POSCO
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 1-13368

POSCO

(Exact name of Registrant as specified in its charter)

POSCO	**The Republic of Korea**
(Translation of Registrant s name into English)	*(Jurisdiction of incorporation or organization)*

POSCO Center, 440 Teheran-ro, Gangnam-gu

Seoul, Korea 06194

(Address of principal executive offices)

Lim, Sung-Su

POSCO Center, 440 Teheran-ro, Gangnam-gu

Seoul, Korea 06194

Telephone: +82-2-3457-1098; E-mail: s2blue@posco.com; Facsimile: +82-2-3457-1997

(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
American Depositary Shares, each representing one-fourth of one share of common stock	New York Stock Exchange, Inc.
Common Stock, par value Won 5,000 per share *	New York Stock Exchange, Inc. *

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.

None

As of December 31, 2018, there were 80,001,132 shares of common stock, par value Won 5,000 per share, outstanding

(not including 7,185,703 shares of common stock held by the company as treasury shares)

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**

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, 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. (Check one):

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.

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing. **U.S. GAAP** **IFRS** **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**

*Not for trading, but only in connection with the registration of the American Depositary Shares.

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GLOSSARY

ADR	American Depositary Receipt evidencing ADSs.
ADR depositary	Citibank, N.A.
ADS	American Depositary Share representing one-fourth of one share of Common Stock.
Commercial Code	Commercial Code of the Republic of Korea.
common stock	Common stock, par value Won 5,000 per share, of POSCO.
deposit agreement	Deposit Agreement, dated as of July 19, 2013, among POSCO, the ADR Depositary and all holders and beneficial owners from time to time of ADRs issued thereunder.
Dollars, $ or US$	The currency of the United States of America.
FSCMA	Financial Investment Services and Capital Markets Act of the Republic of Korea.
Government	The government of the Republic of Korea.
IASB	International Accounting Standards Board.
IFRS	International Financial Reporting Standards.
Yen	The currency of Japan.
Korea	The Republic of Korea.
Gwangyang Works	Gwangyang Steel Works.
We	POSCO and its consolidated subsidiaries.
Pohang Works	Pohang Steel Works.
POSCO Group	POSCO and its consolidated subsidiaries.
Renminbi	The currency of the People s Republic of China.
Securities Act	The United States Securities Act of 1933, as amended.
Securities Exchange Act	The United States Securities Exchange Act of 1934, as amended.
SEC	The United States Securities and Exchange Commission.
tons	Metric tons (1,000 kilograms), equal to 2,204.6 pounds.
U.S. GAAP	Generally accepted accounting principles in the United States of America.
Won or	The currency of the Republic of Korea.

Any discrepancies in any table between totals and the sums of the amounts listed are due to rounding.

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PART I

Item 1. ***Identity of Directors, Senior Managers and Advisers***

Item 1.A. ***Directors and Senior Management***

Not applicable

Item 1.B. ***Advisers***

Not applicable

Item 1.C. ***Auditor***

Not applicable

Item 2. ***Offer Statistics and Expected Timetable***

Not applicable

Item 2.A. ***Offer Statistics***

Not applicable

Item 2.B. ***Method and Expected Timetable***
Not applicable

Item 3. ***Key Information***

Item 3.A. ***Selected Financial Data***
The selected financial data presented below should be read in conjunction with our Consolidated Financial Statements and related notes thereto and Item 5. Operating and Financial Review and Prospects included elsewhere in this annual report. The selected financial data in Won as of December 31, 2017 and 2018 and for each of the years in the three-year period ended December 31, 2018 were derived from our Consolidated Financial Statements included elsewhere in this annual report. Our Consolidated Financial Statements are prepared in accordance with IFRS as issued by the IASB.

In addition to preparing financial statements in accordance with IFRS as issued by the IASB included in this annual report, we prepare financial statements in accordance with Korean International Financial Reporting Standards (K-IFRS) as adopted by the Korean Accounting Standards Board (the KASB), which we are required to file with the Financial Services Commission and the Korea Exchange under the FSCMA. English translations of such financial statements are furnished to the SEC under Form 6-K. K-IFRS differs in certain respects from IFRS as issued by the IASB in the presentation of operating profit. Additionally, under K-IFRS, revenue from the development and sale of certain real estate is recognized using the percentage of completion method. However, under IFRS as issued by the IASB, revenue from the development and sale of real estate is recognized when an individual unit of residential real estate is delivered to the buyer. As a result, our consolidated statements of comprehensive income and our consolidated statements of financial position prepared in accordance with IFRS as issued by the IASB included in this annual report differ from our consolidated statements of comprehensive income and consolidated statements of financial position prepared in accordance with K-IFRS. See Item 5.A. Operating Results Explanatory Note Regarding Presentation of Certain Financial Information under K-IFRS.

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The information set forth below is not necessarily indicative of the results of future operations and should be read in conjunction with Item 5. Operating and Financial Review and Prospects and our consolidated financial statements and related notes included in this annual report.

Selected consolidated statement of comprehensive income data

	For the Year Ended December 31,				
	2014	2015	2016	2017	2018
	(In billions of Won, except per share data)				
Revenue	64,759	58,522	52,940	60,187	65,155
Cost of sales	57,465	52,018	46,271	51,916	57,129
Gross profit	7,293	6,504	6,668	8,271	8,026
Impairment loss on trade accounts and notes receivable	109	190	165	174	75
Other administrative expenses	2,201	2,206	2,126	2,003	1,986
Selling expenses	1,760	1,729	1,554	1,557	369
Impairment loss on other receivables	96	158	38	98	63
Other operating income	269	549	215	448	524
Other operating expenses	884	1,285	718	691	2,014
Operating profit	2,513	1,486	2,282	4,196	4,042
Share of profit (loss) of equity-accounted investees, net	(300)	(506)	(89)	11	113
Finance income	2,397	2,557	2,232	2,373	1,706
Finance costs	3,222	3,387	3,014	2,484	2,244
Profit before income tax	1,388	150	1,412	4,095	3,616
Income tax expense	824	267	380	1,186	1,684
Profit (loss)	564	(116)	1,032	2,909	1,932
Total comprehensive income (loss)	108	(278)	1,486	2,348	1,504
Profit (loss) for the period attributable to:					
Owners of the controlling company	633	171	1,355	2,756	1,712
Non-controlling interests	(69)	(288)	(323)	153	220
Total comprehensive income (loss) attributable to:					
Owners of the controlling company	182	24	1,814	2,184	1,293
Non-controlling interests	(73)	(302)	(328)	164	211
Basic and diluted earnings per share (1)	7,514	1,731	16,521	34,040	21,177
Dividends per share of common stock	8,000	8,000	8,000	8,000	10,000

Selected consolidated statements of financial position data

	As of December 31,				
	2014	2015	2016	2017	2018
	(In billions of Won)				
Working capital (2)	10,833	9,148	10,711	12,354	14,721
Total current assets	33,208	29,502	29,655	31,844	34,152
Property, plant and equipment, net	35,241	34,523	33,770	31,884	30,018
Total non-current assets	52,636	51,246	50,483	47,941	44,625
Total assets	85,844	80,748	80,138	79,786	78,777
Short-term borrowings and current installments of long-term borrowings	12,195	12,371	10,195	11,275	10,290
Long-term borrowings, excluding current installments	15,233	12,849	12,510	9,789	9,920
Total liabilities	40,586	35,735	34,372	32,459	32,104
Share capital	482	482	482	482	482
Total equity	45,257	45,013	45,765	47,327	46,673

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Selected consolidated statements of cash flows data

	For the Year Ended December 31,				
	2014	2015	2016	2017	2018
	(In billions of Won)				
Net cash provided by operating activities	3,412	7,602	5,269	5,607	5,870
Net cash used in investing activities	(3,745)	(4,535)	(3,755)	(3,818)	(2,648)
Net cash provided by (used in) financing activities	135	(2,242)	(3,951)	(1,566)	(3,195)
Net increase (decrease) in cash and cash equivalents	(186)	849	(2,424)	165	31
Cash and cash equivalents at beginning of the year	4,209	4,022	4,871	2,448	2,613
Cash and cash equivalents at end of the year	4,022	4,871	2,448	2,613	2,644

(1) See Note 36 of Notes to Consolidated Financial Statements for method of calculation. The weighted average number of common shares outstanding used to calculate basic and diluted earnings per share was 79,801,539 shares as of December 31, 2014, 79,993,834 shares as of December 31, 2015, 79,996,389 shares as of December 31, 2016, 79,998,600 shares as of December 31, 2017 and 80,000,606 shares as of December 31, 2018.

(2) Working capital means current assets minus current liabilities.

Item 3.B. ***Capitalization and Indebtedness***

Not applicable

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

Not applicable

Item 3.D. ***Risk Factors***

You should carefully consider the risks described below.

The global economic downturn may adversely affect our business and performance. The global economic outlook for the near future remains uncertain.

Our business is affected by highly cyclical market demand for our steel products from a number of industries, including the construction, automotive, shipbuilding and electrical appliances industries as well as downstream steel processors, which are sensitive to general conditions in the global economy. Macroeconomic factors, such as the economic growth rate, employment levels, interest rates, inflation rates, exchange rates, commodity prices, demographic trends and fiscal policies of governments can have a significant effect on such industries. From time to time, these industries have experienced significant and sometimes prolonged downturns, which in turn have negatively impacted our steel business. Global economic conditions have deteriorated in recent years, with global financial and capital markets experiencing substantial volatility. Such developments have been caused by, and continue to be exacerbated by, among other things, the slowdown of economic growth in China and other major emerging market economies, adverse economic and political conditions in Europe and Latin America and continuing geopolitical and social instability in North Korea and various parts of the Middle East, as well as uncertainty regarding the timing and method of the United Kingdom s exit from the European Union (Brexit), and a deterioration in economic and trade relations between the United States and its major trading partners, including China, Canada and Mexico.

An actual or anticipated further deterioration of global economic conditions may result in a decline in demand for our products that could have a negative impact on the prices at which they can be sold. In such a case, we will likely face pressure to reduce prices and we may need to rationalize our production capacity and reduce fixed costs. In the past, we have adjusted our crude steel production levels and sales prices in response to sluggish demand from our customers in industries adversely impacted by the deteriorating economic conditions. We produced 42.2 million tons of crude

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steel and stainless steel in 2016, 42.2 million tons in 2017 and 42.9 million tons in 2018. The average unit sales prices for our semi-finished and finished steel products were Won 745 thousand per ton in 2016, Won 904 thousand per ton in 2017 and Won 934 thousand per ton in 2018.

We expect fluctuation in demand for our steel products and trading services to continue to prevail at least in the near future. We may decide to further adjust our future crude steel production or our sales prices on an on-going basis subject to market demand for our products, the production outlook of the global steel industry and global economic conditions in general. In addition, economic downturns in the Korean and global economies could result in market conditions characterized by weaker demand for steel products from a number of industries as well as falling prices for export and import products and reduced trade levels. Deterioration of market conditions may result in changes in assumptions underlying the carrying value of certain assets, which in turn could result in impairment of such assets, including intangible assets such as goodwill. In addition, our ability to reduce expenditures for production facilities and research and development during an industry downturn is limited because of the need to maintain our competitive position. If we are unable to reduce our expenses sufficiently to offset reductions in price and sales volume, our margins will suffer and our business, financial condition and results of operations may be materially and adversely affected.

Korea is our most important market, and our current business and future growth could be materially and adversely affected if economic conditions in Korea deteriorate.

We are incorporated in Korea, and a substantial portion of our operations and assets are located in Korea. Korea is our most important market, accounting for 38.4% of our total revenue from steel products produced and sold by us in 2018. Domestic demand for our products is affected by the condition of major steel consuming industries, such as construction, shipbuilding, automotive, electrical appliances and downstream steel processors, and the Korean economy in general. In addition, the trading operations of POSCO International Corporation (POSCO International and formerly known as POSCO Daewoo Corporation) are affected by the general level of trade between Korea and other countries, which in turn tends to fluctuate based on general conditions in the Korean and global economies. As a result, we are subject to political, economic, legal and regulatory risks specific to Korea, and our performance and successful fulfillment of our operational strategies are largely dependent on the overall Korean economy. The economic indicators in Korea in recent years have shown mixed signs, and future growth of the Korean economy is subject to many factors beyond our control, including developments in the global economy.

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. The value of the Won relative to major foreign currencies has also fluctuated significantly and, as a result of changing global and Korean economic conditions, there has been volatility in the stock prices of Korean companies in recent years. Future declines in the Korea Composite Stock Price Index (the KOSPI) and large amounts of sales of Korean securities by foreign investors and subsequent repatriation of the proceeds of such sales may adversely affect the value of the Won, the foreign currency reserves held by financial institutions in Korea and the ability of Korean companies to raise capital. Any future deterioration of the Korean or global economy could adversely affect our business, financial condition and results of operations.

Developments that could have an adverse impact on Korea s economy include:

- declines in consumer confidence and a slowdown in consumer spending;

- 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 (such as the controversy between Korea and China regarding the deployment of a Terminal High Altitude Area Defense system in Korea by the United States in

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March 2017 and the ensuing economic and other retaliatory measures by China against Korea during the remainder of 2017);

adverse conditions in the economies of countries and regions that are important export markets for Korea, such as China, the United States, Europe and Japan, or in emerging market economies in Asia or elsewhere, as well as increased uncertainties related to Brexit;

adverse changes or volatility in foreign currency reserve levels, commodity prices (including oil prices), exchange rates (including fluctuation of the U.S. dollar, Euro or Japanese Yen exchange rates or revaluation of the Chinese Renminbi), interest rates, inflation rates or stock markets;

increased sovereign default risk in select countries and the resulting adverse effects on the global financial markets;

investigations of large Korean business groups and their senior management for possible misconduct;

a continuing rise in the level of household debt and increasing delinquencies and credit defaults by retail and small- and medium-sized enterprise borrowers in Korea;

social and labor unrest;

decreases in the market prices of Korean real estate;

the economic impact of any pending or future free trade agreements or of any changes to existing free trade agreements;

a decrease in tax revenue or a substantial increase in the Government s expenditures for fiscal stimulus measures, unemployment compensation and other economic and social programs that would lead to an increased government budget deficit;

financial problems or lack of progress in the restructuring of Korean business groups, other large troubled companies, their suppliers or the financial sector;

loss of investor confidence arising from corporate accounting irregularities or corporate governance issues concerning certain Korean companies;

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

geo-political uncertainty and risk of further attacks by terrorist groups around the world;

the occurrence of severe health epidemics in Korea or other parts of the world, such as the Middle East Respiratory Syndrome outbreak in Korea in 2015;

natural or man-made disasters that have a significant adverse economic or other impact on Korea or its major trading partners;

political uncertainty or increasing strife among or within political parties in Korea;

hostilities or political or social tensions involving oil producing countries in the Middle East and North Africa and any material disruption in the global supply of oil or sudden increase in the price of oil;

increased reliance on exports to service foreign currency debts, which could cause friction with Korea s trading partners;

the continued growth of the Chinese economy, to the extent its benefits (such as increased exports to China) are outweighed by its costs (such as competition in export markets or for foreign investment and the relocation of manufacturing bases from Korea to China);

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- political or social tensions involving Russia and any resulting adverse effects on the global supply of oil or the global financial markets; and

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

We rely on export sales for a significant portion of our total sales. Adverse economic and financial developments in Asia in the future may have an adverse effect on demand for our products in Asia and increase our foreign exchange risks.

Our export sales and overseas sales to customers abroad accounted for 61.6% of our total revenue from steel products produced and sold by us in 2018. Our export sales volume to customers in Asia, including China, Japan, Indonesia, Thailand and Malaysia, accounted for 62.6% of our total export sales revenue from steel products produced and exported by us in 2018, and we expect our sales to these countries to remain important in the future. In particular, our export volume to China has increased in recent years and accounted for 28.9% of our total export sales revenue from steel products produced and exported by us in 2018. Accordingly, adverse economic and financial developments in these countries may have an adverse effect on demand for our products. Unfavorable or uncertain economic and market conditions, which can be caused, among others, by difficulties in the financial sector, corporate, political or other scandals that may reduce confidence in the markets, declines in business confidence, increases in inflation, natural disasters or pandemics, outbreaks of hostilities or other geopolitical instability. 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 (such as the controversy between Korea and China, which is Korea s largest export market, regarding the deployment of a Terminal High Altitude Area Defense system in Korea by the United States in March 2017 and the ensuing economic and other retaliatory actions by China against Korea during the remainder of 2017), or a combination of these or other factors, have, in the past adversely affected, and may in the future adversely affect, demand for our products.

Economic weakness in Asia may also adversely affect our sales to the Korean companies that export to the region, especially companies in the construction, shipbuilding, automotive, electrical appliances and downstream steel processing industries. Weaker demand in these countries, combined with an increase in global production capacity, may also reduce export prices in Dollar terms of our principal products sold to customers in Asia. For a discussion of production over-capacity in the global steel industry, see We operate in the highly competitive steel, trading and construction industries, and our failure to successfully compete would adversely affect our market position and business. We attempt to maintain and expand our export sales to generate foreign currency receipts to cover our foreign currency purchases and debt service requirements. Consequently, any decrease in our export sales could also increase our foreign exchange risks.

Depreciation of the value of the Won against the Dollar and other major foreign currencies may have a material adverse effect on the results of our operations and on the price of the ADSs.

Our consolidated financial statements are prepared from our local currency denominated financial results, assets and liabilities and our subsidiaries around the world, which are then translated into Won. A substantial proportion of our consolidated financial results is accounted for in currencies other than the Won. Accordingly, our consolidated financial results and assets and liabilities may be materially affected by changes in the exchange rates of foreign currencies. In 2018, 61.6% of our total revenue from steel products produced and sold by us was in overseas markets outside of Korea. To the extent that we incur costs in one currency and make sales in another, our profit margins may be affected by changes in the exchange rates between the two currencies. Since the currency in which sales are recorded may not be the same as the currency in which expenses are incurred, foreign exchange rate fluctuations may materially affect our results of operations. Depreciation of the Won may materially affect the results of our operations because, among other things, it causes:

- an increase in the amount of Won required for us to make interest and principal payments on our foreign currency-denominated debt;
- an increase in Won terms in the costs of raw materials and equipment that we purchase from overseas sources and a substantial portion of our freight costs, which are denominated primarily in Dollars; and
- foreign exchange translation losses on foreign-currency denominated liabilities, which lower our earnings for accounting purposes.

Appreciation of the Won against major currencies, on the other hand, causes:

- our export products to be less competitive by raising our prices in Dollar, Yen and Renminbi terms; and
- a reduction in net sales and accounts receivables in Won from export sales, which are primarily denominated in Dollars and to a lesser extent in Yen and Renminbi.

