PT. Bayan Resources TBK	1,388,199	566,890	1,707,387	521,666
S-Power Co., Ltd.	825,354	588,022	551,378	(6,185)
Pioneer Gas Power Limited	311,742	316,810		(45,934)
Eurasia Energy Holdings	572	1,020		

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	2018			
Investees	**Total assets**	**Total liabilities**	**Sales**	**Profit (loss) for the period**
		In millions of won		
Xe-Pian Xe-Namnoy Power Co., Ltd.	1,015,013	702,187		(1,214)
Hadong Mineral Fiber Co., Ltd.	203	231		
Green Biomass Co., Ltd.	4,411	3,107	909	(1,057)
PT. Mutiara Jawa	24,022	22,763	14,393	3,917
Samcheok Eco Materials Co., Ltd.	24,391	2,921	4,135	(1,836)
Noeul Green Energy Co., Ltd.	147,886	120,249	58,686	19,453
Naepo Green Energy Co., Ltd.	93,194	76,190	6,459	(6,623)
Goseong Green Energy Co., Ltd.	1,891,662	1,659,415		(7,323)
Gangneung Eco Power Co., Ltd.	813,938	651,621		(4,194)
Shin Pyeongtaek Power Co., Ltd.	674,100	511,582		682
Heang Bok Do Si Photovoltaic Power Co., Ltd.	2,630	1,915	455	52
Dongducheon Dream Power Co., Ltd.	1,512,510	1,244,178	828,430	(22,864)
Jinbhuvish Power Generation Pvt. Ltd.	63,163	13,044		
SE Green Energy Co., Ltd.	7,048			(230)
Daegu Photovoltaic Co., Ltd.	16,828	9,923	3,695	1,645
Jeongam Wind Power Co., Ltd.	93,444	81,971	1,559	2,154
Korea Power Engineering Service Co., Ltd.	18,609	3,666	20,809	3,207
Busan Green Energy Co., Ltd.	195,227	151,995	77,011	17,370
Gunsan Bio Energy Co., Ltd.	8,990	20,660		(4,420)
Korea Electric Vehicle Charging Service	15,019	9,328	8,615	(1,056)
Ulleungdo Natural Energy Co., Ltd.	17,134	1,625		(5,855)
Korea Nuclear Partners Co., Ltd.	615	12	80	(707)
Tamra Offshore Wind Power Co., Ltd.	170,238	131,717	21,701	4,077
Korea Electric Power Corporation Fund	48,280	176	1,315	(649)
Energy Infra Asset Management Co., Ltd.	7,225	507	5,757	2,193
Daegu clean Energy Co., Ltd.	389	328		(190)
YaksuESS Co., Ltd	7,525	5,944	2,094	1,259
Nepal Water & Energy Development Company Private Limited	55,453	4,249		(984)
Gwangyang Green Energy Co., Ltd.	29,234	23,293		(2,831)
PND solar., Ltd	42,283	39,297	1,094	(795)
Hyundai Eco Energy Co., Ltd.	165,555	148,852		(2,193)
YeongGwang Yaksu Wind Electric. Co., Ltd	46,027	43,606	7,604	(493)
<Joint ventures>				
KEPCO-Uhde Inc.	403	34	18	(139)
Eco Biomass Energy Sdn. Bhd.				
Shuweihat Asia Power Investment B.V.	55,614			(187)
Shuweihat Asia Operation & Maintenance Company	1,472	31	2,391	1,719
Waterbury Lake Uranium L.P.	55,933	64		
ASM-BG Investicii AD	84,924	42,166	12,745	4,406
RES Technology AD	69,609	39,192	7,879	1,567
KV Holdings, Inc.	4,795		8	1,257
KEPCO SPC Power Corporation	312,093	35,091	184,046	59,543

Gansu Datang Yumen Wind Power Co., Ltd.	79,354	54,402	8,323	(2,046)
Datang Chifeng Renewable Power Co., Ltd.	751,551	336,024	117,270	37,159
Datang KEPCO Chaoyang Renewable Power Co., Ltd.	190,951	92,347	18,824	2,557
Rabigh Electricity Company	2,448,690	2,003,050	274,184	38,789

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Investees	2018 Total assets	Total liabilities	Sales	Profit (loss) for the period
		In millions of won		
Rabigh Operation & Maintenance Company Limited	26,172	11,587	26,387	7,173
Jamaica Public Service Company Limited	1,396,421	827,837	992,677	32,507
KW Nuclear Components Co., Ltd.	24,598	7,077	6,031	2,543
Busan Shinho Solar Power Co., Ltd.	45,538	26,494	7,901	3,018
GS Donghae Electric Power Co., Ltd.	2,259,129	1,551,509	787,425	58,976
Global Trade Of Power System Co., Ltd.	2,039	263	1,368	(134)
Expressway Solar-light Power Generation Co., Ltd.	18,443	9,215	2,986	692
Daejung Offshore Wind Power Co., Ltd.	6,440	1,091		(590)
Amman Asia Electric Power Company	792,532	496,791	23,676	32,674
KAPES, Inc.	82,494	64,691	57,047	4,710
Dangjin Eco Power Co., Ltd.	51,125	260		(111,789)
Honam Wind Power Co., Ltd.	43,713	27,066	7,700	3,122
Chun-cheon Energy Co., Ltd.	666,050	523,904	320,950	(19,133)
Yeonggwangbaeksu Wind Power Co., Ltd.	99,368	80,450	11,366	734
Nghi Son 2 Power LLC	477,947	561,266	144,381	8,979
Kelar S.A	626,206	518,135	87,507	8,587
PT. Tanjung Power Indonesia	505,551	485,321	109,029	9,717
Incheon New Power Co., Ltd.	6,559	4,563	2,687	3
Seokmun Energy Co., Ltd.	253,544	195,782	50,052	10,224
Daehan Wind Power PSC	33,081	29,817		(1,799)
Barakah One Company	21,480,187	21,459,035		(3,062)
Nawah Energy Company	70,386	68,864		
MOMENTUM	7,476	5,730	16,933	520
Daegu Green Power Co., Ltd.	591,263	523,972	291,734	(4,424)
Yeonggwang Wind Power Co., Ltd.	255,777	219,013		(145)
Chester Solar IV SpA	15,307	13,114	1,415	609
Chester Solar V SpA	4,759	4,324	298	(19)
Diego de Almagro Solar SpA	21,317	19,399	78	(340)
South Jamaica Power Company Limited	294,341	213,723		(932)
Daesan Green Energy Co., Ltd.	52,582	2,774		(1,192)
RE Holiday Holdings LLC	334,742	232,553	9,451	1,319
RE Pioneer Holdings LLC	252,512	174,717	12,364	6,544
RE Barren Ridge 1 Holdings LLC	221,304	138,473	10,567	8,625
RE Astoria 2 Land Co LLC	11,030	210	619	583
RE Barren Ridge Land Co LLC	3,881	84	248	230
Laurel SpA	5,475	4,572		(369)
KIAMCO KOWEPO Bannerton Hold Co Pty Ltd	31,958	173		(222)
Chile Solar JV SpA	73,740	10	73	8,906
Taebaek Gadeoksan Wind Power Co., Ltd.	18,766	499		18
Cheong-Song Noraesan Wind Power Co., Ltd.	8,221	24		
Chester Solar I SpA	1,712	562		(81)
Solar Philippines Calatagan Corporation	121,650	51,219	16,689	8,732

(*1) The profit for the year ended December 31, 2018 is net of net income attributable to non-controlling interests.

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(5) Financial information of associates and joint ventures reconciled to the Company s investments in consolidated financial statements as of December 31, 2017 and 2018 are as follows:

Investees	Net assets	Percentage of ownership(*)	2017 Share in net assets	Investment differential	Intercompany transaction	Others	Book value
			In millions of won				
<Associates>							
Korea Gas Corporation	8,140,414	21.57%	1,755,887			(137,019)	1,618,868
Korea Electric Power Industrial Development Co., Ltd.	75,303	29.00%	21,838				21,838
YTN Co., Ltd.	189,568	21.43%	40,624		(18)		40,606
Cheongna Energy Co., Ltd.	13,423	43.90%	5,893	2,584	(140)		8,337
Gangwon Wind Power Co., Ltd.	92,038	15.00%	13,806			49	13,855
Hyundai Green Power Co., Ltd.	395,883	29.00%	114,806				114,806
Korea Power Exchange	237,631	100.00%	237,631				237,631
AMEC Partners Korea Ltd.	1,131	19.00%	215				215
Hyundai Energy Co., Ltd.	(36,547)	46.30%	(16,921)		(1,037)	17,958	
Ecollite Co., Ltd.	1,700	36.10%	614			(614)	
Taebaek Wind Power Co., Ltd.	21,274	25.00%	5,319				5,319
Taeback Guinemi Wind Power Co., Ltd.	12,357	25.00%	3,089				3,089
Pyeongchang Wind Power Co., Ltd.	16,546	25.00%	4,136				4,136
Daeryun Power Co., Ltd.	123,881	19.45%	24,095	1,014		4	25,113
Changjuk Wind Power Co., Ltd.	25,049	30.00%	7,515				7,515
KNH Solar Co., Ltd.	8,217	27.00%	2,218				2,218
SPC Power Corporation	137,586	38.00%	52,283				52,283
Gemeng International Energy Co., Ltd.	1,911,686	34.00%	649,973				649,973
PT. Cirebon Electric Power	354,217	27.50%	97,410				97,410
KNOC Nigerian East Oil Co., Ltd.	(87,831)	14.63%	(12,850)			12,850	

KNOC Nigerian West Oil Co., Ltd.	(80,403)	14.63%	(11,763)			11,763	
PT Wampu Electric Power	63,918	46.00%	29,403				29,403
PT. Bayan Resources TBK	351,225	20.00%	70,245	482,109		(100,523)	451,831
S-Power Co., Ltd.	242,409	49.00%	118,780		(1,835)		116,945
Pioneer Gas Power Limited	42,373	38.50%	16,314	22,278		67	38,659
Eurasia Energy Holdings	(430)	40.00%	(172)			172	
Xe-Pian Xe-Namnoy Power Co., Ltd.	251,327	25.00%	62,832	74	(838)	(289)	61,779
Hadong Mineral Fiber Co., Ltd.	(28)	8.33%	(2)			2	
Green Biomass Co., Ltd.	2,361	8.80%	208				208
PT. Mutiara Jawa	(2,572)	29.00%	(746)			746	
Samcheok Eco Materials Co., Ltd.	23,459	2.35%	551			(551)	
Noeul Green Energy Co., Ltd.	7,128	29.00%	2,067				2,067
Naepo Green Energy Co., Ltd.	49,430	41.67%	20,598				20,598
Goseong Green Energy Co., Ltd.	239,908	1.12%	2,676		(79)		2,597
Gangneung Eco Power Co., Ltd.	166,421	1.61%	2,681		(98)		2,583
Shin Pyeongtaek Power Co., Ltd.	85,208	40.00%	34,083	7,808	(6,988)		34,903
Heang Bok Do Si Photovoltaic Power Co., Ltd.	662	28.00%	185			2	187
Dongducheon Dream Power Co., Ltd.	209,330	33.61%	70,356		(4,409)	(12,714)	53,233
Jinbhuvish Power Generation Pvt. Ltd.	52,407	5.16%	2,704			(2,704)	
SE Green Energy Co., Ltd.	7,278	47.76%	3,476				3,476
Daegu Photovoltaic Co., Ltd.	5,923	29.00%	1,718				1,718
Jeongam Wind Power Co., Ltd.	9,408	40.00%	3,763				3,763
Korea Power Engineering Service Co., Ltd.	12,617	29.00%	3,659				3,659
Busan Green Energy Co., Ltd.	25,389	29.00%	7,363				7,363
Gunsan Bio Energy Co., Ltd.	(6,814)	18.87%	(1,286)			1,286	
	6,246	28.00%	1,749				1,749

Korea Electric Vehicle Charging Service						
Ulleungdo Natural Energy Co., Ltd.	21,341	29.85%	6,370			6,370
Korea Nuclear Partners Co., Ltd.	1,322	29.00%	383			383
Tamra Offshore Wind Power Co., Ltd.	31,704	27.00%	8,560			8,560
Korea Electric Power Corporation Fund	48,905	98.09%	47,971		3	47,974
Energy Infra Asset Management Co., Ltd.	4,809	9.90%	476			476
Daegu clean Energy Co., Ltd.	40	28.00%	11			11
YaksuESS Co., Ltd	668	29.00%	193		1	194
Nepal Water & Energy Development Company Private Limited	46,451	62.13%	28,860	972	666	30,498

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	2017						
Investees	**Net assets**	**Percentage of ownership(*)**	**Share in net assets**	**Investment differential**	**Intercompany transaction**	**Others**	**Book value**
	In millions of won						
Gwangyang Green Energy Co., Ltd.	8,772	20.00%	1,754	18			1,772
PND solar., Ltd	3,779	29.00%	1,096	154			1,250
<Joint ventures>							
KEPCO-Uhde Inc.	508	50.85%	258				258
Eco Biomass Energy Sdn. Bhd.		61.53%					
Datang Chaoyang Renewable Power Co., Ltd.	68,154	40.00%	27,262				27,262
Shuweihat Asia Power Investment B.V.	31,991	49.00%	15,675				15,675
Shuweihat Asia Operation & Maintenance Company	1,206	55.00%	663				663
Waterbury Lake Uranium L.P.	55,313	35.76%	19,780			1	19,781
ASM-BG Investicii AD	42,404	50.00%	21,202				21,202
RES Technology AD	28,750	50.00%	14,375				14,375
KV Holdings, Inc.	4,795	40.00%	1,918				1,918
KEPCO SPC Power Corporation	288,689	75.20%	217,094				217,094
Gansu Datang Yumen Wind Power Co., Ltd.	27,101	40.00%	10,840				10,840
Datang Chifeng Renewable Power Co., Ltd.	427,762	40.00%	171,105			(50)	171,055
Datang KEPCO Chaoyang Renewable Power Co., Ltd.	27,649	40.00%	11,060				11,060
Rabigh Electricity Company	428,119	40.00%	171,248		(70,978)	(914)	99,356
Rabigh Operation & Maintenance Company Limited	9,967	40.00%	3,987				3,987
Jamaica Public Service Company Limited	523,662	40.00%	209,464	(80,161)		91,850	221,153
KW Nuclear Components Co., Ltd.	15,472	45.00%	6,962			(259)	6,703
Busan Shinho Solar Power Co., Ltd.	17,386	25.00%	4,346				4,346
GS Donghae Electric Power Co., Ltd.	649,199	34.00%	220,727				220,727
Global Trade Of Power System Co., Ltd.	1,990	29.00%	577				577

Expressway Solar-light Power Generation Co., Ltd.	8,492	29.00%	2,463				2,463
KODE NOVUS I LLC	(107,377)	50.00%	(53,689)			53,689	
KODE NOVUS II LLC	(47,391)	50.00%	(23,696)			23,696	
Daejung Offshore Wind Power Co., Ltd.	5,950	49.90%	2,969				2,969
Amman Asia Electric Power Company	242,940	60.00%	145,764			(88)	145,676
KAPES, Inc.	14,658	51.00%	7,476				7,476
Dangjin Eco Power Co., Ltd.	162,676	34.00%	55,310	2,618			57,928
Honam Wind Power Co., Ltd.	14,724	29.00%	4,270	32			4,302
Chun-cheon Energy Co., Ltd.	160,919	29.90%	48,115	3			48,118
Yeonggwangbaeksu Wind Power Co., Ltd.	18,189	15.00%	2,728	6			2,734
Nghi Son 2 Power LLC	365	50.00%	183				183
Kelar S.A	100,192	65.00%	65,125	2,424		(316)	67,233
PT. Tanjung Power Indonesia	5,075	35.00%	1,776				1,776
Incheon New Power Co., Ltd.	2,135	29.00%	619				619
Seokmun Energy Co., Ltd.	47,538	29.00%	13,786				13,786
Daehan Wind Power PSC	(824)	50.00%	(412)			412	
Barakah One Company	3,476	18.00%	626				626
Nawah Energy Company	1,436	18.00%	258				258
MOMENTUM	1,174	33.33%	391				391
Daegu Green Power Co., Ltd.	71,706	29.00%	20,795		84	21,512	42,391
Yeonggwang Wind Power Co., Ltd.	36,740	41.00%	15,063	231			15,294
Chester Solar IV SpA	2,034	81.82%	1,664			36	1,700
Chester Solar V SpA	512	81.82%	419			106	525
Diego de Almagro Solar SpA	2,436	81.82%	1,993			98	2,091
South Jamaica Power Company Limited	33,522	20.00%	6,704				6,704

(*) The percentage of ownership shown above is after considering the treasury stocks and others.

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Investees	Net assets	Percentage of ownership(*)	2018 Share in net assets	Investment differential	Intercompany transaction	Others	Book value
			In millions of won				
<Associates>							
Korea Gas Corporation	8,503,204	21.57%	1,834,141			(132,293)	1,701,848
Korea Electric Power Industrial Development Co., Ltd.	75,302	29.00%	21,838				21,838
YTN Co., Ltd.	188,282	21.43%	40,346		(6)	(2)	40,338
Cheongna Energy Co., Ltd.	2,313	43.90%	1,015	2,584	(134)		3,465
Gangwon Wind Power Co., Ltd.	87,809	15.00%	13,171			49	13,220
Hyundai Green Power Co., Ltd.	438,482	29.00%	127,160				127,160
Korea Power Exchange	251,802	100.00%	251,802				251,802
AMEC Partners Korea Ltd.	1,099	19.00%	209				209
Hyundai Energy Co., Ltd.	(56,772)	46.30%	(26,285)		(996)	27,281	
Ecollite Co., Ltd.	1,632	36.10%	589			(589)	
Taebaek Wind Power Co., Ltd.	22,661	25.00%	5,665				5,665
Taeback Guinemi Wind Power Co., Ltd.	10,276	25.00%	2,569				2,569
Pyeongchang Wind Power Co., Ltd.	21,676	25.00%	5,419				5,419
Daeryun Power Co., Ltd.	288,211	9.34%	26,919			(820)	26,099
Changjuk Wind Power Co., Ltd.	26,954	30.00%	8,086				8,086
KNH Solar Co., Ltd.	8,656	27.00%	2,337				2,337
SPC Power Corporation	208,780	38.00%	79,336			(21,778)	57,558
Gemeng International Energy Co., Ltd.	2,735,376	34.00%	930,028			(283,018)	647,010
PT. Cirebon Electric Power	395,008	27.50%	108,628				108,628
KNOC Nigerian East Oil Co., Ltd.	(73,176)	14.63%	(10,706)			10,706	
KNOC Nigerian West Oil Co., Ltd.	(67,226)	14.63%	(9,835)			9,835	
PT Wampu Electric Power	67,603	46.00%	31,097				31,097
	821,309	20.00%	164,262	423,763		(76,379)	511,646

PT. Bayan Resources TBK							
S-Power Co., Ltd.	237,332	49.00%	116,293		(1,727)		114,566
Pioneer Gas Power Limited	(5,068)	38.50%	(1,951)	22,278		68	20,395
Eurasia Energy Holdings	(448)	40.00%	(179)			179	
Xe-Pian Xe-Namnoy Power Co., Ltd.	312,826	25.00%	78,207	253	(1,006)	(289)	77,165
Hadong Mineral Fiber Co., Ltd.	(28)	8.33%	(2)			2	
Green Biomass Co., Ltd.	1,304	8.80%	115				115
PT. Mutiara Jawa	1,259	29.00%	365				365
Samcheok Eco Materials Co., Ltd.	21,470	2.35%	505			(505)	
Noeul Green Energy Co., Ltd.	27,637	29.00%	8,015				8,015
Naepo Green Energy Co., Ltd.	17,004	41.67%	7,085			(7,085)	
Goseong Green Energy Co., Ltd.	232,247	1.12%	2,590		(131)		2,459
Gangneung Eco Power Co., Ltd.	162,317	1.61%	2,615		(120)		2,495
Shin Pyeongtaek Power Co., Ltd.	162,518	40.00%	65,007	12,800	(10,207)		67,600
Heang Bok Do Si Photovoltaic Power Co., Ltd.	715	28.00%	200			2	202
Dongducheon Dream Power Co., Ltd.	268,332	34.01%	91,260	1,757	(4,049)	(12,582)	76,386
Jinbhuvish Power Generation Pvt. Ltd.	50,119	5.16%	2,586			(2,586)	
SE Green Energy Co., Ltd.	7,048	47.76%	3,366				3,366
Daegu Photovoltaic Co., Ltd.	6,905	29.00%	2,002				2,002
Jeongam Wind Power Co., Ltd.	11,473	40.00%	4,589				4,589
Korea Power Engineering Service Co., Ltd.	14,943	29.00%	4,333				4,333
Busan Green Energy Co., Ltd.	43,232	29.00%	12,537				12,537
Gunsan Bio Energy Co., Ltd.	(11,670)	18.87%	(2,202)			2,202	
Korea Electric Vehicle Charging Service	5,691	28.00%	1,593				1,593
Ulleungdo Natural Energy Co., Ltd.	15,509	29.85%	4,629			(1)	4,628
	603	29.00%	175				175

Korea Nuclear Partners Co., Ltd.						
Tamra Offshore Wind Power Co., Ltd.	38,521	27.00%	10,401			10,401
Korea Electric Power Corporation Fund	48,104	98.09%	47,185		4	47,189
Energy Infra Asset Management Co., Ltd.	6,718	9.90%	665			665
Daegu clean Energy Co., Ltd.	61	28.00%	17			17
YaksuESS Co., Ltd	1,581	29.00%	458		2	460
Nepal Water & Energy Development Company Private Limited	51,204	57.67%	29,529	972	460	30,961
Gwangyang Green Energy Co., Ltd.	5,941	20.00%	1,188	18		1,206
PND solar., Ltd	2,986	29.00%	866	154		1,020
Hyundai Eco Energy Co., Ltd.	16,703	19.00%	3,174	214		3,388
YeongGwang Yaksu Wind Electric. Co., Ltd	2,421	9.63%	233	300		533

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	2018						
Investees	**Net assets**	**Percentage of ownership(*)**	**Share in net assets**	**Investment differential**	**Intercompany transaction**	**Others**	**Book value**
			In millions of won				
<Joint ventures>							
KEPCO-Uhde Inc.	369	50.85%	188				188
Eco Biomass Energy Sdn. Bhd.		61.53%					
Shuweihat Asia Power Investment B.V.	55,614	49.00%	27,251				27,251
Shuweihat Asia Operation & Maintenance Company	1,441	55.00%	793			(1)	792
Waterbury Lake Uranium L.P.	55,869	34.07%	19,032				19,032
ASM-BG Investicii AD	42,758	50.00%	21,379				21,379
RES Technology AD	30,417	50.00%	15,209				15,209
KV Holdings, Inc.	4,795	40.00%	1,918				1,918
KEPCO SPC Power Corporation	277,002	75.20%	208,306				208,306
Gansu Datang Yumen Wind Power Co., Ltd.	24,952	40.00%	9,981				9,981
Datang Chifeng Renewable Power Co., Ltd.	415,527	40.00%	166,211			(49)	166,162
Datang KEPCO Chaoyang Renewable Power Co., Ltd.	98,604	40.00%	39,442				39,442
Rabigh Electricity Company	445,640	40.00%	178,256		(70,977)	(1,951)	105,328
Rabigh Operation & Maintenance Company Limited	14,585	40.00%	5,834				5,834
Jamaica Public Service Company Limited	568,584	40.00%	227,434	(80,161)		92,359	239,632
KW Nuclear Components Co., Ltd.	17,521	45.00%	7,884			(176)	7,708
Busan Shinho Solar Power Co., Ltd.	19,044	25.00%	4,761				4,761
GS Donghae Electric Power Co., Ltd.	707,620	34.00%	240,591				240,591
Global Trade Of Power System Co., Ltd.	1,776	29.00%	515				515
Expressway Solar-light Power Generation Co., Ltd.	9,228	29.00%	2,676				2,676
Daejung Offshore Wind Power Co., Ltd.	5,349	49.90%	2,669				2,669
Amman Asia Electric Power Company	295,741	60.00%	177,445			(88)	177,357
KAPES, Inc.	17,803	51.00%	9,079				9,079

Dangjin Eco Power Co., Ltd.	50,865	34.00%	17,294	2,618		19,912
Honam Wind Power Co., Ltd.	16,647	29.00%	4,828	32		4,860
Chun-cheon Energy Co., Ltd.	142,146	29.90%	42,502	3		42,505
Yeonggwangbaeksu Wind Power Co., Ltd.	18,918	15.00%	2,837	6		2,843
Nghi Son 2 Power LLC	(83,319)	50.00%	(41,660)		41,660	
Kelar S.A	108,071	65.00%	70,246	2,470	108	72,824
PT. Tanjung Power Indonesia	20,230	35.00%	7,081			7,081
Incheon New Power Co., Ltd.	1,996	29.00%	579			579
Seokmun Energy Co., Ltd.	57,762	29.00%	16,751			16,751
Daehan Wind Power PSC	3,264	50.00%	1,632			1,632
Barakah One Company	21,152	18.00%	3,807			3,807
Nawah Energy Company	1,522	18.00%	274			274
MOMENTUM	1,746	33.33%	582			582
Daegu Green Power Co., Ltd.	67,291	29.00%	19,514	84	21,512	41,110
Yeonggwang Wind Power Co., Ltd.	36,764	41.00%	15,074	230		15,304
Chester Solar IV SpA	2,193	81.82%	1,794	57		1,851
Chester Solar V SpA	435	81.82%	356	118		474
Diego de Almagro Solar SpA	1,918	81.82%	1,569	94		1,663
South Jamaica Power Company Limited	80,618	20.00%	16,124			16,124
Daesan Green Energy Co., Ltd.	49,808	35.00%	17,433			17,433
RE Holiday Holdings LLC	102,189	50.00%	51,094			51,094
RE Pioneer Holdings LLC	77,795	50.00%	38,898			38,898
RE Barren Ridge 1 Holdings LLC	82,831	50.00%	41,415			41,415
RE Astoria 2 LandCo LLC	10,820	50.00%	5,410			5,410
RE Barren Ridge LandCo LLC	3,797	50.00%	1,898			1,898
Laurel SpA	903	81.82%	739	182		921
KIAMCO KOWEPO Bannerton Hold Co Pty Ltd	31,785	12.37%	3,931	9		3,940
Chile Solar JV SpA	73,730	50.00%	36,865			36,865
Taebaek Gadeoksan Wind Power Co., Ltd.	18,267	46.58%	8,508			8,508
Cheong-Song Noraesan Wind Power Co., Ltd.	8,197	24.76%	2,029	44		2,073
Chester Solar I SpA	1,150	81.82%	940	241		1,181
Solar Philippines Calatagan Corporation	70,431	38.00%	26,764	21,139		47,903

(*) The percentage of ownership shown above is after considering the treasury stocks and others.

