DOOSAN ENGINE CO., LTD. AND SUBSIDIARIES

CONSOLIDATED FINANCIAL STATEMENTS
AS OF AND FOR THE YEARS ENDED
DECEMBER 31, 2016 AND 2015

ATTACHMENT: INDEPENDENT AUDITORS' REPORT

DOOSAN ENGINE CO., LTD.

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INDEPENDENT AUDITORS' REPORT

English Translation of the Independent Auditors' Report Originally Issued in Korean on March 22, 2017

To the Stockholders and Board of Directors of
Doosan Engine Co., Ltd.:

Report on the Consolidated Financial Statements

We have audited the accompanying consolidated financial statements of Doosan Engine Co., Ltd. (the "Company") and subsidiaries, which comprise the consolidated statements of financial position as of December 31, 2016 and 2015, respectively, and the related consolidated statements of income, consolidated statements of comprehensive income, consolidated statements of changes in stockholders' equity and consolidated statements of cash flows, all expressed in Korean won, for the years ended December 31, 2016 and 2015, respectively, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Consolidated Financial Statements

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

Auditors' Responsibility

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

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

Deloitte.

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

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company and its subsidiaries as of December 31, 2016 and 2015, respectively, and its financial performance and its cash flows for the years ended December 31, 2016 and 2015, respectively, in accordance with K-IFRSs.

Deloitte Anjin LLC

March 22, 2017

Notice to Readers

This report is effective as of March 22, 2017, the auditors' report date. Certain subsequent events or circumstances may have occurred between the auditors' report date and the time the auditors' report is read. Such events or circumstances could significantly affect the consolidated financial statements and may result in modifications to the auditors' report.

DOOSAN ENGINE CO., LTD. (the “Company”)
AND SUBSIDIARIES

CONSOLIDATED FINANCIAL STATEMENTS
AS OF AND FOR THE YEARS ENDED DECEMBER 31, 2016 AND 2015

The accompanying consolidated financial statements, including all footnote disclosures, were prepared by, and are the responsibility of, the Company.

Kim, Dong-Chul
Chief Executive Officer
Doosan Engine Co., Ltd.

DOOSAN ENGINE CO., LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF FINANCIAL POSITION
AS OF DECEMBER 31, 2016 AND 2015
(In Korean won)

ASSETS	Notes	December 31, 2016	December 31, 2015
CURRENT ASSETS:			
Cash and cash equivalents	10	₩72,820,704,197	₩45,482,382,275
Short-term financial instruments	5 and 10	7,618,000,000	17,330,000,000
Short-term loans receivable	10	879,872,362	1,206,666,362
Trade and other receivables	6, 10, 14, 30 and 32	76,120,802,544	53,264,509,922
Gross amount due from customers for contract work	23	15,762,003,759	2,331,456,039
Prepaid income tax		86,976,180	321,408,124
Derivative assets	9 and 10	508,056,490	1,485,413,778
Firm commitment assets	9	30,191,452,671	48,225,408,694
Inventories	7	203,788,760,831	198,981,404,071
Assets held for sale	34	4,912,999,994	64,355,499,916
Other current assets		17,188,307,029	11,347,858,544
Total current assets		429,877,936,057	444,332,007,725
NON-CURRENT ASSETS:			
Long-term financial instruments	5, 10 and 31	6,000,000	6,000,000
Long-term investment securities	8 and 10	397,742,607,738	72,048,000
Investments in associates	11 and 31	7,214,902,281	391,382,539,736
Long-term loans receivable	10	1,248,909,461	1,719,786,920
Long-term other receivables	6 and 10	3,883,005,014	14,056,919,161
Property, plant and equipment	12	498,194,693,878	505,995,771,822
Intangible assets	13	7,755,945,455	28,543,609,001
Derivative assets	9 and 10	126,767,145	1,246,978,730
Firm commitment assets	9	6,659,599,148	9,584,804,110
Other non-current assets		3,739,158,888	9,101,045,479
Total non-current assets		926,571,589,008	961,709,502,959
TOTAL ASSETS		₩1,356,449,525,065	₩1,406,041,510,684

(Continued)

DOOSAN ENGINE CO., LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF FINANCIAL POSITION (CONTINUED)
AS OF DECEMBER 31, 2016 AND 2015
(In Korean won)

LIABILITIES AND STOCKHOLDERS' EQUITY	Notes	December 31, 2016	December 31, 2015
CURRENT LIABILITIES:			
Trade and other payables	10 and 32	₩156,703,928,327	₩122,440,914,405
Gross amount due to customers for contract work	23	16,562,496,578	9,702,365,258
Short-term borrowings	10, 14 and 30	51,439,724,730	70,106,925,953
Current portion of long-term borrowings	10 and 14	45,000,000,000	-
Current portion of bonds	10 and 14	99,907,752,422	-
Advance receipts		239,157,081,846	262,995,923,163
Income tax payable		-	12,759,183
Current derivative liabilities	9 and 10	28,578,393,711	31,962,933,015
Current firm commitment liabilities	9	5,404,842,462	7,862,163,477
Current liability provisions	16	4,694,520,263	4,433,211,662
Other current liabilities		25,326,271,947	20,802,120,179
Total current liabilities		672,775,012,286	530,319,316,295
NON-CURRENT LIABILITIES:			
Long-term borrowings	10 and 14	30,000,000,000	75,000,000,000
Bonds	10 and 14	89,809,733,451	189,483,246,417
Long-term other payables	10	2,594,126,964	8,126,942,214
Retirement benefit obligation	15	6,519,461,393	7,932,876,997
Non-current derivative liabilities	9 and 10	5,144,229,974	6,701,954,873
Non-current firm commitment liabilities	9	1,165,994,358	4,542,533,243
Financial warranty liabilities	10 and 31	-	3,865,652,143
Liability provisions	16	3,840,512,312	3,034,720,345
Deferred income tax liabilities	28	8,851,171,935	2,361,546,028
Other non-current liabilities		1,484,420,870	-
Total non-current liabilities		149,409,651,257	301,049,472,260
TOTAL LIABILITIES		822,184,663,543	831,368,788,555
STOCKHOLDERS' EQUITY			
Share capital	1 and 17	69,500,000,000	69,500,000,000
Capital surplus	17	367,214,701,425	367,214,701,425
Other capital items	18	621,477,800	623,042,540
Accumulated other comprehensive income (loss)	8, 12 and 19	99,126,056,661	(37,386,250,002)
Retained earnings	20	(2,197,374,364)	174,721,228,166
Equity attributable to owners of the parent company		534,264,861,522	574,672,722,129
Non-controlling interests		-	-
TOTAL STOCKHOLDERS' EQUITY		534,264,861,522	574,672,722,129
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY		₩1,356,449,525,065	₩1,406,041,510,684

(Concluded)

See accompanying notes to consolidated financial statements.