The overall net impact from fluctuations of the Won against major currencies is difficult to estimate and varies from year to year. We strive to naturally offset our foreign exchange risk by matching foreign currency receivables with our foreign currency payables and our overseas subsidiaries have sought to further mitigate the adverse impact of exchange rate fluctuations by conducting business transactions in the local currency of the respective market in which the transactions occur. In particular, POSCO International s exposure to fluctuations in exchange rates, including the Won/Dollar exchange rate, is limited because trading transactions typically involve matched purchase and sale contracts, which result in limited settlement exposure, and because POSCO International s contracts with domestic suppliers of products for export and with domestic purchasers of imported products are generally denominated in Dollars. Although the impact of exchange rate fluctuations is partially mitigated by such strategies, we and our subsidiaries, particularly POSCO International and POSCO Engineering & Construction Co., Ltd. (POSCO E&C), also periodically enter into derivative contracts, primarily foreign currency swaps and forward exchange contracts, to further hedge some of our foreign exchange risks. However, our results of operations have historically been affected by exchange rate fluctuations and there can be no assurance that such strategies will be sufficient to reduce or eliminate the adverse impact of such fluctuations in the future.

Fluctuations in the exchange rate between the Won and the Dollar will also affect the Dollar equivalent of the Won price of the shares of our common stock on the KRX KOSPI Market and, as a result, will likely affect the market price of the ADSs. These fluctuations will also affect the Dollar conversion by the depositary for the ADRs of cash dividends, if any, paid in Won on shares of common stock represented by the ADSs.

We are dependent on imported raw materials, and significant increases in market prices of essential raw materials could adversely affect our margins and profits.

We purchase substantially all of the principal raw materials we use from sources outside Korea, including iron ore and coal. POSCO imported approximately 54 million dry metric tons of iron ore and 29 million wet metric tons of coal in 2018. Iron ore is imported primarily from Australia, Brazil and Canada. Coal is imported primarily from Australia, Canada and Russia. Although we have not experienced significant unanticipated supply disruptions in the past, supply disruptions, which could be caused by political or other events in the countries from which we import these materials, could adversely affect our operations. In addition, we are particularly exposed to increases in the prices of coal, iron ore and nickel, which represent the largest components of our cost of goods sold. The prices

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of our key raw materials have fluctuated significantly in recent years. For example, the average market price of coal per wet metric ton (Premium Low Vol Coking Coal, FOB Australia Index announced by Platts) was US$143 in 2016, US$188 in 2017 and US$207 in 2018. The average market price of iron ore per dry metric ton (Iron Ore 62% Fe, CFR China Index announced by Platts) was US$58 in 2016, US$71 in 2017 and US$69 in 2018.

Our long-term supply contracts generally have terms of three to ten years and provide for periodic price adjustments to the then-market prices. We typically adjust the prices on a quarterly basis and maintain approximately one month of inventory of raw materials. Such price adjustments are driven by various factors, including the global economic outlook, global market prices of raw materials and steel products, supply and demand outlook of raw materials and production costs of raw materials. For both coal and iron ore, we typically agree on the purchase price with the suppliers primarily based on the spot market price periodically announced by Platts (Premium Low Vol Coking Coal, FOB Australia Index and Iron Ore 62% Fe, CFR China Index). As of December 31, 2018, 100 million tons of iron ore and 14 million tons of coal remained to be purchased under long-term supply contracts. Future increases in prices of our key raw materials and our inability to pass along such increases to our customers could adversely affect our margins and profits. Increased prices may also cause potential customers to defer purchase of steel products, while rapidly falling prices may increase loss on valuation of raw material inventory purchased when prices were higher, either of which could have an adverse effect on our business, financial condition and results of operations.

We operate in the highly competitive steel, trading and construction industries, and our failure to successfully compete would adversely affect our market position and business.

Steel. The markets for our steel products are highly competitive and we face intense global competition. China is the largest steel producing country in the world by a significant margin, with the balance between its domestic production and demand being an important factor in the determination of global steel prices. In recent years, a slowdown in domestic demand for steel products in China resulting from slowed economic growth, combined with an expansion in steel production capacity, has led to production over-capacity in the Chinese steel industry, which in turn has led the Chinese government to pursue aggressive consolidation in the Chinese steel industry, such as the consolidation of Baosteel Group and Wuhan Iron and Steel in 2016, that has resulted in fewer but larger steel manufacturers that are able to compete more effectively in the global steel industry. In addition, the global steel industry has experienced consolidation in the past, including through the mergers of Mittal and Arcelor in 2006 and Nippon Steel and Sumitomo Metal in 2012. Competition from such global steel manufacturers with expanded production capacity as well as competitors from emerging markets, especially from China and India, has resulted in significant price competition and may result in declining margins and reductions in revenue in the future. Our larger competitors may use their resources, which may be greater than ours, against us in a variety of ways, including by making additional acquisitions, investing more aggressively in product development and capacity and displacing demand for our export products.

In the past, increased production capacity, combined with decreased demand resulting from a slowdown of the global economy, has from time to time resulted in production over-capacity in the global steel industry which in turn resulted in downward pressure on global steel prices. For example, the global steel prices decreased in the fourth quarter of 2018 in part due to a decrease in demand from China as well as an increase in the production capacity of Chinese manufacturers that survived the consolidation of the Chinese steel industry. Production over-capacity in global steel industry may intensify if global economic growth slows or demand from developing countries, particularly from China, continues to lag behind the growth in production capacity. Production over-capacity in the global steel industry is likely to:

- reduce export prices in Dollar terms of our principal products, which in turn may reduce our sales prices in Korea;

increase competition in the Korean market as foreign producers seek to export steel products to Korea as other markets experience a slowdown;

negatively affect demand for our products abroad and our ability to expand export sales; and

affect our ability to increase steel production in general.

Steel also competes with other natural and synthetic materials that may be used as steel substitutes, such as aluminum, cement, composites, glass, plastic and wood. Government regulatory initiatives mandating the use of such materials instead of steel, whether for environmental or other reasons, as well as the development of attractive alternative substitutes for steel products, may reduce demand for steel products and increase competition in the global steel industry.

As part of our strategy to compete in this challenging landscape, we will continue to invest in developing innovative products that offer the greatest potential returns and enhance the overall quality of our products, as well as make additional investments in the development of new manufacturing technologies. However, there is no assurance that we will be able to continue to compete successfully in this economic environment or that a slowdown of the global economy or production over-capacity will not have a material adverse effect on our business, results of operations or financial condition.

Trading. POSCO International competes principally with other Korean general trading companies that are affiliated with major domestic business groups, as well as global trading companies based in other countries. In the domestic market, competition for export transactions on behalf of domestic suppliers and import transactions on behalf of domestic purchasers was limited, as most affiliated general trading companies of large Korean business groups generally relied on affiliate transactions for the bulk of their trading business. However, in recent years, many of these Korean general trading companies have reduced their reliance on their affiliated business group and transactions carried out on behalf of their member companies and instead have generally evolved to focus on segments of the import and export markets in which they have a competitive advantage. As a result, competition among Korean general trading companies in the area of traditional trade has become more intense.

The overseas trading markets in which POSCO International operates are also highly competitive. POSCO International s principal competitors in overseas trading markets include Korean trading companies that operate in various international markets, as well as foreign trading companies, particularly those based in Japan. As POSCO International diversifies into businesses other than traditional trading such as natural resources development, it also increasingly competes with other Korean and international companies involved in these businesses. Some of POSCO International s competitors may be more experienced and have greater financial resources and pricing flexibility than POSCO International, as well as more extensive global networks and wider access to customers. There is no assurance that POSCO International will be able to continue to compete successfully in this economic environment or that the prolonged slowdown of the global economy will not have a material adverse effect on its business, results of operations or financial condition. In 2018, we recognized impairment of goodwill of Won 158 billion related to a decrease in value-in-use of POSCO International.

Construction. POSCO E&C, our consolidated subsidiary, operates in the highly competitive construction industry. Competition is based primarily on price, reputation for quality, reliability, punctuality and financial strength of contractors. Intense competition among construction companies may result in, among other things, a decrease in the price POSCO E&C can charge for its services, difficulty in winning bids for construction projects, an increase in construction costs and difficulty in obtaining high-quality contractors and qualified employees.

In Korea, POSCO E&C s main competition in the construction of residential and non-residential buildings, EPC (or engineering, procurement and construction) projects, urban planning and development projects and civil works projects consists of approximately ten major domestic construction companies, many of which are member companies of other large business groups in Korea and are capable of undertaking larger-scale, higher-value-added projects that offer greater potential returns. A series of measures introduced by the Government over the past few years to regulate housing prices in Korea, as well as increasing popularity of low-bid contracts in civil works project mandates, have contributed to increased competition in the Korean construction industry in recent years.

Competition for new project awards in overseas markets is also intense. In these markets, POSCO E&C faces competition from local construction companies and other major Korean construction companies with overseas operations, as well as international construction companies from other countries. Construction companies from other developed countries may be more experienced, have greater financial resources and possess more sophisticated technology than POSCO E&C, while construction companies from developing countries often have the advantage of lower wage costs. Some of these competitors have achieved higher market penetration than POSCO E&C has in specific markets in which it competes, and POSCO E&C may need to accept lower margins in order for it to compete successfully against them. POSCO E&C s failure to successfully compete in the domestic or overseas construction markets could adversely affect its market position and its results of operations and financial condition.

We may not be able to successfully execute our diversification strategy.

In part to prepare for the eventual maturation of the Korean steel market, we have made investments in the past decade to secure new growth engines by diversifying into new businesses related to our steel operations that we believe will offer greater potential returns, such as participation in EPC projects in the steel sector and natural resources development, as well as entering into new businesses not related to our steel operations such as power generation and alternative energy solutions, LNG and agricultural trading and production of anode and cathode materials for rechargeable batteries as well as other comprehensive materials such as lithium, magnesium sheet, nickel and cobalt. From time to time, we may selectively acquire or invest in companies to pursue such diversification strategy.

The success of our diversification strategy will depend, in part, on our ability to realize the anticipated growth opportunities and synergies. Some of our diversification efforts have not been successful. For example, we incurred impairment loss of Won 810 billion in 2018 related to our synthetic natural gas production facility in Gwangyang due to our discontinuation of the business which we had launched in 2011, which was adversely impacted by a decline in the market price of liquefied natural gas (LNG). The realization of the anticipated benefits depends on numerous factors, some of which are outside our control, including the availability of qualified personnel, establishment of new relationships and expansion of existing relationships with various customers and suppliers, procurement of necessary technology and know-how to engage in such businesses and decreases in the prices of competing products or services that make our products or services less competitive. The realization of the anticipated benefits may be impeded, delayed or reduced as a result of numerous factors, some of which are outside our control. These factors include:

- difficulties in integrating the operations of the acquired business, including information and accounting systems, personnel, policies and procedures, and in reorganizing or reducing overlapping operations, marketing networks and administrative functions, which may require significant amounts of time, financial resources and management attention;
- unforeseen contingent risks or latent liabilities relating to the acquisition that may become apparent in the future;
- difficulties in managing a larger business; and
- loss of key management personnel or customers.

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In addition, in order to finance these acquisitions, we intend to use cash on hand, funds from operations, issuances of equity and debt securities, and, if necessary, financings from banks and other sources as well as entering into consortiums with financial investors. However, no assurance can be given that we will be able to obtain sufficient financing for such acquisitions or investments on terms commercially acceptable to us or at all. We cannot assure you that our diversification strategy can be completed profitably or that the diversification efforts will not adversely affect our combined business, financial condition and results of operations.

Expansion of our production operations abroad is important to our long-term success, and our limited experience in the operation of our business outside Korea increases the risk that our international expansion efforts will not be successful.

We conduct international trading and construction operations abroad, and our business relies on a global trading network comprised of overseas subsidiaries, branches and representative offices. Although many of our subsidiaries and overseas branches are located in developed countries, we also operate in numerous countries with developing economies. In addition, we intend to continue to expand our steel production operations internationally by carefully seeking out promising investment opportunities, particularly in China, India, Southeast Asia and Latin America, in part to prepare for the eventual maturation of the Korean steel market. We may enter into additional joint ventures with foreign steel producers that would enable us to rely on these businesses to conduct our operations, establish local networks and coordinate our sales and marketing efforts abroad. To the extent that we enter into these arrangements, our success will depend in part on the willingness of our partner companies to dedicate sufficient resources to their partnership with us.

In other situations, we may decide to establish manufacturing facilities by ourselves instead of relying on partners. The demand and market acceptance for our products produced abroad are subject to a high level of uncertainty and are substantially dependent upon the market condition of the global steel industry. We cannot assure you that our international expansion plan will be profitable or that we can recoup the costs related to such investments.

Expansion of our trading, construction and production operations abroad requires management attention and resources. In addition, we face additional risks associated with our expansion outside Korea, including:

- challenges caused by distance, language and cultural differences;
- higher costs associated with doing business internationally;
- legal and regulatory restrictions, including foreign exchange controls that might prevent us from repatriating cash earned in countries outside Korea;
- longer payment cycles in some countries;
- credit risk and higher levels of payment fraud;
- currency exchange risks;
- potentially adverse tax consequences;
- political and economic instability; and

seasonal reductions in business activity during the summer months in some countries.

We have limited insurance coverage and may incur significant losses resulting from operating hazards, product liability claims from customers or business interruptions.

The normal operation of our manufacturing facilities may be interrupted by accidents caused by operating hazards, power supply disruptions and equipment failures, as well as natural disasters. As with other industrial companies, our operations involve the use, handling, generation, processing, storage, transportation and disposal of hazardous materials, which may result in fires, explosions, spills and other unexpected or dangerous accidents causing property damage as well as personal injuries or death. We are also exposed to risks associated with product liability claims in the event that the use of the products we sell results in injury. We maintain property insurance for our property, plant and equipment that we believe to be consistent with market practice in Korea. However, we may not have adequate resources to satisfy a judgment in excess of our insurance coverage in the event of a successful claim against us. Any occurrence of accidents or other events affecting our operations could result in potentially significant monetary damages, diversion of resources, production disruption and delay in delivery of our products, which may have a material adverse effect on our business, financial condition and results of operations.

Further increases in, or new impositions of, anti-dumping, safeguard or countervailing duty proceedings may have an adverse impact on our export sales.

As a steel producer with global sales and operations, we are involved in trade remedy proceedings in markets worldwide, including in the United States. We proactively participate in and plan for such proceedings to minimize any adverse effects and associated risks. While there has been an increase in the number of trade cases in recent years, and an increased focus on trade issues by government officials, all such cases have been product and market-specific, and thus have been limited in scope relative to our global sales and operations. We continue to carefully monitor developments with respect to trade remedy policy in all markets in which we participate and, where necessary, vigorously defend our rights through litigation before tribunals such as the U.S. Court of International Trade. Our products that are subject to anti-dumping duties, safeguard duties, countervailing duties, quotas or tariffs in the aggregate currently do not account for a material portion of our total sales, and such proceedings have not had a material adverse impact on our business and operations in recent years. However, there can be no assurance that increases in, or new impositions of, anti-dumping duties, safeguard duties, countervailing duties, quotas or tariffs on our exports of products abroad may not have a material adverse impact on our exports in the future.

We participate in overseas natural resources exploration, development and production projects, which expose us to various risks.

As part of our efforts to diversify our operations, we carefully seek out promising overseas natural resources exploration, development and production opportunities. For instance, we purchased lithium mining rights at the Salar del Hombre Muerto salt flat in northern Argentina in August 2018 for $280 million. We also participate in natural resources projects as part of consortia or through acquisitions of minority interests, such as a gas field exploration project in Myanmar through POSCO International. We may also selectively acquire or invest in companies or businesses that engage in such activities. To the extent that we enter into these arrangements, our success in these endeavors will depend in part on the willingness of our partner companies to dedicate sufficient resources to their partnership with us, as well as our ability to finance such investments.

The demand and market acceptance for such activities abroad are subject to a substantially higher level of uncertainty than our traditional steel business and are substantially dependent upon the market condition of the global natural resources industry as well as the political and social environment of the target countries. The performance of projects in which we participate may be adversely affected by the occurrence of military hostility, political unrest or acts of terrorism. In addition, some of our current exploration, development and production projects involve drilling exploratory wells on properties with no proven amount of natural resource reserves. Although all drilling, whether developmental or exploratory, involves risks, exploratory drilling involves greater risks of dry holes or failure to find commercial quantities of natural resources. Other risks to which such activities are subject include obtaining required regulatory approvals and licenses, securing and maintaining adequate property rights to land and natural resources, and managing local opposition to project development. A decrease in the market price of raw materials may also adversely impact the value of our investments related to natural resources projects, potentially resulting in impairment losses. For example, in 2018, we recognized impairment of industrial property rights of Won 78 billion related to our investment in Hume Coal Pty Limited, a coal mining company in Australia, and Won 50 billion in connection with a shale oil and gas project in Canada. We have limited experience in this business, and we cannot assure you that our overseas natural resources exploration, development and production projects will be profitable, that we will be able to meet the financing requirements for such projects, or that we can recoup the costs related to such investments, which in turn could materially and adversely affect our business, financial condition and results of operations.

We may encounter problems with joint overseas natural resources exploration, development and production projects and large-scale infrastructure projects, which may materially and adversely affect our business.

We typically pursue our natural resources exploration, development and production projects jointly with consortium partners or through acquisition of minority interests in such projects, and we expect to be involved in other joint projects in the future. We sometimes hold a majority interest in the projects among the consortium partners, but we often lack a controlling interest in the joint projects. Therefore, we may not be able to require that our joint ventures sell assets or return invested capital, make additional capital contributions or take any other action without the vote of at least a majority of our consortium partners. If there are disagreements between our consortium partners and us regarding the business and operations of the joint projects, we cannot assure you that we will be able to resolve them in a manner that will be in our best interests. Certain major decisions, such as selling a stake in the joint project, may require the consent of all other partners. These limitations may adversely affect our ability to obtain the economic and other benefits we seek from participating in these projects.

In addition, our consortium partners may:

- have economic or business interests or goals that are inconsistent with ours;
- take actions contrary to our instructions, requests, policies or objectives;
- be unable or unwilling to fulfill their obligations;
- have financial difficulties; or
- have disputes with us as to their rights, responsibilities and obligations.

Any of these and other factors may have a material adverse effect on the performance of our joint projects and expose us to a number of risks, including the risk that the partners may be incapable of providing the required financial support to the partnerships and the risk that the partners may not be able to fulfill their other obligations, resulting in disputes not only between our partners and us, but also between the joint ventures and their customers. Such a material adverse effect on the performance of our joint projects may in turn materially and adversely affect our business, results of operations and financial condition.

Cyclical fluctuations based on macroeconomic factors may adversely affect POSCO E&C s business and performance.

We engage in engineering and construction activities through POSCO E&C. The Construction Segment is highly cyclical and tends to fluctuate based on macroeconomic factors, such as consumer confidence and income, employment levels, interest rates, inflation rates, demographic trends and policies of the Government. From time to time, the construction industry has experienced significant and sometimes prolonged downturns, and our construction revenues have fluctuated in the past depending on the level of public and private sector construction activities in Korea and abroad. In addition, the performance of POSCO E&C s domestic residential property business is highly dependent on the general condition of the real estate market in Korea. Although the construction industry in Korea has shown signs of recovery in recent years, the demand for construction activities abroad remains weak and the overall prospects for Korean construction companies in 2019 and beyond remain uncertain. A prolonged general downturn in the construction market resulting in weaker demand may adversely affect our business, results of operations or financial condition.