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(6) As of December 31, 2017 and 2018, unrecognized equity interest in investments in associates and joint ventures whose book value has been reduced to zero due to accumulated losses are as follows:

	2017		2018	
	Unrecognized equity interest	Accumulated unrecognized equity interest	Unrecognized equity interest	Accumulated unrecognized equity interest
	In millions of won			
Shin Pyeongtaek Power Co., Ltd.	(2,537)			
Kelar S.A	(61,309)			
Hadong Mineral Fiber Co., Ltd.	(3)	2		2
PT. Mutiara Jawa	(1,159)	746	(746)	
Eurasia Energy Holdings	(22)	172	7	179
KODE NOVUS I LLC	8,706	53,689		
KODE NOVUS II LLC	181	23,696		
Gunsan Bio Energy Co., Ltd.	1,154	1,286	916	2,202
Daehan Wind Power PSC	412	412	(412)	
Hyundai Energy Co., Ltd.			25,841	25,841
Nghi Son 2 Power LLC			41,659	41,659
Samcheok Eco Materials Co., Ltd.			1,285	1,285

(7) As of December 31, 2018, shareholders agreements on investments in associates and joint ventures that may cause future economic resource or cash outflows are as follows:

(i) Gemeng International Energy Co., Ltd.

Gemeng International Energy Co., Ltd., issued put options on 8% of its shares to its financial investors, KEPCO Woori Sprott PEF (NPS Co-Pa PEF). If the investment fund is not collected until the maturity date (December 25, 2023, two years extension is possible), PEF can exercise the option at strike price which is the same as a principal investment price (including operating fees ratio of below 1% per annum), and also, the Company provided a performance guarantee on this agreement.

(ii) Hyundai Energy Co., Ltd.

The Company had placed guarantees for a fixed return on the investment to NH Power II Co., Ltd. and National Agricultural Cooperative Federation (NACF) and had obtained the rights to acquire the investment securities in return preferentially. In addition, NH Power II Co., Ltd. and NACF have a right, which can be exercised for 30 days starting from 2 months to 1 month prior to 17 years after the termination date of the contract to sell their shares to the Company.

(iii) Taebaek Wind Power Co., Ltd.

In case non-controlling shareholders decide to dispose of their shares in Taebaek Wind Power Co., Ltd. after the warrant period of defect repair for wind power generator has expired, the Company acquires those shares at fair value.

The acquisition is to be made after the conditions of the acquisition are discussed among the parties involved, with consideration of various factors such as financial status and business situation.

(iv) Pyeongchang Wind Power Co., Ltd.

In case non-controlling shareholders decide to dispose of their shares in Pyeongchang Wind Power Co., Ltd. after commercial operation of the power plant has started, the Company acquires those shares at fair value. The acquisition is to be made after the conditions of the acquisition are discussed among the parties involved, with the careful consideration of various factors such as financial status and business situation.

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(v) Jeongam Wind Power Co., Ltd.

In case non-controlling shareholders decide to dispose of their shares in Jeongam Wind Power Co., Ltd. after the construction of the power plant has been completed, the Company is obligated to acquire those shares at fair value.

(vi) Daejung Offshore Wind Power Co., Ltd.

In case Samsung Heavy Industries Co., Ltd., a co-participant of the joint venture agreement, decides to dispose of its shares in Daejung Offshore Wind Power Co., Ltd., the Company is obligated to acquire those shares after evaluating the economic feasibility of the facilities installed by Samsung Heavy Industries Co., Ltd.

(vii) Hyundai Green Power Co., Ltd.

As of December 31, 2018, Hyundai Green Power Co., Ltd., an associate of the Company, which engages in the byproduct gas power generating business, entered into a project financing agreement with a limit of 852.1 billion with Korea Development Bank and others. At a certain period in the future, the Company has call option against the financial investors (Korea Development Bank and others) and also has an obligation to purchase its shares when claimed by the financial investors. At a certain period in the future, the Company has put option against Hyundai Steel Company and a third party designated by Hyundai Steel Company (collectively, Hyundai Steel Company), the operating investor of Hyundai Green Power Co., Ltd., according to the conditions of the agreement and also has an obligation to sell its shares upon request from Hyundai Steel Company.

(viii) YeongGwang Yaksu Wind Electric. Co., Ltd

As of December 31, 2018, YeongGwang Yaksu Wind Electric. Co., Ltd, an associate of the Company, which engages in the wind power generating business, entered into a project financing agreement with a limit of 46.8 billion with Hanwha Life Insurance Co., Ltd. and others.

(8) Significant restrictions on the Company s abilities on associates or joint ventures are as follows:

Company	Nature and extent of any significant restrictions
Daeryun Power Co., Ltd.	Principals on subordinated loans or dividends can only be paid when all conditions of the loan agreement are satisfied or prior written consent of financial institutions is obtained.
Changjuk Wind Power Co., Ltd.	Principals on subordinated loans or dividends can only be paid when all conditions of the loan agreement are satisfied or prior written consent of financial institutions is obtained.
Taebaek Wind Power Co., Ltd.	Financial institutions can reject or defer an approval with regard to the request for fund executions on subordinated loans of shareholders in order to pay senior loans based on the loan agreement.
Pyeongchang Wind Power Co., Ltd.	Principals on subordinated loans or dividends can only be paid when all conditions of the loan agreement are satisfied or prior written consent of

	financial institutions is obtained.
Daegu Green Power Co., Ltd.	Principals on subordinated loans or dividends can only be paid when all conditions of the loan agreement are satisfied or prior written consent of financial institutions is obtained. Shares cannot be wholly or partially transferred without prior written consent of financial institutions is obtained.
KNH Solar Co., Ltd.	Principal and interest, dividends to shareholders cannot be paid without written consent of financial institutions.

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21. Property, Plant and Equipment

(1) Property, plant and equipment as of December 31, 2017 and 2018 are as follows:

	2017				
	Acquisition cost	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
	In millions of won				
Land	13,318,542	(21,968)			13,296,574
Buildings	18,777,678	(63,539)	(6,722,376)	(1,776)	11,989,987
Structures	66,184,484	(196,414)	(22,071,667)	(8,039)	43,908,364
Machinery	75,826,292	(183,188)	(28,904,982)	(45,512)	46,692,610
Ships	4,175		(3,772)		403
Vehicles	276,425	(6,322)	(195,260)	(127)	74,716
Equipment	1,440,870	(761)	(1,020,192)	(6)	419,911
Tools	1,010,537	(1,027)	(809,842)	(32)	199,636
Construction-in-progress	25,610,649	(49,084)		(38,108)	25,523,457
Finance lease assets	2,390,680	(27)	(2,093,001)		297,652
Asset retirement costs	9,395,821		(3,356,337)		6,039,484
Others	11,247,021		(8,807,401)		2,439,620
	225,483,174	(522,330)	(73,984,830)	(93,600)	150,882,414

	2018				
	Acquisition cost	Government grants	Accumulated depreciation	Accumulated impairment losses	Book value
	In millions of won				
Land	13,554,292	(21,968)			13,532,324
Buildings	19,431,536	(63,189)	(7,494,176)	(3,669)	11,870,502
Structures	66,335,506	(190,854)	(23,615,312)	(8,399)	42,520,941
Machinery	82,047,823	(173,242)	(34,151,878)	(439,350)	47,283,353
Ships	3,655		(3,353)		302
Vehicles	287,954	(4,220)	(215,649)	(116)	67,969
Equipment	1,558,309	(418)	(1,175,408)	(42)	382,441
Tools	1,073,145	(675)	(880,432)	(38)	192,000
Construction-in-progress	29,026,880	(54,740)		(205,713)	28,766,427
Finance lease assets	2,390,701	(26)	(2,194,971)		195,704
Asset retirement costs	9,424,181		(3,706,004)	(146,423)	5,571,754
Others	11,875,394		(9,515,917)		2,359,477
	237,009,376	(509,332)	(82,953,100)	(803,750)	152,743,194

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(2) Changes in property, plant and equipment for the years ended December 31, 2017 and 2018 are as follows:

	2017						
	Beginning balance	Acquisition	Disposal	Depreciation	Impairment(*1)	Others	Ending balance
	In millions of won						
Land	12,969,741	32,773	(8,961)			324,989	13,318,542
(Government grants)	(3,204)		5			(18,769)	(21,968)
Buildings	11,784,624	40,592	(19,715)	(794,804)	(923)	1,043,752	12,053,526
(Government grants)	(61,188)	(900)	28	5,996		(7,475)	(63,539)
Structures	43,330,415	428	(519,366)	(2,421,168)	(6,856)	3,721,325	44,104,778
(Government grants)	(197,641)		1,905	10,011		(10,689)	(196,414)
Machinery	43,421,945	421,892	(242,428)	(4,821,595)	(43,121)	8,139,105	46,875,798
(Government grants)	(111,064)	(10,834)	489	17,390		(79,169)	(183,188)
Ships	550			(147)			403
Vehicles	70,970	3,447	(174)	(34,236)	(127)	41,158	81,038
(Government grants)	(107)	(107)	14	1,070		(7,192)	(6,322)
Equipment	376,395	53,529	(413)	(158,614)	(6)	149,781	420,672
(Government grants)	(732)	(43)		454		(440)	(761)
Tools	179,032	30,990	(166)	(74,909)	(32)	65,748	200,663
(Government grants)	(430)			354		(951)	(1,027)
Construction-in-progress	27,296,260	11,996,508	(6,487)			(13,713,740)	25,572,541
(Government grants)	(135,807)	(42,728)				129,451	(49,084)
Finance lease assets	406,353		(29,696)	(107,390)		28,412	297,679
(Government grants)				1		(28)	(27)
Asset retirement costs	4,065,412			(518,565)		2,492,637	6,039,484
Others	2,351,532	10,411	(28)	(762,711)		840,416	2,439,620
	145,743,056	12,535,958	(824,993)	(9,658,863)	(51,065)	3,138,321	150,882,414

(*1) Korea Midland Power Co., Ltd. and Korea Western Power Co., Ltd., 100% owned subsidiaries, have determined that there are impairment indicators for the shutdowns of certain power generation units and fire, and performed an impairment test over the individual assets. As a result, the Company recognized the amount of the carrying amount in excess of its recoverable amount as impairment loss in the consolidated statements of comprehensive income.

	2018						
	Beginning balance	Acquisition	Disposal	Depreciation	Impairment(*1)	Others	Ending balance
	In millions of won						
Land	13,318,542	2,254	(18,240)			251,736	13,554,292
(Government grants)	(21,968)						(21,968)
Buildings	12,053,526	10,156	(8,545)	(767,845)	(1,896)	648,295	11,933,691
(Government grants)	(63,539)	(4,213)	31	6,836		(2,304)	(63,189)

Structures	44,104,778	11,123	(587,278)	(2,476,278)	(360)	1,659,810	42,711,795
(Government grants)	(196,414)		3,270	10,292		(8,002)	(190,854)
Machinery(*2)	46,875,798	460,676	(250,159)	(4,973,252)	(393,839)	5,737,371	47,456,595
(Government grants)	(183,188)	(1,185)	823	18,099		(7,791)	(173,242)
Ships	403			(103)		2	302
Vehicles	81,038	2,774	(402)	(32,620)		21,399	72,189
(Government grants)	(6,322)	(45)		2,146		1	(4,220)
Equipment	420,672	36,884	(265)	(187,821)	(36)	113,425	382,859
(Government grants)	(761)	(22)		365			(418)
Tools	200,663	12,331	(268)	(83,283)	(6)	63,238	192,675
(Government grants)	(1,027)	(44)		432		(36)	(675)
Construction-in-progress	25,572,541	11,749,397	(47,463)		(167,603)	(8,285,705)	28,821,167
(Government grants)	(49,084)	(23,895)				18,239	(54,740)
Finance lease assets	297,679			(101,888)		(61)	195,730
(Government grants)	(27)			1			(26)
Asset retirement costs	6,039,484	1,988		(610,435)	(146,424)	287,141	5,571,754
Others	2,439,620	8,691	(715)	(709,579)		621,460	2,359,477
	150,882,414	12,266,870	(909,211)	(9,904,933)	(710,164)	1,118,218	152,743,194

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(*1) Korea Hydro & Nuclear Power Co., Ltd. and Korea Western Power Co., Ltd., 100% owned subsidiaries, have determined that there are impairment indicators for the shutdowns of certain power generation units and fire, and performed an impairment test over the individual assets. As a result, the Company recognized the amount of the carrying amount in excess of its recoverable amount as impairment loss in the consolidated statements of comprehensive income. The amount includes impairment loss of 703,133 million in relation to Wolsong unit 1, and Shin-Hanul unit 3 and 4 as described in note 2, and the loss of 7,031 million due to fire at Taean unit 2.

(*2) As described in note 29, the amount of acquisition of machinery includes 204,787 million of that the Company believes the possibility of economic outflow is probable on the request for additional construction costs of Hyundai E&C, GS Engineering & Construction Corp. and Hansol SeenTec Co., Ltd.

22. Investment Properties

(1) Investment properties as of December 31, 2017 and 2018 are as follows:

	2017			
	Acquisition cost	Government grants	Accumulated depreciation	Book value
	In millions of won			
Land	264,205			264,205
Buildings	36,165	(83)	(15,573)	20,509
	300,370	(83)	(15,573)	284,714

	2018			
	Acquisition cost	Government grants	Accumulated depreciation	Book value
	In millions of won			
Land	139,940			139,940
Buildings	34,801	(50)	(15,132)	19,619
	174,741	(50)	(15,132)	159,559

(2) Changes in investment properties for the years ended December 31, 2017 and 2018 are as follows:

	2017			
	Beginning balance	Depreciation	Others	Ending balance

		In millions of won		
Land	336,421		(72,216)	264,205
Buildings	17,323	(1,178)	4,447	20,592
(Government grants)	(64)	2	(21)	(83)
	353,680	(1,176)	(67,790)	284,714

	2018			
	Beginning balance	**Depreciation**	**Others**	**Ending balance**
	In millions of won			
Land	264,205		(124,265)	139,940
Buildings	20,592	(924)	1	19,669
(Government grants)	(83)	1	32	(50)
	284,714	(923)	(124,232)	159,559

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(3) Income and expenses related to investment properties for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Rental income	9,581	9,494
Operating and maintenance expenses related to rental income	(1,172)	(923)
	8,409	8,571

(4) Fair value of investment properties as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Book value	Fair value	Book value	Fair value
	In millions of won			
Land	264,205	309,241	139,940	167,178
Buildings	20,509	23,319	19,619	23,276
	284,714	332,560	159,559	190,454

The fair values of the investment properties as of the reporting date were determined in consideration of the fluctuation on the publicly announced individual land price after the IFRS transition date (January 1, 2010).

(5) All of the Company s investment property is held under freehold interests.

23. Construction Services Contracts

(1) Changes in total contract amount in which revenue is not yet recognized for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016			
	Beginning balance	Increase (decrease)(*)	Recognized as revenue	Ending balance
	In millions of won			
Nuclear power plant construction in UAE and others	12,308,839	(1,045,094)	(4,026,857)	7,236,888

(*)

For the year ended December 31, 2016, the increased balance of contracts from new orders and other is 718,118 million and the decreased balance of contracts due to changes in scope of construction work is 1,763,212 million.

	2017			
	Beginning balance	**Increase (decrease)(*)**	**Recognized as revenue**	**Ending balance**
	In millions of won			
Nuclear power plant construction in UAE and others	7,236,888	151,891	(3,212,184)	4,176,595

(*) For the year ended December 31, 2017, the increased balance of contracts from new orders and other is 438,142 million and the decreased balance of contracts due to changes in scope of construction work is 286,251 million.

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	2018			
	Beginning balance	Increase (decrease)(*)	Recognized as revenue	Ending balance
	In millions of won			
Nuclear power plant construction in UAE and others	4,176,595	1,186,584	(1,742,391)	3,620,788

(*) For the year ended December 31, 2018, the increased balance of contracts from new orders and foreign exchange impact is 1,207,097 million and the decreased balance of contracts due to changes in scope of construction work is 20,513 million.

(2) Accumulated earned revenue, expense and others related to the Company s construction contracts as of December 31, 2017 and 2018 are as follows:

	2017			
	Accumulated earned revenue	Accumulated expense	Accumulated profit	Unearned advance receipts
	In millions of won			
Nuclear power plant construction in UAE and others	18,236,992	16,937,772	1,299,220	

	2018			
	Accumulated earned revenue	Accumulated expense	Accumulated profit	Unearned advance receipts
	In millions of won			
Nuclear power plant construction in UAE and others	19,801,220	18,651,188	1,150,032	

(3) Gross amount due from customers recognized as assets and due to customers recognized as liabilities for contract work as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Assets(*1)	Liabilities(*2)	Assets(*1)	Liabilities(*2)
	In millions of won			
Nuclear power plant construction in UAE and others	55,755	542,921	36,232	350,460

(*1) Included in trade and other receivables, net, in the consolidated statements of financial position.

(*2) Included in non-financial liabilities in the consolidated statements of financial position.

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24. Intangible Assets other than Goodwill

(1) Intangible assets as of December 31, 2017 and 2018 are as follows:

	2017				
	Acquisition cost	Government grants	Accumulated amortization	Accumulated impairment losses	Book value
	In millions of won				
Software	534,191	(486)	(408,300)		125,405
Licenses and franchises	3,398		(3,398)		
Copyrights, patents rights and other industrial rights	43,857		(19,876)		23,981
Mining rights	553,876		(14,243)		539,633
Development expenditures	836,996	(3,702)	(752,478)		80,816
Intangible assets under development	143,851	(10,540)		(3,941)	129,370
Usage rights of donated assets and other	459,682	(11)	(358,024)		101,647
Leasehold rights	24,306		(19,262)		5,044
Others	297,289		(103,995)	(12,069)	181,225
	2,897,446	(14,739)	(1,679,576)	(16,010)	1,187,121

	2018				
	Acquisition cost	Government grants	Accumulated amortization	Accumulated impairment losses	Book value
	In millions of won				
Software	619,662	(420)	(461,981)		157,261
Licenses and franchises	3,398		(3,398)		
Copyrights, patents rights and other industrial rights	97,033		(29,921)		67,112
Mining rights	561,945		(27,421)		534,524
Development expenditures	878,462	(2,110)	(785,976)		90,376
Intangible assets under development	83,381	(10,564)		(12,845)	59,972
Usage rights of donated assets and other	459,682		(372,671)		87,011
Leasehold rights	25,482		(19,930)		5,552
Greenhouse gas emissions rights	7,050				7,050
Others	333,621		(104,486)	(12,051)	217,084
	3,069,716	(13,094)	(1,805,784)	(24,896)	1,225,942

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(2) Changes in intangible assets for the years ended December 31, 2017 and 2018 are as follows:

	2017						
	Beginning balance	Acquisition	Disposal	Amortization	Impairment	Others	Ending balance
	In millions of won						
Software	93,221	12,700	(5)	(44,809)		64,784	125,891
(Government grants)	(595)	(17)		255		(129)	(486)
Copyrights, patents rights and other industrial rights	20,081	30	(7)	(3,350)		7,227	23,981
Mining rights	538,860	26,751	(272)	(4,640)		(21,066)	539,633
Development expenditures	62,405	494		(25,924)		47,543	84,518
(Government grants)	(5,152)			2,811		(1,361)	(3,702)
Intangible assets under development	115,533	56,527			(20)	(32,130)	139,910
(Government grants)	(11,090)					550	(10,540)
Usage rights of donated assets and other	84,102			(14,462)		32,018	101,658
(Government grants)	(21)			10			(11)
Leasehold rights	4,632			(545)		957	5,044
Greenhouse gas emissions rights	6,283					(6,283)	
Others	72,562	47,402	(377)	(23,018)	54	84,602	181,225
(Government grants)							
	980,821	143,887	(661)	(113,672)	34	176,712	1,187,121

	2018						
	Beginning balance	Acquisition	Disposal	Amortization	Impairment(*)	Others	Ending balance
	In millions of won						
Software	125,891	10,861	(1)	(53,755)		74,685	157,681
(Government grants)	(486)			254		(188)	(420)
Licenses and franchises	23,981	28		(8,665)	(13)	51,781	67,112
Copyrights, patents rights and other industrial rights	539,633	29,687		(3,186)		(31,610)	534,524
Development expenditures	84,518	823		(27,100)		34,245	92,486
(Government grants)	(3,702)			1,591		1	(2,110)
Intangible assets under development	139,910	67,383			(8,912)	(127,845)	70,536

(Government grants)	(10,540)				799	(823)	(10,564)
Usage rights of donated assets and other	101,658			(13,307)		(1,340)	87,011
(Government grants)	(11)			11			
Leasehold rights	5,044			(667)		1,175	5,552
Greenhouse gas emissions rights						7,050	7,050
Others	181,225	1,805	(8)	(14,114)	(14)	48,190	217,084
(Government grants)							
	1,187,121	110,587	(9)	(118,938)	(8,140)	55,321	1,225,942

(*) 8,104 million of impairment loss on the intangible assets under development in relation to the technology development of heat transfer tube owned by KEPCO Nuclear Fuel Co., Ltd., 96.36% owned subsidiary, is included.

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(3) Significant specific intangible assets as of December 31, 2017 and 2018 are as follows:

2017				
Type	**Description**	**Currency**	**Amount**	**Remaining useful lives**
	In millions of won and thousands of Australian dollars			
Software	ERP system and others	KRW	1,135	3 years and 2 months ~ 3 years and 4 months
	AMI GATEWAY S/W	KRW	3,528	3 years and 2 months
Copyrights, patents rights and other industrial rights	Smart technology verification and standard design project conducting right	KRW	11,724	4 years and 9 months
Mining rights	Mining right of Bylong mine	AUD	401,225	(*)
Development expenditures	Electricity sales information system	KRW	29,391	4 years and 3 months
Intangible assets under development	Contributions to ARP NRC DC	KRW	46,458	
Usage rights of donated assets and others	Sejong Haengbogdosi sharing charge	KRW	40,460	8 years and 11 months
	Dangjin power plant load facility usage right	KRW	20,463	3 years and 3 months
Others	Occupancy and use of public waters	KRW	103,269	18 years and 11 months

(*) Mining rights are amortized using the units-of-production method and the amortization has not commenced yet.

2018				
Type	**Description**	**Currency**	**Amount**	**Remaining useful lives**
	In millions of won and thousands of Australian dollars			
Software	ERP system and others	KRW	783	2 years and 2 months ~ 2 years and 4 months
	Electricity sales information system	KRW	6,477	4 years
Copyrights, patents rights and other industrial rights	Smart technology verification and standard design project conducting right	KRW	9,256	3 years and 9 months
	Contributions to ARP NRC DC	KRW	46,594	9 years
Mining rights	Mining right of Bylong mine	AUD	401,225	(*)
Development expenditures	Electricity sales information system	KRW	22,337	3 years and 3 months
Usage rights of donated assets and others	Sejong Haengbogdosi sharing charge	KRW	35,923	7 years and 11 months
	Dangjin power plant load facility usage right	KRW	14,167	2 years and 3 months
Others	Occupancy and use of public waters	KRW	97,858	17 years and 11 months

(*) Mining rights are amortized using the units-of-production method and the amortization has not commenced yet.