DOOSAN ENGINE CO., LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF INCOME
FOR THE YEARS ENDED DECEMBER 31, 2016 AND 2015
(In Korean won)

	Notes	2016	2015
SALES	21, 22, 23 and 32	₩802,916,582,708	₩693,645,086,189
COST OF SALES	24, 30 and 32	(761,285,101,081)	(694,797,317,070)
SELLING AND ADMINISTRATIVE EXPENSES	24 and 25	(37,394,208,049)	(62,601,345,631)
OPERATING INCOME (LOSS)		4,237,273,578	(63,753,576,512)
Finance income	10 and 26	96,578,400,004	94,398,390,297
Finance expenses	10 and 26	(115,012,081,870)	(124,651,120,979)
Other non-operating income	27	1,448,990,508	2,147,487,644
Other non-operating expenses	27	(303,982,239,325)	(84,344,616,882)
Gain on investments in associates, net	11 and 13	128,935,583,318	10,499,540,337
LOSS BEFORE INCOME TAX BENEFIT		(187,794,073,787)	(165,703,896,095)
INCOME TAX BENEFIT	28	6,567,610,450	40,261,406,804
NET LOSS		₩(181,226,463,337)	₩(125,442,489,291)
Attributable to:			
Owners of the parent		₩(181,226,463,337)	₩(125,442,489,291)
Non-controlling interests		-	-
EARNINGS PER SHARE:	29		
Basic earnings per share		₩(2,608)	₩(1,805)
Diluted earnings per share		₩(2,608)	₩(1,805)

See accompanying notes to consolidated financial statements.

DOOSAN ENGINE CO., LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
FOR THE YEARS ENDED DECEMBER 31, 2016 AND 2015
(In Korean won)

	Notes	2016	2015
NET LOSS		₩(181,226,463,337)	₩(125,442,489,291)
OTHER COMPREHENSIVE INCOME (LOSS)			
Items not reclassified subsequently to profit or loss:			
Remeasurements of net defined benefit liabilities	15 and 20	(479,400,533)	36,539,304
Revaluation of property, plant and equipment	12 and 19	-	26,872,895,283
Increase (decrease) in retained earnings of associates	11 and 20	(2,241,450,490)	2,949,314,149
Items reclassified subsequently to profit or loss:			
Gain (loss) on translation of foreign operations	19	(476,824,933)	114,300,519
Decrease in equity of associates	11 and 19	102,272,358,785	(30,632,397,623)
Gain on valuation of AFS financial assets		41,745,484,641	-
Total other comprehensive income (loss)		140,820,167,470	(659,348,368)
TOTAL COMPREHENSIVE LOSS		₩(40,406,295,867)	₩(126,101,837,659)
COMPREHENSIVE LOSS ATTRIBUTABLE TO:			
Owners of the parent		₩(40,406,295,867)	₩(126,101,837,659)
Non-controlling interests		-	-

See accompanying notes to consolidated financial statements.

DOOSAN ENGINE CO., LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY
FOR THE YEARS ENDED DECEMBER 31, 2016 AND 2015
(In Korean won)

	Share capital	Capital surplus	Other equity items	Accumulated other comprehensive income (loss)	Retained earnings (deficit)	Total
Balance at January 1, 2015	₩69,500,000,000	₩367,214,701,425	₩550,159,285	₩(33,724,240,471)	₩297,161,056,294	₩700,701,676,533
Total comprehensive income:						
Net loss	-	-	-	-	(125,442,489,291)	(125,442,489,291)
Remeasurements of net defined benefit liabilities	-	-	-	-	36,539,304	36,539,304
Disposal of revaluation of land	-	-	-	(16,807,710)	16,807,710	-
Revaluation surplus of land	-	-	-	26,872,895,283	-	26,872,895,283
Increase in retained earnings of associates	-	-	-	-	2,949,314,149	2,949,314,149
Gain on translation of foreign operations	-	-	-	114,300,519	-	114,300,519
Decrease in equity of associates	-	-	-	(30,632,397,623)	-	(30,632,397,623)
Subtotal	-	-	-	(3,662,009,531)	(122,439,828,128)	(126,101,837,659)
Capital transactions with stockholders' stock-based payment	-	-	72,883,255	-	-	72,883,255
Balance at December 31, 2015	₩69,500,000,000	₩367,214,701,425	₩623,042,540	₩(37,386,250,002)	₩174,721,228,166	₩574,672,722,129
Balance at January 1, 2016	₩69,500,000,000	₩367,214,701,425	₩623,042,540	₩(37,386,250,002)	₩174,721,228,166	₩574,672,722,129
Total comprehensive income:						
Net loss	-	-	-	-	(181,226,463,337)	(181,226,463,337)
Remeasurements of net defined benefit liabilities	-	-	-	-	(479,400,533)	(479,400,533)
Disposal of revaluation of land	-	-	-	(7,028,711,830)	7,028,711,830	-
Gain on valuation of AFS financial assets	-	-	-	41,745,484,641	-	41,745,484,641
Increase in retained earnings of associates	-	-	-	-	(2,241,450,490)	(2,241,450,490)
Loss on translation of foreign operations	-	-	-	(476,824,933)	-	(476,824,933)
Increase in equity of associates	-	-	-	102,272,358,785	-	102,272,358,785
Subtotal	-	-	-	136,512,306,663	(176,918,602,530)	(40,406,295,867)
Capital transactions with stockholders' stock-based payment	-	-	(1,564,740)	-	-	(1,564,740)
Balance at December 31, 2016	₩69,500,000,000	₩367,214,701,425	₩621,477,800	₩99,126,056,661	₩(2,197,374,364)	₩534,264,861,522

See accompanying notes to consolidated financial statements.

DOOSAN ENGINE CO., LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
FOR THE YEARS ENDED DECEMBER 31, 2016 AND 2015
(In Korean won)

	2016	2015
CASH FLOWS FROM OPERATING ACTIVITIES:		
Cash generated from operations:		
Net loss	₩(181,226,463,337)	₩(125,442,489,291)
Adjustments	239,876,972,425	88,571,165,393
Changes in operating assets and liabilities	(40,835,366,166)	1,566,811,902
Interest received	741,921,725	1,766,767,010
Interest paid	(14,119,443,970)	(10,583,081,825)
Dividend received	-	600,000
Income tax received	104,249,019	(24,900,297)
Net cash provided by (used in) operating activities	4,541,869,696	(44,145,127,108)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Cash inflows from investing activities:		
Decrease in short-term financial instruments	9,712,000,000	20,480,000,000
Decrease in short-term loans receivable	1,145,344,000	1,100,900,000
Decrease in short-term investment securities	-	7,000,000,000
Decrease in long-term financial instruments	-	1,928,858,690
Decrease in long-term loans receivable	-	896,636,352
Disposal of property, plant and equipment	917,083,796	311,300,000
Disposal of intangible assets	324,999,998	743,181,819
Disposal of associates’ investment securities	413,341,565	-
Disposal of non-current assets classified as held for sale	53,116,390,802	-
Subtotal	65,629,160,161	32,460,876,861
Cash outflows for investing activities:		
Increase in long-term loans	428,260,000	594,967,714
Acquisition of investments in associates	4,155,084,864	-
Acquisition of property, plant and equipment	16,827,798,232	5,049,583,134
Acquisition of intangible assets	2,792,457,742	11,929,974,351
Subtotal	(24,203,600,838)	(17,574,525,199)
Net cash provided by investing activities	41,425,559,323	14,886,351,662