Many of POSCO E&C s domestic and overseas construction projects are on a fixed-price basis, which could result in losses for us in the event that unforeseen additional expenses arise with respect to the project.

Many of POSCO E&C s domestic and overseas construction projects are carried out on a fixed-price basis according to a predetermined timetable, pursuant to the terms of a fixed-price contract. Under such fixed-price contracts, POSCO E&C retains all cost savings on completed contracts but is also liable for the full amount of all cost overruns and may be required to pay damages for late delivery. The pricing of fixed-price contracts is crucial to POSCO E&C s profitability, as is its ability to quantify risks to be borne by it and to provide for contingencies in the contract accordingly.

POSCO E&C attempts to anticipate costs of labor, raw materials, parts and components in its bids on fixed-price contracts. However, the costs incurred and gross profits realized on a fixed-price contract may vary from its estimates due to factors such as:

- unanticipated variations in labor and equipment productivity over the term of a contract;
- unanticipated increases in labor, raw material, parts and components, subcontracting and overhead costs, including as a result of bad weather;
- delivery delays and corrective measures for poor workmanship; and
- errors in estimates and bidding.

If unforeseen additional expenses arise over the course of a construction project, such expenses are usually borne by POSCO E&C, and its profit from the project will be correspondingly reduced or eliminated. For example, we incurred losses in recent years in connection with a delay in the construction of CSP-Companhia Siderurgia do Pecem steel plant complex in Brazil. If POSCO E&C experiences significant unforeseen additional expenses with respect to its fixed price projects, it may incur losses on such projects, which could have a material adverse effect on its financial condition and results of operations.

We are subject to environmental regulations, and our operations could expose us to substantial liabilities.

We are subject to national and local environmental laws and regulations, including increasing pressure to reduce emission of carbon dioxide relating to our manufacturing process, and our steel manufacturing and construction operations could expose us to risk of substantial liability relating to environmental or health and safety issues, such as those resulting from discharge of pollutants and carbon dioxide into the environment, the handling, storage and disposal of solid or hazardous materials or wastes and the investigation and remediation of contaminated sites. We may be responsible for the investigation and remediation of environmental conditions at currently and formerly operated manufacturing or construction sites. For example, we incurred expenses in recent years relating to contamination of land near our magnesium smelting plant located in Gangneung, Korea and gas treatment plant located in our Pohang Works. We may also be subject to associated liabilities, including liabilities for natural resource damage, third party property damage or personal injury resulting from lawsuits brought by the Government or private litigants. In the course of our operations, hazardous wastes may be generated at third party-owned or operated sites, and hazardous wastes may be disposed of or treated at third party-owned or operated disposal sites. If those sites become contaminated, we could also be held responsible for the cost of investigation and remediation of such sites, for any associated natural resource damage, and for civil or criminal fines or penalties.

If our cybersecurity is breached, we may incur significant legal and financial exposure, damage to our reputation and a loss of confidence of our customers.

Our business involves the storage and transmission of confidential information relating to us as well as our customers and suppliers, and any breach in our cybersecurity could expose us to a risk of loss, the improper use or disclosure of such information, ensuing potential liability or litigation, any of which could harm our reputation and adversely affect our business. Although there has been no material instance where an unauthorized party was able to obtain access to our data or our customers data, there can be no assurance that we will not be vulnerable to cyber-attacks in the future.

Our cybersecurity measures may also fail due to employee error, malfeasance or otherwise. Instituting appropriate access controls and safeguards across our information technology infrastructure is challenging. Furthermore, outside parties may attempt to fraudulently induce employees to disclose sensitive information in order to gain access to our data or our customers data or accounts or may otherwise obtain access to such data or accounts. Because the techniques used to obtain unauthorized access, disable or degrade service or sabotage systems change frequently and often are not recognized until launched against a target, we may be unable to anticipate these techniques or implement adequate preventative measures. If an actual or perceived breach of our cybersecurity occurs or the market perception of the effectiveness of our cybersecurity measures is adversely affected, we may incur significant legal and financial exposure, including legal claims and regulatory fines and penalties, damage to our reputation and a loss of confidence of our customers, which could have an adverse effect on our business, financial condition and results of operations.

Failure to protect our intellectual property rights could impair our competitiveness and harm our business and future prospects.

We believe that developing new steel manufacturing technologies that can be differentiated from those of our competitors, such as FINEX, automotive steel manufacturing technology and high-manganese steel manufacturing technology, is critical to the success of our business. We take active measures to obtain protection of our intellectual property by obtaining patents and undertaking monitoring activities in our major markets. However, we cannot assure you that the measures we take will effectively deter competitors from improper use of our proprietary technologies. Our competitors may misappropriate our intellectual property, disputes as to ownership of intellectual property may arise and our intellectual property may otherwise become known or independently developed by our competitors. Any failure to protect our intellectual property could impair our competitiveness and harm our business and future prospects.

We rely on trade secrets and other unpatented proprietary know-how to maintain our competitive position, and unauthorized disclosure of our trade secrets or other unpatented proprietary know-how could negatively affect our business.

We rely on trade secrets and unpatented proprietary know-how and information. We enter into confidentiality agreements with each of our employees and consultants upon the commencement of an employment or consulting relationship. These agreements generally provide that all inventions, ideas, discoveries, improvements and patentable material made or conceived by the individual arising out of the employment or consulting relationship and all confidential information developed or made known to the individual during the term of the relationship is our exclusive property. We cannot assure the enforceability of these types of agreements, or that they will not be breached. We also cannot be certain that we will have adequate remedies for any breach. The disclosure of our trade secrets or other know-how as a result of such a breach could adversely affect our business.

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We face the risk of litigation proceedings relating to infringement of intellectual property rights of third parties, which, if determined adversely to us, could cause us to lose significant rights, pay significant damage awards or suspend the sale of certain products.

Our success depends largely on our ability to develop and use our technology and know-how in a proprietary manner without infringing the intellectual property rights of third parties. The validity and scope of claims relating to technology and patents involve complex scientific, legal and factual questions and analysis and, therefore, may be highly uncertain. In addition, because patent applications in many jurisdictions are kept confidential for an extended period before they are published, we may be unaware of other persons pending patent applications that relate to our products or manufacturing processes. Accordingly, we face the risk of litigation proceedings relating to infringement of intellectual property rights of third parties.

The plaintiffs in actions relating to infringement of intellectual property rights typically seek injunctions and substantial damages. Although patent and other intellectual property disputes are often settled through licensing or similar arrangements, there can be no assurance that such licenses can be obtained on acceptable terms or at all. Accordingly, regardless of the scope or validity of disputed patents or the merits of any patent infringement claims by potential or actual litigants, we may have to engage in protracted litigation. The defense and prosecution of intellectual property suits, patent opposition proceedings and related legal and administrative proceedings can be both costly and time consuming and may significantly divert the efforts and resources of our technical and management personnel. An adverse determination in any such litigation or proceedings could subject us to pay substantial damages to third parties, require us to seek licenses from third parties and pay ongoing royalties or redesign certain products, or subject us to injunctions prohibiting the manufacture and sale of our products or the use of technologies in certain jurisdictions. The occurrence of any of the foregoing could have a material adverse effect on our reputation, business, financial condition and results of operations.

We may be exposed to potential claims for unpaid wages and become subject to additional labor costs arising from the Supreme Court of Korea s interpretation of ordinary wages.

Under the Labor Standards Act, an employee s ordinary wage is used as the basis for calculating various statutory benefits. Prior to the Supreme Court of Korea s decision described below, we and other companies in Korea had interpreted the previous guidelines issued by the Ministry of Employment and Labor as excluding fixed bonuses that are paid other than on a monthly basis, such as bi monthly, quarterly or biannually paid bonuses, from employees ordinary wages.

On December 18, 2013, the Supreme Court of Korea ruled that regularly paid bonuses, including those that are paid other than on a monthly basis, are included in the scope of employees ordinary wages if these bonuses are paid (i) regularly, (ii) uniformly and (iii) on a fixed basis, notwithstanding differential amounts based on seniority. Under this decision, any provision of a collective bargaining agreement or other agreements that attempt to exclude such regular bonuses from employees ordinary wages will be deemed void for violation of the mandatory provisions of Korean law.

The Supreme Court of Korea s decision clarified that if payment of a regular bonus is limited only to those working for the employer on a specific date, such bonus is not fixed and thus does not constitute part of an employee s ordinary wage. The Ministry of Employment and Labor subsequently published guidelines on January 23, 2014 (the Guidelines). According to the Guidelines, the Government excludes, from ordinary wages, regular bonuses contingent on employment on a specific date. Based on the Supreme Court of Korea s decision and the Guidelines, we believe that regular bonuses we have paid to our employees are likely not required to be included in their ordinary wages because we have paid regular bonuses only to those working for us on the date of payment calculation, the 15th day of each month. However, if we are nonetheless determined to have underpaid employees by under-calculating their ordinary wages over the past three years or in the future, we may be liable for additional payments reflecting the expanded scope of employees ordinary wages. Any such additional payments may have an adverse effect on our financial condition and results of operations.

Escalations in tensions with North Korea could have an adverse effect on us and the market value of our common shares and ADSs.

Relations between Korea and North Korea have been tense throughout Korea s modern history. The level of tension between the two Koreas has fluctuated and may increase abruptly as a result of current and future events. In particular, there have been heightened security concerns in recent years stemming from North Korea s nuclear weapon and ballistic missile programs as well as its hostile military actions against Korea. Some of the significant incidents in recent years include the following:

North Korea renounced its obligations under the Nuclear Non-Proliferation Treaty in January 2003 and conducted six rounds of nuclear tests since October 2006, including claimed detonations of hydrogen bombs, which are more powerful than plutonium bombs, and warheads that can be mounted on ballistic missiles. Over the years, North Korea has also conducted a series of ballistic missile tests, including missiles launched from submarines and intercontinental ballistic missiles that it claims can reach the United States mainland. In response, the Government has repeatedly condemned the provocations and flagrant violations of relevant United Nations Security Council resolutions. In February 2016, the Government also closed the inter-Korea Gaesong Industrial Complex in response to North Korea s fourth nuclear test in January 2016. Internationally, the United Nations Security Council has passed a series of resolutions condemning North Korea s actions and significantly expanding the scope of sanctions applicable to North Korea, most recently in December 2017 in response to North Korea s intercontinental ballistic missile test in November 2017. Over the years, the United States and the European Union have also expanded their sanctions applicable to North Korea.

In March 2010, a Korean naval vessel was destroyed by an underwater explosion, killing many of the crewmen on board. The Government formally accused North Korea of causing the sinking, while North Korea denied responsibility. Moreover, in November 2010, North Korea fired more than one hundred artillery shells that hit Korea s Yeonpyeong Island near the Northern Limit Line, which acts as the de facto maritime boundary between Korea and North Korea on the west coast of the Korean peninsula, causing casualties and significant property damage. The Government condemned North Korea for the attack and vowed stern retaliation should there be further provocation.

North Korea s economy also faces severe challenges, which may further aggravate social and political pressures within North Korea.

Although bilateral summit meetings were held between Korea and North Korea in April, May and September 2018 and between the United States and North Korea in June 2018 and February 2019, there can be no assurance that the level of tensions affecting the Korean peninsula will not escalate in the future. Any increase in tensions, which may occur, for example, if North Korea experiences a leadership crisis, high-level contacts between Korea or the United States and North Korea break down or further military hostilities occur, could have a material adverse effect on the Korean economy and on our business, financial condition and results of operations and the market value of our common stock and ADSs.

If you surrender your ADRs to withdraw shares of our common stock, you may not be allowed to deposit the shares again to obtain ADRs.

Under the deposit agreement, holders of shares of our common stock may deposit those shares with the ADR depositary s custodian in Korea and obtain ADRs, and holders of ADRs may surrender

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ADRs to the ADR depositary 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 that exceeds the difference between (i) the aggregate number of shares deposited by us 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 (ii) the number of shares on deposit with the depositary bank at the time of such proposed deposit. It is possible that we may not give the consent. As a result, if you surrender ADRs and withdraw shares of common stock, you may not be able to deposit the shares again to obtain ADRs. See Item 10. Additional Information Item 10.D. Exchange Controls.

You may not be able to exercise preemptive rights for additional shares of common stock and may suffer dilution of your equity interest in us.

The 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 issue new shares to persons other than our shareholders (See Item 10.B. Memorandum and Articles of Association Preemptive Rights and Issuance of Additional Shares), a holder of our ADSs will experience dilution of such holding. If none of these exceptions is available, we will be required to grant preemptive rights when issuing additional common shares under Korean law. Under the deposit agreement governing the ADSs, if we offer any rights to subscribe for additional shares of our common stock or any rights of any other nature, the ADR depositary, 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 ADR depositary, 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 Securities Act 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 Securities Act.

We are under no obligation to file any registration statement under the Securities Act to enable you to exercise preemptive rights in respect of the common shares underlying the ADSs, and we cannot assure you that any registration statement would be filed or that an exemption from the registration requirement under the Securities Act would be available. Accordingly, 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 may suffer dilution of your equity interest in us.

U.S. investors may have difficulty enforcing civil liabilities against us and our directors and senior management.

We are incorporated in Korea with our principal executive offices located in Seoul. The majority of our directors and senior management are residents of jurisdictions outside the United States, and the majority of our assets and the assets of such persons are located outside the United States. As a result, U.S. investors may find it difficult to effect service of process within the United States upon us or such persons or to enforce outside the United States judgments obtained against us or such persons in U.S. courts, including actions predicated upon the civil liability provisions of the U.S. federal securities laws. It may also be difficult for an investor to enforce in U.S. courts judgments obtained against us or such persons in courts in jurisdictions outside the United States, including actions predicated upon the civil liability provisions of the U.S. federal securities laws. It may also be difficult for a U.S. investor to bring an action in a Korean court predicated upon the civil liability provisions of the U.S. federal securities laws against our directors and senior management and non-U.S. experts named in this annual report.

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We expect to continue operations and investments relating to countries targeted by United States and European Union economic sanctions.

The U.S. Department of the Treasury s Office of Foreign Assets Control, or OFAC, enforces certain laws and regulations (OFAC Sanctions) that impose restrictions upon U.S. persons and, in some instances, foreign entities owned or controlled by U.S. persons, with respect to activities or transactions with certain countries, governments, entities and individuals that are the subject of OFAC Sanctions (U.S. Sanctions Targets). U.S. persons are also generally strictly prohibited from facilitating such activities or transactions. Similarly, the European Union enforces certain laws and regulations (E.U. Sanctions) that impose restrictions upon nationals of E.U. member states, persons located within E.U. member states, entities incorporated or constituted under the law of an E.U. member state, or business conducted in whole or in part in E.U. member states with respect to activities or transactions with certain countries, governments, entities and individuals that are the subject of E.U. Sanctions (E.U. Sanctions Targets and together with U.S. Sanctions Targets, Sanctions Targets). E.U. persons are also generally prohibited from activities that promote such activities or transactions.

We engage in limited business activities in countries that are deemed Sanctions Targets, including Iran and Cuba. We produce and export, typically through our sales subsidiaries, steel products to such countries, including automotive steel sheets and other steel materials to Iranian entities. Our subsidiaries also engage in limited business activities in countries that are deemed Sanctions Targets. In particular, POSCO International engages in the trading of steel, raw materials and other items with entities in countries that are deemed Sanctions Targets, including Iran and Cuba. We believe that such activities and investments do not involve any U.S. goods or services. Our activities in Iran and Cuba accounted for approximately 0.5% of our consolidated revenues in 2016, 0.6% in 2017 and 0.3% in 2018.

We expect to continue to engage in business activities and make investments in countries that are deemed Sanctions Targets over the foreseeable future. Although we believe that OFAC Sanctions under their current terms are not applicable to our current activities, our reputation may be adversely affected, and some of our U.S. investors may be required to divest their investments in us under the laws of certain U.S. states or under internal investment policies or may decide for reputational reasons to divest such investments. We are aware of initiatives by U.S. governmental entities and U.S. institutional investors, such as pension funds, to adopt or consider adopting laws, regulations or policies prohibiting transactions with or investment in, or requiring divestment from, entities doing business with countries identified as state sponsors of terrorism. We cannot assure you that the foregoing will not occur or that such occurrence will not have a material adverse effect on the value of our securities.

This annual report contains forward-looking statements that are subject to various risks and uncertainties.

This annual report contains forward-looking statements that are based on our current expectations, assumptions, estimates and projections about our company and our industry. The forward-looking statements are subject to various risks and uncertainties. These forward-looking statements include, but are not limited to, those statements using words such as anticipate, believe, continues, expect, estimate, intend, project, a likely to, target, contemplate, predict, potential and similar expressions and future or conditional verbs such as will, would, should, can, may, or similar expressions generally intended to identify forward-looking statements. Those statements include, among other things, the discussions of our business strategy and expectations concerning our market position, future operations, margins, profitability, liquidity and capital resources. We caution you that reliance on any forward-looking statement involves risks and uncertainties, and that although we believe that the assumptions on which our forward-looking statements are based are reasonable, any of those assumptions could prove to be inaccurate, and, as a result, the forward-looking statements based on those assumptions could be incorrect. The uncertainties in this regard include, but are not limited to, those identified in the risk factors discussed above. In light of these and other uncertainties, you should not conclude that we will necessarily achieve any plans and objectives or projected financial results referred to in any of the forward-looking statements. We do not undertake to release the results of any revisions of these forward-looking statements to reflect future events or circumstances.

Item 4. *Information on the Company*

Item 4.A. *History and Development of the Company*

We were established by the Government on April 1, 1968, under the Commercial Code, to manufacture and distribute steel rolled products and plates in the domestic and overseas markets. The Government owned more than 70% of our equity until 1988, when the Government reduced its ownership of our common stock to 35% through a public offering and listing our shares on the KRX KOSPI Market. In December 1998, the Government sold all of our common stock it owned directly, and The Korea Development Bank completed the sale of our shares that it owned in September 2000. The Government no longer holds any direct interest in us, and our outstanding common stock is currently held by individuals and institutions. See Item 7. Major Shareholders and Related Party Transactions Item 7A. Major Stockholders.

Our legal and commercial name is POSCO. Our principal executive offices are located at POSCO Center, 440 Teheran-ro, Gangnam-gu, Seoul, Korea 06194, and our telephone number is +82-2-3457-0114. The address of our English website is *http://www.posco.com*.

The SEC maintains a website (*http://www.sec.gov*), which contains reports, information statements and other information regarding issuers that file electronically with the SEC.