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(4) For the years ended December 31, 2016, 2017 and 2018, the Company recognized research and development expenses of 705,504 million, 721,437 million and 723,888 million, respectively.

25. Trade and Other Payables

Trade and other payables as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Current	Non-current	Current	Non-current
	In millions of won			
Trade payables	2,936,990		3,411,830	
Other trade payables	1,649,933	2,825,039	1,630,860	2,626,876
Accrued expenses	1,087,844	1,951	1,127,796	1,859
Leasehold deposits received	1,562	1,308	1,949	1,084
Other deposits received	186,817	102,896	169,317	72,453
Finance lease liabilities	131,792	286,468	57,200	226,606
Dividends payable	4,448		6,443	
Others(*)	135	5,818		12,818
	5,999,521	3,223,480	6,405,395	2,941,696

(*) Details of others as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Current	Non-current	Current	Non-current
	In millions of won			
Advance received from local governments		5,818		5,818
Others	135			7,000
	135	5,818		12,818

26. Borrowings and Debt Securities

(1) Borrowings and debt securities as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Current liabilities		

Short-term borrowings	1,038,328	860,602
Current portion of long-term borrowings	128,543	312,994
Current portion of debt securities	7,961,182	6,790,778
Less : Current portion of discount on long-term borrowings	(886)	(972)
Less : Current portion of discount on debt securities	(3,882)	(1,974)
Add : Current portion of premium on debt securities		20
	9,123,285	7,961,448
Non-current liabilities		
Long-term borrowings	2,455,737	3,280,015
Debt securities	43,270,825	49,905,077
Less : Discount on long-term borrowings	(21,113)	(22,000)
Less : Discount on debt securities	(81,424)	(89,913)
Add: Premium on debt securities	82	
	45,624,107	53,073,179
	54,747,392	61,034,627

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(2) Repayment schedule of borrowings and debt securities as of December 31, 2017 and 2018 are as follows:

	2017	
Type	**Borrowings**	**Debt Securities**
	In millions of won	
Less than 1 year	1,166,871	7,961,182
1~ 5 years	1,117,222	25,047,075
Over 5 years	1,338,515	18,223,750
	3,622,608	51,232,007

	2018	
Type	**Borrowings**	**Debt Securities**
	In millions of won	
Less than 1 year	1,173,596	6,790,778
1~ 5 years	1,911,226	30,175,734
Over 5 years	1,368,789	19,729,343
	4,453,611	56,695,855

(3) Short-term borrowings as of December 31, 2017 and 2018 are as follows:

	2017				
Type	**Creditor**	**Interest rate (%)**	**Maturity**	**Foreign currency**	**Local currency**
	In millions of won and thousands of foreign currencies				
Local short-term borrowings	KTB Investment and securities and others	1.57~2.47	2018.01.12~ 2018.09.19		686,561
Foreign short-term borrowings	SCNT and others	4.60~6.50	2018.12.03	USD 8,955	9,594
Foreign short-term borrowings	Export-import Bank of Korea	3M Libor+0.41~0.63	2018.12.18	AUD 327,259	273,314
Local bank overdraft	Nonghyup Bank	3.04	2018.01.02		51,300
Local bank overdraft	Woori Bank	Standard overdraft rate+1.12	2018.02.27		17,559
					1,038,328

		2018			
Type	**Creditor**	**Interest rate (%)**	**Maturity**	**Foreign currency**	**Local currency**
		In millions of won and thousands of foreign currencies			
Local short-term borrowings	KTB Investment and securities and others	2.05~2.51	2019.01.04~ 2019.02.20		674,000
Foreign short-term borrowings	SCNT and others	4.60~6.50	2019.12.03	USD 8,955	10,013
Foreign short-term borrowings	BDO Unibank	6.59	2020.12.17(*)	PHP 450,000	9,581
Local bank overdraft	Nonghyup Bank	2.59~3.09	2019.01.10~ 2019.12.31		142,773
Local bank overdraft	Woori Bank	Standard overdraft rate+1.09	2019.02.26		24,235
					860,602

(*) The contractual maturity is 2020 but is classified as short-term borrowing due to intention of early payment in 3 months after borrowing.

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(4) Long-term borrowings as of December 31, 2017 and 2018 are as follows:

		2017			
Type		Interest rate (%)	Maturity	Foreign currency	Local currency
		In millions of won and thousands of foreign currencies			
Local long-term borrowings					
Korea Development Bank	Others	0.50	2018~2044		4,909
	Facility	2.45~4.60	2023~2028		68,883
	Facility	1yr KoFC bond rate +0.31	2018		25,000
	Operating funds	2.59~3.04	2018~2020		47,000
	Operating funds	1yr KoFC bond rate +0.95	2020		14,000
KEB Hana Bank	Commercial Paper	3M CD+0.24~0.32	2021~2022		400,000
	Facility	4.60	2028		15,038
	Facility	3yr KTB rate-1.25	2018~2028		8,947
IBK	PF Refinancing	CD+1.25	2030		22,500
Export-Import Bank of Korea	Project loans	1.50	2026		25,042
	Operating funds	2.21	2020		35,000
Korea Energy Agency	Development of power resources	3yr KTB rate-2.25	2023~2025		6,765
	Facility	3yr KTB rate-2.25	2018~2024		3,121
	Project loans		2022~2025		3,733
	Others	KTB rate -2.25	2024~2028		18,455
Shinhan Bank	Collateral borrowing	2.32	2019		30,000
	Facility	CB rate +1.10	2028		22,557
	Operating funds	2.70	2018		15,000
	Others	4.10	2035		105,000
	Others	Standard overdraft rate+1.10	2035		105,000
Kookmin Bank	Facility	3.16	2020		10,000
	Facility	MOR+0.79	2023		35,000
Others	Facility	1.75~4.60	2026~2029		148,423
	Facility	CB rate+1.10~1.20	2022~2028		46,278
	PF Refinancing	4.10	2030		62,500
	Others	4.50~8.00	2022~2039		102,346
					1,380,497
Foreign long-term borrowings					
Korea Energy Agency	Project loans		2021~2023	USD 8,744	9,368
		1M Libor+1.80~	2036	USD 64,913	69,548

Export-Import Bank of Korea and others	Direct loan and others	3.20			
	Direct loan and others	3M Libor+2.75~ 3.70	2027	JOD 168,663	254,514
	Commercial loan and others	3M Libor+1.50~ 2.50	2030~2033	USD 289,026	309,662
	PF Loan	6M Libor+1.70~ 2.50	2032	USD 123,253	132,054

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Type		2017 Interest rate (%)	Maturity	Foreign currency	Local currency
		In millions of won and thousands of foreign currencies			
SCNT and others	Shareholder s loan	6.50~8.00	2023	USD 41,718	44,697
	Shareholder s loan	8.00	2031	JOD 5,136	7,750
PT PJB	Shareholder s loan	12.75	2019	IDR 10,932,568	864
Samsung Life Insurance and others	Syndicated Loan	3.10	2032	JPY 5,325,000	50,540
Woori Bank and others	Syndicated Loan	JPY 6M Libor+2.00	2032	JPY 3,435,000	32,602
SMBC and others	Equity Bridge Loan	1M Libor+0.90	2019	USD 70,986	76,054
IFC and others	Others	6M Libor+5.00	2031	PKR 16,652,350	161,195
Federal Financing Bank	PF loan	2.39	2031	USD 48,366	51,819
Others	Others		2019	USD 2,907	3,116
					1,203,783
					2,584,280
Less : Discount of long-term borrowings					(21,999)
Less : Current portion of long-term borrowings					(128,543)
Add : Current portion of discount on long-term borrowings					886
					2,434,624

Type		2018 Interest rate (%)	Maturity	Foreign currency	Local currency
		In millions of won and thousands of foreign currencies			
Local long-term borrowings					
Korea Development Bank	Others	0.50	2019~2044		4,154
	Facility	2.45~4.60	2023~2028		66,793
	Operating funds	2.59~3.56	2020~2021		67,000
	Operating funds	1yr KoFC bond rate +0.95	2020		14,000
KEB Hana Bank	Commercial Paper	3M CD+0.19~0.32	2021~2023		950,000
	Facility	4.60	2028		13,781
	Facility	3yr KTB rate-1.25	2019~2028		8,072
IBK	PF Refinancing	CD+1.25	2030		22,500
Export-Import Bank of Korea	Project loans	1.50	2026		22,096
	Operating funds	2.21	2020		35,000

Korea Energy Agency	Development of power resources	3yr KTB rate-2.25	2023~2025	5,558
	Facility	3yr KTB rate-2.25	2019~2024	2,589
	Project loans		2023	1,197
	Others	KTB rate -2.25	2024~2028	17,347
Shinhan Bank	Collateral borrowing	2.32	2019	30,000
	Facility	CB rate+1.10	2028	20,672
	Others	3.95	2035	103,851
	Others	Standard overdraft rate+1.00	2035	103,851

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		2018			
Type		Interest rate (%)	Maturity	Foreign currency	Local currency
		In millions of won and thousands of foreign currencies			
Kookmin Bank	Facility	3.16	2020		10,000
	Facility	MOR+0.79	2023		30,333
Others	Facility	1.75~4.60	2026~2036		168,080
	Facility	CB rate+1.10~1.60	2023~2036		52,810
	PF Refinancing	4.10	2030		62,500
	Others	4.50~7.90	2022~2039		102,347
					1,914,531
Foreign long-term borrowings					
Korea Energy Agency	Project loans		2021~2023	USD 8,744	9,776
Export-Import Bank of Korea and others	Direct loan and others	1M Libor+1.80~3.20	2036	USD 123,909	138,542
	Direct loan and others	3M Libor+2.75~3.70	2027	JOD 158,524	249,783
	Commercial loan and others	3M Libor+1.50~2.50	2030~2033	USD 277,538	310,315
	PF Loan	6M Libor+1.70~2.50	2032	USD 126,798	141,773
SCNT and others	Shareholder s loan	8.00	2031	JOD 4,853	7,647
	Shareholder s loan	6.50~8.00	2023	USD 44,680	49,956
	Others	3.88	2021	USD 278,105	310,427
PT PJB	Shareholder s loan	12.75	2019	IDR 5,569,304	428
Samsung Life Insurance and others	Syndicated Loan	3.10	2032	JPY 5,286,835	53,565
Woori Bank and others	Syndicated Loan	JPY 6M Libor+2.00	2032	JPY 3,410,381	34,553
SMBC and others	Equity Bridge Loan	1M Libor+0.90	2019	USD 44,019	49,218
IFC and others	Others	6M Libor+5.00	2031	PKR 25,900,420	206,944
Federal Financing Bank and others	PF loan	2.39~13.00	2031~2038	USD 102,322	114,406
Others	Others		2019	USD 1,025	1,145
					1,678,478
					3,593,009
Less : Discount of long-term borrowings					(22,972)
Less : Current portion of long-term borrowings					(312,994)
Add : Current portion of discount on long-term borrowings					972
					3,258,015

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(5) Local debt securities as of December 31, 2017 and 2018 are as follows:

	Issue date	Maturity	Interest rate (%)	2017	2018
			In millions of won		
Electricity Bonds	2009.12.03~ 2018.12.04	2019.01.08~ 2048.10.29	1.62~5.45	20,700,000	24,480,000
Electricity Bonds	2013.06.25	2018.06.25	3M CD+0.31	150,000	
Corporate Bonds(*1)	2009.05.04~ 2018.11.09`	2019.01.21~ 2048.11.09	1.36~6.00	21,122,708	23,223,228
				41,972,708	47,703,228
Less : Discount on local debt securities				(37,816)	(41,247)
Less : Current portion of local debt securities				(5,200,000)	(5,330,000)
Add : Current portion of discount on local debt securities				923	1,035
				36,735,815	42,333,016

(*1) Corporate bonds of HeeMang Sunlight Power Co., Ltd. amounting to 2,697 million can be redeemed every March 31 after five years from its issue date, March 31, 2016.

(6) Foreign debt securities as of December 31, 2017 and 2018 are as follows:

			2017		
Type	Issue date	Maturity	Interest rate (%)	Foreign currency	Local currency
			In millions of won and thousands of foreign currencies		
FY-96	1996.04.01~ 1996.12.06	2026.12.01~ 2096.04.01	6.00~8.37	USD 249,070	266,854
FY-97	1997.01.31~ 1997.08.04	2027.02.01~ 2027.08.01	6.75~7.00	USD 314,717	337,188
FY-04	2004.04.23	2034.04.23	5.13	USD 286,920	307,406
FY-08	2008.11.27	2018.11.27	4.19	JPY 20,000,000	189,822
FY-11	2011.07.13	2021.07.13	4.75	USD 500,000	535,700
FY-12	2012.09.19	2022.09.19	3.00	USD 750,000	803,550
FY-13	2013.02.05~ 2013.11.27	2018.02.05~ 2018.11.27	1.88~2.88	USD 1,900,000	2,035,660
FY-13	2013.09.26~ 2013.10.23	2019.03.26~ 2019.04.23	1.50~1.63	CHF 400,000	437,888

FY-13	2013.09.25	2020.09.25	5.75	AUD 325,000	271,427
FY-13	2013.02.20~ 2013.07.25	2018.02.20~ 2018.07.25	3M Libor+0.84~1.50	USD 500,000	535,700
FY-14	2014.02.11~ 2014.12.02	2019.02.11~ 2029.07.30	2.38~3.57	USD 1,500,000	1,607,100
FY-15	2015.06.15	2025.06.15	3.25	USD 300,000	321,420
FY-16	2016.01.21	2021.07.21	2.50	USD 300,000	321,420
FY-17	2017.04.12~ 2017.07.25	2020.04.12~ 2027.07.25	2.38~3.13	USD 1,100,000	1,178,540
FY-17	2017.10.30	2037.10.30	1.70	EUR 40,000	51,170
FY-17	2017.11.16	2037.11.16	2.36	SEK 450,000	58,454
					9,259,299
Less : Discount on foreign debt securities					(47,490)
Add : Premium on foreign debt securities					82
Less : Current portion of foreign debt securities					(2,761,182)
Add : Current portion of discount on foreign debt securities					2,959
					6,453,668

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			2018		
Type	**Issue date**	**Maturity**	**Interest rate (%)**	**Foreign currency**	**Local currency**
			In millions of won and thousands of foreign currencies		
FY-96	1996.04.01~	2026.12.01~	6.00~8.37		
	1996.12.06	2096.04.01		USD 249,071	278,488
FY-97	1997.01.31~	2027.02.01~	6.75~7.00		
	1997.08.04	2027.08.01		USD 314,717	351,885
FY-04	2004.04.23	2034.04.23	5.13	USD 286,920	320,805
FY-11	2011.07.13	2021.07.13	4.75	USD 500,000	559,050
FY-12	2012.09.19	2022.09.19	3.00	USD 750,000	838,575
FY-13	2013.09.26~	2019.03.26~	1.50~1.63		
	2013.10.23	2019.04.23		CHF 400,000	454,488
FY-13	2013.09.25	2020.09.25	5.75	AUD 325,000	256,038
FY-14	2014.02.11~	2019.02.11~	2.38~3.57		
	2014.12.02	2029.07.30		USD 1,500,000	1,677,150
FY-15	2015.06.15	2025.06.15	3.25	USD 300,000	335,430
FY-16	2016.01.21	2021.07.21	2.50	USD 300,000	335,430
FY-17	2017.04.12~	2020.04.12~	2.38~3.13		
	2017.07.25	2027.07.25		USD 1,100,000	1,229,910
FY-17	2017.10.30	2037.10.30	1.70	EUR 40,000	51,166
FY-17	2017.11.16	2037.11.16	2.36	SEK 450,000	56,061
FY-18	2018.01.29~	2021.01.29~	3.00~3.88		
	2018.07.25	2023.07.25		USD 1,800,000	2,012,580
FY-18	2018.03.13	2028.03.13	3.35	HKD 1,650,000	235,571
					8,992,627
Less : Discount on foreign debt securities					(50,640)
Add : Premium on foreign debt securities					20
Less : Current portion of foreign debt securities					(1,460,778)
Add : Current portion of discount on foreign debt securities					939
Less: Current portion of premium on foreign debt securities					(20)
					7,482,148

(7) Changes in borrowings and debt securities for the years ended December 31, 2017 and 2018 are as follows:

	2017	**2018**
	In millions of won	
Beginning balance	53,639,205	54,747,392

Cash flow	2,269,513	5,972,336
Effect of exchange rate fluctuations	(1,169,418)	322,515
Others	8,092	(7,616)
Ending balance	54,747,392	61,034,627

27. Finance Lease Liabilities

(1) Lease contracts

The Company entered into power purchase agreements (PPA) with GS EPS and two other providers. The Company recognizes these PPAs as finance leases; under the PPAs, there is no transfer of ownership or bargain purchase option of the plants at the end of the agreement, however, the present value of the future minimum power purchase payments equals substantially all of the plants respective fair values over a twenty-year period which makes up the major part of the respective plant s economic life.

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(2) Finance lease liabilities as of December 31, 2017 and 2018 are as follows and are included in current and non-current trade and other payables, net, in the consolidated statements of financial position:

	2017		2018	
	Minimum lease payments	Present value of minimum lease payments	Minimum lease payments	Present value of minimum lease payments
	In millions of won			
Less than 1 year	174,534	131,792	87,709	57,200
1 ~ 5 years	272,994	204,069	228,783	170,676
More than 5 years	108,748	82,399	65,250	55,930
	556,276	418,260	381,742	283,806

(3) Current and non-current portion of financial lease liabilities as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Current finance lease liabilities	131,792	57,200
Non-current finance lease liabilities	286,468	226,606
	418,260	283,806

(4) Minimum lease payment and contingent rent payment recognized as an expense as a lessee for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Minimum lease payment	158,859	111,530
Contingent rent payment	(21,024)	(18,872)

(5) Changes in finance lease liabilities for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Beginning balance	541,179	418,260
Cash flow	(122,919)	(134,454)

Acquisition of finance lease assets		
Ending balance	418,260	283,806

28. Employment Benefits

(1) Employment benefit obligations as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Net defined benefit obligations	1,476,201	1,638,785
Other long-term employee benefit obligations	6,868	6,284
	1,483,069	1,645,069

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(2) Principal assumptions on actuarial valuation as of December 31, 2017 and 2018 are as follows:

	2017	2018
Discount rate	2.75%~2.90%	2.24%~2.90%
Future salary and benefit levels	4.88%	4.88%
Weighted average duration	13.40 years	13.71 years

(3) Details of expense relating to defined benefit plans for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Current service cost	378,930	392,820	369,899
Interest cost	67,104	79,524	87,687
Expected return on plan assets	(23,612)	(31,307)	(42,135)
Loss from settlement	(706)	(1,055)	(767)
	421,716	439,982	414,684

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

	2016	2017	2018
	In millions of won		
Cost of sales	312,391	332,249	308,672
Selling and administrative expenses	61,362	59,111	51,903
Others (Construction-in-progress and others)	47,963	48,622	54,109
	421,716	439,982	414,684

In addition, for the years ended December 31, 2016, 2017 and 2018, employee benefit obligations expenses of 62,435 million, 65,603 million and 66,833 million, respectively, are recognized as cost of sales, and 11,450 million, 11,983 million and 13,204 million, respectively, are recognized as selling and administrative expenses, and 14,024 million, 13,332 million and 14,189 million, respectively, are recognized as construction-in-progress and others, relates to the Company s defined contribution plans.

(4) Details of defined benefit obligations as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Present value of defined benefit obligation from funded plans	2,951,842	3,414,116

Fair value of plan assets	(1,475,641)	(1,775,331)
	1,476,201	1,638,785
Present value of defined benefit obligation from unfunded plans		
Net liabilities incurred from defined benefit plans	1,476,201	1,638,785

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(5) Changes in the present value of defined benefit obligations for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Beginning balance	2,867,377	2,951,842
Current service cost	392,820	369,899
Interest cost(*)	79,524	87,687
Remeasurement component	(258,223)	154,939
Loss from settlement	(1,055)	(767)
Actual payments	(128,707)	(149,454)
Others	106	(30)
Ending balance	2,951,842	3,414,116

(*) Corporate bond (AAA rated) yield at year-end is applied to measure the interest cost on employee benefit obligations.

(6) Changes in the fair value of plan assets for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Beginning balance	1,188,907	1,475,641
Expected return	31,307	42,135
Remeasurement component	(10,435)	(12,308)
Contributions by the employers	325,080	330,064
Actual payments	(59,218)	(60,201)
Ending balance	1,475,641	1,775,331

In addition, loss on accumulated remeasurement component amounting to 43,513 million and 219,381 million has been recognized as other comprehensive income or loss for the years ended December 31, 2017 and 2018, respectively.

(7) Details of the fair value of plan assets as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Equity instruments	79,204	96,823
Debt instruments	517,040	510,184

Bank deposit	293,477	275,518
Others	585,920	892,806
	1,475,641	1,775,331

For the years ended December 31, 2017 and 2018, actual returns on plan assets amounted to 20,782 million and 29,827 million, respectively.

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(8) Remeasurement component recognized in other comprehensive income (loss) for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Actuarial gain from changes in financial assumptions	(300,058)	186,428
Experience adjustments, etc.	41,835	(31,489)
Expected return	10,435	12,308
	(247,788)	167,247

Remeasurement component recognized as other comprehensive income or loss is recorded in retained earnings.

29. Provisions

(1) Provisions as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Current	Non-current	Current	Non-current
	In millions of won			
Employment benefits				
Provisions for employment benefits	913,787		976,347	
Litigation				
Litigation provisions	48,621	24,955	40,157	37,636
Decommissioning cost				
Nuclear plants		13,007,228		13,388,134
Spent fuel		1,339,046		1,291,354
Radioactive waste	11,494	1,626,877	4,310	1,680,698
PCBs		180,087		147,668
Other recovery provisions		6,659		10,477
Others				
Power plant regional support program	153,756		137,668	
Transmission regional support program	243,365		151,698	
Provisions for tax	61		6,845	
Provisions for financial guarantee		23,475	1,320	14,266
Provisions for RPS	271,624		93,919	
Provisions for greenhouse gas emissions obligations	414,252		136,187	
Others	80,538	16,387	46,347	15,515
	2,137,498	16,224,714	1,594,798	16,585,748

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(2) Changes in provisions for the years ended December 31, 2017 and 2018 are as follows:

	2017					
	Beginning balance	Increase in provision	Payment	Reversal	Others	Ending balance
	In millions of won					
Employment benefits						
Provisions for employment benefits	810,607	984,896	(880,255)	(1,461)		913,787
Litigation						
Litigation provisions	198,237	34,629	(152,461)	(7,096)	267	73,576
Decommissioning cost						
Nuclear plants	10,195,928	2,818,033	(6,733)			13,007,228
Spent fuel	1,374,225	307,682	(342,861)			1,339,046
Radioactive waste	1,479,502	222,632	(63,763)			1,638,371
PCBs	191,744	5,309	(14,266)	(2,700)		180,087
Other recovery provisions	507	5,939			213	6,659
Others						
Power plant regional support program	152,851	94,039	(103,889)		10,755	153,756
Transmission regional support program	282,608	143,178	(182,421)			243,365
Provisions for tax	242		(25)	(136)	(20)	61
Provisions for financial guarantee	29,665	3,760		(9,945)	(5)	23,475
Provisions for RPS	417,404	242,946	(388,726)			271,624
Provisions for greenhouse gas emissions obligations	249,644	422,666	(256,758)	(1,300)		414,252
Others(*)	43,975	6,639	(3,348)	(26,477)	76,136	96,925
	15,427,139	5,292,348	(2,395,506)	(49,115)	87,346	18,362,212

(*) The Company believes that the possibility of economic outflow is probable on the cost of construction suspension of Shin-Kori unit 5 and 6 for three months. For this reason, the Company recognized 77,261 million of provision as addition to construction-in-progress.

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	2018					
	Beginning balance	Increase in provision	Payment	Reversal	Others	Ending balance
	In millions of won					
Employment benefits						
Provisions for employment benefits	913,787	912,440	(843,281)	(6,599)		976,347
Litigation						
Litigation provisions(*)	73,576	234,517	(216,187)	(13,847)	(266)	77,793
Decommissioning cost						
Nuclear plants	13,007,228	411,316	(30,410)			13,388,134
Spent fuel	1,339,046	435,007	(482,699)			1,291,354
Radioactive waste	1,638,371	112,815	(66,178)			1,685,008
PCBs	180,087	4,600	(13,758)	(23,261)		147,668
Other recovery provisions	6,659	2,125			1,693	10,477
Others						
Power plant regional support program	153,756	46,366	(71,978)		9,524	137,668
Transmission regional support program	243,365	141,661	(233,328)			151,698
Provisions for tax	61	6,821			(37)	6,845
Provisions for financial guarantee	23,475	1,179	(67)	(8,432)	(569)	15,586
Provisions for RPS	271,624	297,802	(475,507)			93,919
Provisions for greenhouse gas emissions obligations	414,252	131,860	(350,356)	(59,569)		136,187
Others	96,925	44,732	(82,632)	(745)	3,582	61,862
	18,362,212	2,783,241	(2,866,381)	(112,453)	13,927	18,180,546

(*) As described in note 53.(1), the Company believes that the possibility of economic outflow is probable on the request for additional construction costs of Hyundai E&C, GS Engineering & Construction Corp. and Hansol SeenTec Co., Ltd. For this reason, the Company recognized 204,787 million of provision as addition to property, plant and equipment.