(Continued)

DOOSAN ENGINE CO., LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS (CONTINUED)
FOR THE YEARS ENDED DECEMBER 31, 2016 AND 2015
(In Korean won)

	2016	2015
CASH FLOWS FROM FINANCING ACTIVITIES:		
Cash inflows from financing activities:		
Proceeds from short-term borrowings	₩-	₩51,221,689,242
Proceeds from long-term borrowings	-	30,000,000,000
Subtotal	-	81,221,689,242
Cash outflows for financing activities:		
Repayment of long-term borrowings	18,650,765,841	51,615,320,000
Subtotal	(18,650,765,841)	(51,615,320,000)
Net cash provided by (used in) financing activities	(18,650,765,841)	29,606,369,242
EFFECT OF EXCHANGE RATE CHANGES ON CASH AND CASH EQUIVALENTS	21,658,744	135,850,450
NET INCREASE IN CASH AND CASH EQUIVALENTS	27,338,321,922	483,444,246
CASH AND CASH EQUIVALENTS AT THE BEGINNING OF YEAR	45,482,382,275	44,998,938,029
CASH AND CASH EQUIVALENTS AT THE END OF YEAR	₩72,820,704,197	₩45,482,382,275

(Concluded)

See accompanying notes to consolidated financial statements.

DOOSAN ENGINE CO., LTD. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
AS OF AND FOR THE YEARS ENDED DECEMBER 31, 2016 AND 2015

1. GENERAL:

(1) The parent company

Doosan Engine Co., Ltd. (the “Company”) was incorporated on December 30, 1999, under the Commercial Code of the Republic of Korea to manufacture and sell marine diesel engines. The Company’s headquarters and plants are located in Changwon, Korea.

Under the Company’s Articles of Incorporation, the Company is authorized to issue 120,000 thousand shares of capital stock (par value of ₩1,000). As of December 31, 2016, the Company issued 69,500 thousand common shares for ₩69,500,000 thousand.

On January 4, 2011, the Company’s shares were listed in the Korea Exchange.

The parent’s shares as of December 31, 2016, are owned as follows:

Name of stockholders	Number of shares owned	Ownership percentage (%)
Doosan Heavy Industries Construction Co., Ltd.(“DHIC”)	29,650,000	42.66
Employee stock ownership association	828,100	1.19
Others	39,021,900	56.15
Total	69,500,000	100.00

(2) Consolidated subsidiaries

1) The details of consolidated subsidiaries as of December 31, 2016 and 2015, are as follows :

Subsidiary	Type of business	Location	Ownership ratio of the Company (%)		Ownership ratio of non-controlling interests (%)		Financial closing date
			2016	2015	2016	2015	
Doosan Marine Industry (Dalian) Co., Ltd. ("DMI")	Manufacturing of marine engine parts	China	100.00	100.00	-	-	December 31
Doosan Engine PNG Co., Ltd. (“DEPNG”)	Diesel power plant	Papua New Guinea	100.00	-	-	-	December 31

2) Condensed financial information of the Company's consolidated subsidiaries as of December 31, 2016, is as follows (in thousands of Korean won):

Subsidiary	Assets	Liabilities	Equity	Sales	Net income (loss)	Total comprehensive income (loss)
DMI	₩24,943,845	₩14,818,145	₩10,125,700	₩13,541,619	₩678,931	₩389,746
DEPNG	1,980,196	10,708,038	(8,727,842)	-	(8,233,276)	(8,420,916)

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES:

The Company and its subsidiaries (the "Group") maintain their official accounting records in Korean won and prepare consolidated financial statements in conformity with Korean statutory requirements and Korean International Financial Reporting Standards ("K-IFRSs"), in the Korean language (Hangul).

(1) Basis of preparation

The Group has prepared the consolidated financial statements in accordance with K-IFRSs.

The principal accounting policies are set out below. Except for the effect of the amendments to K-IFRSs and new interpretations set out below, the principal accounting policies used to prepare the consolidated financial statements as of and for the year ended December 31, 2016, are consistent with the accounting policies used to prepare the consolidated financial statements as of and for the year ended December 31, 2015.

The accompanying consolidated financial statements have been prepared on the historical cost basis, except for certain non-current assets and financial instruments that are measured at revalued amounts or fair values. Historical cost is generally based on the fair value of the consideration given.

1) Amendments to K-IFRSs and new interpretations that are mandatorily effective for the current year

Amendments to K-IFRS 1110 – *Consolidated Financial Statements*, K-IFRS 1112 – *Disclosure of Interests in Other Entities* and K-IFRS 1028 – *Investment in Associates*

The amendments clarify that in applying the equity method of accounting to an associate or a joint venture that is an investment entity, an investor may retain the fair value measurements that the associate or the joint venture used for its subsidiaries. The application of these amendments has no material impact on the disclosures or the amounts recognized in the Group's consolidated financial statements.

Amendments to K-IFRS 1111 – *Accounting for Acquisitions of Interests in Joint Operations*

The amendments to K-IFRS 1111 provide guidance on how to account for the acquisition of a joint operation that constitutes a business as defined in K-IFRS 1103 Business Combinations. A joint operator is also required to disclose the relevant information required by K-IFRS 1103 and other standards for business combinations. The application of these amendments has no material impact on the disclosures or the amounts recognized in the Group's consolidated financial statements.

Amendments to K-IFRS 1001 – *Disclosure Initiative*

The amendments to K-IFRS 1001 clarify the concept of applying materiality in practice and restrict an entity reducing the understandability of its financial statements by obscuring material information with immaterial information or by aggregating material items that have different natures or functions. The application of these amendments has no material impact on the disclosures or the amounts recognized in the Group's consolidated financial statements.

Amendments to K-IFRS 1016 – *Property, Plant and Equipment*

The amendments to K-IFRS 1016 prohibit the Group from using a revenue-based depreciation method for items of property, plant and equipment. The application of these amendments has no material impact on the disclosures or the amounts recognized in the Group's consolidated financial statements.

Amendments to K-IFRS 1038 – *Intangible Assets*

The amendments to K-IFRS 1038 do not allow presumption that revenue is an appropriate basis for the amortization of intangible assets; the presumption can only be limited when an intangible asset is expressed as a measure of revenue or when it can be demonstrated that revenue and consumption of the economic benefits of the intangible asset are highly correlated. The application of these amendments has no material impact on the disclosures or the amounts recognized in the Group's consolidated financial statements.