Item 4.B. *Business Overview*

The Company

We are the largest fully integrated steel producer in Korea, and one of the largest steel producers in the world, based on annual crude steel production. We produced approximately 42.9 million tons of crude steel and stainless steel in 2018, a substantial portion of which was produced at Pohang Works and Gwangyang Works. As of December 31, 2018, we had approximately 47.6 million tons of annual crude steel and stainless steel production capacity, including 17.6 million tons of production capacity of Pohang Works and 24.8 million tons of production capacity of Gwangyang Works. We believe Pohang Works and Gwangyang Works are two of the most technologically advanced integrated steel facilities in the world. We manufacture and sell a diversified line of steel products, including cold rolled and hot rolled products, stainless steel products, plates, wire rods and silicon steel sheets, and we are able to meet a broad range of customer needs from manufacturing industries that consume steel, including automotive, shipbuilding, home appliance, engineering and machinery industries.

Korea is our most important market. Domestic sales accounted for 38.4% of our total revenue from steel products produced and sold by us in 2018 and 39.0% in 2017. On a non-consolidated basis, we believe that our steel products constituted approximately 50% of the total sales volume of such steel products sold in Korea in 2018 and approximately 44% in 2017. Our export sales and overseas sales to customers abroad accounted for 61.6% of our total revenue from steel products produced and sold by us in 2018 and 61.0% in 2017. Our major export market is Asia, with China accounting for 28.9%, Asia other than China and Japan accounting for 23.4%, and Japan accounting for 10.3% of our total steel export revenue from steel products produced and exported by us in 2018 and China accounting for 28.5%, Asia other than China and Japan accounting for 23.3%, and Japan accounting for 11.3% of our total steel export revenue from steel products produced and exported by us in 2017.

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We also engage in businesses that complement our steel manufacturing operations as well as carefully seek out promising investment opportunities to diversify our businesses both vertically and horizontally, in part to prepare for the eventual maturation of the Korean steel market. POSCO International is a global trading company that primarily engages in trading of steel and raw materials as well as investing in energy and mineral development projects throughout the world. POSCO E&C is one of the leading engineering and construction companies in Korea that primarily engages in the planning, design and construction of industrial plants and architectural works and civil engineering. POSCO Energy Corporation is the largest private power generation company in Korea.

We generated revenue of Won 65,155 billion and profit of Won 1,932 billion in 2018, compared to revenue of Won 60,187 billion and profit of Won 2,909 billion in 2017. We had total assets of Won 78,777 billion and total equity of Won 46,673 billion as of December 31, 2018, compared to total assets of Won 79,786 billion and total equity of Won 47,327 billion as of December 31, 2017.

Major Products

We manufacture and sell a broad line of steel products, including the following:

- cold rolled products;
- hot rolled products;
- stainless steel products;
- plates;
- wire rods; and
- silicon steel sheets.

The table below sets out our revenue of steel products produced by us and directly sold to external customers (either by us or through POSCO Processing & Service Co., Ltd. (POSCO P&S), our former subsidiary that primarily engaged in sales of steel products produced by us prior to the transfer of its steel product sales business to POSCO International in March 2017) which are recognized as external revenue of the Steel Segment, by major steel product categories for the periods indicated. Such amounts do not include steel products produced by us and sold to our consolidated subsidiaries (including POSCO International) other than POSCO P&S. Although our external revenue of the Steel Segment increased in 2017 compared to 2016 and 2018 compared to 2017, they were negatively impacted in 2017 and 2018 by the recognition of the external revenue of POSCO P&S s steel product sales business under the Trading Segment commencing March 2017 following the transfer of such business to POSCO International.

	For the Year Ended December 31,					
	2016		2017		2018	
Steel Products	**Billions of Won**	**%**	**Billions of Won**	**%**	**Billions of Won**	**%**
Cold rolled products	8,467	31.5%	9,441	31.2%	10,585	32.7%
Hot rolled products	4,377	16.3	5,101	16.9	5,620	17.4
Stainless steel products	6,064	22.6	6,624	21.9	6,624	20.5
Plates	2,762	10.3	3,087	10.2	3,587	11.1
Wire rods	1,747	6.5	1,880	6.2	1,882	5.8
Silicon steel sheets	1,100	4.1	1,025	3.4	1,012	3.1

Sub-total	24,517	91.3	27,159	89.8	29,309	90.6
Others	2,327	8.7	3,072	10.2	3,049	9.4
Total	26,844	100.0%	30,230	100.0%	32,358	100.0%

The table below sets out our sales volume of the principal categories of steel products produced by us and directly sold to external customers (either by us or through POSCO P&S prior to the transfer

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of its steel product sales business to POSCO International in March 2017), which are recognized as external sales volume of the Steel Segment, by major steel product categories for the periods indicated. Such amounts do not include steel products produced by us and sold to our consolidated subsidiaries (including POSCO International) other than POSCO P&S. In 2017 and 2018, our external sales volume of the Steel Segment was negatively impacted by the recognition of the external sales volume of POSCO P&S s steel product sales business under the Trading Segment commencing March 2017 following the transfer of such business to POSCO International.

	For the Year Ended December 31,					
	2016		2017		2018	
Steel Products	**Thousands of Tons**	**%**	**Thousands of Tons**	**%**	**Thousands of Tons**	**%**
Cold rolled products	12,713	38.7%	11,279	37.5%	12,300	39.2%
Hot rolled products	8,632	26.2	7,786	25.9	8,153	26.0
Stainless steel products	3,027	9.2	2,874	9.6	2,853	9.1
Plates	4,748	14.4	4,896	16.3	4,957	15.8
Wire rods	2,737	8.3	2,333	7.8	2,227	7.1
Silicon steel sheets	1,032	3.1	877	2.9	892	2.8
Total [(1)]	32,888	100.0%	30,046	100.0%	31,381	100%

(1) Not including sales volume of steel products categorized under others.

In addition to steel products produced by us and directly sold to external customers (either by us or through POSCO P&S prior to the transfer of its steel product sales business to POSCO International in March 2017), we engage our consolidated sales subsidiaries (including POSCO International) to sell our steel products produced by us. Our revenue from steel products produced by us and sold to our consolidated sales subsidiaries that in turn sold them to their external customers amounted to Won 6,403 billion in 2016, Won 7,385 billion in 2017 and Won 7,492 billion in 2018. Sales of such steel products by our consolidated sales subsidiaries to external customers are recognized as external revenue of the Trading Segment.

Cold Rolled Products

Cold rolled coils and further refined galvanized cold rolled products are used mainly in the automotive industry to produce car body panels. Other users include the household goods, electrical appliances, engineering and metal goods industries.

Our deliveries of cold rolled products produced by us and directly sold to external customers amounted to 12.3 million tons in 2018, representing 39.2% of our total sales volume of principal steel products produced by us and directly sold to external customers.

Cold rolled products constitute our largest product category in terms of sales volume and revenue from steel products produced by us and directly sold to external customers. In 2018, our sales volume of cold rolled products produced by us and directly sold to external customers increased by 9.1% compared to our sales volume in 2017 primarily due to an increase in sales of cold rolled products manufactured and sold by our Chinese subsidiaries.

Including sales of cold rolled products produced by us and sold through our consolidated sales subsidiaries in addition to cold rolled products produced by us and directly sold to external customers, we believe we had a domestic market share for cold rolled products of approximately 61% on a non-consolidated basis in 2018.

Hot Rolled Products

Hot rolled coils and sheets have many different industrial applications. They are used to manufacture structural steel used in the construction of buildings, industrial pipes and tanks, and

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automobile chassis. Hot rolled coil is also manufactured in a wide range of widths and thicknesses as the feedstock for higher value-added products such as cold rolled products and silicon steel sheets.

Our deliveries of hot rolled products produced by us and directly sold to external customers amounted to 8.2 million tons in 2018, representing 26.0% of our total sales volume of principal steel products produced by us and directly sold to external customers. The largest customers of our hot rolled products are downstream steelmakers in Korea which use the products to manufacture pipes and cold rolled products.

Hot rolled products constitute our second largest product category in terms of sales volume and third largest product category in terms of revenue from steel products produced by us and directly sold to external customers. In 2018, our sales volume of hot rolled products produced by us and directly sold to external customers increased by 4.7% compared to our sales volume in 2017 primarily due to completion of rationalization of furnace no. 3 at Pohang Works, which in turn led to increases in our production and sales volume of hot rolled products.

Including sales of hot rolled products produced by us and sold through our consolidated sales subsidiaries in addition to hot rolled products produced by us and directly sold to external customers, we believe we had a domestic market share for hot rolled products of approximately 52% on a non-consolidated basis in 2018.

Stainless Steel Products

Stainless steel products are used to manufacture household goods and are also used by the chemical industry, paper mills, the aviation industry, the automotive industry, the construction industry and the food processing industry.

Our deliveries of stainless steel products produced by us and directly sold to external customers amounted to 2.9 million tons in 2018, representing 9.1% of our total sales volume of principal steel products produced by us and directly sold to external customers.

Stainless steel products constitute our second largest product category in terms of revenue from steel products produced by us and directly sold to external customers. Although sales of stainless steel products accounted for only 9.1% of total sales volume of the principal steel products produced by us and directly sold to external customers in 2018, they represented 20.5% of our total revenue from steel products in 2018. In 2018, our sales volume of stainless steel products produced by us and directly sold to external customers decreased by 0.8% compared to our sales volume in 2017, in part due to a decrease in demand from the automotive industry.

Including sales of stainless steel products produced by us and sold through our consolidated sales subsidiaries in addition to stainless steel products produced by us and directly sold to external customers, we believe we had a domestic market share for stainless steel products of approximately 40% on a non-consolidated basis in 2018.

Plates

Plates are used in shipbuilding, structural steelwork, offshore oil and gas production, power generation, mining, and the manufacture of earth-moving and mechanical handling equipment, boiler and pressure vessels and other industrial machinery.

Our deliveries of plates produced by us and directly sold to external customers amounted to 5.0 million tons in 2018, representing 15.8% of our total sales volume of principal steel products produced by us and directly sold to external customers. The Korean shipbuilding industry, which uses plates to manufacture chemical tankers, rigs, bulk carriers and containers, and the construction industry are our largest customers of plates.

In 2018, our sales volume of plates produced by us and directly sold to external customers increased by 1.2% compared to our sales volume in 2017 primarily due to an increase in demand from the shipbuilding industry.

Including sales of plates produced by us and sold through our consolidated sales subsidiaries in addition to plates produced by us and directly sold to external customers, we believe we had a domestic market share for plates of approximately 49% on a non-consolidated basis in 2018.

Wire Rods

Wire rods are used mainly by manufacturers of wire, fasteners, nails, bolts, nuts and welding rods. Wire rods are also used in the manufacture of coil springs, tension bars and tire cords in the automotive industry.

Our deliveries of wire rods produced by us and directly sold to external customers amounted to 2.2 million tons in 2018, representing 7.1% of our total sales volume of principal steel products produced by us and directly sold to external customers. The largest customers for our wire rods are manufacturers of wire ropes and fasteners.

In 2018, our sales volume of wire rods produced by us and directly sold to external customers decreased by 4.6% compared to 2017 primarily due to decreases in sales of our wire rods in Vietnam and Japan.

Including sales of wire rods produced by us and sold through our consolidated sales subsidiaries in addition to wire rods produced by us and directly sold to external customers, we believe we had a domestic market share for wire rods of approximately 59% on a non-consolidated basis in 2018.

Silicon Steel Sheets

Silicon steel sheets are used mainly in the manufacture of power transformers and generators and rotating machines.

Our deliveries of silicon steel sheets produced by us and directly sold to external customers amounted to 0.9 million tons in 2018, representing 2.8% of our total sales volume of principal steel products produced by us and directly sold to external customers.

In 2018, our sales volume of silicon steel sheets produced by us and directly sold to external customers increased by 1.7% compared to 2017 primarily due to an increase in demand for silicon steel sheets in India.

Including sales of silicon steel sheets produced by us and sold through our consolidated sales subsidiaries in addition to silicon steel sheets produced by us and directly sold to external customers, we believe we had a domestic market share for silicon steel sheets of approximately 80% on a non-consolidated basis in 2018.

Others

Other products include lower value-added semi-finished products such as pig iron, billets, blooms and slab.

Markets

Korea is our most important market. Domestic sales represented 38.4% of our total revenue from steel products produced and sold by us in 2018. Our export sales and overseas sales to

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customers abroad represented 61.6% of our total revenue from steel products in 2018. Our sales strategy has been to devote our production primarily to satisfy domestic demand, while seeking export sales to utilize capacity to the fullest extent and to expand our international market presence.

Domestic Market

We primarily sell in Korea higher value-added and other finished products to end-users and semi-finished products to other steel manufacturers for further processing. Local distribution companies and sales affiliates sell finished steel products to low-volume customers. We provide service technicians for large customers and distributors in each important product area.

The table below sets out our estimate of the market share of our steel products in Korea for the periods indicated based on sales volume.

	For the Year Ended December 31,		
Source	**2016**	**2017**	**2018**
POSCO s sales[1]	40.6%	43.4%	49.5%
Other domestic steel companies sales	27.6	28.2	28.0
Imports	31.8	28.4	22.5
Total	100.0%	100.0%	100.0%

(1) POSCO s sales volume includes steel products produced by us (but not by our subsidiaries) and sold through our consolidated sales subsidiaries in addition to steel products produced by us (but not by our subsidiaries) and directly sold to external customers.

Exports

Our export sales and overseas sales to customers abroad represented 61.6% of our total revenue from steel products produced and sold by us in 2018, 62.6% of which was generated from exports sales and overseas sales to customers in Asian countries. Our export sales and overseas sales to customers abroad in terms of revenue from such products increased by 6.9% from Won 22,963 billion in 2017 to Won 24,551 billion in 2018.

The tables below set out our export sales and overseas sales to customers abroad in terms of revenue from steel products produced and sold by us (including our consolidated sales subsidiaries), by geographical market and by product for the periods indicated.

	For the Year Ended December 31,					
	2016		**2017**		**2018**	
Region	**Billions of Won**	**%**	**Billions of Won**	**%**	**Billions of Won**	**%**
China	5,840	29.0%	6,542	28.5%	7,097	28.9%
Asia (other than China and Japan)	4,821	23.9	5,354	23.3	5,749	23.4
Japan	2,089	10.4	2,601	11.3	2,530	10.3
Europe	1,914	9.5	2,181	9.5	2,212	9.0
Middle East	187	0.9	163	0.7	204	0.8
North America	2,019	10.0	1,947	8.5	1,861	7.6
Others	3,292	16.3	4,176	18.2	4,898	19.9
Total	20,163	100.0%	22,963	100.0%	24,551	100.0%

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	For the Year Ended December 31,					
	2016		2017		2018	
Steel Products	**Billions of Won**	**%**	**Billions of Won**	**%**	**Billions of Won**	**%**
Cold rolled products	6,852	34.0%	9,224	40.2%	10,499	42.8%
Hot rolled products	2,999	14.9	2,604	11.3	2,738	11.2
Stainless steel products	5,227	25.9	5,345	23.3	5,661	23.1
Plates	1,486	7.4	2,000	8.7	1,812	7.4
Wire rods	585	2.9	606	2.6	677	2.8
Silicon steel sheets	821	4.1	950	4.1	1,021	4.2
Others	2,194	10.9	2,235	9.7	2,143	8.7
Total	20,163	100.0%	22,963	100.0%	24,551	100.0%

We distribute our export products mostly through Korean trading companies, including POSCO International, and our overseas sales subsidiaries. Our largest export market in 2018 was China, which accounted for 28.9% of our export revenue from steel products produced and sold by us. The principal products exported to China were cold rolled products, including continuous galvanized products. Our exports to China increased by 8.5% from Won 6,542 billion in 2017 to Won 7,097 billion in 2018 primarily due to increases in sales of cold rolled products to steel processing companies in China.

Our second largest export market in 2018 was Asia (other than China and Japan), which accounted for 23.4% of our export revenue from steel products produced and sold by us. The principal products exported to Asia (other than China and Japan) were cold rolled products, including continuous galvanized products. Our exports to Asia (other than China and Japan) increased by 7.4% from Won 5,354 billion in 2017 to Won 5,749 billion in 2018 primarily due to increases in sales of steel products in Thailand and Vietnam.

Anti-Dumping, Safeguard and Countervailing Duty Proceedings

From time to time, our exporting activities have become subject to anti-dumping, safeguard and countervailing proceedings. As a steel producer with global sales and operations, we are involved in trade remedy proceedings in markets worldwide, including in the United States. We proactively participate in and plan for such proceedings to minimize any adverse effects and associated risks. While there has been an increase in the number of trade cases in recent years, and an increased focus on trade issues by government officials, all such cases have been product and market-specific, and thus have been limited in scope relative to our global sales and operations. We continue to carefully monitor developments with respect to trade remedy policy in all markets in which we participate and, where necessary, vigorously defend our rights through litigation before tribunals such as the U.S. Court of International Trade. Our products that are subject to anti-dumping duties, safeguard duties, countervailing duties, quotas or tariffs in the aggregate currently do not account for a material portion of our total sales, and such proceedings have not had a material adverse impact on our business and operations in recent years.

Pricing Policy

We determine the sales price of our products based on market conditions. In setting prices, we take into account our costs, including those of raw materials, supply and demand in the Korean market, exchange rates, and conditions in the international steel market. Our prices can fluctuate considerably over time, depending on market conditions and other factors. The prices of our higher value-added steel products in the largest markets are determined considering the prices of similar products charged by our competitors.

Both our export prices and domestic sales prices decreased in 2016, reflecting production over-capacity in the global steel industry. In 2017 and the first three quarters of 2018, our export prices and domestic sales prices generally increased, as consolidation of the steel industry in China led to a decrease in export volume from China, which in turn had a positive impact on global steel prices until the fourth quarter of 2018. The global steel prices decreased in the fourth quarter of 2018 in part due to a decrease in demand from China as well as an increase in the production capacity of Chinese manufacturers that survived the consolidation of the Chinese steel industry. We will continue to adjust our sales prices in the future subject to market demand for our products, prices of raw materials, the production outlook of the global steel industry and global economic conditions in general.

Raw Materials

Steel Production

The principal raw materials used in producing steel through the basic oxygen steelmaking method are iron ore and coal. We require approximately 1.7 tons of iron ore and 0.7 tons of coal to produce one ton of steel. We import all of the coal and virtually all of the iron ore that we use. In 2018, POSCO imported approximately 54 million dry metric tons of iron ore and 29 million wet metric tons of coal. Iron ore is imported primarily from Australia, Brazil and Canada. Coal is imported primarily from Australia, Canada and Russia.

We purchase a substantial portion of our iron ore and coal imports pursuant to long-term contracts. Our long-term supply contracts generally have terms of three to ten years and provide for periodic price adjustments to the then-market prices. We typically adjust the prices on a quarterly basis and maintain approximately one month of inventory of raw materials. Such price adjustments are driven by various factors, including the global economic outlook, global market prices of raw materials and steel products, supply and demand outlook of raw materials and production costs of raw materials. For both coal and iron ore, we typically agree on the purchase price with the suppliers primarily based on the spot market price periodically announced by Platts (Premium Low Vol Coking Coal, FOB Australia Index and Iron Ore 62% Fe, CFR China Index). We or the suppliers may cancel the long-term contracts only if performance under the contracts is prevented by causes beyond our or their control and these causes continue for a specified period.