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30. Government Grants

(1) Government grants as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Land	(21,968)	(21,968)
Buildings	(63,539)	(63,189)
Structures	(196,414)	(190,854)
Machinery	(183,188)	(173,242)
Vehicles	(6,322)	(4,220)
Equipment	(761)	(418)
Tools	(1,027)	(675)
Construction-in-progress	(49,084)	(54,740)
Finance lease assets	(27)	(26)
Investment properties	(83)	(50)
Software	(486)	(420)
Development expenditures	(3,702)	(2,110)
Intangible assets under development	(10,540)	(10,564)
Usage rights of donated assets and other	(11)	
Other intangible assets other than goodwill		
	(537,152)	(522,476)

(2) Changes in government grants for the years ended December 31, 2017 and 2018 are as follows:

	2017						
	Beginning balance	Receipt	Acquisition	Offset the items of depreciation expense and others	Disposal	Others	Ending balance
	In millions of won						
Cash		(55,533)				55,533	
Land	(3,204)				5	(18,769)	(21,968)
Buildings	(61,188)			5,996	28	(8,375)	(63,539)
Structures	(197,641)			10,011	1,905	(10,689)	(196,414)
Machinery	(111,064)			17,390	489	(90,003)	(183,188)
Vehicles	(107)			1,070	14	(7,299)	(6,322)
Equipment	(732)			454		(483)	(761)
Tools	(430)			354		(951)	(1,027)

Construction-in-progress	(135,807)		129,451			(42,728)	(49,084)
Finance lease assets				1		(28)	(27)
Investment properties	(64)			2		(21)	(83)
Software	(595)			255		(146)	(486)
Development expenditures	(5,152)			2,811		(1,361)	(3,702)
Intangible assets under development	(11,090)					550	(10,540)
Usage rights of donated assets and other	(21)			10			(11)
Others							
	(527,095)	(55,533)	129,451	38,354	2,441	(124,770)	(537,152)

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	Beginning balance	Receipt	Acquisition	2018 Offset the items of depreciation expense and others	Disposal	Others	Ending balance
				In millions of won			
Cash		(30,416)				30,416	
Land	(21,968)						(21,968)
Buildings	(63,539)			6,836	31	(6,517)	(63,189)
Structures	(196,414)			10,292	3,270	(8,002)	(190,854)
Machinery	(183,188)			18,099	823	(8,976)	(173,242)
Vehicles	(6,322)			2,146		(44)	(4,220)
Equipment	(761)			365		(22)	(418)
Tools	(1,027)			432		(80)	(675)
Construction-in-progress	(49,084)		18,239			(23,895)	(54,740)
Finance lease assets	(27)			1			(26)
Investment properties	(83)			1		32	(50)
Software	(486)			254		(188)	(420)
Development expenditures	(3,702)			1,591		1	(2,110)
Intangible assets under development	(10,540)					(24)	(10,564)
Usage rights of donated assets and other	(11)			11			
Others							
	(537,152)	(30,416)	18,239	40,028	4,124	(17,299)	(522,476)

31. Deferred Revenues

Deferred revenue related to the Company s construction contracts for the years ended December 31, 2017 and 2018 are as follows which included in current and non-current non-financial liabilities in the consolidated statements of financial position:

	2017	2018
	In millions of won	
Beginning balance	7,825,765	8,325,181
Increase during the current year	978,389	875,930
Recognized as revenue during the current year	(478,973)	(594,548)
Ending balance	8,325,181	8,606,563

32. Non-financial Liabilities

Non-financial liabilities as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Current	**Non-current**	**Current**	**Non-current**
	In millions of won			
Advance received	3,772,713	181,612	3,724,238	80,937
Unearned revenue	41,593	19,718	63,038	4,690
Deferred revenue	476,631	7,848,550	556,072	8,050,491
Withholdings	164,370	10,529	172,454	10,856
Others	1,129,001	12,025	1,058,239	13,059
	5,584,308	8,072,434	5,574,041	8,160,033

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33. Contributed Capital

(1) Details of shares issued as of December 31, 2017 and 2018 are as follows:

	2017					
	Shares authorized	Shares issued	Par value per share (in won)	Owned by government(*)	Owned by others	Total
	In millions of won except share information					
Common shares	1,200,000,000	641,964,077	5,000	1,640,385	1,569,435	3,209,820

(*) Korea Development Bank s interest of 1,056,176 million is included.

	2018					
	Shares authorized	Shares issued	Par value per share (in won)	Owned by government(*)	Owned by others	Total
	In millions of won except share information					
Common shares	1,200,000,000	641,964,077	5,000	1,640,385	1,569,435	3,209,820

(*) Korea Development Bank s interest of 1,056,176 million is included.

(2) Details in number of outstanding capital stock for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	Number of shares	
Beginning balance	641,964,077	641,964,077
Ending balance	641,964,077	641,964,077

(3) Details of share premium as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Share premium	843,758	843,758

34. Retained Earnings and Dividends Paid

(1) Details of retained earnings as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Legal reserve(*)	1,604,910	1,604,910
Voluntary reserves	34,833,844	35,906,267
Retained earnings before appropriations	16,931,804	14,007,942
Retained earnings	53,370,558	51,519,119

(*) The KEPCO Act requires KEPCO to appropriate a legal reserve equal to at least 20 percent of net income for each accounting period until the reserve equals 50 percent of KEPCO s common stock. The legal reserve is not available for cash dividends; however, this reserve may be credited to paid-in capital or offset against accumulated deficit by the resolution of the shareholders.

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(2) Details of voluntary reserves as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Reserve for investment on social overhead capital	5,277,449	5,277,449
Reserve for research and human development(*)	330,000	330,000
Reserve for business expansion	29,016,395	30,088,818
Reserve for equalizing dividends	210,000	210,000
	34,833,844	35,906,267

(*) The reserve for research and human development is appropriated by KEPCO to use as qualified tax credits to reduce corporate tax liabilities. The reserve is available for cash dividends for a certain period as defined by the Restriction of Special Taxation Act of Korea.

(3) Changes in retained earnings for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Beginning balance	53,173,871	53,370,558
Effect of change in accounting policy		71,928
Net profit (loss) for the period attributed to owner of the Company	1,298,720	(1,314,567)
Changes in equity method retained earnings	10,065	(1,153)
Remeasurements of defined benefit liability, net of tax	158,991	(100,495)
Dividends paid	(1,271,089)	(507,152)
Ending balance	53,370,558	51,519,119

(4) Dividends paid for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016				
In millions of won	Number of shares issued	Number of treasury stocks	Number of shares eligible for dividends	Dividends paid per share (In won)	Dividends paid
Common shares	641,964,077		641,964,077	3,100	1,990,089

	2017
In millions of won	

	Number of shares issued	Number of treasury stocks	Number of shares eligible for dividends	Dividends paid per share	Dividends paid
				(In won)	
Common shares	641,964,077		641,964,077	1,980	1,271,089

	2018				
In millions of won	Number of shares issued	Number of treasury stocks	Number of shares eligible for dividends	Dividends paid per share (In won)	Dividends paid
Common shares	641,964,077		641,964,077	790	507,152

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(5) Changes in retained earnings of investments in associates and joint ventures for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Beginning balance	(4,943)	5,122
Changes	10,065	(1,153)
Ending balance	5,122	3,969

(6) Changes in remeasurement components for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Beginning balance	(222,997)	(43,513)
Changes	239,636	(154,198)
Income tax effect	(80,645)	53,703
Transfer to reserve for business expansion	20,493	(75,373)
Ending balance	(43,513)	(219,381)

35. Statement of Disposition of Deficit

For the year ended December 31, 2017, KEPCO s retained earnings were appropriated on March 30, 2018. For the year ended December 31, 2018, KEPCO s deficits are expected to be appropriated on March 22, 2019. Statements of disposition of deficit and appropriation of retained earnings of KEPCO, the controlling company, for the years ended December 31, 2017 and 2018, respectively, are as follows:

	2017	2018
	In millions of won except for dividends per share	
I. Retained earnings before appropriations (undisposed deficit)		
Unappropriated retained earnings carried over from prior years		
Effect of change in accounting policy		39,813
Net income (loss)	1,506,852	(1,095,213)
Remeasurements of the defined benefit plan	72,723	(65,442)
	1,579,575	(1,120,842)
II. Transfer from voluntary reserves		1,120,842

III. Subtotal (I+II)			1,579,575
IV. Appropriations of retained earnings			(1,579,575)
Legal reserve			
Dividends (government, individual)	Current year	0	
Amount of dividends per share (%) :	Prior year	790 (16%)	(507,152)
Reserve for business expansion			(1,072,423)
V. Unappropriated retained earnings to be carried over forward to subsequent year			

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36. Hybrid Bonds

Hybrid bonds classified as equity (non-controlling interest) as of December 31, 2017 and 2018 are as follows:

Issuer	Hybrid bond	Issued date	Maturity	Yield (%)	2017	2018
					In millions of won	
Korea South-East Power Co., Ltd.	1st hybrid bond	2012.12.07	2042.12.06	4.38	170,000	170,000
Korea South-East Power Co., Ltd.	2nd hybrid bond	2012.12.07	2042.12.06	4.44	230,000	230,000
Expense of issuance					(1,090)	(1,090)
					398,910	398,910

Although these instruments have contractual maturity dates, the contractual agreements allow these subsidiaries to indefinitely extend the maturity dates and defer the payment of interest without modification to the other terms of the instruments. When the Company decides not to pay dividends on ordinary shares, they are not required to pay interest on the hybrid bonds.

Substantially, as these instruments have no contractual obligation to pay principal and interest, these instruments have been classified as equity (non-controlling interest) in the Company s consolidated financial statements.

37. Other Components of Equity

(1) Other components of equity of the parent as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Other capital surplus	1,233,793	1,234,825
Accumulated other comprehensive loss	(271,457)	(358,570)
Other equity	13,294,973	13,294,973
	14,257,309	14,171,228

(2) Changes in other capital surplus for the years ended December 31, 2017 and 2018 are as follows:

	2017			2018		
	Gains on disposal of	Others	Subtotal	Gains on disposal of	Others	Subtotal

	treasury stocks			treasury stocks		
			In millions of won			
Beginning balance	387,524	847,622	1,235,146	387,524	846,269	1,233,793
Issuance of share capital of subsidiary		(1,378)	(1,378)		1,032	1,032
Others		25	25			
Ending balance	387,524	846,269	1,233,793	387,524	847,301	1,234,825

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(3) Changes in accumulated other comprehensive income (loss) for the years ended December 31, 2017 and 2018 are as follows:

	2017				
	Available-for-sale financial asset valuation reserve	Shares in other comprehensive Income (loss) of investments in associates and joint ventures	Reserve for overseas operations translation credit	Reserve for gain (loss) on valuation of derivatives	Total
	In millions of won				
Beginning balance	36,370	221,455	(223,056)	(68,644)	(33,875)
Changes in the unrealized fair value of available-for-sale financial assets, net of tax	(7,102)				(7,102)
Shares in other comprehensive loss of associates and joint ventures, net of tax		(154,991)			(154,991)
Foreign currency translation of foreign operations, net of tax			(95,103)		(95,103)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax				19,614	19,614
Ending balance	29,268	66,464	(318,159)	(49,030)	(271,457)

	2018				
	Financial asset at fair value through other comprehensive income valuation reserve	Shares in other comprehensive income of investments in associates and joint ventures	Reserve for overseas operations translation credit	Reserve for gain (loss) on valuation of derivatives	Total
	In millions of won				
Beginning balance	29,268	66,464	(318,159)	(49,030)	(271,457)
Effect of change in accounting Policy	(76,851)				(76,851)
Changes in the unrealized fair value of financial assets at FVOCI,	(34,125)				(34,125)

net of tax					
Shares in other comprehensive income of associates and joint ventures, net of tax		57,089			57,089
Foreign currency translation of foreign operations, net of tax			(32,086)		(32,086)
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax				(1,140)	(1,140)
Ending balance	(81,708)	123,553	(350,245)	(50,170)	(358,570)

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(4) Details of changes in other equity for the years ended December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Statutory revaluation reserve	13,295,098	13,295,098
Changes in other equity	(125)	(125)
	13,294,973	13,294,973

38. Sales

Details of sales for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016		2017		2018	
	Domestic	Overseas	Domestic	Overseas	Domestic	Overseas
	In millions of won					
[Type of goods and services]						
Sales of goods	54,982,095	397,392	55,373,316	399,232	57,514,866	382,938
Electricity	54,304,529		54,649,882		56,842,011	
Heat supply	181,597		205,838		216,117	
Others	495,969	397,392	517,596	399,232	456,738	382,938
Sales of service	195,697	161,046	186,990	164,167	176,539	216,328
Sales of construction services	132,219	3,894,638	92,501	3,119,683	108,586	1,633,805
	55,310,011	4,453,076	55,652,807	3,683,082	57,799,991	2,233,071
[Timing of revenue recognition]						
Performance obligations satisfied at a point in time	54,982,095	397,392	55,373,316	399,232	57,514,866	382,938
Performance obligations satisfied over time	327,916	4,055,684	279,491	3,283,850	285,125	1,850,133
	55,310,011	4,453,076	55,652,807	3,683,082	57,799,991	2,233,071

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39. Selling and Administrative Expenses

(1) Selling and administrative expenses for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Salaries	734,930	735,383	757,819
Retirement benefit expense	72,812	71,094	65,107
Welfare and benefit expense	162,243	179,406	132,089
Insurance expense	11,513	15,414	12,181
Depreciation	169,431	190,245	214,499
Amortization of intangible assets	35,171	44,990	54,153
Bad debt expense	38,719	126,714	39,784
Commission	605,879	673,740	714,096
Advertising expense	34,658	114,519	30,894
Training expense	6,314	7,027	6,277
Vehicle maintenance expense	10,390	9,998	10,148
Publishing expense	3,643	3,672	3,307
Business promotion expense	3,477	3,700	2,785
Rent expense	40,020	38,380	42,851
Telecommunication expense	25,448	24,916	23,505
Transportation expense	596	495	686
Taxes and dues	46,531	48,395	46,424
Expendable supplies expense	6,834	7,731	6,166
Water, light and heating expense	9,720	10,545	12,629
Repairs and maintenance expense	75,122	63,477	62,580
Ordinary development expense	188,063	211,417	215,494
Travel expense	16,115	16,658	14,363
Clothing expense	8,273	8,410	10,108
Survey and analysis expense	666	698	705
Membership fee	1,132	1,122	1,043
Others	331,532	154,709	148,197
	2,639,232	2,762,855	2,627,890

(2) Other selling and administrative expenses for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Accommodation development expenses	186,896	55,799	52,822
Miscellaneous wages	31,907	32,300	32,447
Litigation and filing expenses	12,328	11,881	12,853

Compensation for damages	60,341	12,297	19,193
Outsourcing expenses	3,530	2,647	3,036
Reward expenses	3,267	2,786	2,713
Overseas market development expenses	2,177	1,876	1,361
Others	31,086	35,123	23,772
	331,532	154,709	148,197

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40. Other Income and Expense

(1) Other income for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Reversal of other provisions	22,034	35,265	12,700
Reversal of other allowance for doubtful accounts	5,489	2,166	143
Gains on government grants	111	430	482
Gains on assets contributed	12,254	4,218	17,336
Gains on liabilities exempted	1,959	3,166	10,303
Compensation and reparations revenue	114,530	89,196	89,901
Revenue from research contracts	13,143	12,580	6,818
Income related to transfer of assets from customers	427,297	478,973	594,548
Rental income	211,580	192,136	186,631
Others	31,787	50,988	51,032
	840,184	869,118	969,894

(2) Details of others of other income for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Refund of claim for rectification	8,722	9,655	8,933
Adjustment of research project	4,148	3,884	2,267
Maintenance expenses on lease building	354	135	176
Training expenses	4,478	3,045	3,220
Deposit redemption	991	34	7
Reversal of expenses on litigation	893	360	753
Revenue on royalty fee	2,486	2,888	6,909
Reimbursement of insurance fee		1,498	7,145
Gains on guarantee contracts	2,796	456	39
Others	6,919	29,033	21,583
	31,787	50,988	51,032

(3) Other expense for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		

Compensation and indemnification expense		37	23,437
Accretion expenses of other provisions	4,556	7,535	41,924
Depreciation expenses on investment properties	678	1,176	923
Depreciation expenses on idle assets	6,639	6,644	6,547
Other bad debt expense	4,585	1,778	17,827
Donations	114,094	119,421	63,743
Others	58,072	43,464	76,929
	188,624	180,055	231,330

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(4) Details of others of other expense for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Operating expenses related to the idle assets	459	136	47
Research grants	1,461	1,180	461
Supporting expenses on farming and fishing village	15,201	11,956	13,537
Operating expenses on fitness center	2,706	3,498	4,788
Expenses on adjustment of research and development grants		806	404
Taxes and dues	4,582	2,270	199
Expenses on R&D supporting	690	5,459	53
Others(*)	32,973	18,159	57,440
	58,072	43,464	76,929

(*) Others include 38,886 million of impairment loss on construction-in-progress of Cheonji unit 1 and 2 and Daejin unit 1 and 2 as described in note 2.

41. Other Gains (Losses)

(1) Composition of other gains (losses) for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Other gains			
Gains on disposal of property, plant, and equipment	74,035	48,316	98,077
Gains on disposal of intangible assets		564	12
Reversal of impairment loss on intangible assets	3	54	17
Gains on foreign currency translation	15,311	20,485	14,905
Gains on foreign currency transaction	55,377	93,151	47,297
Gains on insurance proceeds		400	
Others	187,792	269,562	221,556
Other losses			
Losses on disposal of property, plant and equipment	(42,715)	(70,514)	(60,704)
Losses on disposal of intangible assets	(158)	(183)	(43)
Impairment loss on property, plant and equipment		(51,067)	(710,162)
Impairment loss on intangible assets	(3,945)	(20)	(8,112)
Impairment loss on other non-current assets			(87,024)
Losses on foreign currency translation	(23,835)	(25,495)	(7,678)
Losses on foreign currency transaction	(72,058)	(36,241)	(65,366)
Others	(119,309)	(92,385)	(63,899)

70,498	156,627	(621,124)

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(2) Details of others of other gains for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Gains on disposal of inventories	9,494	6,024	6,350
Gains on valuation of inventories	2		
Gains on proxy collection of TV license fee	38,991	39,711	40,450
Gains on compensation of impaired electric poles	3,650	1,526	1,166
Gains on compensation for infringement on contract	3,040	18,990	3,648
Gains on harbor facilities dues	2,957	3,025	3,803
Gains on technical fees	1,271	2,105	2,026
Reversal of occupation development training fees	1,756	1,697	1,602
Gains on disposal of waste	4,222	4,261	4,232
Gains on insurance	3,786	10,410	22,382
Gains on tax rebate	5,226	2,161	542
Gains on other commission	4,639	4,790	4,347
Gains on research tasks	10		
Gains on settlement and others	2,188		
Gains on sales of greenhouse gas emissions rights	46		
Others	106,514	174,862	131,008
	187,792	269,562	221,556

(3) Details of others of other losses for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Losses on valuation of inventories	2,683	3,875	1,953
Losses on disposal of inventories	3,092	3,273	3,555
Losses due to disaster	1,522	5,374	2,129
Losses on rounding adjustment of electric charge surtax	1,260	1,253	1,265
Losses on adjustments of levies	1,184	1	
Forfeit of taxes and dues	4,582	656	
Losses on litigation	2,581		
Others	102,405	77,953	54,997
	119,309	92,385	63,899

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42. Finance Income

(1) Finance income for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Interest income	241,778	206,143	223,767
Dividends income	9,446	11,477	12,777
Gains on disposal of financial assets	1,482	1,130	1,838
Gains on valuation of Financial assets at fair value through profit or loss		12	8,495
Gains on valuation of derivatives	293,830	16,165	199,943
Gains on transaction of derivatives	45,549	29,257	179,745
Gains on foreign currency translation	161,905	1,115,832	143,254
Gains on foreign currency transaction	37,553	150,602	27,051
	791,543	1,530,618	796,870

(2) Interest income included in finance income for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Cash and cash equivalents	61,380	35,474	40,704
Financial assets at fair value through profit or loss		290	21,713
Financial assets at amortized cost			89
Held-to-maturity investments	97	82	
Loans	25,106	30,014	21,925
Short-term financial instrument	45,763	29,412	41,025
Long-term financial instrument	7,195	8,144	7,920
Other financial assets			1
Trade and other receivables	102,237	102,727	90,390
	241,778	206,143	223,767

43. Finance Expenses

(1) Finance expenses for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Interest expense	1,752,868	1,789,552	1,868,458
Losses on sale of financial assets	9	2,343	1
Losses on valuation of financial assets at fair value through profit or loss			6,616
Impairment of available-for-sale financial assets	86,703	2,713	
Losses on valuation of derivatives	5,762	890,832	46,740
Losses on transaction of derivatives	101,987	198,218	32,448
Losses on foreign currency translation	406,849	207,944	393,859
Losses on foreign currency transaction	57,889	35,175	121,763
Losses on repayment of financial liabilities	23,000	5	
Other	2,020	1,170	858
	2,437,087	3,127,952	2,470,743

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(2) Interest expense included in finance expenses for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Trade and other payables	68,375	57,160	42,830
Short-term borrowings	6,969	35,891	32,545
Long-term borrowings	91,584	87,011	92,243
Debt securities	1,922,900	1,698,232	1,771,544
Other financial liabilities	482,428	491,665	505,112
	2,572,256	2,369,959	2,444,274
Less: Capitalized borrowing costs	(819,388)	(580,407)	(575,816)
	1,752,868	1,789,552	1,868,458

Capitalization rates for the years ended December 31, 2016, 2017 and 2018 are 2.29%~4.16%, 2.30%~3.60% and 2.17%~3.86%, respectively.

44. Income Taxes

(1) Income tax expense (benefit) for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Current income tax expense			
Payment of income tax	2,689,640	881,583	378,715
Adjustment in respect of prior years due to change in estimate	231,113	4,484	(195,648)
Current income tax directly recognized in equity	30,059	(56,098)	101,528
Effect of change in accounting policy			1,780
	2,950,812	829,969	286,375
Deferred income tax expense			
Generation and realization of temporary differences	509,762	1,283,012	(495,658)
Changes of unrecognized tax losses, tax credit and temporary differences for prior periods	(86,845)	44,573	(28,509)
Changes in deferred tax on tax losses carryforwards			(572,305)
Tax credit carryforwards	(8,588)	15,270	(16,224)
	414,329	1,342,855	(1,112,696)

Income tax expense (benefit)	3,365,141	2,172,824	(826,321)

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(2) Reconciliation between actual income tax expense and amount computed by applying the statutory tax rate to income before income taxes for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
		In millions of won	
Income (loss) before income tax	10,513,468	3,614,218	(2,000,819)
Income tax expense (benefit) computed at applicable tax rate(*1)	2,544,259	874,641	(550,225)
Adjustments			
Effect of applying gradual tax rate	(5,082)	(5,082)	(1,408)
Effect of non-taxable income	(29,554)	(32,032)	(1,705)
Effect of non-deductible expenses	22,258	15,032	40,151
Effect of tax losses that are not recognized as deferred tax asset			2,086
Effects of tax credits and deduction	(194,731)	(161,069)	(39,471)
Recognition (reversal) of unrecognized deferred tax asset, net	(86,845)	44,573	(28,509)
Effect of change in deferred tax due to change in tax rate		1,055,154	261
Deferred income tax related to investments in subsidiaries and associates	862,956	394,145	(52,618)
Others, net	20,767	(17,022)	765
	589,769	1,293,699	(80,448)
Adjustment in respect of prior years due to change in estimate	231,113	4,484	(195,648)
Income tax expense (benefit)	3,365,141	2,172,824	(826,321)
Effective tax rate	32%	60%	(*2)

(*1) Applicable tax rate is 24.2% as of December 31, 2016 and 2017, and 27.5% as of December 31, 2018.

(*2) The effective tax rate for the year ended December 31, 2018 is not calculated for income tax benefit.