Amendments to K-IFRS 1016 – *Property, plant and equipment* and K-IFRS 1041 – *Agriculture: Bearer Plants*

The amendments to K-IFRS 1016 and K-IFRS 1041 define a bearer plant and require biological assets that meet the definition of a bearer plant to be accounted for as property, plant and equipment in accordance with K-IFRS 1016, instead of K-IFRS 1041. The application of these amendments has no material impact on the disclosures or the amounts recognized in the Group's consolidated financial statements.

Annual Improvements to K-IFRS 2012-2014 Cycle

The annual improvements include amendments to a number of K-IFRSs. The amendments introduce a specific guidance in K-IFRS 1105 Non-current Assets Held for Sale and Discontinued Operations when an entity reclassifies an asset (or a disposal group) from held for sale to held for distribution to owners (or vice versa); such a change is considered as a continuation of the original plan of disposal, and not as a change to a plan of sale. Other amendments in the annual improvements include K-IFRS 1107 Financial Instruments: Disclosures, K-IFRS 1019 Employee Benefits and K-IFRS 1034 Interim Financial Reporting. The application of these amendments has no material impact on the disclosures or the amounts recognized in the Group's consolidated financial statements.

2) New and revised K-IFRSs in issue but not yet effective

The Group has not applied the following new and revised K-IFRSs that have been issued but are not yet effective:

Amendments to K-IFRS 1109 – *Financial Instruments*

The amendments to K-IFRS 1109 contain the requirements for the classification and measurement of financial assets and financial liabilities based on a business model whose objective is achieved both by collecting contractual cash flows and selling financial assets and based on the contractual terms that give rise on specified dates to cash flows, impairment methodology based on the expected credit losses, broadened types of instruments that qualify as hedging instruments, the types of risk components of non-financial items that are eligible for hedge accounting and the change in the hedge effectiveness test. The amendments are effective for annual periods beginning on or after January 1, 2018. The detail of the amendments to the K-IFRS 1109 is as follows:

The amendments to K-IFRS 1109 are to be applied retrospectively with exceptions such as the exemption of restating comparative information on the classification and measurement of financial instruments and impairment. In the case of hedge accounting, the amendments are to be applied prospectively with exceptions such as accounting for the time value of options.

Main characteristics of K-IFRS 1109 include a business model for the management of financial assets and the classification and measurement of financial assets based on the characteristics of contractual cash flows resulting from financial assets, impairment model for financial instruments based on expected credit losses, expansion of items that meet the requirements for hedge accounting and hedging methods, and changes in valuation methods to evaluate the effectiveness of hedge accounting.

In general, steps to preparation are necessary, such as analyzing the financial impact, establishing accounting policies and accounting systems and stabilizing systems. The effect of the first-time adoption on the financial statements may change contingent on selection and judgment in accounting policies, financial instruments held by the Company and economic conditions.

The Company has neither started on changing or improving internal control processes and accounting systems nor analyzed the financial impact that the adoption of K-IFRS 1109 will have on its financial statements. The Company plans to perform preliminary analytical reviews in the first half of fiscal year 2017 and complete a more detailed analysis in the second half of the year. General effects of the major items of this standard on the financial statements are as follows:

- Classification of financial instruments and possibility of change in carrying amounts (Note 10)
- Potential change in amounts recorded as allowances for doubtful accounts and other receivables (Note 6)

Amendments to K-IFRS 1102 – *Share-Based Payment*

The amendments include the following: 1) When measuring the fair value of share-based payment, the effects of vesting and non-vesting conditions on the measurement of cash-settled share-based payment should be consistent with the measurement of equity-settled share-based payment; 2) Share-based payment transaction in which the Group settles the share-based payment arrangement net by withholding a specified portion of the equity instruments per statutory tax withholding requirements would be classified as equity-settled share-based payment in its entirety; otherwise, it would be classified as equity-settled share-based payment without the net settlement feature; and 3) when a cash-settled share-based payment changes to an equity-settled share-based payment because of modifications of the terms and conditions, the original liability recognized is derecognized and the equity-settled share-based payment is recognized at the modification-date fair value. Any difference between the carrying amount of the liability at the modification date and the amount recognized in equity at the same date would be recognized in profit and loss immediately. The amendments are effective for annual periods beginning on or after January 1, 2018.

Amendments to K-IFRS 1007 – *Statement of Cash Flows*

The amendments require that changes in liabilities arising from financial activities are disclosed. The amendments are effective for annual periods beginning on or after January 1, 2017.

Amendments to K-IFRS 1012 – *Income Taxes*

The amendments clarify that unrealized losses on fixed-rate debt instruments measured at fair value and measured at cost for tax purposes give rise to a deductible temporary difference regardless of whether the holder expects to recover the carrying amount of the debt instrument by sale or by use and that the estimate of probable future taxable profit may include the recovery of some of the assets for more than their carrying amount. When the Group assesses whether there will be sufficient taxable profit, it should compare the deductible temporary differences with future taxable profit that excludes tax deductions resulting from the reversal of those deductible temporary differences. The amendments are effective for annual periods beginning on or after January 1, 2017.

Amendments to K-IFRS 1115 – *Revenue from Contracts with Customers*

The core principle under K-IFRS 1115 is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The amendments introduce a five-step approach to revenue recognition and measurement: 1) Identify the contract with a customer, 2) Identify the performance obligations in the contract, 3) Determine the transaction price, 4) Allocate the transaction price to the performance obligations in the contract and 5) Recognize revenue when (or as) the entity satisfies a performance obligation. This standard will supersede K-IFRS 1011 - *Construction Contracts*, K-IFRS 1018 – *Revenue*, K-IFRS 2113 – *Customer Loyalty Program*, K-IFRS 2115 – *Agreements for the Construction of Real Estate*, K-IFRS 2118 – *Transfers of Assets from Customers* and K-IFRS 2031 – *Revenue-Barter Transactions Involving Advertising Services*. The amendments are effective for annual periods beginning on or after January 1, 2018.

K-IFRS 1018 provides revenue recognition for various types of transactions, such as the sale of goods, rendering of services, interest income, royalty income, dividend income and construction contracts. However, K-IFRS 1115 introduces a five-step approach to revenue recognition and measurement: 1) Identify the contract with a customer, 2) Identify the performance obligations in the contract, 3) Determine the transaction price, 4) Allocate the transaction price to the performance obligations in the contract and 5) Recognize revenue when (or as) the entity satisfies a performance obligation.

The Group has neither started on changing or improving internal control processes and accounting systems nor analyzed the financial impact that the adoption of K-IFRS 1115 will have on its consolidated financial statements. The Group plans to perform preliminary analytical reviews in the first half of fiscal year 2017 and complete a more detailed analysis in the second half of the year. As of December 31, 2016, the adoption of the amendments may have an impact on revenues of ₩804,680,106 thousand, gross amount due from customers for contract work of ₩15,762,004 thousand and gross amount due to customers for contract work of ₩16,562,497 thousand. General effects of the major items of this standard on the financial statements are as follows.