We also engage in exploration and production projects abroad to enhance our ability to meet the requirements for high-quality raw materials, by acquiring mining rights of raw materials or by investing in projects either as part of a consortium or through an acquisition of a minority interest. In 2018, we purchased approximately 36% of our iron ore imports and 18% of our coal imports from foreign mines in which we have made investments. Our major investments to procure supplies of coal, iron ore and nickel are primarily located in Australia, Brazil, New Caledonia and Canada. We will continue to selectively seek opportunities to enter into additional strategic relationships that would enhance our ability to meet the requirements for principal raw materials.

The average market price of coal per wet metric ton (Premium Low Vol Coking Coal, FOB Australia Index announced by Platts) was US$143 in 2016, US$188 in 2017 and US$207 in 2018. The average market price of iron ore per dry metric ton (Iron Ore 62% Fe, CFR China Index announced by Platts) was US$58 in 2016, US$71 in 2017 and US$69 in 2018. We currently do not depend on any single country or supplier for our coal or iron ore.

Stainless Steel Production

The principal raw materials for the production of stainless steel are ferronickel, ferrochrome and stainless steel scrap. We purchase a majority of our ferronickel primarily from suppliers in Korea that procure nickel ore from New Caledonia, and the remainder primarily from leading suppliers in Indonesia, Japan and Ukraine. Our primary suppliers of ferrochrome are located in South Africa, India and Kazakhstan. Our stainless steel scraps are primarily supplied by domestic and overseas suppliers in Japan and Southeast Asia. Revert scraps from the Pohang Steelworks are also used for our stainless steel production. The average market price of nickel per ton on the London Metal Exchange was US$9,609 in 2016, US$10,411 in 2017 and US$13,122 in 2018.

Transportation

In order to meet our transportation needs for iron ore and coal, we have entered into long-term contracts with shipping companies in Korea to retain a fleet of dedicated vessels. Such contracts are on consecutive voyage basis with maximum capacity loading, where the shipping company is compensated for the maximum amount of cargo on each trip regardless of whether the vessels are loaded to such amount. These dedicated vessels transported approximately 73% of the total requirements in 2018, and the remaining approximately 27% was transported by vessels retained through short to medium term contracts, depending on market conditions. We plan to continue to optimize the fleet of dedicated vessels that we use by 2020 in order to cope with changes in the global shipping environment, as well as upgrade some of the existing vessels with others that utilize more energy-efficient technologies.

The Steelmaking Process

Our major production facilities, Pohang Works and Gwangyang Works, produce steel by the basic oxygen steelmaking method. The stainless steel plant at Pohang Works produces stainless steel by the electric arc furnace method. Continuous casting improves product quality by imparting a homogenous structure to the steel. Pohang Works and Gwangyang Works produce all of their products through the continuous casting.

Steel Basic Oxygen Steelmaking Method

First, molten pig iron is produced in a blast furnace from iron ore, which is the basic raw material used in steelmaking. Molten pig iron is then refined into molten steel in converters by blowing pure oxygen at high pressure to remove impurities. Different desired steel properties may also be obtained by regulating the chemical contents.

At this point, molten steel is made into semi-finished products such as slabs, blooms or billets at the continuous casting machine. Slabs, blooms and billets are produced at different standardized sizes and shapes. Slabs, blooms and billets are semi-finished lower margin products that we either use to produce our further processed products or sell to other steelmakers that produce further processed steel products.

Slabs are processed to produce hot rolled coil products at hot strip mills or to produce plates at plate mills. Hot rolled coils are an intermediate stage product that may either be sold to our customers as various finished products or be further processed by us or our customers into higher value-added products, such as cold rolled sheets and silicon steel sheets. Blooms and billets are processed into wire rods at wire rod mills.

Stainless Steel Electric Arc Furnace Method

Stainless steel is produced from stainless steel scrap, chrome, nickel and steel scrap using an electric arc furnace. Stainless steel is then processed into higher value-added products by methods similar to those used for steel production. Stainless steel slabs are produced at a continuous casting mill. The slabs are processed at hot rolling mills into stainless steel hot coil, which can be further processed at cold strip mills to produce stainless cold rolled steel products.

Competition

Domestic Market

We are the largest fully integrated steel producer in Korea. In hot rolled products, where we believe we had a market share of approximately 52% on a non-consolidated basis in 2018, we face competition from a Korean steel producer that operates mini-mills and produces hot rolled coil products from slabs and from various foreign producers, primarily from China and Japan. In cold rolled products and stainless steel products, where we believe we had a market share of approximately 61% and 40%, respectively, on a non-consolidated basis in 2018, we compete with smaller specialized domestic manufacturers and various foreign producers, primarily from China and Japan. For a discussion of domestic market shares, see Markets Domestic Market.

We may face increased competition in the future from new specialized or integrated domestic manufacturers of steel products in the Korean market. Our biggest competitor in Korea is Hyundai Steel Co., Ltd. with an annual crude steel production of approximately 21 million tons.

The Korean Government does not impose quotas on or provide subsidies to local steel producers. As a World Trade Organization signatory, Korea has also removed all steel tariffs.

Export Markets

The competitors in our export markets include all the leading steel manufacturers of the world. In the past decade, there has been a trend toward industry consolidation among our competitors, and smaller competitors in the global steel market today may become larger competitors in the future. In recent years, a slowdown in domestic demand for steel products in China resulting from slowed economic growth, combined with an expansion in steel production capacity, has led to production over-capacity in the Chinese steel industry, which in turn has led the Chinese government to pursue aggressive consolidation in the Chinese steel industry, such as the consolidation of Baosteel Group and Wuhan Iron and Steel in 2016, that has resulted in fewer but larger steel manufacturers that are able to compete more effectively in the global steel industry. Competition from global steel manufacturers with significant production capacity such as ArcelorMittal S.A. and Nippon Steel & Sumitomo Metal Corporation, as well as competitors from emerging markets, especially from China and India, could result in a significant increase in competition. Major competitive factors include range of products offered, quality, price, delivery performance and customer service. Our larger competitors may use their resources, which may be greater than ours, against us in a variety of ways, including by making additional acquisitions, investing more aggressively in product development and capacity and displacing demand for our export products.

Various export markets currently impose tariffs on different types of steel products. However, we do not believe that tariffs significantly affect our ability to compete in these markets.

Subsidiaries and Global Joint Ventures

Steel Production

In order to effectively implement our strategic initiatives and to solidify our leadership position in the global steel industry, we have established various subsidiaries and joint ventures in Korea and elsewhere around the world that engage in steel production activities.

China. We entered into an agreement with Sagang Group Co. to establish Zhangjiagang Pohang Stainless Steel Co., Ltd., a joint venture company in China for the manufacture and sale of stainless cold rolled steel products. We have an 82.5% interest in the joint venture (including 23.9% interest held by POSCO China Holding Corporation), which commenced production of stainless cold rolled steel products in December 1998. As of December 31, 2018, Zhangjiagang Pohang Stainless Steel had an annual production capacity of 1,100 thousand tons of stainless steel products and it produced 1,158 thousand tons of stainless steel products in 2018. See Production Facilities Abroad Zhangjiagang Pohang Stainless Steel.

Indonesia. We entered into an agreement with PT. Krakatau Steel (Persero) Tbk. to establish PT. Krakatau POSCO Co., Ltd. (PT. Krakatau POSCO), a joint venture company in Indonesia for the manufacture and sale of plates and slabs. We hold a 70.0% interest in the joint venture. We completed the construction of a steel manufacturing plant in December 2013. As of December 31, 2018, PT. Krakatau POSCO had an annual production capacity of 3,000 thousand tons of plates and slabs and it produced 3,009 thousand tons of plates and slabs in 2018. See Production Facilities Abroad PT. Krakatau POSCO.

Vietnam. We established POSCO SS VINA Co., Ltd., a wholly owned subsidiary engaged in the manufacture and sale of shape steel and steel reinforcement products. The plant became operational in June 2015. As of December 31, 2018, POSCO SS VINA Co., Ltd. had an annual production capacity of 1,100 thousand tons of shape steel and steel reinforcement products and it produced 965 thousand tons of shape steel and steel reinforcement products in 2018. See Production Facilities Abroad POSCO SS VINA.

Trading

Our trading activities consist primarily of trading activities of POSCO International. Our consolidated subsidiaries that also engage in trading activities include POSCO Asia Co., Ltd. located in Hong Kong, POSCO Japan Co., Ltd. located in Tokyo, Japan, POSCO America Corporation located in Georgia, U.S.A., POSCO (Thailand) Company Limited located in Chonburi, Thailand and POSCO Singapore LNG Trading Pte. Ltd. in Singapore.

POSCO International is a global trading company that primarily engages in trading of steel and raw materials as well as investing in energy and mineral development projects. It also manufactures and sells textiles and agricultural commodities. POSCO International was established in December 2000 when the international trading and construction businesses of Daewoo Corporation were spun off into three separate companies as part of a debt workout program of Daewoo Corporation. In order to expand and strengthen its core business and to further promote efficiency within the POSCO Group, POSCO International acquired the steel product sales business from POSCO P&S in March 2017.

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The following table sets forth a breakdown of POSCO International s total consolidated sales by export sales, domestic sales and third-country trades as well as product category for the periods indicated:

Product Category	2016		2017		2018	
	For the Year Ended December 31, (in billions of Won, except percentages)					
Export trading sales:						
Steel and metal	4,185	25.4%	5,059	22.4%	5,354	21.3%
Chemical and commodities	1,277	7.7	1,429	6.3	1,563	6.2
Automobile and machinery parts	1,986	12.0	2,224	9.9	1,795	7.1
Electronics and miscellaneous items	3	0.0				
Natural resources items	2	0.0				
Other goods					0	0.0
Sub-total	7,453	45.2	8,712	38.6	8,712	34.6
Domestic trading sales:						
Steel and metal	473	2.9%	2,322	10.3%	3,316	13.2%
Chemical and commodities	90	0.5	23	0.1	19	0.1
Automobile and machinery parts	40	0.2	59	0.2	36	0.1
Electronics and miscellaneous items						
Other goods			17	0.1		
Sub-total	603	3.7	2,421	10.7	3,371	13.4
Manufactured product sales	13	0.1	502	2.2	547	2.2
Others	90	0.5	253	1.1	222	0.9
Third-Country Trades:						
Trading (1)	10,376	62.9%	14,969	66.3%	17,390	69.1%
Natural resources development (1)	1,504	9.1	573	2.5	829	3.3
Manufactured product trading	192	1.2	221	1.0	329	1.3
Total third-country trades	12,072	73.2	15,763	69.8	18,547	73.7
Total sales prior to consolidation adjustments	20,229	122.7	27,650	122.4	31,399	124.7
Consolidation adjustments	(3,737)	(22.7)	(5,079)	(22.4)	(6,225)	(24.7)
Total sales	16,492	100.0%	22,572	100.0%	25,174	100.0%

(1) In 2016, revenues from trading of raw materials were included as natural resources development revenues. However, in 2017 and 2018, revenues from trading of raw materials were included as trading revenues.

Trading Activities. POSCO International s trading activities consist of exporting and importing a wide variety of products and commodities, including iron and steel, raw materials for steel production, non-ferrous metals, chemicals, automotive parts, machinery and plant equipment, electronics products, agricultural commodities and textiles. POSCO International is also engaged in third-country trade that does not involve exports from or imports to Korea. The products are obtained from and supplied to numerous suppliers and purchasers in Korea and overseas, which are procured through a global trading network comprised of overseas trading subsidiaries, branches and representative offices. Such subsidiaries and offices support POSCO International s trading activities by locating suitable local suppliers and purchasers on behalf of customers, identifying business opportunities and providing information regarding local market conditions.

In most cases, POSCO International enters into trading transactions after the underlying sale and purchase contracts have been matched, which mitigates inventory and price risks to POSCO International. POSCO International typically enters into trading transactions as a principal, and in limited cases as an import or export agent. When acting as a principal or an agent, POSCO International derives its gross trading profit from the margin between the selling price of the products and the purchase price it pays for such products. In the case of principal transactions, the selling price is recorded as sales and the purchase price is recorded as cost of sales, while only the margin is recorded as sales in the case of agency transactions in which POSCO International does not assume the risks and rewards of ownership of the goods. In the instances in which it acts as an arranger for a third country transaction, POSCO International derives its gross trading profit from, and records as sales, the commission paid to it by the customer. The sizes of margins and commissions for POSCO International s trading activities vary depending on a number of factors, including prevailing supply and demand conditions for the product involved, the cost of financing, insurance, storage and transport and the creditworthiness of the customer, and tends to decline as the product or market matures.

In connection with its export and import transactions, POSCO International has accounts receivable and payable in a number of currencies, but principally in Dollars. POSCO International s exposure to fluctuations in exchange rates, including the Won/Dollar exchange rate, is limited because trading transactions typically involve matched purchase and sale contracts, which result in limited settlement exposure, and because POSCO International s contracts with domestic suppliers of products for export and with domestic purchasers of imported products are generally denominated in Dollars. Although the impact of exchange rate fluctuations is substantially mitigated by such strategies, POSCO International also periodically enters into derivative contracts, primarily currency forward contracts, to further hedge its foreign exchange risks.

In connection with its trading activities, POSCO International arranges insurance and product transport at the request of customers, the costs of which generally become reflected in the sales price of the relevant products, and also provides financing services to its purchasers and suppliers as necessary. In the case of trading transactions involving large-scale industrial or construction projects, POSCO International also provides necessary project planning and organizing services to its customers.

Natural Resources Development Activities. POSCO International also invests in energy and mineral development projects throughout the world. In particular, POSCO International holds interests in several gas field projects in Myanmar, where production of gas commenced in July 2013. POSCO International recognized revenues of approximately Won 530 billion in 2016, Won 498 billion in 2017 and Won 474 billion in 2018 from the Myanmar gas field projects. Such natural resources development projects, while entailing higher risks than the traditional trading business, offer higher potential returns. POSCO International intends to continue to expand its operations by carefully seeking out promising energy development projects abroad.

Competition. POSCO International competes principally with other Korean general trading companies that are affiliated with major domestic business groups, as well as global trading companies based in other countries. In the domestic market, competition for export transactions on behalf of domestic suppliers and import transactions on behalf of domestic purchasers was limited, as most affiliated general trading companies of large Korean business groups generally relied on affiliate transactions for the bulk of their trading business. However, in recent years, many of these Korean general trading companies have reduced their reliance on their affiliated business group and transactions carried out on behalf of their member companies and instead have generally evolved to focus on segments of the import and export markets in which they have a competitive advantage. As a result, competition among Korean general trading companies in the area of traditional trade has become more intense. POSCO International s principal competitors in the overseas trading markets include Korean trading companies that operate in various international markets, as well as foreign trading companies, particularly those based in Japan. As POSCO International diversifies into businesses other than traditional trading such as natural resources development, it also increasingly competes with other Korean and international companies involved in these businesses.

Construction

POSCO E&C is one of the leading engineering and construction companies in Korea, primarily engaged in the planning, design and construction of industrial plants and architectural works and civil engineering projects. In particular, POSCO E&C has established itself as one of the premier engineering and construction companies in Korea through:

- its strong and stable customer base; and
- its cutting-edge technological expertise obtained from construction of advanced integrated steel plants, as well as participation in numerous modernization and rationalization projects at our Pohang Works and Gwangyang Works.

Leveraging its technical know-how and track record of building some of the leading industrial complexes in Korea, POSCO E&C has also focused on diversifying its operations into construction of high-end apartment complexes and participating in a wider range of architectural works and civil engineering projects, as well as engaging in urban planning and development projects and expanding its operations abroad. In September 2015, we completed the sale of our 38.0% interest in POSCO E&C to PIF, the sovereign wealth fund of Saudi Arabia, for US$1.05 billion. In connection with the sale, POSCO E&C and PIF agreed to jointly explore additional business opportunities in Saudi Arabia, including participating in various infrastructure projects sponsored by the Saudi Arabian government.

POSCO E&C also has substantial experience in the energy field obtained from the construction of various power plants for member companies of the POSCO Group, specializing primarily in engineering and construction of LNG and coal-fired thermal power plants. In recent years, POSCO E&C has obtained various orders for such power plants, including LNG-fired power plants in Incheon, Korea, coal-fired thermal power plants in Ventanas and Angamos, Chile and an integrated cycle power plant and an LNG terminal facility in Colón, Panama. In response to increasing demand from the energy industry, POSCO E&C plans to continue to target opportunities in power plant construction, especially in Asia and Africa, which it believes offers significant growth potential. In order to further promote efficiency among the member companies of the POSCO Group as well as to enhance the engineering expertise of POSCO E&C, POSCO Engineering Co., Ltd. merged into POSCO E&C in February 2017.

Competition. Competition in the construction industry is based primarily on price, reputation for quality, reliability, punctuality and financial strength of contractors. In Korea, POSCO E&C s main competition in the construction of residential and non-residential buildings, EPC projects, urban planning and development projects and civil works projects consists of approximately ten major domestic construction companies, all of which are member companies of other large business groups in Korea and are capable of undertaking larger-scale, higher-value-added projects that offer greater potential returns. A series of measures introduced by the Government over the past few years to regulate housing prices in Korea, as well as an increasing popularity of low-bid contracts in civil works project mandates, have contributed to increased competition in the Korean construction industry in recent years. In the overseas markets, POSCO E&C faces competition from local construction companies and other major Korean construction companies with overseas operations, as well as international construction companies from other countries.

Others

As part of our diversification efforts, we strive to identify business opportunities that supplement our steel, trading and construction segments, including power generation, LNG logistics, manufacturing of various industrial materials and network and system integration.

POSCO Energy Corporation. In 2006, we acquired the largest domestic private power utility company that operates LNG combined cycle power generation facilities with total power generation capacity of 1,800 megawatts and subsequently renamed it POSCO Energy Corporation. Since our acquisition, POSCO Energy Corporation has expanded its power generation capacity by constructing additional power plants in Korea and Southeast Asia. POSCO Energy Corporation s total power generation capacity was approximately 4,570 megawatts as of December 31, 2018. POSCO Energy

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Corporation is also selectively seeking opportunities to expand into solar, wind and other renewable energy businesses in order to become an integrated provider of energy solutions.

LNG Logistics. We operate an LNG receiving terminal with an aggregate capacity to process up to 2.4 million tons of LNG annually in Gwangyang. In order to achieve maximum operational efficiency of our LNG terminal, we participate in the LNG trading and LNG ship gas trial businesses. In April 2019, our board of directors resolved to transfer our LNG logistics business to POSCO Energy Corporation. The transfer is expected to be completed in September 2019.