(3) Income tax directly adjusted to shareholders equity (except for accumulated other comprehensive income (loss)) for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
		In millions of won	
Dividends of hybrid bond	5,253	5,248	4,273
Gain on disposal of investments in subsidiaries	(7,006)		

Effect of change in effective tax rate		(25)	
	(1,753)	5,223	4,273

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(4) Income tax recognized as other comprehensive income (loss) for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016	2017	2018
	In millions of won		
Income tax recognized as other comprehensive income (loss)			
Gain on valuation of financial assets at fair value through other comprehensive income			35,798
Loss on valuation of available-for-sale financial assets	(8,143)	(2,551)	
Net change in the unrealized fair value of derivatives using cash flow hedge accounting, net of tax	(18,335)	(11,016)	6,639
Remeasurement of defined benefit obligations	49,986	(80,645)	53,703
Investments in associates	7,731	8,649	6,592
Others	573	24,242	(5,477)
	31,812	(61,321)	97,255

(5) Changes in deferred income tax assets (liabilities) recognized in the statements of financial position for the years ended December 31, 2017 and 2018 are as follows:

	2017				
	Beginning balance	Amounts recognized in profit or loss	Amount recognized in other comprehensive income (loss)	Amounts recognized directly in equity	Ending balance
	In millions of won				
Deferred income tax on temporary differences					
Employee benefits	493,331	86,008	(80,645)		498,694
Cash flow hedge	(53,583)	130,044	(11,016)		65,445
Investments in associates or subsidiaries	(7,166,345)	(1,510,295)	8,649	(25)	(8,668,016)
Property, plant and equipment	(5,527,318)	(1,333,122)			(6,860,440)
Finance lease	(345,431)	(81,518)			(426,949)
Intangible assets	8,987	(1,339)			7,648
Financial assets at fair value through profit or loss	(62)	952			890
Available-for-sale financial assets	(68,347)	62,055	(2,551)		(8,843)
Deferred revenue	213,859	16,852			230,711
Provisions	3,583,371	1,239,462			4,822,833

Doubtful receivables	2,696	(2,637)			59
Other finance liabilities	30,249	(2,742)		5,248	32,755
Gains or losses on foreign exchange translation	138,938	(140,292)			(1,354)
Allowance for doubtful accounts	17,252	25,679			42,931
Accrued income	(5,367)	3,542			(1,825)
Special deduction for property, plant and equipment	(194,309)	(6,618)			(200,927)
Reserve for research and human development	(12,883)	9,842			(3,041)
Others	695,870	232,642	24,242		952,754
	(8,189,092)	(1,271,485)	(61,321)	5,223	(9,516,675)

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	Beginning balance	Amounts recognized in profit or loss	Amount recognized in other comprehensive income (loss)	Amounts recognized directly in equity	Ending balance
			In millions of won		
Deferred income tax on unused tax losses and tax credit					
Tax losses					
Tax credit	35,703	(15,272)			20,431
	35,703	(15,272)			20,431
	(8,153,389)	(1,286,757)	(61,321)	5,223	(9,496,244)

	Beginning balance	Amounts recognized in profit or loss	2018 Amount recognized in other comprehensive income (loss)	Amounts recognized directly in equity	Ending balance
			In millions of won		
Deferred income tax on temporary differences					
Employee benefits	498,694	42,144	53,703		594,541
Cash flow hedge	65,445	(32,623)	6,639		39,461
Investments in associates or subsidiaries	(8,668,016)	(5,447)	6,592		(8,666,871)
Property, plant and equipment	(6,860,440)	337,662			(6,522,778)
Finance lease	(426,949)	(26,125)			(453,074)
Intangible assets	7,648	(1,593)			6,055
Financial assets at fair value through profit or loss	890	(871)			19
Financial assets at fair value through other comprehensive income	(8,843)	(1,379)	35,798		25,576
Deferred revenue	230,711	(10,969)			219,742
Provisions	4,822,833	(21,887)			4,800,946
Doubtful receivables	59				59
Other finance liabilities	32,755	2,465		4,273	39,493
	(1,354)	28,434			27,080

Gains or losses on foreign exchange translation					
Allowance for doubtful accounts	42,931	15,825			58,756
Accrued income	(1,825)	(1,089)			(2,914)
Special deduction for property, plant and equipment	(200,927)	(10,819)			(211,746)
Reserve for research and human development	(3,041)	3,041			
Others	952,754	105,869	(5,477)		1,053,146
	(9,516,675)	422,638	97,255	4,273	(8,992,509)
Deferred income tax on unused tax losses and tax credit					
Unused tax losses		554,457			554,457
Excess of donation limit		17,848			17,848
Tax credit	20,431	16,225			36,656
	20,431	588,530			608,961
	(9,496,244)	1,011,168	97,255	4,273	(8,383,548)

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(6) Deferred income tax assets (liabilities) recognized in the statements of financial position as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Deferred income tax assets	919,153	1,233,761
Deferred income tax liabilities	(10,415,397)	(9,617,309)
	(9,496,244)	(8,383,548)

(7) Details of deductible temporary differences, tax losses and unused tax credits for which no deferred income tax assets were recognized as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Deductible temporary differences	444,426	442,391

45. Assets Held-for-Sale

Assets held-for-sale as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Land(*1)	2,765	2,765
Building(*1)	19,369	19,369
Investments in associates(*2, 3, 4)	5,837	
Investments in subsidiaries(*5)		747
	27,971	22,881

(*1) The board of directors of KEPCO Engineering & Construction Company, Inc., a subsidiary of the Company, determined to dispose the office building in Yongin as part of the government s plan to relocate state-run companies for balanced national development and moved the head office to Kimchun, Kyungsangbukdo, in 2015. As the Company believes the book value of Yongin office will be recovered by a disposal transaction rather than continuous operation, it reclassified buildings, land and structures as assets held-for-sale.

(*2) Korea Western Power Co., Ltd., a subsidiary of the Company, planned to dispose certain portion of its investment in Dongducheon Dream Power Co., Ltd. and had classified the relevant book value as non-current assets held-for-sale. However, due to uncertainty of sale, it reclassified the relevant book value

to investments in associates during the year ended December 31, 2017.

(*3) Korea Hydro & Nuclear Power Co., Ltd., a subsidiary of the Company, initiated efforts to sell its shares in Yeongwol Energy Station Co., Ltd. during the year ended December 31, 2016, and sold its shares in Yeongwol Energy Station Co. during the year ended December 31, 2018.

(*4) KEPCO Engineering & Construction Company, Inc., a subsidiary of the Company, exercised a put option to sell the shares of DS POWER Co., Ltd. on December 11, 2017 and the shares were sold on February 28, 2018.

(*5) KOWEPO India Private Limited was in the process of liquidating its business as of December 31, 2018 and has been reclassified to assets held-for-sale, accordingly.

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46. Expenses Classified by Nature

Expenses classified by nature for the years ended December 31, 2016, 2017 and 2018 are as follows:

	2016		
	Selling and administrative expenses	Cost of sales	Total
	In millions of won		
Raw materials used		13,470,586	13,470,586
Salaries	734,930	3,425,712	4,160,642
Retirement benefit expense	72,812	374,826	447,638
Welfare and benefit expense	162,243	507,691	669,934
Insurance expense	11,513	79,987	91,500
Depreciation	169,431	8,704,525	8,873,956
Amortization of intangible assets	35,171	44,544	79,715
Bad debt expense	38,719		38,719
Commission	605,879	423,179	1,029,058
Advertising expense	34,658	9,693	44,351
Training expense	6,314	13,347	19,661
Vehicle maintenance expense	10,390	7,016	17,406
Publishing expense	3,643	4,615	8,258
Business promotion expense	3,477	4,836	8,313
Rent expense	40,020	133,670	173,690
Telecommunication expense	25,448	75,925	101,373
Transportation expense	596	5,153	5,749
Taxes and dues	46,531	464,962	511,493
Expendable supplies expense	6,834	34,668	41,502
Water, light and heating expense	9,720	25,820	35,540
Repairs and maintenance expense	75,122	1,896,656	1,971,778
Ordinary development expense	188,063	517,441	705,504
Travel expense	16,115	63,611	79,726
Clothing expense	8,273	5,363	13,636
Survey and analysis expense	666	3,209	3,875
Membership fee	1,132	8,714	9,846
Power purchase		10,755,739	10,755,739
Others	331,532	4,488,065	4,819,597
	2,639,232	45,549,553	48,188,785

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	2017		
	Selling and administrative expenses	Cost of sales	Total
	In millions of won		
Raw materials used		15,924,707	15,924,707
Salaries	735,383	3,479,591	4,214,974
Retirement benefit expense	71,094	397,852	468,946
Welfare and benefit expense	179,406	543,738	723,144
Insurance expense	15,414	90,677	106,091
Depreciation	190,245	9,461,974	9,652,219
Amortization of intangible assets	44,990	68,682	113,672
Bad debt expense	126,714		126,714
Commission	673,740	469,695	1,143,435
Advertising expense	114,519	10,917	125,436
Training expense	7,027	14,362	21,389
Vehicle maintenance expense	9,998	7,468	17,466
Publishing expense	3,672	4,248	7,920
Business promotion expense	3,700	4,973	8,673
Rent expense	38,380	148,509	186,889
Telecommunication expense	24,916	73,956	98,872
Transportation expense	495	9,145	9,640
Taxes and dues	48,395	437,643	486,038
Expendable supplies expense	7,731	31,994	39,725
Water, light and heating expense	10,545	30,150	40,695
Repairs and maintenance expense	63,477	2,047,943	2,111,420
Ordinary development expense	211,417	510,020	721,437
Travel expense	16,658	69,015	85,673
Clothing expense	8,410	4,985	13,395
Survey and analysis expense	698	3,661	4,359
Membership fee	1,122	8,482	9,604
Power purchase		14,264,331	14,264,331
Others	154,709	3,980,137	4,134,846
	2,762,855	52,098,855	54,861,710

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	2018		
	Selling and administrative expenses	Cost of sales	Total
	In millions of won		
Raw materials used		19,537,928	19,537,928
Salaries	757,819	3,478,804	4,236,623
Retirement benefit expense	65,107	375,505	440,612
Welfare and benefit expense	132,089	464,483	596,572
Insurance expense	12,181	93,876	106,057
Depreciation	214,499	9,683,887	9,898,386
Amortization of intangible assets	54,153	64,785	118,938
Bad debt expense	39,784		39,784
Commission	714,096	475,188	1,189,284
Advertising expense	30,894	9,419	40,313
Training expense	6,277	14,096	20,373
Vehicle maintenance expense	10,148	7,809	17,957
Publishing expense	3,307	3,530	6,837
Business promotion expense	2,785	3,860	6,645
Rent expense	42,851	171,132	213,983
Telecommunication expense	23,505	82,568	106,073
Transportation expense	686	4,537	5,223
Taxes and dues	46,424	440,317	486,741
Expendable supplies expense	6,166	31,844	38,010
Water, light and heating expense	12,629	34,640	47,269
Repairs and maintenance expense	62,580	2,156,668	2,219,248
Ordinary development expense	215,494	508,394	723,888
Travel expense	14,363	67,064	81,427
Clothing expense	10,108	4,368	14,476
Survey and analysis expense	705	3,929	4,634
Membership fee	1,043	11,563	12,606
Power purchase		18,307,289	18,307,289
Others	148,197	2,170,238	2,318,435
	2,627,890	58,207,721	60,835,611

47. Earnings (Loss) Per Share

(1) Basic earnings (loss) per share for the years ended December 31, 2016, 2017 and 2018 are as follows:

Type	2016	2017	2018
		In won	
Basic earnings (loss) per share	10,980	2,023	(2,048)

(2) Diluted earnings (loss) per share for the years ended December 31, 2016, 2017 and 2018 are as follows:

Type	2016	2017	2018
		In won	
Diluted earnings (loss) per share	10,980	2,023	(2,048)

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(3) Basic earnings (loss) per share

Net profit (loss) for the period and weighted average number of common shares used in the calculation of basic earnings (loss) per share for the years ended December 31, 2016, 2017 and 2018 are as follows:

Type	2016	2017	2018
	In millions of won except number of shares		
Net profit (loss) attributable to controlling interest	7,048,581	1,298,720	(1,314,567)
Profit (loss) used in the calculation of total basic earnings (loss) per share	7,048,581	1,298,720	(1,314,567)
Weighted average number of common shares	641,964,077	641,964,077	641,964,077

(4) Diluted earnings (loss) per share

Diluted earnings (loss) per share is calculated by applying adjusted weighted average number of common shares under the assumption that all dilutive potential common shares are converted to common shares.

Earnings (loss) used in the calculation of total diluted earnings per share for the years ended December 31, 2016, 2017 and 2018 are as follows:

Type	2016	2017	2018
		In millions of won	
Profit (loss) used in the calculation of total diluted earnings (loss) per share	7,048,581	1,298,720	(1,314,567)

Weighted average common shares used in calculating diluted earnings (loss) per share are adjusted from weighted average common shares used in calculating basic earnings (loss) per share. Detailed information of the adjustment for the years ended December 31, 2016, 2017 and 2018 are as follows:

Type	2016	2017	2018
		In number of shares	
Weighted average number of common shares	641,964,077	641,964,077	641,964,077
Diluted weighted average number of shares	641,964,077	641,964,077	641,964,077

(5) There are no potential dilutive instruments and diluted earnings (loss) per share are same as basic earnings (loss) per share for the years ended December 31, 2016, 2017 and 2018.

48. Risk Management

(1) Capital risk management

The Company manages its capital to ensure that entities in the Company will be able to continue while maximizing the return to shareholder through the optimization of the debt and equity balance. The capital structure of the Company consists of net debt (offset by cash and cash equivalents) and equity. The Company s overall capital risk management strategy remains consistent with the prior year.

Details of the Company s capital management accounts as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Total borrowings and debt securities	54,747,392	61,034,627
Cash and cash equivalents	2,369,739	1,358,345
Net borrowings and debt securities	52,377,653	59,676,282
Total shareholder s equity	72,964,641	71,092,762
Debt to equity ratio	71.78%	83.94%

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(2) Financial risk management

The Company is exposed to various risks related to its financial instruments, such as, market risk (currency risk, interest rate risk, price risk), credit risk. The Company monitors and manages the financial risks relating to the operations of the Company through internal risk reports which analyze exposures by degree and magnitude of risks. The Company uses derivative financial instruments to hedge certain risk exposures. The Company s overall financial risk management strategy remains consistent with the prior year.

(i) Credit risk

Credit risk is the risk of finance loss to the Company if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises primarily from the sales activities, securities and derivatives. In addition, credit risk exposure may exist within financial guarantees and unused line of credits. As these financial institutions the Company makes transactions with are reputable financial institutions, the credit risk from them are considered limited. The Company decides credit transaction limits based on evaluation of client s credit, through information obtained from the credit bureau and disclosed financial position at committing contracts.

Credit risk management

Electricity sales, the main operations of the Company are the necessity for daily life and industrial activities of Korean nationals, and have importance as one of the national key industries. The Company dominates the domestic market supplying electricity to customers. The Company is not exposed to significant credit risk as customers of the Company are diverse and are from various industries and areas. The Company uses publicly available information and its own internal data related to trade receivables, to rate its major customers and to measure the credit risk that a counter party will default on a contractual obligation. For the incurred but not recognized loss, it is measured considering overdue period.

Impairment and allowance account

In accordance with the Company policies, individual material financial assets are assessed on a regular basis, trade receivables that are assessed not to be impaired individually are, in addition, assessed for impairment on a collective basis. Value of the acquired collateral (including the confirmation of feasibility) and estimated collectable amounts are included in this assessment.

Allowance for bad debts assessed on a collective basis are recognized for (i) the group of assets which individually are not material and (ii) incurred but not recognized losses that are assessed using statistical methods, judgment and past experience.

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Book values of the financial assets represent the maximum exposed amounts of the credit risk. Details of the Company s level of maximum exposure to credit risk as of December 31, 2017 and 2018 are as follows:

	2017	2018
	In millions of won	
Cash and cash equivalents	2,369,739	1,358,345
Financial assets at fair value through profit or loss		920,935
Financial assets at fair value through profit or loss	111,512	
Derivative assets (trading)	22,020	37,631
Equity investment at fair value through other comprehensive income		399,495
Available-for-sale financial assets	699,833	
Financial assets at amortized cost		14,042
Held-to-maturity investments	3,144	
Loans	905,641	718,674
Long-term/short-term financial instruments	2,244,514	2,318,027
Derivative assets (applying hedge accounting)	10,606	64,704
Trade and other receivables	9,683,769	9,613,437
Financial guarantee contracts(*)	1,154,862	1,310,817

(*) Maximum exposure associated with the financial guarantee contracts is the maximum amounts of the obligation.

As of the reporting date, there are no financial assets and non-financial assets that were acquired through the exercise of the right of collateralized assets and reinforcement of credit arrangement.

(ii) Market risk

Market risk is the risk that the Company s fair values of the financial instruments or future cash flows are affected by the changes in the market. Market risk consists of interest rate risk, currency risk and other price risk.

(iii) Sensitivity analysis

Significant assets and liabilities with uncertainties in underlying assumptions

Defined benefit obligation

A sensitivity analysis of defined benefit obligation assuming a 1% increase and decrease movements in the actuarial valuation assumptions as of December 31, 2017 and 2018 are as follows:

	2017	2018

Type	Accounts	1% Increase	1% Decrease	1% Increase	1% Decrease
		In millions of won			
Future salary increases	Increase (decrease) in defined benefit obligation	354,852	(305,494)	416,956	(363,820)
Discount rate	Increase (decrease) in defined benefit obligation	(313,597)	377,148	(377,221)	445,833

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Changes of employee benefits assuming a 1% increase and decrease movements in discount rate on plan asset for the years ended December 31, 2017 and 2018 are 8,926 million and 14,646 million, respectively.

Provisions

Changes in provisions due to movements in underlying assumptions as of December 31, 2017 and 2018 are as follows:

Type	Accounts	2017	2018
PCBs	Inflation rate	1.23%	1.27%
	Discount rate	2.55%	2.18%
Nuclear plants	Inflation rate	1.21%	1.21%
	Discount rate	2.94%	2.94%
Spent fuel	Inflation rate	2.93%	2.93%
	Discount rate	4.49%	4.49%

A sensitivity analysis of provisions assuming a 0.1% increase and decrease movements in the underlying assumptions as of December 31, 2017 and 2018 are as follows:

		2017		2018	
Type	Accounts	0.1% Increase	0.1% Decrease	0.1% Increase	0.1% Decrease
		In millions of won			
Discount rate	PCBs	(811)	816	(623)	627
	Nuclear plants	(262,949)	270,370	(256,513)	263,595
	Spent fuel	(51,015)	52,997	(49,182)	51,098
Inflation rate	PCBs	826	(822)	632	(629)
	Nuclear plants	287,926	(280,249)	294,984	(287,110)
	Spent fuel	53,763	(51,823)	51,837	(49,961)

Management judgment effected by uncertainties in underlying assumptions

Foreign currency risk

The Company undertakes transactions denominated in foreign currencies; consequently, exposures to exchange rate fluctuations arise. The carrying amounts of the Company s foreign currency denominated monetary assets and monetary liabilities as of December 31, 2017 and 2018 are as follows:

	Assets		Liabilities	
Type	2017	2018	2017	2018
	In thousands of foreign currencies			
AED	5,693	10,513	2,049	5,890
AUD	145	143	652,259	717,712

BDT	60,208	71,575	1,001	1,175
BWP	797	1,214		
CAD	82	96	171	4
CHF			400,004	400,000
CNY	13,007		26,140	26,140
EUR	5,708	337	68,003	105,673
GBP	3		2,327	1
HKD				1,650,000
IDR	167,775	60,568		206,935
INR	1,228,259	1,228,795	227,078	183,963

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Type	Assets		Liabilities	
	2017	2018	2017	2018
	In thousands of foreign currencies			
JOD	1,624	2,764	5	5
JPY	799,501	35,935	21,624,128	390,921
KZT	359	319		
MGA	2,762,572	3,318,447	319,581	170,641
NOK			482	
PHP	189,261	709,285	125,431	66,985
PKR	251,190	305,542	4,676	3,588
SAR	1,191	2,024	44	
SEK			449,002	450,000
USD	1,653,858	1,422,510	8,321,335	8,103,602
UYU	12,955	39,898	10,586	4,253
ZAR	361	170	4	4
MMK		25,208		
GHS		25,794		

A sensitivity analysis on the Company s income for the period assuming a 10% increase and decrease in currency exchange rates as of December 31, 2017 and 2018 are as follows:

Type	2017		2018	
	10% Increase	10% Decrease	10% Increase	10% Decrease
	In millions of won			
Increase (decrease) of profit before income tax	(844,122)	844,122	(887,561)	887,561
Increase (decrease) of shareholder s equity(*)	(844,122)	844,122	(887,561)	887,561

(*) The effect on the shareholders equity excluding the impact of income taxes.

The sensitivity analysis above is conducted for monetary assets and liabilities denominated in foreign currencies other than functional currency, without consideration of hedge effect of related derivatives, as of December 31, 2017 and 2018.

To manage its foreign currency risk related to foreign currency denominated receivables and payables, the Company has a policy to enter into currency forward agreements. In addition, to manage its foreign currency risk related to foreign currency denominated expected sales transactions and purchase transactions, the Company enters into cross-currency swap agreements.

Interest rate risk

The Company is exposed to interest rate risk due to its borrowing with floating interest rates. A 1% increase or decrease is used when reporting interest rate risk internally to key management personnel and represents management s assessment of the reasonably possible change in interest rates.

The Company s borrowings and debt securities with floating interest rates as of December 31, 2017 and 2018 are as follows:

Type	2017	2018
	In millions of won	
Short-term borrowings	290,873	24,235
Long-term borrowings	1,743,252	2,358,860
Debt securities	685,700	
	2,719,825	2,383,095

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A sensitivity analysis on the Company s long-term borrowings and debt securities assuming a 1% increase and decrease in interest rates, without consideration of hedge effect of related derivatives for the years ended December 31, 2017 and 2018 are as follows:

Type	2017		2018	
	1% Increase	1% Decrease	1% Increase	1% Decrease
	In millions of won			
Increase (decrease) of profit before income tax	(27,198)	27,198	(23,831)	23,831
Increase (decrease) of shareholder s equity(*)	(27,198)	27,198	(23,831)	23,831

(*) The effect on the shareholders equity excluding the impact of income taxes.

To manage its interest rate risks, the Company enters into certain interest swap agreements or maintains an appropriate mix of fixed and floating rate borrowings.

Electricity rates risk

The Company is exposed to electricity rates risk due to the rate regulation of the government which considers the effect of electricity rate on the national economy.

A sensitivity analysis on the Company s income for the period assuming a 1% increase and decrease in price of electricity for the years ended December 31, 2017 and 2018 are as follows:

Type	2017		2018	
	1% Increase	1% Decrease	1% Increase	1% Decrease
	In millions of won			
Increase (decrease) of profit before income tax	546,499	(546,499)	568,420	(568,420)
Increase (decrease) of shareholder s equity(*)	546,499	(546,499)	568,420	(568,420)

(*) The effect on the shareholders equity excluding the impact of income taxes.

(iv) Liquidity risk

The Company has established an appropriate liquidity risk management framework for the management of the Company s short, medium and long-term funding and liquidity management requirements. The Company manages liquidity risk by continuously monitoring forecasted and actual cash flows, and by matching the maturity profiles of financial assets and liabilities.

In addition, the Company has established credit lines on its trade financing and bank overdrafts, and through payment guarantees it has received, it maintains an adequate credit (borrowing) line. In addition, the Company has the ability to utilize excess cash or long-term borrowings for major construction investments.

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The following table shows the details of maturities of non-derivative financial liabilities as of December 31, 2017 and 2018. This table, based on the undiscounted cash flows of the non-derivative financial liabilities including estimated interests, has been prepared based on the respective liabilities earliest maturity date.

	2017				
Type	Less than 1 year	1~2 Years	2~5 Years	More than 5 years	Total
	In millions of won				
Borrowings and debt securities	10,748,437	7,948,320	21,331,394	22,694,867	62,723,018
Finance lease liabilities	174,534	87,709	185,284	108,749	556,276
Trade and other payables	5,867,729	301,165	698,289	1,937,558	8,804,741
Financial guarantee contracts(*)	7,081	18,054	1,049,667	80,060	1,154,862
	16,797,781	8,355,248	23,264,634	24,821,234	73,238,897

	2018				
Type	Less than 1 year	1~2 Years	2~5 Years	More than 5 years	Total
	In millions of won				
Borrowings and debt securities	10,204,471	9,274,378	28,143,311	25,312,534	72,934,694
Finance lease liabilities	87,709	87,709	141,074	65,250	381,742
Trade and other payables	6,348,195	150,479	375,661	2,188,950	9,063,285
Financial guarantee contracts(*)	91,722	855,488	363,607		1,310,817
	16,732,097	10,368,054	29,023,653	27,566,734	83,690,538

(*) This represents the total guarantee amounts associated with the financial guarantee contracts. Financial guarantee liabilities which are recognized as of December 31, 2017 and 2018 are 23,475 million and 15,586 million, respectively.