- Possible change in revenue recognition as to time and amount (Notes 21, 22 and 23)

The Company is currently under review of the effect of the amendments and revision on its financial statements.

(2) Basis of Consolidation

The consolidated financial statements incorporate the financial statements of the Company and entities (including structured entities) controlled by the Company (and its subsidiaries). Control is achieved where the Company 1) has the power over the investee, 2) is exposed, or has rights, to variable returns from its involvement with the investee and 3) has the ability to use its power to affect its returns. The Company reassesses whether or not it controls an investee if facts and circumstances indicate that there are changes to one or more of the three elements of control listed above.

When the Company has less than a majority of the voting rights of an investee, it has power over the investee when the voting rights are sufficient to give it the practical ability to direct the activities of the investee unilaterally. The Company considers all relevant facts and circumstances in assessing whether or not its voting rights in an investee are sufficient to give it power, including:

- the size of the Company's holding of voting rights relative to the size and dispersion of holdings of other vote holders;
- potential voting rights held by the Company, other vote holders or other parties;
- rights arising from other contractual arrangements; and
- any additional facts and circumstances that indicate that the Company has, or does not have, the current ability to direct the relevant activities at the time that decisions need to be made, including voting patterns at previous stockholders' meetings.

Income and expenses of subsidiaries acquired or disposed of during the year are included in the consolidated statement of comprehensive income from the date the Company gains control to the date when the Company ceases to control the subsidiary. Profit or loss and each component of other comprehensive income are attributed to the owners of the Company and to the non-controlling interests. Total comprehensive income of subsidiaries is attributed to the owners of the Company and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

When necessary, adjustments are made to the financial statements of subsidiaries to bring their accounting policies into line with the Group’s accounting policies.

All intra-Group transactions and related assets and liabilities, income and expenses are eliminated in full on consolidation.

Changes in the Group’s ownership interests in subsidiaries that do not result in the Group losing control over the subsidiaries are accounted for as equity transactions. The carrying amounts of the Group’s interests and the non-controlling interests are adjusted to reflect the changes in their relative interests in the subsidiaries. Any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognized directly in equity and attributed to owners of the Company.

When the Group loses control of a subsidiary, a gain or loss on disposal is calculated as the difference between (i) the aggregate of the fair value of the consideration received and the fair value of any retained interest and (ii) the previous carrying amount of the assets (including goodwill) and liabilities of the subsidiary and any non-controlling interests. When assets of the subsidiary are carried at revalued amounts or fair values and the related cumulative gain or loss has been recognized in other comprehensive income and accumulated in equity, the amounts previously recognized in other comprehensive income and accumulated in equity are accounted for as if the Company had directly disposed of the relevant assets (i.e., reclassified to profit or loss or transferred directly to retained earnings). The fair value of any investment retained in the former subsidiary at the date when control is lost is recognized as the fair value on initial recognition for subsequent accounting under K-IFRS 1039 Financial Instruments: Recognition and Measurement or, when applicable, the cost on initial recognition of an investment in an associate or a joint venture.

(3) Business Combination

Acquisitions of businesses are accounted for using the acquisition method. The consideration transferred in a business combination is measured at fair value, which is calculated as the sum of the fair values of the assets transferred by the Group, liabilities incurred by the Group to the former owners of the acquiree and the equity interests issued by the Group in exchange for control of the acquiree. Acquisition-related costs are generally recognized in profit or loss as incurred.

At the acquisition date, the identifiable assets acquired and the liabilities assumed are recognized at their fair value at the acquisition date, except that:

- deferred tax assets or liabilities and liabilities or assets related to employee benefit arrangements are recognized and measured in accordance with K-IFRS 1012 – *Income Taxes* and K-IFRS 1019 – *Employee Benefits*, respectively;
- liabilities or equity instruments related to share-based payment arrangements of the acquiree or share-based payment arrangements of the Group entered into to replace share-based payment arrangements of the acquiree are measured in accordance with K-IFRS 1102 – *Share-based Payment* at the acquisition date; and
- assets (or disposal groups) that are classified as held for sale in accordance with K-IFRS 1105 – *Non-current Assets Held for Sale and Discontinued Operations* are measured in accordance with that standard.

Goodwill is measured as the excess of the sum of a) the consideration transferred, b) the amount of any non-controlling interests in the acquiree and c) the fair value of the acquirer's previously held equity interest in the acquiree (if any) over the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed. If, after reassessment, the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed exceeds the sum of a) the consideration transferred, b) the amount of any non-controlling interests in the acquiree and c) the fair value of the acquirer's previously held interest in the acquiree (if any), the excess is recognized immediately in profit or loss as a bargain purchase gain.

Non-controlling interests that are present ownership interests and entitle their holders to a proportionate share of the entity's net assets in the event of liquidation may be initially measured either at fair value or at the non-controlling interests' proportionate share of the recognized amounts of the acquiree's identifiable net assets. The choice of measurement basis is made on a transaction-by-transaction basis. Other types of non-controlling interests are measured at fair value or, when applicable, on the basis specified in another K-IFRS.

When the consideration transferred by the Group in a business combination includes assets or liabilities resulting from a contingent consideration arrangement, the contingent consideration is measured at its acquisition-date fair value and included as part of the consideration transferred in a business combination. Changes in the fair value of the contingent consideration that qualify as measurement-period adjustments are adjusted retrospectively, with corresponding adjustments against goodwill. Measurement-period adjustments are adjustments that arise from additional information obtained during the 'measurement period' (which cannot exceed one year from the acquisition date) about facts and circumstances that existed at the acquisition date.

The subsequent accounting for changes in the fair value of the contingent consideration that do not qualify as measurement-period adjustments depends on how the contingent consideration is classified. Contingent consideration that is classified as equity is not remeasured at subsequent reporting dates and its subsequent settlement is accounted for within equity. Contingent consideration that is classified as an asset or a liability is remeasured at subsequent reporting dates in accordance with K-IFRS 1039 or K-IFRS 1037 – *Provisions, Contingent Liabilities and Contingent Assets*, as appropriate, with the corresponding gain or loss being recognized in profit or loss.

When a business combination is achieved in stages, the Group's previously held equity interest in the acquiree is remeasured to fair value at the acquisition date and the resulting gain or loss, if any, is recognized in profit or loss. Amounts arising from interests in the acquiree prior to the acquisition date that have previously been recognized in other comprehensive income are reclassified to profit or loss where such treatment would be appropriate if those interests were disposed of.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period (see above), or additional assets or liabilities are recognized, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognized at that date.

(4) Investments in associates and joint ventures

An associate is an entity over which the Group has significant influence. Significant influence is the power to participate in the financial and operating policy decisions of the investee, but is not control or joint control over those policies.

A joint venture is a joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint arrangement. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control.

The results, assets and liabilities of associates or joint ventures are incorporated in these consolidated financial statements using the equity method of accounting, except when the investment is classified as held for sale, in which case it is accounted for in accordance with K-IFRS 1105.