Others. POSCO Chemical Co., Ltd. (formerly known as POSCO Chemtech Co., Ltd.) specializes in the manufacturing of refractories and lime used in steel manufacturing processes as well as a wide range of chemical products. It also expanded into the anode and cathode manufacturing business in 2018 following its merger with POSCO ESM Co., Ltd., our former subsidiary specializing in the production of battery materials. POSCO M-Tech Co., Ltd. produces aluminum deoxidizers, substances used to remove excess oxygen during the steel manufacturing process to improve durability of steel products, and it also provides integrated steel product packing solutions for steel production facilities. POSCO ICT Co., Ltd. provides information and technology consulting and system network integration and outsourcing services.

Insurance

We maintain property insurance for our property, plant and equipment that we believe to be consistent with market practice in Korea.

Item 4.C. ***Organizational Structure***

The following table sets out the jurisdiction of incorporation and our ownership interests of our significant subsidiaries:

Name	Jurisdiction of Incorporation	Percentage of Ownership
POSCO International Corporation	Korea	62.9%
POSCO Engineering & Construction Co., Ltd	Korea	52.8%
POSCO Energy Corporation	Korea	89.0%
PT. Krakatau POSCO	Indonesia	70.0%
POSCO Asia Co., Ltd.	Hong Kong	100.0%
POSCO Maharashtra Steel Private Limited	India	100.0%
Zhangjiagang Pohang Stainless Steel Co., Ltd.	China	82.5% (1)
POSCO Chemical Co., Ltd.	Korea	60.0%
POSCO SS VINA Co., Ltd.	Vietnam	100.0%

(1) POSCO holds a 58.6% interest and POSCO-China holds a 23.9% interest.

Item 4.D. ***Property, Plants and Equipment***

Our principal properties are Pohang Works, which is located at Youngil Bay on the southeastern coast of Korea, and Gwangyang Works, which is located in Gwangyang City in the southwestern region of Korea. We also maintain and operate production properties abroad, including plants operated by Zhangjiagang Pohang Stainless Steel in China, PT. Krakatau POSCO in Indonesia and POSCO SS Vina in Vietnam. We may increase our production capacity in the future when we increase our capacity as part of our facilities expansion or as a result of continued modernization and rationalization of our existing facilities. For a discussion of major items of our capital expenditures currently in progress, see Item 5. Operating and Financial Review and Prospects Item 5.B. Liquidity and Capital Resources Liquidity Capital Expenditures and Capital Expansion.

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We are vigorous in our efforts to engage in environmentally responsible management of, and to protect the environment from damage resulting from, our operations. Our levels of pollution control are higher than those mandated by Government standards. We established an on-line environmental monitoring system with real-time feedback on pollutant levels and a forecast system of pollutant concentration in surrounding areas. We also undergo periodic environmental inspection by both internal and external inspectors in accordance with ISO 14001 standards to monitor execution and maintenance of our environmental management plan. We also operate a certification program targeting our suppliers and outsourcing partners, pursuant to which they are encouraged to establish environmental management systems of their own.

Production Facilities in Korea

Pohang Works

Construction of Pohang Works began in 1970 and ended in 1983. Pohang Works currently has an annual crude steel and stainless steel production capacity of 17.6 million tons. Pohang Works produces a wide variety of steel products. Products produced at Pohang Works include hot rolled sheets, plates, wire rods and cold rolled sheets, as well as specialty steel products such as stainless steel sheets and silicon steel sheets. These products can also be customized to meet the specifications of our customers.

Situated on a site of 8.9 million square meters at Youngil Bay on the southeastern coast of Korea, Pohang Works consists of iron-making, crude steelmaking and continuous casting and other rolling facilities. Pohang Works also has docking facilities capable of accommodating large ships for unloading raw materials, storage areas for raw materials and separate docking facilities for ships carrying products for export. Pohang Works is equipped with a highly advanced computerized production-management system allowing constant monitoring and control of the production process.

Gwangyang Works

Construction of Gwangyang Works began in 1985 and ended in 1992. Gwangyang Works currently has an annual crude steel production capacity of 24.8 million tons. Gwangyang Works specializes in high volume production of a limited number of steel products. Products manufactured at Gwangyang Works include both hot and cold rolled types.

Situated on a site of 13.7 million square meters reclaimed from the sea in Gwangyang City in the southwestern region of Korea, Gwangyang Works is comprised of iron-making plants, steelmaking plants, continuous casting plants, hot strip mills and thin-slab hot rolling plants. The site also features docking and unloading facilities for raw materials capable of accommodating large ships for unloading raw materials, storage areas for raw materials and separate docking facilities for ships carrying products for export.

We believe Gwangyang Works is one of the most technologically advanced integrated steel facilities in the world. Gwangyang Works has a completely automated, linear production system that enables the whole production process, from iron-making to finished products, to take place without interruption. This advanced system reduces the production time for hot rolled products to only four hours. Like Pohang Works, Gwangyang Works is equipped with a highly advanced computerized production-management system allowing constant monitoring and control of the production process.

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Capacity Utilization Rates

The following table sets out the capacity utilization rates of our production facilities in Korea for the periods indicated.

	As of or for the Year Ended December 31,		
	2016	2017	2018
Crude steel and stainless steel production capacity as of end of the year (million tons per year)	42.39	42.39	42.39
Actual crude steel and stainless steel output (million tons)	37.50	37.21	37.74
Capacity utilization rate (%) (1)	88.5%	87.8%	89.0%

(1) Calculated by dividing actual crude steel and stainless steel output by the actual crude steel and stainless steel production capacity for the relevant period as determined by us.

Production Facilities Abroad

Our various subsidiaries and joint ventures around the world, including Zhangjiagang Pohang Stainless Steel Co., Ltd. in China, PT. Krakatau POSCO in Indonesia and POSCO SS Vina Co., Ltd. in Vietnam, engage in steel production activities. For a discussion of such operations, see Item 4. Information on the Company Item 4.B. Business Overview Subsidiaries and Joint Ventures.

Zhangjiagang Pohang Stainless Steel

The following table sets out Zhangjiagang s capacity utilization rates for the periods indicated.

	As of or for the Year Ended December 31,		
	2016	2017	2018
Crude steel and stainless steel production capacity as of end of the year (million tons per year)	1.10	1.10	1.10
Actual crude steel and stainless steel output (million tons)	1.16	1.16	1.16
Capacity utilization rate (%) (1)	105.2%	105.4%	105.3%

(1) Calculated by dividing actual crude steel and stainless steel output by the actual crude steel and stainless steel production capacity for the relevant period as determined by us.

PT. Krakatau POSCO

The following table sets out PT. Krakatau POSCO s capacity utilization rates for the periods indicated.

	As of or for the Year Ended December 31,		
	2016	2017	2018
Crude steel production capacity as of end of the year (million tons per year)	3.00	3.00	3.00
Actual crude steel output (million tons)	2.91	2.92	3.01
Capacity utilization rate (%) (1)	97.0%	97.4%	100.3%

(1) Calculated by dividing actual crude steel output by the actual crude steel production capacity for the relevant period as determined by us.

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POSCO SS VINA Co., Ltd.

The following table sets out POSCO SS VINA s capacity utilization rates for the periods indicated.

	As of or for the Year Ended December 31,		
	2016	2017	2018
Crude steel production capacity as of end of the year (million tons per year)	1.10	1.10	1.10
Actual crude steel output (million tons)	0.64	0.91	0.97
Capacity utilization rate (%) (1)	58.0%	82.3%	87.7%

(1) Calculated by dividing actual crude steel output by the actual crude steel production capacity for the relevant period as determined by us.

Item 4A. ***Unresolved Staff Comments***

We do not have any unresolved comments from the Securities and Exchange Commission staff regarding our periodic reports under the Exchange Act of 1934.

Item 5. ***Operating and Financial Review and Prospects***

Item 5.A. ***Operating Results***

The following discussion and analysis is based on our consolidated financial statements, which have been prepared in accordance with IFRS, as issued by the IASB. Unless otherwise noted, the amounts included in Item 5.A. are presented on a consolidated basis.

Overview

We are the largest fully integrated steel producer in Korea. We have four reportable operating segments a steel segment, a trading segment, a construction segment and a segment that contains operations of all other entities which fall below the reporting thresholds. The steel segment includes production of steel products and sale of such products. The trading segment consists primarily of global trading activities and natural resources development activities of POSCO International. POSCO International exports and imports a wide range of steel products that are both obtained from and supplied to POSCO, as well as between other suppliers and purchasers in Korea and overseas. The construction segment includes planning, designing and construction of industrial plants, civil engineering projects and commercial and residential buildings, both in Korea and overseas. The others segment includes power generation, LNG logistics, manufacturing of various industrial materials and network and system integration. See Note 40 of Notes to Consolidated Financial Statements.

One of the major factors contributing to our historical performance has been the growth of the Korean economy, and our future performance will depend at least in part on Korea s general economic growth and prospects. For a description of recent developments that have had and may continue to have an adverse effect on our results of operations and financial condition, see Item 3. Key Information Item 3.D. Risk Factors Korea is our most important market, and our current business and future growth could be materially and adversely affected if economic conditions in Korea deteriorate. A number of other factors have had or are expected to have a material impact on our results of operations, financial condition and capital expenditures. These factors include:

- our sales volume, unit prices and product mix;

- costs and production efficiency; and

exchange rate fluctuations.

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As a result of these factors, our financial results in the past may not be indicative of future results or trends in those results.

Sales Volume, Prices and Product Mix

In recent years, our net sales have been affected by the following factors:

- the demand for our products in the Korean market and our capacity to meet that demand;
- our ability to compete for sales in the export market;
- price levels; and
- our ability to improve our product mix.

Domestic demand for our products is affected by the condition of major steel consuming industries, such as construction, shipbuilding, automotive, electrical appliances and downstream steel processors, and the Korean economy in general.

In 2017, unit sales prices in Won for each of our principal product lines of steel products produced by us and directly sold to external customers increased. The weighted average unit price for such products increased by 21.3% from 2016 to 2017, despite an appreciation in the average value of the Won against the Dollar in 2017 that decreased our export prices in Won terms. The average exchange rate of the Won against the Dollar, as announced by Seoul Money Brokerage Services, Ltd., appreciated from Won 1,160.5 to US$1.00 in 2016 to Won 1,130.8 to US$1.00 in 2017.

The unit sales price of hot rolled products, which accounted for 25.9% of total sales volume of the principal steel products produced by us and directly sold to external customers, increased by 29.2% in 2017. The unit sales price of wire rods, which accounted for 7.8% of total sales volume of such products, increased by 26.2% in 2017. The unit sales price of cold rolled products, which accounted for 37.5% of total sales volume of such products, increased by 25.7% in 2017. The unit sales price of stainless steel products, which accounted for 9.6% of total sales volume of such products, increased by 15.0% in 2017. The unit sales price of silicon steel products, which accounted for 2.9% of total sales volume of such products, increased by 9.7% in 2017. The unit sales price of plates, which accounted for 16.3% of total sales volume of such products, increased by 8.4% in 2017.

In 2018, unit sales prices in Won for each of our principal product lines of steel products produced by us and directly sold to external customers, other than silicon steel products, increased. The weighted average unit price for such products increased by 3.3% from 2017 to 2018, despite an appreciation in the average value of the Won against the Dollar in 2018 that decreased our export prices in Won terms. The average exchange rate of the Won against the Dollar, as announced by Seoul Money Brokerage Services, Ltd., appreciated from Won 1,130.8 to US$1.00 in 2017 to Won 1,100.3 to US$1.00 in 2018.

The unit sales price of plates, which accounted for 15.8% of total sales volume of the principal steel products produced by us and directly sold to external customers, increased by 14.8% in 2018. The unit sales price of hot rolled products, which accounted for 26.0% of total sales volume of such products, increased by 5.2% in 2018. The unit sales price of wire rods, which accounted for 7.1% of total sales volume of such products, increased by 4.9% in 2018. The unit sales price of cold rolled products, which accounted for 39.2% of total sales volume of such products, increased by 2.8% in 2018. The unit sales price of stainless steel products, which accounted for 9.1% of total sales volume of such products, increased by 0.8% in 2018. On the other hand, the unit sales price of silicon steel products, which accounted for 2.8% of total sales volume of such products, decreased by 2.9% in 2018.

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The table below sets out the average unit sales prices for our semi-finished and finished steel products for the periods indicated.

Products	2016	2017	2018
	For the Year Ended December 31, (In thousands of Won per ton)		
Cold rolled products	666	837	861
Hot rolled products	507	655	689
Stainless steel products	2,003	2,304	2,322
Plates	582	631	724
Wire rods	638	806	845
Silicon steel sheets	1,065	1,169	1,135
Average [(1)]	745	904	934

(1) Average prices are based on the weighted average, by sales volume, of our sales for the listed principal products produced by us and directly sold to external customers. See Item 4. Information on the Company Item 4.B. Business Overview Major Products. The average unit sales price calculation does not include sales results of steel products categorized as others.

Costs and Production Efficiency

Our major costs and operating expenses are raw material purchases, depreciation, labor and other purchases. The table below sets out our cost of sales and selling and administrative expenses as a percentage of our revenue as well as gross profit margin and operating profit margin for the periods indicated.

	2016	2017	2018
	For the Year Ended December 31, (Percentage of net sales)		
Cost of sales	87.4%	86.3%	87.7%
Selling and administrative expenses	7.3	6.2	3.7
Gross margin	12.6	13.7	12.3
Operating profit margin	4.3	7.0	6.2

Our operating profit margin increased from 4.3% in 2016 to 7.0% in 2017, but decreased to 6.2% in 2018 as discussed below.

We are closely monitoring changes in market conditions and we implemented the following measures in recent years to improve our profit margins:

- pursuing cost reduction through enhancing product designs, improving productivity and reducing fixed costs;
- focusing on marketing activities to increase the sales of higher margin, higher value-added products and to strengthen our domestic market position;
- pursuing synergies among member companies of the POSCO Group through corporate restructurings; and
- establishing a special sales committee to more effectively respond to changes in market trends and preparing responses to various scenarios of future sales.

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Production capacity represents our maximum production capacity that can be achieved with an optimal level of operations of our facilities. The table below sets out certain information regarding our production capacity and efficiency in the production of steel products for the periods indicated.

	For the Year Ended December 31,		
	2016	2017	2018
Crude steel and stainless steel production capacity (million tons per year)	47.6	47.6	47.6
POSCO	42.4	42.4	42.4
Zhangjiagang Pohang Stainless Steel Co., Ltd.	1.1	1.1	1.1
PT. Krakatau POSCO	3.0	3.0	3.0
POSCO SS VINA Co., Ltd.	1.1	1.1	1.1
Actual crude steel and stainless steel output (million tons)	42.2	42.2	42.9
POSCO	37.5	37.2	37.7
Zhangjiagang Pohang Stainless Steel Co., Ltd.	1.2	1.2	1.2
PT. Krakatau POSCO	2.9	2.9	3.0
POSCO SS VINA Co., Ltd.	0.6	0.9	1.0
Capacity utilization rate (%)	88.7%	88.7%	90.1%
POSCO	88.5%	87.8%	89.0%
Zhangjiagang Pohang Stainless Steel Co., Ltd.	105.2%	105.4%	105.3%
PT. Krakatau POSCO	97.0%	97.4%	100.3%
POSCO SS VINA Co., Ltd.	58.0%	82.3%	87.7%

Exchange Rate Fluctuations

Our consolidated financial statements are prepared from our local currency denominated financial results, assets and liabilities and our subsidiaries around the world, which are then translated into Won. A substantial proportion of our consolidated financial results is accounted for in currencies other than the Won. Accordingly, our consolidated financial results and assets and liabilities may be materially affected by changes in the exchange rates of foreign currencies. In 2018, 61.6% of our total revenue from steel products produced and sold by us was in overseas markets outside of Korea. To the extent that we incur costs in one currency and make sales in another, our profit margins may be affected by changes in the exchange rates between the two currencies. Since the currency in which sales are recorded may not be the same as the currency in which expenses are incurred, foreign exchange rate fluctuations may materially affect our results of operations. Depreciation of the Won may materially affect the results of our operations because, among other things, it causes:

- an increase in the amount of Won required for us to make interest and principal payments on our foreign currency-denominated debt;
- an increase in Won terms in the costs of raw materials and equipment that we purchase from overseas sources and a substantial portion of our freight costs, which are denominated primarily in Dollars; and
- foreign exchange translation losses on foreign-currency denominated liabilities, which lower our earnings for accounting purposes.

Appreciation of the Won against major currencies, on the other hand, causes:

- our export products to be less competitive by raising our prices in Dollar, Yen and Renminbi terms; and
- a reduction in net sales and accounts receivables in Won from export sales, which are primarily denominated in Dollars and to a lesser extent in Yen and Renminbi.

The overall net impact from fluctuations of the Won against major currencies is difficult to estimate and varies from year to year. We strive to naturally offset our foreign exchange risk by matching foreign currency receivables with our foreign currency payables and our overseas subsidiaries have sought to further mitigate the adverse impact of exchange rate fluctuations by

conducting business transactions in the local currency of the respective market in which the transactions occur. In particular, POSCO International s exposure to fluctuations in exchange rates, including the Won/Dollar exchange rate, is limited because trading transactions typically involve matched purchase and sale contracts, which result in limited settlement exposure, and because POSCO International s contracts with domestic suppliers of products for export and with domestic purchasers of imported products are generally denominated in Dollars. Although the impact of exchange rate fluctuations is partially mitigated by such strategies, we and our subsidiaries, particularly POSCO International and POSCO E&C, also periodically enter into derivative contracts, primarily foreign currency swaps and forward exchange contracts, to further hedge some of our foreign exchange risks. However, our results of operations have historically been affected by exchange rate fluctuations and there can be no assurance that such strategies will be sufficient to reduce or eliminate the adverse impact of such fluctuations in the future.

Inflation

Inflation in Korea, which was 1.0% in 2016, 1.9% in 2017 and 1.5% in 2018, has not had a material impact on our results of operations in recent years.

Critical Accounting Estimates

We have prepared our consolidated financial statements in accordance with IFRS as issued by the IASB. These accounting principles require us to make certain estimates and judgments that affect the reported amounts in our consolidated financial statements. Our estimates and judgments are based on historical experience, forecasted future events and various other assumptions that we believe to be reasonable under the circumstances. Estimates and judgments may differ under different assumptions or conditions. We evaluate our estimates and judgments on an ongoing basis. We believe the critical accounting policies discussed below are the most important to the portrayal of our financial condition and results of operations. Each of them is dependent on projections of future market conditions, and they often require us to make difficult, subjective and complex judgments.

Allowance for Doubtful Accounts

We maintain an allowance for doubtful accounts for exposures in our receivable balances that represent our estimate of probable losses in our short-term and long-term receivable balances from the inability of our customers to make required payments. If the financial condition of our customers were to deteriorate and negatively impact their ability to make payments, additional allowances may be required. Determining the allowance for doubtful accounts requires significant management judgment and estimates including, among others, the credit worthiness of our customers, experience of historical collection patterns, potential events and circumstances affecting future collections and the ongoing risk assessment of our customer s ability to pay.