The expected maturities for non-derivative financial assets as of December 31, 2017 and 2018 in detail are as follows:

	2017				
Type	Less than 1 year	1~5 Years	More than 5 years	Other(*)	Total
	In millions of won				

Cash and cash equivalents	2,369,739				2,369,739
Available-for-sale financial assets			214,156	485,677	699,833
Held-to-maturity investments	5	3,139			3,144
Loans	244,309	261,672	429,628	10,821	946,430
Long-term/short-term financial instruments	1,702,084	201,821	340,304	305	2,244,514
Financial assets at fair value through profit or loss			111,512		111,512
Trade and other receivables	7,930,715	920,539	788,795	52,031	9,692,080
	12,246,852	1,387,171	1,884,395	548,834	16,067,252

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	2018				
Type	Less than 1 year	1~5 Years	More than 5 years	Other(*)	Total
	In millions of won				
Cash and cash equivalents	1,358,345				1,358,345
Equity investment at fair value through other comprehensive income				399,495	399,495
Financial assets at amortized cost	11,956	2,086			14,042
Loans	123,646	314,744	319,988		758,378
Long-term/short-term financial instruments	1,869,286	278,899	164,057	5,785	2,318,027
Financial assets at fair value through profit or loss	313,893	81,828	483,398	41,816	920,935
Trade and other receivables	7,795,619	1,067,800	701,743	57,651	9,622,813
	11,472,745	1,745,357	1,669,186	504,747	15,392,035

(*) The maturities cannot be presently determined.

Derivative liabilities classified by maturity periods which from reporting date to maturity date of contract as of December 31, 2017 and 2018 are as follows:

	2017				
Type	Less than 1 year	1~2 Years	2~5 Years	More than 5 years	Total
	In millions of won				
Net settlement					
Trading	(774)				(774)
Gross settlement					
Trading	(51,496)	(19,887)	(16,597)	(4,967)	(92,947)
Hedging	(17,547)	(28,977)	(192,205)	(44,137)	(282,866)
	(69,817)	(48,864)	(208,802)	(49,104)	(376,587)

	2018				
Type	Less than 1 year	1~2 Years	2~5 Years	More than 5 years	Total
	In millions of won				
Net settlement					
Trading					

Gross settlement					
Trading	5,734	16,565	28,283	40,124	90,706
Hedging	5,154	(43,447)	71,840	(40,917)	(7,370)
	10,888	(26,882)	100,123	(793)	83,336

(3) Fair value risk

The fair value of the Company s actively-traded financial instruments (i.e. FVTPL, FVOCI, etc.) is based on the traded market-price as of the reporting period end. The fair value of the Company s financial assets is the amount which the asset could be exchanged for or the amount a liability could be settled for.

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The fair values of financial instruments where no active market exists or where quoted prices are not otherwise available are determined by using valuation techniques. Valuation techniques include using recent arm s length market transactions between knowledgeable, willing parties, if available, reference to the current fair value of another instrument that is substantially the same, discounted cash flow analysis and option pricing models. If there is a valuation technique commonly used by market participants to price the instrument and that technique has been demonstrated to provide reliable estimates of prices obtained in actual market transactions, the Company uses that technique.

For trade receivables and payables, the Company considers the carrying value net of impairment as fair value. While for disclosure purposes, the fair value of financial liabilities is estimated by discounting a financial instruments with similar contractual cash flows based on the effective interest method.

(i) Fair value and book value of financial assets and liabilities as of December 31, 2017 and 2018 are as follows:

	2017		2018	
Type	**Book value**	**Fair value**	**Book value**	**Fair value**
		In millions of won		
Assets recognized at fair value				
Financial assets at fair value through other comprehensive income			399,495	399,495
Available-for-sale financial assets(*1)	699,833	699,833		
Derivative assets (trading)	22,020	22,020	37,631	37,631
Derivative assets (applying hedge accounting)	10,606	10,606	64,704	64,704
Long-term financial instruments	542,430	542,430		
Short-term financial instruments	1,702,084	1,702,084		
Financial assets at fair value through profit or loss			920,935	920,935
Financial assets at fair value through profit or loss	111,512	111,512		
	3,088,485	3,088,485	1,422,765	1,422,765
Assets carried at amortized cost				
Financial assets at amortized cost			14,042	14,042
Held-to-maturity investments	3,144	3,144		
Loans and receivables	905,641	905,641	718,674	718,674
Long-term financial instruments			448,741	448,741
Short-term financial instruments			1,869,286	1,869,286
Trade and other receivables	9,683,769	9,683,769	9,613,437	9,613,437
Cash and cash equivalents	2,369,739	2,369,739	1,358,345	1,358,345
	12,962,293	12,962,293	14,022,525	14,022,525

Liabilities recognized at fair value

Derivative liabilities (trading)	150,929	150,929	99,010	99,010
Derivative liabilities (applying hedge accounting)	277,130	277,130	213,153	213,153
	428,059	428,059	312,163	312,163

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Type	2017		2018	
	Book value	Fair value	Book value	Fair value
	In millions of won			
Liabilities carried at amortized cost				
Secured borrowings	1,055,554	1,055,554	741,029	741,029
Unsecured bond	51,146,783	53,436,659	56,603,988	58,804,070
Finance lease liabilities	418,260	418,260	283,806	283,806
Unsecured borrowings	2,476,196	2,477,055	3,522,602	3,950,517
Trade and other payables(*2)	8,804,741	8,804,741	9,063,285	9,063,285
Bank overdraft	68,859	68,859	167,008	167,008
	63,970,393	66,261,128	70,381,718	73,009,715

(*1) Book value of equity securities held by the Company that were measured at cost as of December 31, 2017 is 37,926 million as a quoted market price does not exist in an active market and its fair value cannot be measured reliably.

(*2) Excludes finance lease liabilities.

(ii) Interest rates used for determining fair value

The interest rates used to discount estimated cash flows, when applicable, are based on the government yield curve at the reporting date plus an adequate credit spread.

The discount rate used for calculating fair value as of December 31, 2017 and 2018 are as follows:

Type	2017	2018
Derivatives	0.03% ~ 4.16%	0.02% ~ 4.16%
Borrowings and debt securities	0.08% ~ 4.38%	0.51% ~ 5.14%
Finance lease	9.00% ~ 10.83%	3.50% ~ 10.83%

(iii) 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 and 2018 are as follows:

Type	2017 Level 1	Level 2	Level 3	Total
		In millions of won		
Financial assets at fair value				
Available-for-sale financial assets	274,453	214,156	173,298	661,907
Derivative assets		18,466	14,160	32,626
Financial assets at fair value through profit or loss		111,512		111,512
	274,453	344,134	187,458	806,045
Financial liabilities at fair value				
Derivative liabilities		428,059		428,059

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	2018			
Type	**Level 1**	**Level 2**	**Level 3**	**Total**
		In millions of won		
Financial assets at fair value				
Financial assets at fair value through other comprehensive income	210,056		189,439	399,495
Derivative assets		100,490	1,845	102,335
Financial assets at fair value through profit or loss	106,600	809,283	5,052	920,935
	316,656	909,773	196,336	1,422,765,
Financial liabilities at fair value				
Derivative liabilities		310,008	2,155	312,163

The fair value of financial assets (FVTPL and FVOCI) publicly traded is measured at the closing bid price quoted at the end of the reporting period. Meanwhile, the fair value of unquoted financial assets (FVTPL and FVOCI) is calculated using the valuation results from an external pricing service in which weighted average borrowing rates of interest of evaluated companies are used as a discount rate. The fair value of derivatives is measured using valuation model which is determined at the present value of estimated future cash flows discounted at current market interest rate.

Changes of financial assets and liabilities which are classified as level 3 for the years ended December 31, 2017 and 2018 are as follows:

	2017						
	Beginning balance	**Acquisition**	**Reclassified category**	**Valuation**	**Disposal**	**Foreign currency translation**	**Ending balance**
	In millions of won						
Financial assets at fair value							
Available-for-sale financial assets							
Unlisted securities	269,461		(92,128)	(6,201)		2,166	173,298

	2018							
	Beginning balance	**Effect of change in accounting policy**	**Acquisition**	**Reclassified category**	**Valuation**	**Disposal**	**Foreign currency translation**	**Ending balance**
	In millions of won							
Financial assets at fair value								
Financial assets at fair value through profit or loss								
Cooperative	5,038				14			5,052
Financial assets at fair value through other comprehensive								

income					
Unlisted securities	197,450	(11,744)	(326)	4,059	189,439

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49. Service Concession Arrangements

(1) Gas Complex Thermal Power Plant at Ilijan, Philippines (BOT)

(i) Significant terms and concession period of the arrangement

The Company has entered into a contract with National Power Corporation (the NPC), based in the Republic of the Philippines whereby the Company can collect the electricity rates which are composed of fixed costs and variable costs during the concession period from 2002 to 2022 after building, rehabilitating, and operating the power plant.

(ii) Rights and classification of the arrangement

The Company has the rights to use and own the power plant during the concession period from 2002 to 2022. At the end of the concession period, the Company has an obligation to transfer its ownership of the power plant to NPC.

(iii) The Company s expected future collections of service concession arrangements as of December 31, 2018 are as follows:

Type	Amounts In millions of won
Less than 1 year	116,790
1~ 2 years	116,790
2~ 3 years	116,790
Over 3 years	48,663
	399,033

(2) Hydroelectric Power Generation at Semangka, Indonesia (BOT)

(i) Significant terms and concession period of the arrangement

The Company has entered into a contract with PT. Perusahaan Listrik Negara (the PLN) whereby the Company provides electricity generated and charge tariff rates designed to recover capital cost, fixed O&M cost, water usage cost, variable O&M cost and special facilities cost during the concession period after building, rehabilitating, and operating the power plant for approximately 30 years (2018~2048) subsequent to the completion of plant construction.

(ii) Rights and classification of the arrangement

The Company has the rights to use and own the power plant during the concession period from 2018 to 2048. At the end of the concession period, PNL has an option to take over the ownership of the power plant from the Company.

(iii) The Company s expected future collections of service concession arrangements as of December 31, 2018 are as follows:

Type	Amounts In millions of won
Less than 1 year	27,803
1~ 2 years	27,929
2~ 3 years	27,863
Over 3 years	595,706
	679,301

(iv) Accumulated contract costs and profits related to the Company s contract in process as of December 31, 2018 are 163,309 million and 9,673 million, respectively. There are no amount due from customers and advance receipts in progress.

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50. Related Parties

(1) Related parties of the Company as of December 31, 2018 are as follows:

Type	Related party
Parent	Republic of Korea government
Subsidiaries (106 subsidiaries)	Korea Hydro & Nuclear Power Co., Ltd., Korea South-East Power Co., Ltd., Korea Midland Power Co., Ltd., Korea Western Power Co., Ltd., Korea Southern Power Co., Ltd., Korea East-West Power Co., Ltd., KEPCO Engineering & Construction Company, Inc., KEPCO Plant Service & Engineering Co., Ltd., KEPCO Nuclear Fuel Co., Ltd., KEPCO KDN Co., Ltd., Garolim Tidal Power Plant Co., Ltd., Gyeonggi Green Energy Co., Ltd., Korea Offshore Wind Power Co., Ltd., KOSEP Material Co., Ltd., KEPCO International HongKong Ltd., KEPCO International Philippines Inc., KEPCO Philippines Corporation, KEPCO Ilijan Corporation, KEPCO Gansu International Ltd., KEPCO Philippines Holdings Inc., KEPCO Lebanon SARL, KEPCO Neimenggu International Ltd., KEPCO Australia Pty., Ltd., KEPCO Shanxi International Ltd., KOMIPO Global Pte Ltd., KOSEP Australia Pty., Ltd., KOMIPO Australia Pty., Ltd., KOWEPO Australia Pty., Ltd.,KOSPO Australia Pty., Ltd., KEPCO Netherlands B.V., KOREA Imouraren Uranium Investment Corp., KEPCO Middle East Holding Company, Qatrana Electric Power Company, Korea Electric Power Nigeria Ltd., KOWEPO International Corporation, KOSPO Jordan LLC, Korea Waterbury Uranium Limited Partnership, PT. Cirebon Power Service, EWP America Inc., KHNP Canada Energy, Ltd., KEPCO Bylong Australia Pty., Ltd., KNF Canada Energy Limited, KEPCO Holdings de Mexico, KST Electric Power Company, KEPCO Energy Service Company, KEPCO Netherlands S3 B.V., PT. KOMIPO Pembangkitan Jawa Bali, EWP (Barbados) 1 SRL, PT. Tanggamus Electric Power, KOMIPO America Inc, KOSEP USA, INC., PT. EWP Indonesia, KEPCO Netherlands J3 B.V., Global One Pioneer B.V., Global Energy Pioneer B.V., Mira Power Limited, EWP Philippines Corporation, KEPCO Singapore Holdings Pte., Ltd., KEPCO KPS Philippines Corp., KOSPO Chile SpA, PT. KOWEPO Sumsel Operation And Maintenance Services, Commerce and Industry Energy Co., Ltd., Gyeongju Wind Power Co., Ltd., California Power Holdings, LLC, DG Fairhaven Power, LLC, DG Whitefield, LLC, EWP Renewable Corporation, EWPRC Biomass Holdings, LLC, Springfield Power, LLC, HeeMang Sunlight Power Co., Ltd., Fujeij Wind Power Company, KOSPO Youngnam Power Co., Ltd., HI Carbon Professional Private Special Asset Investment Trust 1, Chitose Solar Power Plant LLC., Solar School Plant Co., Ltd., KEPCO Energy Solution Co. Ltd., KOSPO Power Services Limitada, KOEN Bylong Pty., Ltd., KOWEPO Bylong Pty., Ltd., KOSPO Bylong Pty., Ltd., EWP Bylong Pty., Ltd., KOWEPO Lao International, KOMIPO Bylong Pty Ltd., Energy New Industry Specialized Investment Private Investment Trust., KEPCO US Inc., KEPCO Alamosa LLC, KEPCO Solar

of Alamosa, LLC (formerly, Cogentrix of Alamosa, LLC), KEPCO-LG CNS Mangilao Holdings LLC, Mangilao Investment LLC, KEPCO-LG CNS Mangilao Solar, LLC Jeju Hanlim Offshore Wind Co., Ltd., PT, Siborpa Eco Power, e-New Industry LB Fund 1, Songhyun e-New Industry Fund, BSK

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	E-New Industry Fund VII, PT. Korea Energy Indonesia, KOLAT SpA, KEPCO California, LLC, KEPCO Mojave Holdings, LLC, Incheon Fuel Cell Co., Ltd., KOEN Service Co., Ltd., KOMIPO Service Co., Ltd., KOWEPO Service Co., Ltd., KOSPO Service Co., Ltd., EWP Service Co., Ltd., PT. KOMIPO Energy Indonesia
Associates (58 associates)	Dongducheon Dream Power Co., Ltd., Korea Gas Corporation, SE Green Energy Co., Ltd., Daegu Photovoltaic Co., Ltd., Jeongam Wind Power Co., Ltd., Korea Power Engineering Service Co., Ltd., Heang Bok Do Si Photovoltaic Power Co., Ltd., Korea Electric Power Industrial Development Co., Ltd., Goseong Green Energy Co., Ltd., Gangneung Eco Power Co., Ltd., Shin Pyeongtaek Power Co., Ltd., Naepo Green Energy Co., Ltd., Noeul Green Energy Co., Ltd., YTN Co., Ltd., Cheongna Energy Co., Ltd., Samcheok Eco Materials Co., Ltd., Gangwon Wind Power Co., Ltd., Gwangyang Green Energy Co., Ltd., Hyundai Green Power Co., Ltd., Korea Power Exchange, AMEC Partners Korea Ltd., Hyundai Energy Co., Ltd., Ecollite Co., Ltd., Taebaek Wind Power Co., Ltd., Taeback Guinemi Wind Power Co., Ltd., Pyeongchang Wind Power Co., Ltd., Daeryun Power Co., Ltd., Changjuk Wind Power Co., Ltd., KNH Solar Co., Ltd., S-Power Co., Ltd., Hadong Mineral Fiber Co., Ltd., Green Biomass Co., Ltd., SPC Power Corporation, Gemeng International Energy Co., Ltd., PT. Cirebon Electric Power, KNOC Nigerian East Oil Co., Ltd., KNOC Nigerian West Oil Co., Ltd., PT Wampu Electric Power, PT. Bayan Resources TBK, Nepal Water & Energy Development Company Private Limited, Pioneer Gas Power Limited, Eurasia Energy Holdings, Xe-Pian Xe-Namnoy Power Co., Ltd., PT. Mutiara Jawa, Jinbhuvish Power Generation Pvt. Ltd., Busan Green Energy Co., Ltd., Gunsan Bio Energy Co., Ltd., Korea Electric Vehicle Charging Service, Ulleungdo Natural Energy Co., Ltd., Korea Nuclear Partners Co., Ltd., Tamra Offshore Wind Power Co., Ltd., Korea Electric Power Corporation Fund, Energy Infra Asset Management Co., Ltd., Daegu clean Energy Co., Ltd., YaksuESS Co., Ltd, PND solar., Ltd, Hyundai Eco Energy Co., Ltd., YeongGwang Yaksu Wind Electric. Co., Ltd
Joint ventures (55 joint ventures)	Daegu Green Power Co., Ltd., KEPCO SPC Power Corporation, Daejung Offshore Wind Power Co., Ltd., KAPES, Inc., Dangjin Eco Power Co., Ltd., Honam Wind Power Co., Ltd., Seokmun Energy Co., Ltd., Incheon New Power Co., Ltd., Chun-cheon Energy Co., Ltd., Yeonggwangbaeksu Wind Power Co., Ltd., KW Nuclear Components Co., Ltd., KEPCO-Uhde Inc., GS Donghae Electric Power Co., Ltd., Busan Shinho Solar Power Co., Ltd., Global Trade Of Power System Co., Ltd., Expressway Solar-light Power Generation Co., Ltd., Gansu Datang Yumen Wind Power Co., Ltd., Datang Chifeng Renewable Power Co., Ltd., Rabigh Electricity Company, Eco Biomass Energy Sdn. Bhd., Rabigh Operation & Maintenance Company Limited, Datang KEPCO Chaoyang Renewable Power Co., Ltd., Shuweihat Asia Power Investment B.V., Shuweihat Asia Operation & Maintenance Company, Waterbury Lake Uranium L.P., ASM-BG Investicii AD, RES Technology AD, Jamaica Public Service Company Limited, KV Holdings, Inc., Amman Asia Electric Power Company, Kelar S.A, PT. Tanjung Power Indonesia, Nghi Son 2 Power LLC, Daehan Wind Power PSC,

MOMENTUM, Barakah One Company, Nawah Energy Company,

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	Yeonggwang Wind Power Co., Ltd., Chester Solar IV SpA, Chester Solar V SpA, Diego de Almagro Solar SpA, South Jamaica Power Company Limited, Daesan Green Energy Co.,Ltd., RE Holiday Holdings LLC, RE Pioneer Holdings LLC, RE Barren Ridge 1 Holdings LLC, RE Astoria 2 LandCo LLC, RE Barren Ridge LandCo LLC, Laurel SpA, KIAMCO KOWEPO Bannerton Hold Co Pty Ltd, Chile Solar JV SpA, Taebaek Gadeoksan Wind Power Co., Ltd., Cheong-Song Noraesan Wind Power Co., Ltd., Chester Solar I SpA, Solar Philippines Calatagan Corporation
Others	
(2 others)	Korea Development Bank, KOWEPO India Private Limited

(2) Transactions between the Company and its subsidiaries are eliminated during the consolidation and are not disclosed in notes.

(3) Related party transactions for the years ended December 31, 2016, 2017 and 2018 are as follows:
<Sales and Others>

Company name	Transaction type	Sales and others		
		2016	2017	2018
		In millions of won		
<Associates>				
Dongducheon Dream Power Co., Ltd.	Electricity sales	15,221	17,041	6,093
Korea Gas Corporation	Electricity sales	89,030	88,011	99,933
Daegu Photovoltaic Co., Ltd.	Electricity sales		349	128
Jeongam Wind Power Co., Ltd.	Electricity sales	6	30	724
Korea Power Engineering Service Co., Ltd.	Service	1,455	1,317	840
KS Solar Co., Ltd.	Electricity sales	20	5	
Heang Bok Do Si Photovoltaic Power Co., Ltd.	Electricity sales	2	2	2
Korea Electric Power Industrial Development Co., Ltd.	Service	10,723	14,044	10,422
Goseong Green Energy Co., Ltd.	Electricity sales	9,195	24,069	10,024
Gangneung Eco Power Co., Ltd.	Service	5,223	2,391	4,928
Shin Pyeongtaek Power Co., Ltd.	Electricity sales	3,579	9,025	8,468
Naepo Green Energy Co., Ltd.	Electricity sales	104	185	160
Noeul Green Energy Co., Ltd.	Electricity sales	177	32	30
Samcheok Eco Materials Co., Ltd.	Electricity sales	64	237	605
YTN Co., Ltd.	Electricity sales	1,785	1,987	2,043
Busan Green Energy Co., Ltd.	Electricity sales	133	120	19
Gunsan Bio Energy Co., Ltd.	Electricity sales	6		3,611
Korea Electric Vehicle Charging Service	Electricity sales	89	700	578
Ulleungdo Natural Energy Co., Ltd.	Service	691	1,013	292

Tamra Offshore Wind Power Co., Ltd.	Electricity sales	12	55	58
Daegu clean Energy Co., Ltd.	Electricity sales		421	126
Cheongna Energy Co., Ltd.	Service	6,831	7,980	11,688
Gangwon Wind Power Co., Ltd.	Electricity sales	1,273	994	2,402
Gwangyang Green Energy Co., Ltd.	Electricity sales			874
Hyundai Green Power Co., Ltd.	Design service	14,835	14,280	14,031
Korea Power Exchange	Service	7,141	8,446	6,854
Hyundai Energy Co., Ltd.	Service	24,719	15,627	1,718
Taebaek Wind Power Co., Ltd.	Service	796	813	614
Pyeongchang Wind Power Co., Ltd.	Design service	497	1,176	1,166
Daeryun Power Co., Ltd.	Electricity sales	1,516	1,796	1,731
Changjuk Wind Power Co., Ltd.	Electricity sales	863	788	758
KNH Solar Co., Ltd.	Electricity sales	17	17	17
S-Power Co., Ltd.	Service	5,994	12,852	9,118

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Company name	Transaction type	Sales and others		
		2016	2017	2018
		In millions of won		
PND solar., Ltd	Electricity sales			12
Busan Solar Co., Ltd.	Electricity sales	8		
Green Biomass Co., Ltd.	Electricity sales	2		
SPC Power Corporation	Dividend income	8,346	5,562	9,549
Gemeng International Energy Co., Ltd.	Dividend income	16,476	13,365	11,246
PT. Cirebon Electric Power	Dividend income		550	4,432
Dolphin Property Limited	Dividend income	35		
PT. Bayan Resources TBK	Service	160	717	33,817
Nepal Water & Energy Development Company Private Limited	Service	375	900	536
Pioneer Gas Power Limited	Rental income and others	164	62	26
Xe-Pian Xe-Namnoy Power Co., Ltd.	Service	773	661	672
PT. Mutiara Jawa	Rental income and others		47	40
<Joint ventures>				
Daegu Green Power Co., Ltd.	Electricity sales	768	1,131	1,022
KEPCO SPC Power Corporation	Service	10,344	45,005	43,141
Daejung Offshore Wind Power Co., Ltd.	Electricity sales	1	1	1
KAPES, Inc.	Commission	1,176	1,420	648
Dangjin Eco Power Co., Ltd.	Technical fee	1,787	670	3,424
Honam Wind Power Co., Ltd.	Electricity sales	169	552	415
Seokmun Energy Co., Ltd.	Service	1,627	1,765	1,897
Incheon New Power Co., Ltd.	Construction revenue	524	539	568
Chun-cheon Energy Co., Ltd.	Electricity sales	3,079	4,855	2,471
Yeonggwangbaeksu Wind Power Co., Ltd.	Electricity sales	1,591	1,654	1,540
Yeonggwang Wind Power Co., Ltd.	Electricity sales			46
KW Nuclear Components Co., Ltd.	Service	3,327	644	839
KEPCO-Uhde Inc.	Service	6	34	17
GS Donghae Electric Power Co., Ltd.	Electricity sales	12,994	11,204	7,238
Busan Shinho Solar Power Co., Ltd.	Electricity sales	210	87	362
Datang Chifeng Renewable Power Co., Ltd.	Interest income	8,216	500	19,013
Rabigh Electricity Company	Service	699	19,179	29,167
Rabigh Operation & Maintenance Company Limited	Service	2,395	2,784	1,707
Datang Chaoyang Renewable Power Co., Ltd.	Dividend income		839	
Shuweihat Asia Power Investment B.V.	Dividend income	2,957	1,707	499
Shuweihat Asia Operation & Maintenance Company	Service	1,179	1,319	1,046
ASM-BG Investicii AD	Service	322	1,062	1,153
Jamaica Public Service Company Limited	Service	1,905		5,160
KV Holdings, Inc.	Dividend income	302		735
Datang KEPCO Chaoyang Renewable Co., Ltd.	Dividend income	440		