Under the equity method, an investment in an associate or a joint venture is initially recognized in the consolidated statements of financial position at cost and adjusted thereafter to recognize the Group's share of the profit or loss and other comprehensive income of the associate or the joint venture. When the Group's share of losses of an associate or a joint venture exceeds its interest in that associate or joint venture (which includes any long-term interests that, in substance, form part of the Group's net investment in the associate or the joint venture), the Group discontinues recognizing its share of further losses. Additional losses are recognized only to the extent that the Group has incurred legal or constructive obligations or made payments on behalf of the associate or the joint venture.

Any excess of the cost of acquisition over the Group's share of the net fair value of the identifiable assets, liabilities and contingent liabilities of an associate or a joint venture recognized at the date of acquisition is recognized as goodwill, which is included within the carrying amount of the investment. Any excess of the Group’s share of the net fair value of the identifiable assets, liabilities and contingent liabilities over the cost of acquisition, after reassessment, is recognized immediately in profit or loss.

Upon disposal of an associate or a joint venture that results in the Group losing significant influence over that associate or joint venture, any retained investment is measured at fair value at that date and the fair value is regarded as its fair value on initial recognition as a financial asset in accordance with K-IFRS 1039. The difference between the previous carrying amount of the associate or the joint venture attributable to the retained interest and its fair value is included in the determination of the gain or loss on disposal of the associate or the joint venture. In addition, the Group accounts for all amounts previously recognized in other comprehensive income in relation to that associate or joint venture on the same basis it would be required if that associate or joint venture had directly disposed of the related assets or liabilities. Therefore, if a gain or loss previously recognized in other comprehensive income by that associate or joint venture would be reclassified to profit or loss on the disposal of the related assets or liabilities, the Group reclassifies the gain or loss from equity to profit or loss (as reclassification adjustment) when it loses significant influence over that associate or joint venture.

When the Group reduces its ownership interest in an associate or a joint venture but continues to use the equity method, it reclassifies to profit or loss the proportion of the gain or loss that had previously been recognized in other comprehensive income relating to that reduction in ownership interest if that gain or loss would be reclassified to profit or loss on the disposal of the related assets or liabilities. In addition, the Group applies K-IFRS 1105 – *Non-current Assets Held for Sale and Discontinued Operations* to a portion of investment in an associate or a joint venture that meets the criteria to be classified as held for sale.

The requirements of K-IFRS 1039 are applied to determine whether it is necessary to recognize any impairment loss with respect to the Group’s investment in an associate or a joint venture. When necessary, the entire carrying amount of the investment (including goodwill) is tested for impairment in accordance with K-IFRS 1036 – *Impairment of Assets* by comparing its recoverable amount (higher of value in use or fair value, less costs to sell) with its carrying amount; any impairment loss recognized forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized in accordance with K-IFRS 1036 to the extent that the recoverable amount of the investment subsequently increases.

The Group continues to use the equity method when an investment in an associate becomes an investment in a joint venture or an investment in a joint venture becomes an investment in an associate. There is no remeasurement to fair value upon such changes in ownership interests.

When a group entity transacts with an associate or a joint venture of the Group, profits and losses resulting from the transactions with the associate or the joint venture are recognized in the Group's consolidated financial statements only to the extent of interests in the associate or the joint venture that are not related to the Group.

(5) Interests in joint operations

A joint operation is a joint arrangement whereby the parties that have joint control of the arrangement have rights to the assets and obligations for the liabilities relating to the arrangement. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control.

When a group entity undertakes its activities under joint operations, the Group as a joint operator recognizes in relation to its interest in a joint operation:

- its assets, including its share of any assets held jointly;
- its liabilities, including its share of any liabilities incurred jointly;
- its revenue from the sale of its share of the output arising from the joint operation;
- its share of the revenue from the sale of the output by the joint operation; and
- its expenses, including its share of any expenses incurred jointly.

The Group accounts for the assets, liabilities, revenues and expenses relating to its interest in a joint operation in accordance with the K-IFRSs applicable to the particular assets, liabilities, revenues and expenses.

When a group entity transacts with a joint operation in which a group entity is a joint operator (such as a sale or contribution of assets), the Group is considered to be conducting the transaction with the other parties to the joint operation, and gains and losses resulting from the transactions are recognized in the Group's consolidated financial statements only to the extent of other parties' interests in the joint operation.
When a group entity transacts with a joint operation in which a group entity is a joint operator (such as a purchase of assets), the Group does not recognize its share of the gains and losses until it resells those assets to a third party.

(6) Goodwill

Goodwill resulting from an acquisition of a business is carried at cost as established at the date of acquisition of the business, less accumulated impairment losses, if any.

For the purpose of impairment testing, goodwill is allocated to each of the Group’s cash-generating units (or groups of cash-generating units) that is expected to benefit from the synergies of the combination.

A cash-generating unit to which goodwill has been allocated is tested for impairment annually or more frequently when there is indication that the unit may be impaired. If the recoverable amount of the cash-generating unit is less than its carrying amount, the impairment loss is allocated first to reduce the carrying amount of any goodwill allocated to the unit and then to the other assets of the unit on a pro rata basis based on the carrying amount of each asset in the unit. Any impairment loss for goodwill is recognized directly in profit or loss. An impairment loss recognized for goodwill is not reversed in subsequent periods.

On disposal of the relevant cash-generating unit, the attributable amount of goodwill is included in the determination of the profit or loss on disposal.

The Group’s policy for goodwill resulting from the acquisition of an associate is described in Note 2. (4).

(7) Non-current assets held for sale

Non-current assets and disposal groups are classified as held for sale if their carrying amount will be recovered principally through a sale transaction rather than through continuing use. This condition is regarded as met only when the sale is highly probable and the non-current asset (or the disposal group) is available for immediate sale in its present condition. Management must be committed to the sale, which should be expected to qualify for recognition as a completed sale within one year from the date of classification.

When the Group is committed to a sale plan involving loss of control of a subsidiary, all of the assets and liabilities of that subsidiary are classified as held for sale when the criteria described above are met, regardless of whether the Group will retain a non-controlling interest in its former subsidiary after the sale.

When the Group is committed to a sale plan involving disposal of an investment, or a portion of an investment, in an associate or a joint venture, the investment or the portion of the investment that will be disposed of is classified as held for sale when the criteria described above are met, and the Group discontinues the use of the equity method in relation to the portion that is classified as held for sale. Any retained portion of an investment in an associate or a joint venture that has not been classified as held for sale continues to be accounted for using the equity method. The Group discontinues the use of the equity method at the time of disposal when the disposal results in the Group losing significant influence over the associate or the joint venture.

After the disposal takes place, the Group accounts for any retained interest in the associate or the joint venture in accordance with K-IFRS 1039, unless the retained interest continues to be an associate or a joint venture, in which case the Group uses the equity method.