Trade account receivables are analyzed on a regular basis and, upon our becoming aware of a customer s inability to meet its financial commitments to us, the value of the receivable is reduced through a charge to the allowance for doubtful accounts. In addition, we record a charge to the allowance for doubtful accounts upon receipt of customer claims in connection with sales that management estimates are unlikely to be collected in full. As of December 31, 2018, the percentage of allowance for doubtful accounts to trade accounts and notes receivable and other receivables was 7.12%. Our allowance for doubtful accounts decreased by 16.2%, or Won 178 billion, from Won 1,094 billion as of December 31, 2017 to Won 917 billion as of December 31, 2018. See Note 23 of Notes to Consolidated Financial Statements.

Lifetime expected credit losses are expected credit losses from any default that may occur over the expected life of a financial instrument. 12-month expected credit losses are portions of lifetime expected credit losses that result from defaults that may occur within the 12 months after the reporting date. The expected life of a financial instrument is the entire contractual period over which we are exposed to credit risk. Expected credit losses are probability-weighted estimates of credit losses. Credit losses are measured as the present value of all cash shortfalls, such as the difference between cash flows specified under contracts and cash flows that we expect to receive.

The actual average annual uncollected percentage rate of accounts receivables resulting in write-offs for the three years in the period ended December 31, 2018 was 1.14%. These historical results, as well as current known conditions impacting the collectability of our accounts receivable balances, are significant factors for us when we estimate the amount of the necessary allowance for doubtful accounts. Historically, losses from uncollectible accounts receivables have been within expectations and in line with the allowances established. However, unforeseen circumstances such as adverse market conditions that deviate significantly from our estimates may require us to change the timing of, and make additional allowances to, our receivable balances. In this case, our results of operations, financial condition and net worth could be materially and adversely affected.

Valuation of Financial Instruments including Debt and Equity Securities and Derivatives

We invest in various financial instruments including debt and equity securities and derivatives. Depending on the accounting treatment specific to each type of financial instrument, an estimate of fair value is required to determine the instrument s effect on our consolidated financial statements.

If available, quoted market prices provide the best indication of fair value. We determine the fair value of our financial instruments using quoted market prices when available, including quotes from dealers trading those securities. If quoted market prices are not available, we determine the fair value based on pricing or valuation models, quoted prices of instruments with similar characteristics, or discounted cash flows. Determining the fair value of unlisted financial instruments involves a significant degree of management resources and judgment as no quoted prices exist and such securities are generally very thinly traded. Derivatives for which quoted market prices are not available are valued using valuation models such as the discounted cash flow method. The key inputs used in the valuation of such derivatives depend upon the type of derivative and the nature of the underlying instrument and include interest rate yield curves, foreign exchange rates, the spot price of the underlying instrument, volatility and correlation. The fair values based on pricing and valuation models and discounted cash flow analysis are subject to various assumptions used that, if changed, could significantly affect the fair value of the investments.

We assess at the end of each reporting period whether there is objective evidence that a financial asset or a group of financial assets is impaired. In the case of equity investments classified as available-for-sale, a significant or prolonged decline in the fair value of the security below its cost is also evidence that the asset is impaired. As part of this impairment review, the investee s operating results, net asset value and future performance forecasts as well as general market conditions are taken into consideration in order to assess whether there is any objective evidence such as significant financial difficulty of the issuer.

We have estimated fair values of material non-marketable securities. We estimated these fair values based on pricing or valuation models, quoted prices of instruments with similar characteristics, or discounted cash flow models. The discounted cash flow model valuation technique is based on the estimated cash flow projections of the underlying investee. Key assumptions and estimates include market conditions, revenue growth rates, operating margin rates, income tax rates, depreciation and amortization rates, the level of capital expenditures, working capital amounts and the discount rates. These estimates are based on historical results of the investee and other market data. In these cash flows projections, the two most significant estimates are the discount rates and revenue growth rates. If the discount rates used in these valuations were increased by 1%, then the estimated fair values would have decreased by approximately 10% in total. In addition, if the revenue growth rate assumptions were decreased by 1% in the cash flow models, then the estimated fair values would have decreased by approximately 13% in total.

We recognized impairment losses on available-for-sale financial assets of Won 248 billion in 2016 and Won 123 billion in 2017, but we did not recognize any such impairment loss in 2018 due to our adoption of IFRS 9 Financial Instruments, effective as of January 1, 2018, which classifies available-for-sale financial assets as financial assets at fair value through other comprehensive income. See Notes 2 and 33 of Notes to Consolidated Financial Statements.

Our estimates and assumptions used to evaluate impairment of investments are made taking into consideration our assessment of the latest information available. However, unforeseen circumstances such as adverse market conditions that deviate significantly from our estimates may require us to recognize additional losses on impairment of investments. We base our fair value estimates on assumptions we believe to be reasonable, but which are unpredictable and inherently uncertain. The use of alternative estimates and assumptions could increase or decrease the estimated fair values of our investments and potentially result in different impacts on our results of operations.

Long-lived Assets

At each reporting date, we review the carrying amounts of our tangible and intangible assets (excluding goodwill) to determine whether there is any indication that the carrying amount of those assets may not be recoverable through continuing use. If any such indication exists, the recoverable amount of the asset (or cash generating unit) is reviewed in order to determine the amount of the impairment, if any. The recoverable amount is the higher of the asset s net selling price (fair value less costs to sell) and its value in use. When the book value of long-lived asset exceeds the recoverable amount of the asset due to obsolescence, physical damage or a decline in market value and such amount is material, the impairment of the asset is recognized and the asset s carrying value is reduced to its recoverable amount and the resulting impairment loss is charged to current operations. Such recoverable amount is based on our estimates of the future use of assets and is subject to changes in market conditions. Based on an impairment test as of December 31, 2018, we recognized impairment loss on property, plant and equipment amounting to Won 810 billion in 2018, which related primarily to our synthetic natural gas production facility in Gwangyang due to our discontinuation of such business that we had launched in 2011, which was adversely impacted by a decline in the market price of LNG. In addition, we recognized impairment loss on industrial property rights of Won 78 billion related to our investment in Hume Coal Pty Limited, a coal mining company in Australia, as well as impairment loss on property, plant and equipment of Won 54 billion in 2018 in connection with the restructuring of our fuel cell business.

The depreciable lives and salvage values of our long-lived assets are estimated and reviewed each year based on industry practices and prior experience to reflect economic lives of long-lived assets. Our estimates of the useful lives and recoverable amount of long-lived assets are based on historical trends adjusted to reflect our best estimate of future market and operating conditions. Also, our estimates include the expected future period in which the future cash flows are expected to be generated from continuing use of the assets that we review for impairment and cash outflows to prepare the assets for use that can be directly attributed or allocated on a reasonable and consistent basis. If applicable, estimates also include net cash flows to be received or paid for the disposal of the assets at the end of their useful lives. As a result of the impairment review, when the sum of the discounted future cash flows expected to be generated by the assets is less than the book value of the assets, we recognize impairment losses based on the recoverable amount of those assets. We make a number of significant assumptions and estimates in the application of the discounted cash flow model to forecast cash flows, including business prospects, market conditions, selling prices and sales volume of products, costs of production and funding sources. The estimated cash flow forecast amounts are derived from the most recent financial budgets for the next three to five years. Beyond the specifically forecasted period, we extrapolate the cash flows for the remaining years based on an estimated growth rate. This estimated growth rate does not exceed the long-term average growth rate of our industry. As of December 31, 2018, for the applicable cash generating units, we estimated a discount rate of 4.6% to 10.4% and a revenue growth rate of 0.6% to 2.0%. Further impairment charges may be required if triggering events occur, such as adverse market conditions, that suggest deterioration in an asset s recoverability or fair value. Results in actual transactions could differ from those estimates used to evaluate the impairment of such long-lived assets. If our future cash flow projections are not realized, either because of an extended recessionary period or other unforeseen events, impairment charges may be required in future periods.

If the estimated discount rates used in these valuations were increased by 1%, then the estimated recoverable amount would have decreased by 4.2% to 4.9% in total. If the estimated revenue growth rate were decreased by 1%, then the estimated recoverable amount would have decreased by 1.9% to 8.5% in total. We believe that any reasonably possible negative change in the key assumptions on which the recoverable amount is based would result in impairment loss of long-lived assets.

Goodwill

Goodwill is tested for impairment annually at the level of the groups of cash generating units or whenever changes in circumstances indicate that the carrying amount may not be recoverable. The recoverable amounts of the groups of cash-generating units are determined from the higher of their fair value less cost to sell or their value-in-use calculations. The key assumptions for the value in use calculations are those regarding the discount rates, growth rates and expected changes to selling prices and direct costs during the period.

Our management estimates discount rates using post-tax rates that reflect current market rates for investments of similar risk. Growth rates are based on industry growth forecasts, and changes in selling prices and direct costs are based on historical experience and expectations of future changes in the market. Cash flow forecasts are derived from the most recent financial budgets for the next five years. Beyond the specifically forecasted period, we extrapolate cash flows for the remaining years based on an estimated growth rate. This rate does not exceed the average long-term growth rate for the relevant markets. Once recognized, impairment losses recognized for goodwill are not reversed.

In validating the value in use determined for the cash generating units, the sensitivity of key assumptions used in the discounted cash-flow model such as discount rates and the terminal growth rate was evaluated. If the estimated average discount rates used in these valuations were increased by 0.25%, the estimated value-in-use for the respective cash generating units would have decreased by 2.72% to 3.71% in total. If the estimated terminal growth rates were decreased by 0.25%, the estimated value-in-use for the respective cash generating units would have decreased by 1.49% to 1.76% in total. Based on an impairment test as of December 31, 2018, we recognized impairment loss on goodwill of Won 158 billion incurred by POSCO International and Won 66 billion incurred by POSCO E&C in connection with decreases in value-in-use of such entities, as well as impairment of industrial property rights of Won 78 billion related to our investment in Hume Coal Pty Limited, a coal mining company in Australia. We believe that determining the existence and impairment of goodwill is a critical accounting estimate because significant management judgment is involved in the evaluation of the value of the cash-generating groups, and any reasonably possible changes in the key assumptions on which the recoverable amount is based would cause a change in impairment loss on goodwill. See Note 15 of Notes to Consolidated Financial Statements.

Inventories

Inventories are stated at the lower of cost or net realizable value. Costs of inventories are determined using the moving-weighted average or weighted average method. Materials-in-transit are determined using the specific identification method. Amounts of inventory are written down to net realizable value due to losses occurring in the normal course of business and the allowance is reported as a contra inventory account, while the related charge is recognized in cost of goods sold.

The net realizable value is determined based on the latest selling price available at the end of each quarter taking into account the directly attributable selling costs. The latest selling price is the base price which is the negotiated selling price based upon the recent transactions entered into with major customers. Considering that our inventory turnover is approximately two months and inventories at the balance sheet date would be sold during the following two months, we perform valuation of inventories using the base price as of the balance sheet date and adjust for significant changes in selling price occurring subsequent to the reporting date. The selling price range used for determining the net realizable value of our inventories ranged from 92.9% to 116.1% of the inventory cost amount. For inventories in which expected selling prices are less than the cost amount, the necessary adjustment to write-down the inventories to net realizable value is made. There was no recovery in 2016, 2017 and 2018. The valuation losses of inventories recognized within cost of goods sold were Won 152 billion in 2016, Won 79 billion in 2017 and Won 142 billion in 2018.

Investments in Associates and Joint Ventures

We hold a significant amount of investments in associates and joint ventures, which interests are accounted for using the equity method. As of December 31, 2018, the book value of our investments in associates and joint ventures was Won 3,650 billion. The carrying amounts of our investments in associates and joint ventures are reviewed at the end of the reporting period to determine whether there is any indication of impairment. If any such indication exists, then the asset s recoverable amount is estimated.

We estimate the recoverable amount of an individual asset. If it is impossible to measure the individual recoverable amount of an asset, then we estimate the recoverable amount of cash-generating unit (CGU), which is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets. The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. The value in use is estimated by applying a post-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU for which estimated future cash flows have not been adjusted, to the estimated future cash flows expected to be generated by the asset or CGU. We treat individual operating entities as CGUs, and 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.

As part of our impairment review, the operating results, net asset value and future performance forecasts of our associates and joint ventures as well as general market conditions are taken into consideration in order to assess whether there is any objective evidence of impairment, such as significant financial difficulty of the associate or joint venture. Unforeseen circumstances such as adverse market conditions that deviate significantly from our estimates may require us to recognize additional losses on impairment of our interest in our associates and joint ventures. We base our value in use estimates on assumptions we believe to be reasonable, but which are unpredictable and inherently uncertain. The use of alternative estimates and assumptions could increase or decrease the estimated fair values used to evaluate impairment of our interest in our associates and joint ventures and potentially have different impacts on our results of operations.

Revenue Recognized by the Input Method

POSCO E&C, our consolidated subsidiary, engages in various construction activities, including construction of industrial plants and civil engineering projects, and revenue recognition is different based on types of contracts. We recognize revenue over time when (i) our customers receive the benefits from our construction activities simultaneously with our performance of such activities, (ii) our construction activities create or improve an asset when such asset is under the customer s control or (iii) our construction activities do not provide alternative benefits to us and we have an enforceable right to payment for performance completed to date.

In the case of construction contracts where we construct plants or other similar structures, our customers control the assets as they are being constructed. Under such contracts, we perform construction of the projects according to the customers on-going specifications, and if a contract is terminated by the customer, we are entitled to reimbursement of all costs incurred to date, including a reasonable margin. When the revenue and costs of a contract can be reliably estimated, we recognize such estimated revenue and costs based on the progress of construction as of the end of the reporting period. The percentage of completion is determined based on the proportion that contract costs incurred for work performed to date bear to the estimated total contract costs. If the revenue and costs of a contract cannot be reliably estimated, revenue is recognized only to the extent the recovery of contract costs are probable. If the total contract cost is likely to exceed the total contract revenue, expected losses are immediately recognized as costs.

Our contract revenue recognition policy requires our management to exercise judgment in estimating the outcome of our contracts and measuring the percentage of completion and actual costs incurred in respect of our projects, which affects the amount and timing of recognition of revenues and cost of sales, provisions for estimated losses, charges against current earnings, trade account receivables and advances. For example, due to factors causing variation in costs for 2018, the estimated total contract costs were changed. Details of changes in estimated total contract costs and the impact on profit before income taxes for 2018 and future periods are as follows:

	Amount (In millions of Won)
Changes in estimated total contract costs	427,812
Changes in profit before income taxes of construction contracts:	
Current period	(38,720)
Future periods	69,428

The effect on current and future profit is estimated based on circumstances that have occurred from the commencement date of the contract to the end of 2018. The estimation is evaluated for total contract costs and expected total contract revenue as of the end of the period. Such estimate may change in future periods.

Our ability to measure reliably the estimated total cost of a project has a significant effect on the amount and timing of recognizing our sales and cost of sales. The timing of recognition of sales we report may differ materially from the timing of actual contract payments received. In addition, to the extent that sales recognized by us exceed the amount of payments to be received by us, such amount is reflected as trade account receivables on our balance sheet. To the extent payments received by us exceed the sales recognized, such amount is reflected under advances from customers on our balance sheet. Thus our ability to measure reliably the estimated total costs and the percentage of completion also affects the amount of our trade account receivables and advances from customers. For a discussion of uncertainty of estimates related to contract revenues and costs, see Note 29(d) of Notes to Consolidated Financial Statements.

Deferred Income Taxes

Our deferred income tax assets and liabilities reflect the tax consequences that would follow from the manner in which we expect, at the end of the reporting period, to recover or settle the carrying mount of our assets and liabilities. We recognize deferred income tax liability for all taxable temporary differences associated with investments in subsidiaries, associates and joint ventures, except to the extent that we are 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. We recognize deferred income tax asset for deductible temporary differences to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which they can be utilized. However, deferred tax is not recognized for 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 carrying amount of a deferred income tax asset is reviewed at the end of each reporting period and is reduced 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.

We believe that recognition of deferred tax assets and liabilities is a significant accounting policy that requires our management s estimates and assumptions regarding, among other things, the level of future taxable income, interpretation of the tax laws and tax planning. Changes in tax laws, projected levels of taxable income and tax planning could affect the effective tax rate and tax balances recorded by us in the future.

Employee Benefits

Our accounting of employee benefits for defined benefit plans involves judgments about uncertain events including, but not limited to, discount rates, life expectancy, future pay inflation and expected rate of return on plan assets. The discount rates are determined by reference to the yield at the reporting date on high quality corporate bonds that have maturity dates approximating the terms of our benefits obligations and that are denominated in the same currency in which the benefits are expected to be paid. We determine the net interest expense (income) on the net defined benefit liability (asset) for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period to the then-net defined benefit liability (asset), taking into account any changes in the net defined benefit liability (asset) during the period as a result of contributions and benefit payments, net interest expense, and other expenses related to defined benefit plans that are recognized in profit or loss. Due to changing market and economic conditions, the underlying key assumptions may differ from actual developments and may lead to significant changes in our defined benefit plan. We immediately recognize all actuarial gains and losses arising from defined benefit plans in retained earnings. If the estimated average discount rates by actuarial assumptions used in these valuations were increased by 1%, then the estimated provision for severance benefits would have decreased by Won 144 billion, or 6.7% in total, as of December 31, 2018. If the estimated future pay inflation rates were decreased by 1%, then the estimated provision for severance benefits would have decreased by Won 147 billion, or 6.9% in total, as of December 31, 2018.

Recent Accounting Changes

For a discussion of new standards, interpretations and amendments to existing standards that have been published, see Note 3 of Notes to Consolidated Financial Statements.

IFRS No. 16 Leases

IFRS No. 16 Leases replaces existing guidance regarding leases, including IAS No. 17 Leases, IFRIC No. 4 Determining whether an Arrangement contains a Lease, SIC No. 15 Operating Leases-Incentives and SIC No. 27 Evaluating the Substance of Transactions Involving the Legal Form of a Lease.

IFRS No. 16 introduces a single accounting model that requires a lessee to recognize lease related assets and liabilities in the financial statements. A lessee is required to recognize as an asset its right to use the underlying leased asset and recognize as a liability its obligation to make lease payments. The lessee may elect not to apply the standard to short-term lease with a term of 12 months or less or low value assets. Accounting treatment for a lessor is similar to the existing standard which classifies leases into finance and operating leases.

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We will apply IFRS No. 16 Leases beginning on January 1, 2019. Based on information currently available, we estimate that we will recognize right-of-use assets and lease liabilities of Won 619 billion as of January 1, 2019, which is the present value of the lease payments of Won 856 billion that are not paid at the date of initial application for the assets currently used as operating leases.

Explanatory Note Regarding Presentation of Certain Financial Information under K-IFRS

In addition to preparing financial statements in accordance with IFRS as issued by the IASB included in this annual report, we also prepare financial statements in accordance with K-IFRS as adopted by the KASB, which we are required to file with the Financial Services Commission and the Korea Exchange under the FSCMA.