Amman Asia Electric Power Company	Service	21,915	14,205	16,569
Kelar S.A	Service	1,702	570	
Nghi Son 2 Power LLC	Service		2,693	25,880
Barakah One Company	Service	25,244	7,059	7,777
Nawah Energy Company	Service		34,421	51,144
South Jamaica Power Company Limited	Service			152
RE Holiday Holdings LLC	Dividend income			112
RE Pioneer Holdings LLC	Dividend income			979
RE Barren Ridge 1 Holdings LLC	Dividend income			1,114
RE Astoria 2 LandCo LLC	Dividend income			504
RE Barren Ridge LandCo LLC	Dividend income			202
<Others>				
Yeongwol Energy Station Co., Ltd.	Service	858	830	373
DS POWER Co., Ltd.	Service	35,133	5,819	565
Korea Development Bank	Electricity sales	3,102	3,239	3,524
	Interest income	3,164	1,685	4,438

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<Purchase and Others>

Company name	Transaction type	Purchase and others		
		2016	2017	2018
		In millions of won		
<Associates>				
Dongducheon Dream Power Co., Ltd.	Electricity purchase	946,463	813,440	828,547
Korea Gas Corporation	Purchase of power generation fuel	3,633,198	3,245,519	5,191,243
Daegu Photovoltaic Co., Ltd.	REC purchase	3,243	3,646	3,745
Korea Power Engineering Service Co., Ltd.	Service	723	1,292	1,765
KS Solar Co., Ltd.	REC purchase	4,080	900	
Heang Bok Do Si Photovoltaic Power Co., Ltd.	Rental fee and others	410	570	455
Korea Electric Power Industrial Development Co., Ltd.	Electricity metering service fee	250,057	289,293	261,668
Gangneung Eco Power Co., Ltd.	Service			19
Noeul Green Energy Co., Ltd.	Service		15,862	18,282
Samcheok Eco Materials Co., Ltd.	Electricity purchase		14	3,819
YTN Co., Ltd.	Advertisement fee	554	731	322
Busan Green Energy Co., Ltd.	Service		12,189	25,123
Korea Electric Vehicle Charging Service	Service		1,093	605
Ulleungdo Natural Energy Co., Ltd.	Electricity purchase	60	119	63
Tamra Offshore Wind Power Co., Ltd.	Electricity purchase		2,105	8,371
Cheongna Energy Co., Ltd.	Service	73	59	58
Gangwon Wind Power Co., Ltd.	Electricity purchase	22,780	25,968	25,407
Hyundai Green Power Co., Ltd.	Electricity purchase	469,547	458,378	480,815
Korea Power Exchange	Trading Fees	91,433	207,855	137,489
Hyundai Energy Co., Ltd.	Electricity purchase	1,313	87,607	3,445
Taebaek Wind Power Co., Ltd.	REC purchase	5,741	6,534	8,582
Pyeongchang Wind Power Co., Ltd.	Service	1,594	4,033	6,994
Daeryun Power Co., Ltd.	Electricity purchase	244,023	146,189	184,063
Changjuk Wind Power Co., Ltd.	Electricity purchase	5,786	6,981	7,929
KNH Solar Co., Ltd.	Electricity purchase	4,006	3,947	3,586
S-Power Co., Ltd.	Electricity purchase	437,206	457,329	507,875
Busan Solar Co., Ltd.	Electricity purchase	1,079		
Hadong Mineral Fiber Co., Ltd.	Service			60
Green Biomass Co., Ltd.	Woodchip purchase	2,232	1,345	440
	Electricity purchase			2,437

YeongGwang Yaksu Wind Electric. Co., Ltd				
Nepal Water & Energy Development Company Private Limited	Service		72	31
<Joint ventures>				
Daegu Green Power Co., Ltd.	Electricity purchase	263,797	252,024	287,008
KAPES, Inc.	Service	140,555	164,165	77,758
Honam Wind Power Co., Ltd.	Electricity purchase	6,776	5,962	7,700
Seokmun Energy Co., Ltd.	REC purchase		21,674	31,759
Chun-cheon Energy Co., Ltd.	REC purchase		194,136	320,954
Yeonggwangbaeksu Wind Power Co., Ltd.	Electricity purchase	11,208	11,124	11,366
GS Donghae Electric Power Co., Ltd.	Electricity purchase	903	351,367	780,233
Busan Shinho Solar Power Co., Ltd.	REC purchase	6,770	7,984	7,901
Global Trade Of Power System Co., Ltd.	Service	882	414	565
Expressway Solar-light Power Generation Co., Ltd.	Electricity purchase	2,942	2,941	3,513
ASM-BG Investicii AD	Service			1
Jamaica Public Service Company Limited	Service	127	154	83
Barakah One Company	Service		2,631	1,145
South Jamaica Power Company Limited	Service			67
<Others>				
Yeongwol Energy Station Co., Ltd.	REC purchase	14,875	14,256	4,019
Korea Development Bank	Interest expense	8,231	4,573	5,043
	Dividend paid	654,829	418,407	166,876

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(4) Receivables and payables arising from related party transactions as of December 31, 2017 and 2018 are as follows:

Company name	Type	Receivables		Payables	
		2017	2018	2017	2018
		In millions of won			
<Associates>					
Dongducheon Dream Power Co., Ltd.	Trade receivables	2,230	332		
	Non-trade receivables and others	655	298		
	Trade payables			77,817	74,651
	Non-trade payables and others				10
Korea Gas Corporation	Trade receivables	9,833	9,439		
	Non-trade receivables and others	339	498		
	Trade payables			524,881	601,092
	Non-trade payables and others			569	314
Daegu Photovoltaic Co., Ltd.	Trade payables			71	83
Jeongam Wind Power Co., Ltd.	Trade receivables		151		
	Non-trade payables and others			4	2
Korea Electric Power Industrial Development Co., Ltd.	Trade receivables	333	278		
	Non-trade receivables and others	42	51		
	Non-trade payables and others			18,006	13,102
Goseong Green Energy Co., Ltd.	Non-trade receivables and others	19			
	Non-trade payables and others			7,140	43,020
Gangneung Eco Power Co., Ltd.	Trade receivables	1	1		
	Non-trade receivables and others	4,747	99		
Shin Pyeongtaek Power Co., Ltd.	Trade receivables		123		
	Non-trade receivables and others	210	242		
	Non-trade payables and others			52	82
Naepo Green Energy Co., Ltd.	Trade receivables	17	17		
Noeul Green Energy Co., Ltd.	Trade receivables	3	3		
	Non-trade payables and others			2,041	8,774
Samcheok Eco Materials Co., Ltd.	Trade receivables	20	61		
YTN Co., Ltd.	Trade receivables	98	98		
	Non-trade payables and others			209	11
Busan Green Energy Co., Ltd.	Trade receivables	7	1		
	Non-trade receivables and others	1,691			
	Non-trade payables and others				10,882
Gunsan Bio Energy Co., Ltd.	Non-trade receivables and others		3,458		
Korea Electric Vehicle Charging Service	Trade receivables	23	69		
	Non-trade receivables and others		354		
	Trade payables			45	
	Non-trade payables and others				56
Daegu Clean Energy Co., Ltd.	Non-trade receivables and others		17		
Cheongna Energy Co., Ltd.	Trade receivables	182	183		
	Non-trade payables and others			1	

Gangwon Wind Power Co., Ltd.	Trade receivables	6	10		
	Trade payables			3,033	2,547
Hyundai Green Power Co., Ltd.	Trade receivables	946	390		
	Trade payables			32,589	38,072
Korea Power Exchange	Trade receivables	463	847		
	Non-trade receivables and others	128	229		
	Non-trade payables and others			1,142	1,214

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Company name	Type	Receivables 2017	Receivables 2018	Payables 2017	Payables 2018
		In millions of won			
Hyundai Energy Co., Ltd.	Trade receivables	49	57		
	Non-trade receivables and others	6,598	9,664		
	Trade payables			223	259
	Non-trade payables and others			13,796	8,021
<Associates>					
Ecollite Co., Ltd.	Non-trade receivables and others	210	210		
Taebaek Wind Power Co., Ltd.	Trade receivables	116			
	Trade payables			533	453
	Non-trade payables and others			121	291
Pyeongchang Wind Power Co., Ltd.	Trade receivables	3	4		
	Non-trade payables and others			163	25
Daeryun Power Co., Ltd.	Trade receivables	162	178		
	Trade payables			15,706	15,845
Changjuk Wind Power Co., Ltd.	Trade receivables	101			
	Trade payables			515	455
	Non-trade payables and others			546	273
KNH Solar Co., Ltd.	Trade receivables	1	1		
	Non-trade payables and others			193	
S-Power Co., Ltd.	Trade receivables	117	922		
	Non-trade receivables and others	5,183	34		
	Trade payables			25,061	56,897
	Non-trade payables and others				16
Green Biomass Co., Ltd.	Non-trade payables and others			85	
PND solar., Ltd	Trade receivables		3		
YeongGwang Yaksu Wind Electric. Co., Ltd	Trade payables				2,679
SPC Power Corporation	Non-trade receivables and others	76	73		
Nepal Water & Energy Development Company Private Limited	Non-trade receivables and others	227	311		
Xe-Pian Xe-Namnoy Power Co., Ltd.	Non-trade receivables and others	53	61		
PT. Mutiara Jawa	Non-trade receivables and others		10		
<Joint ventures>					
Daegu Green Power Co., Ltd.	Trade receivables	98	110		
	Non-trade receivables and others	10	12		
	Trade payables			25,257	32,609
KAPES, Inc.	Non-trade receivables and others		253		
	Trade payables			55	
	Non-trade payables and others				338
Dangjin Eco Power Co., Ltd.	Non-trade receivables and others	1,211	18		
	Non-trade payables and others			41	
Honam Wind Power Co., Ltd.	Trade payables			381	432
	Non-trade payables and others			3,013	3,573
Seokmun Energy Co., Ltd.	Trade receivables	93	39		
	Non-trade receivables and others	276	303		

Non-trade payables and others	3,052	5,043

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Company name	Type	Receivables 2017	Receivables 2018	Payables 2017	Payables 2018
		In millions of won			
Incheon New Power Co., Ltd.	Trade receivables	128	128		
Chun-cheon Energy Co., Ltd.	Trade receivables	129	20		
	Non-trade receivables and others	252	308		
	Trade payables			29,676	33,796
<Joint ventures>					
Yeonggwangbaeksu Wind Power Co., Ltd.	Trade receivables	7	7		
	Non-trade receivables and others	144			
	Trade payables			619	736
	Non-trade payables and others			1,300	789
Yeonggwang Wind Power Co., Ltd.	Trade receivables		10		
KW Nuclear Components Co., Ltd.	Trade receivables	4	4		
	Non-trade receivables and others		31		
KEPCO-Uhde Inc.	Non-trade payables and others			4	4
GS Donghae Electric Power Co., Ltd.	Trade receivables	450	245		
	Non-trade receivables and others	1,892	2,537		
	Trade payables			73,570	69,820
	Non-trade payables and others				59
Busan Shinho Solar Power Co., Ltd.	Trade receivables	2	2		
	Trade payables			159	175
	Non-trade payables and others			811	717
Datang Chifeng Renewable Power Co., Ltd.	Non-trade receivables and others	82			
Rabigh Operation & Maintenance Company Limited	Non-trade receivables and others	869	449		
ASM-BG Investicii AD	Non-trade receivables and others	37	38		
Jamaica Public Service Company Limited	Trade receivables		594		
	Non-trade payables and others				24
Amman Asia Electric Power Company	Trade receivables	2,675			
	Non-trade payables and others				18,351
Nawah Energy Company	Trade receivables	10,419	29,614		
	Non-trade receivables and others		253		
<Others>					
Yeongwol Energy Station Co., Ltd.	Trade receivables	7,068			
DS POWER Co., Ltd.	Trade receivables	340			
Korea Development Bank	Accrued interest income	204	1,147		
	Non-trade receivables and others	501,029	12,125		
	Non-trade payables and others			200	218

Derivatives	569	27,306	22,398	18,095

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(5) Loans and others arising from related party transactions as of December 31, 2017 and 2018 are as follows:

Type	Company name	Beginning balance	Loans	Collection	Others	Ending balance
		In millions of won				
Associates	KNOC Nigerian East Oil Co., Ltd.,					
	KNOC Nigerian West Oil Co., Ltd.	26,341	229		1,064	27,634
	(Allowance for doubtful accounts)	(16,551)		4,072	6,414	(6,065)
Associates	PT. Cirebon Electric Power	15,436	1,283	(8,522)	499	8,696
Associates	Xe-Pian Xe-Namnoy Power Co., Ltd.	1,413				1,413
Associates	PT Wampu Electric Power	13,288	970		622	14,880
Associates	Gunsan Bio Energy Co., Ltd.	9,396				9,396
Associates	Hyundai Energy Co., Ltd.	2,465				2,465
	(Allowance for doubtful accounts)	(2,465)				(2,465)
Joint ventures	KEPCO SPC Power Corporation	17,249		(17,715)	466	
Joint ventures	Datang Chifeng Renewable Power Co., Ltd.	7,245		(7,440)	195	
Joint ventures	Nghi Son 2 Power LLC		4,566	(4,566)		
Joint ventures	KODE NOVUS II LLC (*)	4,018			(4,018)	
	(Allowance for doubtful accounts) (*)	(4,018)			4,018	
Joint ventures	Kelar S.A	46,620			2,074	48,694
Joint ventures	Daehan Wind Power PSC	1,211		(606)	(605)	
Joint ventures	Chester Solar IV SpA	4,607		(4,607)		
Joint ventures	Chun-cheon Energy Co., Ltd.		616			616
		126,255	7,664	(39,384)	10,729	105,264

(*) The loans of KODE NOVUS II LLC is eliminated because the Company sold all of its shares of KODE NOVUS II LLC during the year ended December 31, 2018 as described in note 20.

(6) Borrowings arising from related party transactions as of December 31, 2017 and 2018 are as follows:

Related parties	Type	Beginning balance	Borrowings	Repayment	Others	Ending balance
		In millions of won				
Korea Development Bank	Facility	93,883	1,200	(28,290)		66,793

	Others	4,909		(755)	4,154
	Operating funds	61,000	32,000	(12,000)	81,000
	Syndicated Loan	16,301		(125) 1,100	17,276

(7) Guarantees provided to associates or joint ventures as of December 31, 2018 are as follows:

Primary guarantor	Principal obligor	Type of guarantees	Credit limit In millions of won and thousands of foreign currencies	Guarantee
Korea Electric Power Corporation	Shuweihat Asia Operation & Maintenance Company	Performance guarantees	USD 11,000	SAPCO
Korea Electric Power Corporation	Rabigh Operation & Maintenance Company Limited	Performance guarantees and others	USD 1,387	RABEC

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Primary guarantor	Principal obligor	Type of guarantees	Credit limit In millions of won and thousands of foreign currencies	Guarantee
Korea Electric Power Corporation	Barakah One Company	Debt guarantees	USD 900,000	Export-Import Bank of Korea and others
		Performance guarantees and others	USD 3,404,275	Export-Import Bank of Korea and others
Korea Electric Power Corporation	RE Holiday Holdings LLC	Performance guarantees	USD 223,000	EPS Renewables Holdings, LLC, Santander Bank and others
Korea Electric Power Corporation	RE Pioneer Holdings LLC	Performance guarantees	USD 170,000	EPS Renewables Holdings, LLC, Santander Bank and others
Korea Electric Power Corporation	RE Barren Ridge 1 Holdings LLC	Performance guarantees	USD 149,000	Firstar Development, LLC, Santander Bank and others
Korea Electric Power Corporation	Nghi Son 2 Power LLC	Performance guarantees	USD 28,000	SMBC Ho Chi Minh
Korea Western Power Co., Ltd.	Cheongna Energy Co., Ltd.	Collateralized money invested	KRW 3,465	KEB Hana Bank and others
		Guarantees for supplemental funding and others(*1)		KEB Hana Bank and others
Korea Western Power Co., Ltd.	Xe-Pian Xe-Namnoy Power Co., Ltd.	Payment guarantees for business reserve	USD 2,500	Krung Thai Bank
		Collateralized money invested	KRW 77,165	Krung Thai Bank
		Impounding bonus guarantees	USD 5,000	SK E&C
Korea Western Power Co., Ltd.	Rabigh Operation & Maintenance Company Limited	Performance guarantees and others	SAR 5,600	Saudi Arabia British Bank

Korea Western Power Co., Ltd.	Daegu Photovoltaic Co., Ltd.	Collateralized money invested	KRW 2,002	Korea Development Bank
Korea Western Power Co., Ltd.	Dongducheon Dream Power Co., Ltd.	Collateralized money invested(*7)	KRW 41,389	Kookmin Bank and others
		Debt guarantees	KRW 20,300	BNK Securities and others
Korea Western Power Co., Ltd.	PT. Mutiara Jawa	Collateralized money invested	KRW 365	Woori Bank

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Primary guarantor	Principal obligor	Type of guarantees	Credit limit In millions of won and thousands of foreign currencies	Guarantee
Korea Western Power Co., Ltd.	Heang Bok Do Si Photovoltaic Power Co., Ltd.	Collateralized money invested	KRW 202	Nonghyup Bank
Korea Western Power Co., Ltd.	Shin Pyeongtaek Power Co., Ltd.	Collateralized money invested	KRW 67,600	Kookmin Bank
		Guarantees for supplemental funding(*1)		Kookmin Bank
Korea East-West Power Co., Ltd.	Busan Shinho Solar Power Co., Ltd.	Collateralized money invested	KRW 4,761	Korea Development Bank and others
Korea East-West Power Co., Ltd.	Seokmun Energy Co., Ltd.	Collateralized money invested	KRW 16,751	Kookmin Bank and others
Korea East-West Power Co., Ltd.	Chun-cheon Energy Co., Ltd.	Collateralized money invested	KRW 42,505	Kookmin Bank and others
		Guarantees for supplemental funding(*1)	KRW 20,000	Kookmin Bank and others
Korea East-West Power Co., Ltd.	Honam Wind Power Co., Ltd.	Collateralized money invested	KRW 4,860	Shinhan Bank and others
Korea East-West Power Co., Ltd.	GS Donghae Electric Power Co., Ltd.	Collateralized money invested	KRW 240,591	Korea Development Bank and others
Korea East-West Power Co., Ltd.	Yeonggwangbaeksu Wind Power Co., Ltd.	Collateralized money invested	KRW 2,843	Kookmin Bank and others
Korea East-West Power Co., Ltd.	Yeonggwang Wind Power Co., Ltd.	Collateralized money invested	KRW 15,304	KDB Capital Corporation and others
Korea East-West Power Co., Ltd.	Daesan Green Energy Co., Ltd.	Collateralized money invested	KRW 17,433	IBK
Korea East-West Power Co., Ltd.	Taebaek Gadeoksan Wind Power Co., Ltd.	Collateralized money invested	KRW 8,508	Samsung Fire & Marine Insurance Co., Ltd. and others
		Debt guarantees	USD 46,983	

Korea East-West Power Co., Ltd.	PT. Tanjung Power Indonesia			MUFG Bank, Ltd.(MUFG) (formerly, the Bank of Tokyo Mitsubishi UFJ, Ltd.(BTMU)) and others
		Other guarantees	USD 3,150	PT Adaro Indonesia

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Primary guarantor	Principal obligor	Type of guarantees	Credit limit In millions of won and thousands of foreign currencies	Guarantee
Korea East-West Power Co., Ltd.	South Jamaica Power Company Limited	Performance guarantees	USD 14,400	Societe Generale
EWP Barbados 1 SRL	South Jamaica Power Company Limited	Guarantees for supplemental funding(*1, 3)	USD 18,350	JCSD Trustee Services Limited and others
Korea Southern Power Co., Ltd.	KNH Solar Co., Ltd.	Collateralized money invested Performance guarantees and guarantees for supplemental funding(*1)	KRW 2,337	Shinhan Bank and Kyobo Life Insurance Co., Ltd.
Korea Southern Power Co., Ltd.	Daeryun Power Co., Ltd.	Collateralized money invested	KRW 26,099	Korea Development Bank and others
		Guarantees for supplemental funding and others(*1)		Korea Development Bank and others
Korea Southern Power Co., Ltd.	Changjuk Wind Power Co., Ltd.	Collateralized money invested Guarantees for supplemental funding(*1)	KRW 8,086	Shinhan Bank Shinhan Bank
Korea Southern Power Co., Ltd.	Daegu Green Power Co., Ltd.	Collateralized money invested	KRW 41,110	Shinhan Bank and others
Korea Southern Power Co., Ltd.	Kelar S.A	Performance guarantees	USD 63,707	KEB Hana Bank, SMBC, Mizuho Bank, MUFG, Natixis
Korea Southern Power Co., Ltd.	Daehan Wind Power PSC	Debt guarantees	USD 18,200	Shinhan Bank
		Performance guarantees Guarantees for supplemental funding(*1)	USD 3,000	Shinhan Bank Shinhan Bank
Korea Southern Power Co., Ltd.	Pyeongchang Wind Power Co., Ltd.	Collateralized money invested	KRW 5,419	Woori Bank and Shinhan Bank and others
		Performance guarantees		Woori Bank and Shinhan Bank and

			others
Korea Southern Power Co., Ltd.	Taebaek Wind Power Co., Ltd.	Guarantees for supplemental funding(*1)	Shinhan Bank and others

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Primary guarantor	Principal obligor	Type of guarantees	Credit limit In millions of won and thousands of foreign currencies	Guarantee
Korea Southern Power Co., Ltd.	Jeongam Wind Power Co., Ltd.	Collateralized money invested Performance guarantees	KRW 4,589	IBK, SK Securities Co., Ltd. and others IBK, SK Securities Co., Ltd. and others
Korea Southern Power Co., Ltd.	Samcheok Eco Materials Co., Ltd.	Payment guarantees(*4)		SEM Investment Co., Ltd.
Korea Midland Power Co., Ltd.	Hyundai Green Power Co., Ltd.	Collateralized money invested	KRW 127,160	Korea Development Bank and others
Korea Midland Power Co., Ltd.	PT. Cirebon Electric Power	Debt guarantees	USD 11,825	Mizuho Bank
Korea Midland Power Co., Ltd.	PT Wampu Electric Power	Debt guarantees	USD 4,854	SMBC
Korea Midland Power Co., Ltd.	YaksuESS Co., Ltd	Collateralized money invested Guarantees for supplemental funding(*1)	KRW 460	Hanwha Life Insurance Co., Ltd. Hanwha Life Insurance Co., Ltd.
Korea Midland Power Co., Ltd.	YeongGwang Yaksu Wind Electric. Co., Ltd	Collateralized money invested	KRW 533	Hanwha Life Insurance Co., Ltd. and others
Korea South-East Power Co., Ltd.	Hyundai Energy Co., Ltd.	Collateralized money invested(*5) Guarantees for supplemental funding and others(*1,6)	KRW 78,600	Korea Development Bank and others Korea Development Bank and others
Korea South-East Power Co., Ltd.	RES Technology AD	Collateralized money invested	KRW 15,209	UniCredit Bulbank and others
Korea South-East Power Co., Ltd.	ASM-BG Investicii AD	Collateralized money invested	KRW 21,379	UniCredit Bulbank and others
Korea South-East Power Co., Ltd.	Expressway Solar-light Power Generation Co., Ltd.	Guarantees for supplemental funding(*1, 2)	KRW 2,500	Woori Bank
Korea South-East Power Co., Ltd.	S-Power Co., Ltd.	Collateralized money invested	KRW 114,566	Korea Development Bank and others
			KRW 2,459	

Korea South-East Power Co., Ltd.	Goseong Green Energy Co., Ltd.	Collateralized money invested	Kyobo Life Insurance Co., Ltd. and others

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Primary guarantor	Principal obligor	Type of guarantees	Credit limit In millions of won and thousands of foreign currencies	Guarantee
Korea South-East Power Co., Ltd.	Gangneung Eco Power Co., Ltd.	Collateralized money invested	KRW 2,495	Kyobo Life Insurance Co., Ltd. and others
Korea South-East Power Co., Ltd.	PND solar., Ltd.	Collateralized money invested	KRW 1,020	IBK and others
Korea South-East Power Co., Ltd.	Tamra Offshore Wind Power Co., Ltd.	Collateralized money invested	KRW 10,401	Nonghyup Life Insurance Co., Ltd. and others
Korea South-East Power Co., Ltd.	Hyundai Eco Energy Co., Ltd.	Collateralized money invested	KRW 3,388	Samsung Life Insurance and others
Korea Hydro & Nuclear Power Co., Ltd.	Noeul Green Energy Co., Ltd.	Collateralized money invested	KRW 8,016	KEB Hana Bank and others
Korea Hydro & Nuclear Power Co., Ltd.	Busan Green Energy Co., Ltd.	Collateralized money invested	KRW 12,537	Shinhan Bank and others
KEPCO Plant Service & Engineering Co., Ltd.	Incheon New Power Co., Ltd.	Collateralized money invested Guarantees for supplemental funding and others(*1)	KRW 579	Shinhan Bank Shinhan Bank

(*1) The Company guarantees to provide supplemental funding for business with respect to excessive business expenses or insufficient repayment of borrowings.