Non-current assets (and disposal groups) classified as held for sale are measured at the lower of their previous carrying amount or fair value, less costs to sell.

(8) Revenue Recognition

Revenue is measured at the fair value of the consideration received or receivable. Revenue is reduced for estimated customer returns, rebates and other similar allowances. The Group recognizes revenue when the amount of revenue can be reliably measured; when it is probable that future economic benefits will flow to the entity; and when specific criteria have been met for each of the Group's activities, as described below.

1) Sales of goods

Revenue from the sale of goods is recognized when the Group has transferred to the buyer the significant risks and rewards of ownership of the goods.

2) Rendering of services

Revenue from a contract to provide services is recognized by reference to the stage of completion of the contract. Depending on the nature of the transaction, the Group determines the stage of completion by reference to surveys of work performed or the proportion that costs incurred to date bear to the estimated total costs of the transaction, as applicable.

3) Dividend income and interest income

Dividend income from investments is recognized when the stockholders' right to receive payment has been established (provided that it is probable that the economic benefits will flow to the Group and the amount of income can be measured reliably).

Interest income from a financial asset is recognized when it is probable that the economic benefits will flow to the Group and the amount of income can be measured reliably. Interest income is accrued on a time basis, by reference to the principal outstanding and at the effective interest rate applicable, which is the rate that exactly discounts estimated future cash receipts through the expected life of the financial asset to that asset's net carrying amount on initial recognition.

4) Rental income

The Group's policy for recognition of revenue from operating leases is described in Note 2 (10).

(9) Construction contracts

Where the outcome of a construction contract can be estimated reliably, revenue and costs are recognized by reference to the stage of completion of the contract activity at the end of the reporting period and measured based on the proportion of contract costs incurred for work performed to date relative to the estimated total contract costs, except where this would not be representative of the stage of completion. Variations in contract work, claims and incentive payments are included to the extent that the amount can be measured reliably and its receipt is considered probable.

Where the outcome of a construction contract cannot be estimated reliably, contract revenue is recognized to the extent of contract costs incurred that, it is probable, will be recoverable. Contract costs are recognized as expenses in the period in which they are incurred.

When it is probable that total contract costs will exceed total contract revenue, the expected loss is recognized as an expense immediately.

When contract costs incurred to date, plus recognized profits, less recognized losses exceed progress billing, the surplus is shown as amounts due from customers for contract work. For contracts where progress billings exceed contract costs incurred to date, plus recognized profits, less recognized losses, the surplus is shown as the amounts due to customers for contract work. Amounts received before the related work is performed are included in the consolidated statements of financial position, as a liability, as advances received. Amounts billed for work performed but not yet paid by the customer are included in the consolidated statements of financial position under trade and other receivables.

(10) Leases

Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

1) The Group as lessor

Amounts due from lessees under finance leases are recognized as receivables at the amount of the Group's net investment in the leases. Finance lease income is allocated to accounting periods so as to reflect a constant periodic rate of return on the Group's net investment outstanding in respect of the leases.

Rental income from operating leases is recognized on a straight-line basis over the term of the relevant lease. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognized on a straight-line basis over the lease term.

2) The Group as lessee

Assets held under finance leases are initially recognized as assets of the Group at their fair value at the inception of the lease or, if lower, at the present value of the minimum lease payments. The corresponding liability to the lessor is included in the consolidated statements of financial position as a finance lease obligation.

Lease payments are apportioned between finance expenses and reduction of the lease obligation so as to achieve a constant rate of interest on the remaining balance of the liability. Finance expenses are recognized immediately in profit or loss, unless they are directly attributable to qualifying assets, in which case they are capitalized in accordance with the Group's general policy on borrowing costs (see Note 2. (12)). Contingent rentals are recognized as expenses in the periods in which they are incurred.

Operating lease payments are recognized as an expense on a straight-line basis over the lease term, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed. Contingent rentals arising under operating leases are recognized as an expense in the period in which they are incurred.

(11) Foreign currencies

The individual financial statements of each group entity are presented in the currency of the primary economic environment in which the entity operates (its functional currency). For the purpose of the consolidated financial statements, the results and financial position of each group entity are expressed in Korean won, which is the functional currency of the entity and the presentation currency for the consolidated financial statements.

In preparing the financial statements of the individual entities, transactions in currencies other than the entity's functional currency (foreign currencies) are recognized at the rates of exchange prevailing at the dates of the transactions. At the end of each reporting period, monetary items denominated in foreign currencies are retranslated at the rates prevailing at that date. Non-monetary items carried at fair value that are denominated in foreign currencies are retranslated at the rates prevailing at the date when the fair value was determined. Non-monetary items that are measured in terms of historical cost in a foreign currency are not retranslated.

Exchange differences are recognized in profit or loss in the period in which they arise, except for:

- exchange differences on foreign currency borrowings relating to assets under construction for future productive use, which are included in the cost of those assets when they are regarded as an adjustment to interest costs on those foreign currency borrowings;
- exchange differences on transactions entered into in order to hedge certain foreign currency risks (see Note 2-(24) below for hedge accounting policies); and
- exchange differences on monetary items receivable from or payable to a foreign operation for which settlement is neither planned nor likely to occur (therefore forming part of the net investment in the foreign operation), which are recognized initially in other comprehensive income and reclassified from equity to profit or loss on disposal or partial disposal of the net investment.

For the purpose of presenting consolidated financial statements, the assets and liabilities of the Group's foreign operations are expressed in Korean won using exchange rates prevailing at the end of the reporting period. Income and expense items are translated at the average exchange rates for the period, unless exchange rates fluctuated significantly during that period, in which case the exchange rates at the dates of the transactions are used. Exchange differences arising, if any, are recognized in other comprehensive income and accumulated in equity (attributed to non-controlling interests as appropriate). On the disposal of a foreign operation (i.e., a disposal of the Group's entire interest in a foreign operation, or a disposal involving loss of control over a subsidiary that includes a foreign operation, or partial disposal of an interest in a joint arrangement or an associate that includes a foreign operation of which the retained interest becomes a financial asset), all of the accumulated exchange differences in respect of that operation attributable to the owners of the Group are reclassified to profit or loss. Any exchange differences that have previously been attributed to non-controlling interests are derecognized, but they are not reclassified to profit or loss.

In the case of a partial disposal (i.e., no loss of control) of a subsidiary that includes a foreign operation, the proportionate share of accumulated exchange differences is reattributed to non-controlling interests in equity and is not recognized in profit or loss. For all other partial disposals (i.e., partial disposals of associates or joint arrangements that do not result in the Group losing significant influence or joint control), the proportionate share of the accumulated exchange differences is reclassified to profit or loss.

Goodwill and fair value adjustments arising on the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated at the closing rate. Exchange differences arising are recognized in other comprehensive income.

(12) Borrowing costs

Borrowing costs directly attributable to the acquisition, construction or production of qualifying assets, which are assets that necessarily take a substantial period of time to get ready for their intended use or sale, are added to the cost of those assets until the assets are substantially ready for their intended use or sale.