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K-IFRS differs in certain respects from IFRS as issued by the IASB in the presentation of operating profit. Additionally, under K-IFRS, revenue from the development and sale of real estate is recognized using the percentage of completion method. However, under IFRS as issued by the IASB, revenue from the development and sale of certain real estate is recognized when an individual unit of residential real estate is delivered to the buyer. As a result, our consolidated statements of comprehensive income and our consolidated statements of financial position prepared in accordance with IFRS as issued by the IASB included in this annual report differ from our consolidated statements of comprehensive income and consolidated statements of financial position prepared in accordance with K-IFRS. The table below sets forth a reconciliation of our operating profit and net income or loss as presented in our consolidated statements of comprehensive income prepared in accordance with IFRS as issued by the IASB for each of the years ended December 31, 2016, 2017 and 2018 to our operating profit and net income or loss in our consolidated statements of comprehensive income prepared in accordance with K-IFRS, for each of the corresponding years, taking into account such differences:

	For the Year Ended December 31,		
	2016	2017	2018
	(In millions of Won)		
Operating profit under IFRS as issued by the IASB	2,282,496	4,196,121	4,041,827
Additions:			
Impairment loss on other receivables	37,567	98,177	63,092
Impairment loss on assets held for sale	24,890		50,829
Loss on disposals of investments in subsidiaries, associates and joint ventures	22,499	19,985	5,226
Loss on disposals of property, plant and equipment	86,622	151,343	117,614
Impairment loss on property, plant and equipment	196,882	117,231	1,004,704
Impairment loss on investment property	318		51,461
Loss on disposals of investment property	21	1,966	9,154
Impairment loss on intangible assets	127,875	167,995	337,519
Increase to provisions	53,058	33,964	134,632
Loss on valuation of firm commitment		43,164	66,281
Donations	43,810	51,424	52,074
Idle tangible asset expenses	6,437	10,490	9,257
Others	143,083	93,814	175,711
	743,062	789,553	2,077,554
Deductions:			
Gain on disposals of assets held for sale	(23,112)	(1,180)	(27,171)
Gain on disposals of investment in subsidiaries, associates and joint ventures	(23,305)	(81,794)	(45,241)
Gain on disposals of property, plant and equipment	(23,826)	(32,145)	(53,139)
Gain on disposals of intangible assets	(671)	(23,391)	(117,139)
Gain on valuation of firm commitment		(56,301)	(39,028)
Gain on insurance proceeds	(22,400)	(5,878)	(14,034)
Others	(109,164)	(247,792)	(227,834)
	(202,478)	(448,481)	(523,586)
Revenue recognition related to development and sale of real estate	143,742	468,233	(176,859)
Cost of sales recognition related to development and sale of real estate	(122,497)	(383,592)	123,664
Operating profit under K-IFRS	2,844,325	4,621,834	5,542,600
Net income (loss) under IFRS as issued by the IASB	1,032,065	2,909,311	1,932,386
Adjustments related to development and sale of real estate:			
Revenue	143,742	468,233	(176,859)
Cost of sales	(122,497)	(383,592)	123,664
Income tax	(5,141)	(20,483)	12,873
Net income (loss) under K-IFRS	1,048,169	2,973,469	1,892,064

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Operating Results   2017 Compared to 2018

The following table presents our statement of comprehensive income information and changes therein for 2017 and 2018.

	For the Year Ended December 31,		Changes 2017 versus 2018	
	2017	2018	Amount	%
	(In billions of Won)			
Revenue	60,187	65,155	4,968	8.3%
Cost of sales	51,916	57,129	5,123	10.0
Gross profit	8,271	8,026	(246)	(3.0)
Selling and administrative expenses:				
Impairment loss on trade accounts and notes receivable	174	75	(99)	(56.9)
Other administrative expenses	2,003	1,986	(17)	(0.9)
Selling expenses	1,557	369	(1,188)	(76.3)
Other operating income and expenses:				
Impairment loss on other receivables	98	63	(35)	(35.7)
Other operating income	448	524	75	16.7
Other operating expenses	691	2,014	1,323	191.4
Operating profit	4,196	4,042	(154)	(3.7)
Share of profit of equity-accounted investees, net	11	113	102	968.6
Finance income	2,373	1,706	(667)	(28.1)
Finance costs	2,484	2,244	(240)	(9.7)
Profit before income tax	4,095	3,616	(479)	(11.7)
Income tax expense	1,186	1,684	498	42.0
Profit	2,909	1,932	(977)	(33.6)
Profit for the period attributable to owners of the controlling company	2,756	1,712	(1,044)	(37.9)
Profit for the period attributable to non-controlling interests	153	220	67	44.0

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Revenue

The following table presents our revenue by segment and changes therein for 2017 and 2018.

	For the Year Ended December 31,		Changes 2017 versus 2018	
	2017	2018	Amount	%
	(In billions of Won)			
Steel Segment:				
External revenue	30,230	32,358	2,128	7.0%
Internal revenue	17,381	18,063	682	3.9
Total revenue from Steel Segment	47,611	50,421	2,810	5.9
Trading Segment:				
External revenue	20,802	22,408	1,606	7.7%
Internal revenue	14,076	15,911	1,835	13.0
Total revenue from Trading Segment	34,878	38,319	3,441	9.9
Construction Segment:				
External revenue	6,887	6,769	(117)	(1.7)
Internal revenue	399	551	152	38.2
Total revenue from Construction Segment	7,286	7,321	35	0.5
Others Segment:				
External revenue	2,736	3,443	707	25.8
Internal revenue	2,549	2,755	207	8.1
Total revenue from Others Segment	5,285	6,198	913	17.3
Total revenue prior to consolidation adjustments and basis difference	95,060	102,259	7,199	7.6
Consolidation adjustments	(34,405)	(37,281)	(2,876)	8.4
Basis difference adjustments (1)	(468)	177	645	N.A. (2)
Revenue	60,187	65,155	4,968	8.3%

(1) Basis difference adjustments are related to the difference in recognizing revenue and expenses of the Construction Segment in connection with development and sale of certain residential real estate between the report reviewed by the chief executive officer and the consolidated financial statements. See Notes 3 and 40 of Notes to Consolidated Financial Statements.

(2) N.A. means not applicable.

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Our revenue increased by 8.3%, or Won 4,968 billion, from Won 60,187 billion in 2017 to Won 65,155 billion in 2018 due to increases in external revenues from the Steel Segment, the Trading Segment and the Others Segment, which were offset in part by a decrease in external revenue from the Construction Segment. Specifically:

Steel Segment. External revenue from the Steel Segment, which does not include internal revenue from inter-company transactions that are eliminated during consolidation and basis difference adjustments, increased by 7.0%, or Won 2,128 billion, from Won 30,230 billion in 2017 to Won 32,358 billion in 2018 due to an increase in our sales volume of the steel products produced by us and directly sold to external customers (including miscellaneous steel products not included in any of our major product categories), as well as an increase in the average unit sales price per ton of the principal steel products produced by us and directly sold to external customers. The overall sales volume of the principal steel products produced by us and directly sold to external customers increased by 4.4% from 30.0 million tons in 2017 to 31.4 million tons in 2018, while the weighted average unit sales price per ton of the principal steel products produced by us and directly sold to external customers increased by 3.3% from Won 903,897 per ton in 2017 to Won 933,990 per ton in 2018. Such factors were principally attributable to the following:

- The sales volume of each of our major product categories, other than wire rods and stainless steel products, increased from 2017 to 2018. The sales volume of cold rolled products, hot rolled products, silicon steel products and plates produced by us and directly sold to external customers increased by 9.1%, 4.7%, 1.7% and 1.2%, respectively, from 2017 to 2018. On the other hand, the sales volume of wire rods and stainless steel products produced by us and directly sold to external customers decreased by 4.6% and 0.8%, respectively, from 2017 to 2018. For a discussion of changes in sales volume of each of our principal product lines, see Item 4.B. Business Overview Major Products.

- The unit sales prices in Won of each of our major product categories, other than silicon steel products, increased from 2017 to 2018. The unit sales prices in Won of plates, hot rolled products, wire rods, cold rolled products and stainless steel products produced by us and directly sold to external customers increased by 14.8%, 5.2%, 4.9%, 2.8% and 0.8%, respectively, from 2017 to 2018. On the other hand, the unit sales price in Won of silicon steel products produced by us and directly sold to external customers decreased by 2.9% from 2017 to 2018. For a discussion of changes in the unit sales prices of each of our principal product lines, see Overview Sales Volume, Prices and Product Mix above.

Total revenue from the Steel Segment, which includes internal revenue from inter-company transactions, increased by 5.9%, or Won 2,810 billion, from Won 47,611 billion in 2017 to Won 50,421 billion in 2018 as internal revenue from inter-company transactions increased by 3.9%, or Won 682 billion, from Won 17,381 billion in 2017 to Won 18,063 billion in 2018.

Trading Segment. External revenue from the Trading Segment, which does not include internal revenue from inter-company transactions that are eliminated during consolidation and basis difference adjustments, increased by 7.7%, or Won 1,606 billion, from Won 20,802 billion in 2017 to Won 22,408 billion in 2018 primarily due to an increase in third-country trades by POSCO International and our other trading subsidiaries from 2017 to 2018, reflecting an increase in trading of agricultural products and steel slabs, as well as the recognition of the sales of POSCO P&S s steel product sales business under the Trading Segment commencing March 2017 following the transfer of such business to POSCO International.

Total revenue from the Trading Segment, which includes internal revenue from inter-company transactions, increased by 9.9%, or Won 3,441 billion, from Won 34,878 billion in 2017 to Won 38,319 billion in 2018 as internal revenue from inter-company transactions increased by 13.0%, or Won 1,835 billion, from Won 14,076 billion in 2017 to Won 15,911 billion in 2018.

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Construction Segment. External revenue from the Construction Segment, which does not include internal revenue from inter-company transactions that are eliminated during consolidation and basis difference adjustments, decreased by 1.7%, or Won 117 billion, from Won 6,887 billion in 2017 to Won 6,769 billion in 2018 primarily due to a decrease in POSCO E&C s construction activities in Brazil following the completion of construction of CSP-Companhia Siderurgia do Pecem steel plant complex in 2017.

Total revenue from the Construction Segment, which includes internal revenue from inter-company transactions, increased by 0.5%, or Won 35 billion, from Won 7,286 billion in 2017 to Won 7,321 billion in 2018 as internal revenue from inter-company transactions increased by 38.2%, or Won 152 billion, from Won 399 billion in 2017 to Won 551 billion in 2018. Such increase in internal revenue reflected an increase in the amount of construction activities for member companies of the POSCO Group in 2018 compared to 2017, which was partially offset by a decrease in external revenue as discussed above.

Others Segment. The Others Segment primarily includes power generation, LNG logistics, manufacturing of various industrial materials and information technology service. External revenue from the Others Segment, which does not include internal revenue from inter-company transactions that are eliminated during consolidation and basis difference adjustments, increased by 25.8%, or Won 707 billion, from Won 2,736 billion in 2017 to Won 3,443 billion in 2018 primarily due to increases in revenue of POSCO Energy Corporation and POSCO Chemical Co., Ltd.

Total revenue from the Others Segment, which includes internal revenue from inter-company transactions, increased by 17.3%, or Won 913 billion, from Won 5,285 billion in 2017 to Won 6,198 billion in 2018 as internal revenue from inter-company transactions increased by 8.1% or Won 207 billion, from Won 2,549 billion in 2017 to Won 2,755 billion in 2018. Such increase primarily reflected an increase in inter-company sales of coal coking by-products from POSCO Chemical Co., Ltd. to POSCO.

Cost of Sales

Our cost of sales increased by 10.0%, or Won 5,213 billion, from Won 51,916 billion in 2017 to Won 57,129 billion in 2018. The increase in cost of sales was primarily due to increases in the average price in Won terms of key raw materials that were used to manufacture our finished goods sold as well as in our sales volume of steel products. Following our adoption of IFRS No. 15 Revenue from Contracts with Customers starting on January 1, 2018, we also began classifying a substantial majority of our freight and custody expenses as cost of sales, which had all been recognized as selling expenses in 2017. We recognized Won 1,415 billion as freight and custody expenses in 2018, of which we recognized Won 1,230 billion as cost of sales and Won 185 billion as selling expenses.

The following table presents a breakdown of our cost of sales by segment, prior to adjusting for inter-company transactions that are eliminated during consolidation and basis difference, and changes therein for 2017 and 2018.

	For the Year Ended December 31,		Changes 2017 versus 2018	
	2017	2018	Amount	%
	(In billions of Won)			
Steel Segment	41,479	44,377	2,898	7.0%
Trading Segment	33,388	37,202	3,814	11.4
Construction Segment	6,598	6,651	53	0.8
Others Segment	4,636	5,603	967	20.9
Consolidation adjustments	(33,802)	(36,828)	(3,026)	9.0
Basis difference adjustments (1)	(383)	124	507	N.A. (2)
Cost of sales	51,916	57,129	5,213	10.0%

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(1) Basis difference adjustments are related to the difference in recognizing revenue and expenses of the Construction Segment in connection with development and sale of certain residential real estate between the report reviewed by the chief executive officer and the consolidated financial statements. See Notes 3 and 40 of Notes to Consolidated Financial Statements.

(2) N.A. means not applicable.

***Steel Segment*.** The cost of sales of our Steel Segment, prior to consolidation and basis difference adjustments, increased by 7.0%, or Won 2,898 billion, from Won 41,479 billion in 2017 to Won 44,377 billion in 2018 primarily due to increases in our sales volume of the principal steel products produced by us and sold to external and internal customers and in the average price in Won terms of key raw materials that were used to manufacture our finished goods sold, as well as our classification of Won 919 billion of freight and custody expenses of the Steel Segment as cost of sales (instead of selling expenses) following our adoption of IFRS 15 starting in 2018.

***Trading Segment*.** The cost of sales of our Trading Segment, prior to consolidation and basis difference adjustments, increased by 11.4%, or Won 3,814 billion, from Won 33,388 billion in 2017 to Won 37,202 billion in 2018 primarily due to an increase in the volume of export and import products sold, as well as our classification of Won 307 billion of freight and custody expenses of the Trading Segment as cost of sales (instead of selling expenses) following our adoption of IFRS 15 starting in 2018.

***Construction Segment*.** The cost of sales of our Construction Segment, prior to consolidation and basis difference adjustments, increased by 0.8%, or Won 53 billion, from Won 6,598 billion in 2017 to Won 6,651 billion in 2018 in line with an increase in the amount of construction activities described above.

Others Segment. The cost of sales of our Others Segment, prior to consolidation and basis difference adjustments, increased by 20.9%, or Won 967 billion, from Won 4,636 billion in 2017 to Won 5,603 billion in 2018 primarily due to increases in the average price in Won terms of key raw materials used by POSCO Energy Corporation.

Gross Profit

Our gross profit decreased by 3.0%, or Won 246 billion, from Won 8,271 billion in 2017 to Won 8,026 billion in 2018 due to decreases in gross profit of each of our four segments, particularly from the Trading Segment. Our gross margin decreased from 13.7% in 2017 to 12.3% in 2018.

The following table presents our gross profit by segment, prior to adjusting for inter-company transactions that are eliminated during consolidation and basis difference, and changes therein for 2017 and 2018.

	For the Year Ended December 31,		Changes 2017 versus 2018	
	2017	2018	Amount	%
		(In billions of Won)		
Steel Segment	6,132	6,044	(88)	(1.4)%
Trading Segment	1,490	1,117	(374)	(25.1)
Construction Segment	688	669	(18)	(2.6)
Others Segment	649	595	(54)	(8.3)
Consolidation adjustments	(603)	(453)	150	(24.8)
Basis difference adjustments (1)	(85)	53	138	N.A. (2)
Gross profit	8,271	8,026	(246)	(3.0)

(1) Basis difference adjustments are related to the difference in recognizing revenue and expenses of the Construction Segment in connection with development and sale of certain residential real estate between the report reviewed by the chief

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executive officer and the consolidated financial statements. See Notes 3 and 40 of Notes to Consolidated Financial Statements.

(2) N.A. means not applicable.

Steel Segment. The gross profit of our Steel Segment, prior to consolidation and basis difference adjustments, decreased by 1.4%, or Won 88 billion, from Won 6,132 billion in 2017 to Won 6,044 billion in 2018 primarily due to our classification of Won 919 billion of freight and custody expenses of the Steel Segment as cost of sales (instead of selling expenses) following our adoption of IFRS 15 starting in 2018, which was largely offset by the impact from our external revenue from the Steel Segment increasing at a greater rate than its cost of sales (excluding freight and custody expenses), prior to consolidation and basis difference adjustments, as discussed above. Due to such factors, the gross margin of our Steel Segment, which is gross profit as a percentage of total revenue prior to consolidation and basis difference adjustments, decreased from 12.9% in 2017 to 12.0% in 2018.

Trading Segment. The gross profit of our Trading Segment, prior to consolidation and basis difference adjustments, decreased by 25.1%, or Won 374 billion, from Won 1,490 billion in 2017 to Won 1,117 billion in 2018 primarily due to a decrease in trading margins resulting from our classification of Won 307 billion of freight and custody expenses of the Trading Segment as cost of sales (instead of selling expenses) following our adoption of IFRS 15 starting in 2018. The gross margin of our Trading Segment, prior to consolidation and basis difference adjustments, decreased from 4.3% in 2017 to 2.9% in 2018.

Construction Segment. The gross profit of our Construction Segment, prior to consolidation and basis difference adjustments, decreased by 2.6%, or Won 18 billion, from Won 688 billion in 2017 to Won 669 billion in 2018 primarily due to a decrease in POSCO E&C s construction activities overseas as well as a decrease in its participation of construction projects with higher margins in 2018. The gross margin of our Construction Segment, prior to consolidation and basis difference adjustments, decreased from 9.4% in 2017 to 9.1% in 2018.

Others Segment. The gross profit of our Others Segment, prior to consolidation and basis difference adjustments, decreased by 8.3%, or Won 54 billion, from Won 649 billion in 2017 to Won 595 billion in 2018 primarily due to a decrease in gross profit of POSCO Energy Corporation. The gross margin of our Others Segment, prior to consolidation and basis difference adjustments, decreased from 12.3% in 2017 to 9.6% in 2018.

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Selling and Administrative Expenses

The following table presents a breakdown of our selling and administrative expenses and changes therein for 2017 and 2018.

	For the Year Ended December 31,		Changes 2017 versus 2018	
	2017	2018	Amount	%
	(In billions of Won)			
Impairment loss on trade accounts and notes receivable	174	75	(99)	(56.9)%
Freight and custody expenses	1,337	185	(1,152)	(86.2)%
Sales commissions	116	79	(37)	(31.8)
Sales promotion	12	14	1	11.1
Sales insurance premium	37	37	1	1.9
Contract cost	23	17	(6)	(26.3)
Others	32	37	5	15.7