(*2) The Company has granted the right to Hana Financial Investment Co., Ltd., as an agent for the creditors to Expressway Solar-light Power Generation Co., Ltd. (ESPG), to the effect that in the event of acceleration of ESPG s payment obligations under certain borrowings to such creditors, Hana Financial may demand the Company to dispose of shares in ESPG held by the Company and apply the resulting proceeds to repayment of ESPG s obligations.

(*3) This includes a guarantee for the shareholder s capital payment in connection with the business of 190MW gas complex thermal power plant in Jamaica. EWP Barbados 1 SRL s capital contribution amount is USD 14,730 thousand and the total amount of guarantees is USD 8,257.5 thousand which consists of USD 3,670 thousand of EWP (Barbados) 1 SRL s contribution obligation and USD 4,587.5 thousand of South Jamaica Energy Holding Limited s portion (50%) of contribution obligation.

(*4) The Company has the obligation to purchase the stocks should preferred stockholders elect to sell their stocks on the expected sell date (3 years from preferred stock payment date) and is required to guarantee the promised yield when preferred stockholders sell their stocks. In relation to this guarantee, the Company has recognized 2,155 million of derivative liabilities as of December 31, 2018.

(*5) The Company recognized impairment loss on all of the equity securities of Hyundai Energy Co., Ltd. in prior years, and the acquisition cost of the securities provided as collateral is 47,067 million.

(*6) Pursuant to the guarantee agreement, the Company recognized other provisions of 40,898 million as the possibility of economic outflow to fulfill the obligation was probable and the amount could be reasonably estimated.

(*7) The common stocks of Dongducheon Dream Power Co., Ltd. held by the Company were pledged as collateral.

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(8) As of December 31, 2018, there is no financial guarantee contract provided by related parties.

(9) Derivatives transactions with related parties as of December 31, 2018 are as follows:

(i) Currency Swap

Counterparty	Contract year	Contract Amount		Contract interest rate per annum		Contract exchange rate
		Pay	Receive	Pay (%)	Receive (%)	
		In millions of won and thousands of foreign currencies				
Korea Development Bank	2016~2019	105,260	USD 100,000	2.48%	2.38%	1,052.60
	2015~2025	111,190	USD 100,000	2.62%	3.25%	1,111.90
	2017~2027	111,610	USD 100,000	2.31%	3.13%	1,116.10
	2018~2028	108,600	HKD 800,000	2.69%	3.35%	135.75
	2018~2023	170,280	USD 150,000	2.15%	3.75%	1,135.20
	2017~2020	114,580	USD 100,000	1.75%	2.38%	1,145.80
	2016~2021	121,000	USD 100,000	2.15%	2.50%	1,210.00
	2018~2023	320,880	USD 300,000	2.03%	3.75%	1,069.60
	2018~2021	212,960	USD 200,000	2.10%	3.00%	1,064.80
	2017~2022	113,300	USD 100,000	1.94%	2.63%	1,133.00
	2018~2023	169,335	USD 150,000	2.26%	3.88%	1,128.90

(ii) Currency forward

Counterparty	Contract date	Maturity date	Contract amounts		Contract exchange rate
			Pay	Receive	
			In millions of won and thousands of foreign currencies		
Korea Development Bank	2017.12.27	2021.07.12	104,849	USD 100,000	1,048.49
	2018.12.18	2019.01.22	11,279	USD 10,000	1,127.85
	2018.12.13	2019.01.10	4,490	USD 4,000	1,122.60
	2018.12.24	2019.01.10	13,497	USD 12,000	1,124.74
	2018.12.21	2019.01.15	10,103	USD 9,000	1,122.50
	2018.12.27	2019.01.23	11,207	USD 10,000	1,120.68
	2018.12.28	2019.01.23	13,412	USD 12,000	1,117.64

(10) Salaries and other compensations to the key members of management of the Company for the years ended December 31, 2016, 2017 and 2018 are as follows:

Type	2016	2017	2018

	In millions of won		
Salaries	1,463	1,271	1,106
Employee benefits	33	54	24
	1,496	1,325	1,130

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51. Non-Cash Transactions

Significant non-cash investing and financing transactions for the years ended December 31, 2016, 2017 and 2018 are as follows:

Transactions	2016	2017	2018
		In millions of won	
Transfer from construction-in-progress to other assets	19,971,599	13,676,233	8,656,252
Recognition of asset retirement cost and related provision for decommissioning costs	470,941	2,494,802	310,272
Transfer from provision for disposal of spent nuclear fuel to accrued expenses	283,675	342,861	482,699

52. Commitments for Expenditure

(1) The commitments for acquisition of property, plant and equipment as of December 31, 2017 and 2018 are as follows:

Contracts	2017		2018	
	Amounts	Balance	Amounts	Balance
		In millions of won		
Purchase of switch (25.8kV Eco) 12,450	50,526	35,494	50,526	
Purchase of cable (PVC,1C,2000SQ) 153,000M and others (Shin-Bupyung-Youngseo)	50,256	42,857	56,183	37,309
Purchase of cable (PVC, 1C, 2500SQ) 103,374M and others (Bukdangjin-Shintangjung)	42,500	29,987	44,315	31,801
Purchase of GIS (362KV 6300A 63KA) 23CB YoungseoS/S	34,500	34,500	34,500	34,500
Purchase of GIS (362KV 6300A 63KA) 27CB KwangyangS/S	37,476	18,044	37,694	10,491
Purchase of GIS (800KV 8000A 50KA) 10CB Shin-JungbuS/S	63,730	44,955	63,730	
Purchase of transformer (765/345/23kV 666.7MVA, 2TANK) 6 units Shin-JungbuS/S	37,500	37,500	37,500	
Purchase of cable (TR CNCE-W/AL,1C,400SQ) 4,645,000M	78,076	76,762	78,076	
Purchase of Concrete Poles (10M, 350KGF) 121,900 and 6 others	133,387	112,981	133,387	13,343
Advanced E-Type low voltage electricity meter 1,600,000 units	65,408	64,592	65,408	
Purchase of Ground Switch (44-D-A125, 600AX4) and 1 other 4,016 units	56,482	55,990	56,482	
Purchase of cable (TR CNCE-W/AL,1C,400SQ) 3,504,000M			66,240	38,998

Purchase of cable (FR CNCO-W,1C,325SQ) 1,400,000			57,475	48,598
Purchase of switch (Eco) 9,360 units			40,631	34,797
Construction of Shin-Kori units (#3,4)	7,363,514	93,637	7,363,514	3,211
Construction of Shin-Kori units (#5,6)	8,625,387	6,757,146	8,625,387	5,930,099
Construction of Shin-Hanul units (#1,2)	7,982,342	1,015,813	7,982,342	355,704
Construction of Shin-Hanul units (#3,4)(*)	8,261,818	8,097,056		
Other 26 contracts	262,400	114,041	269,681	161,243
Purchase of main machine for construction of Seoul Combined units (#1,2)	361,203	99,031	365,164	51,165
Construction of Seoul Combined units (#1,2)	227,685	60,568	285,890	27,125

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Contracts	2017		2018	
	Amounts	Balance	Amounts	Balance
	In millions of won			
Purchase of smoke eliminating machine for construction of Shin-Boryeong units (#1,2)	169,544	36,417	172,609	13,986
Service of designing Shin-Boryeong units (#1,2)	127,810	16,371	120,199	1,076
Purchase of main machine for construction of Shin-Boryeong units (#1,2)	866,065	4,981	866,065	4,981
Construction of Shin-Boryeong units (#1,2)	316,190	23,100	309,466	
Purchase of furnace for construction of Shin-Seocheon thermal power plant	302,030	222,555	305,209	74,631
Purchase of turbine generator for construction of Shin-Seocheon thermal power plant	104,402	83,522	104,402	57,968
Electricity construction of Shin-Seocheon thermal power plant	200,453	196,993	217,848	174,122
Purchase of main machine for Jeju LNG combined	166,287	15,409	166,287	11,272
Purchase of coal handling machine for construction of Taean (#9,10) and IGCC units (conditional contract for installation)	193,375	5,129	205,764	282
Purchase of furnace for construction of Taean units (#9,10)	566,945	33,817	556,504	18,502
Service of designing Taean units (#9,10)	111,322	13,671	112,344	13,338
Purchase of turbine generator for construction of Taean units (#9,10)	205,267	550	214,462	10,422
Purchase of oxygen plant for construction of Taean IGCC units	94,564	199	96,068	1,552
Service of designing Taean IGCC plant units	44,802	2,669	46,001	3,161
Purchase of furnace for construction of Samcheok units (#1,2)	1,082,641	5,963	1,092,287	12,215
Purchase of coal handling machine for construction of Samcheok units (#1,2)	304,924	52,362	307,925	48,736
Service of designing Samcheok units (#1,2)	114,047	4,745	103,679	
Purchase of turbine main equipment for Samcheok units (#1,2)	215,333	874	212,188	348
Purchase of main equipment for Namjeju			146,594	134,949

(*) The Company recognized impairment loss in relation to Shin-Hanul unit 3 and 4, and there are no legally binding commitments for expenditure as of December 31, 2018.

(2) As of December 31, 2018, details of contracts for inventory purchase commitment are as follows:

The Company imports all of its uranium ore concentrates from sources outside Korea (including the United States, United Kingdom, Kazakhstan, France, Russia, South Africa, Canada and Australia) which are paid for with currencies other than Won, primarily in U.S. dollars. In order to ensure stable supply, the Company entered into long-term and medium-term contracts with various suppliers, and supplements such supplies with purchases of fuels on spot markets. The long-term and medium-term contract periods vary among contractors and the stages of fuel manufacturing process. Contract prices for processing of uranium are generally based on market prices. Contract periods for ore concentrates, conversion, enrichment and design and fabrication are as follows:

Type	Periods	Contracted quantity
Concentrate	2018 ~ 2030	48,162 Ton U3O8
Transformed	2018 ~ 2030	23,484 Ton U
Enrichment	2018 ~ 2030	25,530 Ton SWU
Molded	2018 ~ 2022	520 Ton U

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53. Contingencies and Commitments

(1) Ongoing litigations and claims related with contingent liabilities and contingent assets as of December 31, 2017 and 2018 are as follows:

	2017		2018	
	Number of cases	Claim amount	Number of cases	Claim amount
		In millions of won		
As the defendant	565	477,719	570	673,882
As the plaintiff	185	690,934	174	793,491

As of December 31, 2018, among the litigations mentioned above, there are ongoing litigations of KHNP, a subsidiary of KEPCO, against KEPCO Engineering & Construction Company, Inc., a subsidiary of KEPCO, as a co-defendant (one case amounting to 65,927 million).

A group of plaintiffs (consisting 2,167 individuals) filed a lawsuit against NSSC regarding NSSC s approval on May 18, 2015 of extending the operation of Wolsong unit 1 nuclear power plant. The appeal was ongoing as of December 31, 2018. Also, Greenpeace and others filed an administrative litigation against NSSC requesting cancelation of the construction permit of Shin-Kori unit 5 and 6, which was ongoing as of December 31, 2018. The Company joined these litigations as a stakeholder with the permission of the Court.

As described in note 2.(4), on June 15, 2018, the board of directors of KHNP, a subsidiary of KEPCO, has decided to shut down the Wolsong unit 1. Accordingly, the Company recognized a full impairment loss of 570,408 million. Also, the provision for decommissioning costs of the Wolsong unit 1 has increased by 28,196 million as the timing of actual cash outflows was accelerated due to the shortened operating period.

As of December 31, 2018, in connection with Shin-Hanul unit 3 & 4, the Company has received communications from a vendor for costs incurred for the preliminary work of the main equipment and associated compensation due to the discontinuation of the construction. The Company does not believe that it has a present obligation for this vendor, and that it is probable that the Company will prevail if a lawsuit is filed against the Company. In addition, the Company cannot reliably estimate the potential outflow related to the obligation, if any.

The long-term service contract between Gyeonggi Green Energy Co., Ltd. (Gyeonggi Green Energy) and its fuel cell supplier expired during the year ended December 31, 2018. Based on the agreement with the creditors of Gyeonggi Green Energy, as Gyeonggi Green Energy was unable to renew the fuel cell supply contract by December 31, 2018, the creditors have the right to request immediate repayment of the related borrowings from Gyeonggi Green Energy or to take over the all shares held by KHNP. Depending on the result of this negotiation, the schedule of repayment of borrowings of Gyeonggi Green Energy Co., Ltd. may be adjusted accordingly. As of December 31, 2018, Gyeonggi Green Energy Co., Ltd. is in negotiations to renew the contract.

The Company is the defendant against a number of claims. The followings are potentially significant ongoing claims pertaining to the Company.

Hyundai Engineering & Construction Co., Ltd. (Hyundai E&C), SK Engineering & Construction Co., Ltd. and GS Engineering & Construction Co., Ltd. filed a lawsuit for increase in contract bill against KHNP in September 2013, in relation to the design changes on the plant construction of Shin-Hanul 1 & 2. KHNP has paid the claim amounts in full upon the first ruling and believes that the contingent liabilities related to the other pending lawsuits are not significant.

In December 2013, the Supreme Court of Korea ruled that regular bonuses also fall under the category of ordinary wages on the condition that those bonuses are paid regularly and uniformly. Also, the Supreme Court ruled that employees are entitled to retroactively demand certain wages based on the new ordinary wages that include regular bonuses as additional wages. However, the request may be limited to the extent of the principle of good faith.

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The Company believes that the possibility of economic outflow is probable on the ongoing and the expected lawsuit. For this reason, the Company recognized 39,139 million of other provision in relation to the lawsuit as of December 31, 2018.

Except these significant ongoing claims, there are 12 arbitration cases pertaining to the Company as of December 31, 2018 and the significant arbitration cases for the year ended December 31, 2018 are as follows:

KEPCO and KEPCO KDN Co., Ltd., a subsidiary of KEPCO, have been accused of breach of contract in relation to ERP software, which is provided by SAP Korea Ltd. The litigation was filed in the International Chamber of Commerce International Court of Arbitration but the Company has not recognized any provision because the probability of economic benefit outflow is remote and the related amount cannot be reliably estimated.

Hyundai Samsung Joint Venture (HSJV), one of the subcontractors of the Company, filed an arbitration against the Company at the London Court of International Arbitration (LCIA) in 2016 due to disagreements in UAE nuclear power plant construction project, but the Company has not recognized any losses because the probability of economic benefit outflow is remote and the related amount cannot be reasonably estimated.

In 2016, Hyundai E&C, GS Engineering & Construction Corp. and Hansol SeenTec Co., Ltd. filed an arbitration against the Company to the Korea Commercial Arbitration Board in relation to the request for additional construction costs. As described in note 29.(2), the Company recognized the litigation provisions of 204,787 million in relation to this arbitration case and made the payment according to the results of this arbitration during the year ended December 31, 2018.

In 2016, Halla Corporation filed on arbitration against the Company to the Korea Commercial Arbitration Board in relation to the request for additional construction costs and the Company filed on arbitration against Halla Corporation to the Korea Commercial Arbitration Board in relation to the request for a penalty payment for the delayed construction work. The Company has recognized 19,754 million of provision for the best estimate of the expenditure required to fulfill its obligations in relation to this arbitration as of December 31, 2018.

In connection with the electric power IT modernization project in Kerala, India, Enzen, a subcontractor, filed an arbitration against the Company to the Indian Council of Arbitration due to disagreements in the contract, but the Company has not recognized any losses because the probability of economic benefit outflow is remote and the related amount cannot be reasonably estimated.

(2) Guarantees of payments and commitments provided to other companies as of December 31, 2017 and 2018 are as follows:

In order to secure its status as a shareholder of Navanakorn Electric Co., Ltd., the Company has signed a fund supplement contract. According to the contract, in case Navanakorn Electric Co., Ltd. does not have sufficient funds for its operation or repayment of borrowings, the Company bears a payment obligation in proportion to its ownership.

The Company has outstanding borrowings with a limit of USD 275,600 thousand from its creditors such as International Finance Corporation. Regarding the borrowing contract, the Company has guaranteed capital contribution of USD 69,808 thousand and additional contribution up to USD 19,000 thousand for contingencies, if any. Moreover, for one of the electricity purchasers, Central Power Purchasing Agency Guarantee Ltd., the Company has provided payment guarantee up to USD 2,777 thousand, in case of construction delay or insufficient contract volume after commencement of the construction.

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The Company has provided PT. Perusahaan Listrik Negara performance guarantee up to USD 2,293 thousand and Mizuho bank and others investment guarantee up to USD 43,500 thousand in proportion to its ownership in the electricity purchase contract with PT. Cirebon Energi Prasarana in relation to the second electric power generation business in Cirebon, Indonesia.

The Company has provided MUFG Bank, Ltd. (MUFG) (formerly, the Bank of Tokyo Mitsubishi UFJ. Ltd. (BTMU)) borrowing guarantee up to USD 41,258 thousand proportion to its ownership in the equity bridge loan guarantee with PT. Cirebon Energi Prasarana in relation to the second electric power generation business in Cirebon, Indonesia.

The Company has provided the Export-Import Bank of Korea, BNP Paribas and ING Bank guarantee of mutual investment of USD 2,192 thousand, which is equivalent to the ownership interest of PT BS Energy and PT Nusantara Hydro Alam, in order to guarantee the expenses related to hydroelectric power business of Tanggamus, Indonesia.

The Company has provided the Export-Import Bank of Korea and SMBC guarantee of mutual investment of USD 401 thousand, which is equivalent to the ownership interest of PT Mega Power Mandiri, in order to guarantee the expenses related to hydroelectric power business of PT Wampu Electric Power, an associate of the Company.

(3) Credit lines provided by financial institutions as of December 31, 2018 are as follows:

Commitments	Financial institutions	Currency	Limited amount	Exercised amount
			In millions of won and thousands of foreign currencies	
Commitments on bank-overdraft	Nonghyup Bank and others	KRW	1,855,000	167,010
Commitments on bank-daylight overdraft	Nonghyup Bank	KRW	280,000	
Limit amount available for CP	KEB Hana Bank and others	KRW	1,050,000	
Limit amount available for card	KEB Hana Bank and others	KRW	55,904	2,740
	Banco de Oro	PHP	5,000	5,000
Loan limit	Kookmin Bank and others	KRW	1,238,500	612,197
	DBS Bank and others	USD	1,840,700	20,000
Certification of payment on payables from foreign country	Kookmin Bank and others	USD	44,680	4,754
Certification of payment on L/C	Shinhan Bank and others	USD	992,434	252,392
Certification of performance guarantee on contract	KEB Hana Bank and others	EUR	4,158	4,158

KEB Hana Bank and others	INR	237,321	237,321
Korea Development Bank and others	JPY	637,322	637,322
Seoul Guarantee	KRW	89,335	72,802
Insurance and others			
First Abu Dhabi Bank and others	USD	923,915	830,314
KEB Hana Bank	SAR	6,508	6,508
Bank of Kathmandu	NPR	36,304	36,304
KEB Hana Bank	CAD	617	617

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Commitments	Financial institutions	Currency	Limited amount	Exercised amount
		In millions of won and thousands of foreign currencies		
Certification of bidding	KEB Hana Bank and others	USD	110,000	3,199
	Shinhan Bank	ZAR	55,730	55,730
Advance payment bond, Warranty bond, Retention bond and others	Export-Import Bank of Korea and others	USD	3,934,928	3,220,418
Others	Shinhan Bank	JPY	381,210	381,210
	Nonghyup Bank and others	KRW	307,436	7,088
	Export-Import Bank of Korea and others	USD	1,171,470	842,897
Inclusive credit	Shinhan Bank	INR	70,028	70,028
	KEB Hana Bank	KRW	258,000	12,278
	KEB Hana Bank and others	USD	30,930	18,245
Trade finance	BNP Paribas and others	USD	800,000	

(4) As of December 31, 2018, blank check and assets provided as collaterals or pledges to financial institutions by the Company are follows:

Guarantor	Guarantee	Type of guarantee	Currency	Amount	Description
		In millions of won and thousands of foreign currencies			
Korea Southern Power Co., Ltd.	Korea Development Bank and others	Shareholdings of DS Power Co., Ltd.	KRW	916	Collateral for borrowings
Mira Power Limited	International Finance Corporation and others	Property, plant and equipment and others	USD	275,600	Collateral for borrowings(*2)
Gyeonggi Green Energy Co., Ltd.	Korea Development Bank and others	Cash and cash equivalents	KRW	327,080	Collateral for borrowings(*1)
Commerce and Industry Energy Co., Ltd.	IBK and others	Land, buildings, structures and machinery and others	KRW	110,500	Collateral for borrowings(*1)
KOSPO Youngnam Power Co., Ltd.	Shinhan Bank and others	Cash and cash equivalents	KRW	396,120	Collateral for borrowings(*1)
Gyeongju Wind Power Co., Ltd.	Samsung Fire & Marine Insurance Co., Ltd. and others	Property, plant and equipment and others	KRW	110,240	Collateral for borrowings(*1)

Korea Offshore Wind Power Co., Ltd	Woori Bank and others	Utility plant and others	KRW	293,400	Collateral for borrowings
Qatrana Electric Power Company	The Islamic Development Bank and others	Finance lease receivable and property, plant and equipment and others	JOD	236,570	Collateral for borrowings(*2)
KST Electric Power Company	The Export Import Bank of Korea and others	Finance lease receivable and property, plant and equipment and others	USD	337,000	Collateral for borrowings(*2)

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(*1) As of December 31, 2018, the Company has established guarantees for pledge for transfer of rights of long-term borrowings, pledge for insurance claims, pledge for shares, etc.

(*2) This is based on the amount of loan commitment limit.
The Company has 1,197 million of project loans from Korea Energy Agency as of December 31, 2018. The Company has provided a blank check as repayment guarantee.

(5) The Company temporarily suspended operations of the Gangneung hydroelectric generating plant, with a carrying amount of 81,900 million as of December 31, 2018, to improve the quality of water used in generating electricity. The expenses related to the suspension of operations of 47 million and depreciation on the utility plant of 6,547 million are recorded in other expenses for the year ended December 31, 2018. Regarding the improvement of water quality, the results of damages compensation for the local residents cannot be reasonably estimated, and the Company is in negotiations with Gangneung City and related stakeholders to restart the Gangneung hydroelectric generating plant as of December 31, 2018.

(6) Due to the Korean government s announcement of suspension of operation in the Gaeseong Industrial District, it is uncertain if the Company can exercise the property rights for the Company s facility in the Gaeseong Industrial District as of December 31, 2018. The book value of facility is 17,522 million and the amount of trade receivables related to the companies residing in Gaeseong industrial complex is 2,911 million. The ultimate outcome of this event cannot be reasonably estimated.

(7) As of December 31, 2018, five subsidiaries of KEPCO, including Korea South-East Power Co., Ltd., have entered into consecutive voyage charter contracts with shipping companies, including Korea Line Corporation, for the stable transportation of overseas bituminous coal used for power generation. As of December 31, 2018, there are 73 vessels under contract and the average remaining contract period is about 9 years.

54. Subsequent Events

Subsequent to December 31, 2018, Korea Midland Power Co., Ltd., Korea Western Power Co., Ltd. and Korea East-West Power Co., Ltd. issued foreign bond, corporate bonds and non-guaranteed corporate bonds for funding facilities and operations as follows:

Company Name	Type	Issue date	Maturity	Interest rate (%)	Amount
		In millions of won and thousands of foreign currencies			
Korea Midland Power Co., Ltd.	#7 foreign bond	2019.01.22	2022.01.22	3.38%	USD 300,000
	#47-1 corporate bond	2019.02.08	2039.02.08	2.19%	KRW 160,000
	#47-2 corporate bond	2019.02.08	2049.02.08	2.17%	KRW 120,000

Korea Western Power Co., Ltd.	#2 Swiss Franc bond	2019.02.27	2024.02.27	0.13%	CHF 200,000
Korea East-West Power Co., Ltd.	#32-1 non-guaranteed corporate bond	2019.03.07	2039.03.07	2.18%	KRW 40,000
	#32-2 non-guaranteed corporate bond	2019.03.07	2049.03.07	2.16%	KRW 40,000

On January 9, 2019, Korea Western Power Co., Ltd., a subsidiary of KEPCO, has completed the liquidation of KOWEPO India Private Limited, which was classified as assets held-for-sale.