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization.

All other borrowing costs are recognized in profit or loss in the period in which they are incurred.

(13) Retirement benefit costs and termination benefits

The Group operates a defined benefit pension plan. The cost of providing benefits is determined using the projected unit credit method, with actuarial valuations being carried out at the end of each reporting period. Remeasurement, comprising actuarial gains and losses, the effect of the changes to the asset ceiling (if applicable) and the return on plan assets (excluding interest), is reflected immediately in the consolidated statements of financial position with a charge or credit recognized in other comprehensive income in the period in which it occurs. Remeasurement recognized in other comprehensive income is reflected immediately in retained earnings and will not be reclassified to profit or loss. Past service cost is recognized in profit or loss in the period of a plan amendment. Net interest is calculated by applying the discount rate at the beginning of the period to the net defined benefit liability or asset. Defined benefit costs are composed of service cost (including current service cost, past service cost as well as gains and losses on curtailments and settlements), net interest expense (income) and remeasurement.

The Group presents the service cost and net interest expense (income) components in profit or loss and the remeasurement component in other comprehensive income. Curtailment gains and losses are accounted for as past service costs.

The retirement benefit obligation recognized in the consolidated statements of financial position represents the actual deficit or surplus in the Group's defined benefit plans. Any surplus resulting from this calculation is limited to the present value of any economic benefits available in the form of refunds from the plans or reductions in future contributions to the plans. A liability for a termination benefit is recognized at the earlier of when the entity can no longer withdraw the offer of the termination benefit or when the entity recognizes any related restructuring costs.

Discretionary contributions made by employees or third parties reduce service cost upon payment of these contributions to the plan. When the formal terms of the plans specify that there will be contributions from employees or third parties, the accounting depends on whether the contributions are linked to service as follows:

If the contributions are not linked to services (e.g., contributions are required to reduce a deficit arising from losses on plan assets or from actuarial losses), they are reflected in the remeasurement of the net defined benefit liability (asset).

If contributions are linked to services, they reduce service costs. For the amount of contribution that is dependent on the number of years of service, the entity reduces service cost by attributing the contributions to periods of service using the attribution method required by K-IFRS 1019 paragraph 70 for the gross benefits. For the amount of contribution that is independent of the number of years of service, the entity reduces service cost in the period in which the related service is rendered.

(14) Share-based payment arrangements

Equity-settled share-based payments to employees and others providing similar services are measured at the fair value of the equity instruments at the grant date.

The fair value determined at the grant date of the equity-settled share-based payments is expensed on a straight-line basis over the vesting period based on the Group’s estimate of equity instruments that will eventually vest. At the end of each reporting period, the Group revises its estimate of the number of equity instruments expected to vest. The impact of the revision of the original estimates, if any, is recognized in profit or loss such that the cumulative expense reflects the revised estimate, with a corresponding adjustment in other component of equity.

(15) Taxation

Income tax expense represents the sum of the tax currently payable and deferred tax.

1) Current tax

The tax currently payable is based on taxable profit for the year. Taxable profit differs from profit as reported in the consolidated statements of income because of items of income or expense that are taxable or deductible in other years and items that are never taxable or deductible. The Group’s liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

2) Deferred tax

Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities in the consolidated financial statements and the corresponding tax bases used in the computation of taxable profit. Deferred tax liabilities are generally recognized for all taxable temporary differences. Deferred tax assets are generally recognized for all deductible temporary differences to the extent it is probable that taxable profits will be available against which those deductible temporary differences can be utilized. Such deferred tax assets and liabilities are not recognized if the temporary difference arises from goodwill or from the initial recognition (other than in a business combination) of other assets and liabilities in a transaction that affects neither the taxable profit nor the accounting profit.

Deferred tax liabilities are recognized for taxable temporary differences associated with investments in subsidiaries and associates and interests in joint ventures, except where the Group is able to control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax assets arising from deductible temporary differences associated with such investments and interests are only recognized to the extent it is probable that there will be sufficient taxable profits against which the benefits of the temporary differences can be utilized, and they are expected to reverse in the foreseeable future.

The carrying amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the assets to be recovered.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply in the period in which the liability is settled or the asset is realized based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. The measurement of deferred tax liabilities and assets reflects the tax consequences that would follow from the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

Deferred tax assets and liabilities are offset if, and only if, the Group has a legally enforceable right to set off current tax assets against current tax liabilities, and the deferred tax assets and liabilities relate to income taxes levied by the same taxation authority on either the same taxable entity or different taxable entities, which intend either to settle current tax liabilities and assets on a net basis or to realize the assets and settle the liabilities simultaneously, in each future period in which significant amounts of deferred tax liabilities or assets are expected to be settled or recovered.

3) Current and deferred taxes for the year

Current and deferred taxes are recognized in profit or loss, except when they relate to items that are recognized in other comprehensive income or directly in equity, in which case, the current and deferred taxes are also recognized in other comprehensive income or directly in equity. Where current tax or deferred tax arises from the initial accounting for a business combination, the tax effect is included in the accounting for the business combination.

(16) Property, Plant and Equipment

Property, plant and equipment are stated at cost, less subsequent accumulated depreciation and accumulated impairment losses. The cost of an item of property, plant and equipment is directly attributable to its purchase or construction, which includes any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. It also includes the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

Subsequent costs are recognized in carrying amount of an asset or as a separate asset if it is probable that future economic benefits associated with the assets will flow into the Group and the cost of an asset can be measured reliably. Routine maintenance and repairs are expensed as incurred.

The Group does not depreciate land. Depreciation expense is computed using the straight-line method based on the estimated useful lives of the assets as follows:

	Estimated useful lives (years)
Buildings	20–40
Structures	10–20
Machinery	5–20
Others	3–10

If each part of an item of property, plant and equipment has a cost that is significant in relation to the total cost of the item, it is depreciated separately.

The Group reviews the depreciation method, the estimated useful lives and the residual values of property, plant and equipment at the end of each annual reporting period. If expectations differ from previous estimates, the changes are accounted for as a change in an accounting estimate.

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected to arise from the continued use of the asset. Any gain or loss arising on derecognition of the property (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in profit or loss in the period in which the property is derecognized.

(17) Investment property

Investment properties are properties held to earn rentals and/or for capital appreciation (including property under construction for such purposes). Investment properties are measured initially at cost, including transaction costs. Subsequent to initial recognition, investment properties are reported at cost, less accumulated depreciation and accumulated impairment losses.

Subsequent costs are recognized in carrying amount of an asset or as a separate asset if it is probable that future economic benefits associated with the assets will flow into the Group and the cost of an asset can be measured reliably. Routine maintenance and repairs are expensed as incurred.

While land is not depreciated, all other investment property is depreciated based on the respective assets estimated useful lives ranging from 20–40 years using the straight-line method.

The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimate accounted for on a prospective basis.

An investment property is derecognized upon disposal or when the investment property is permanently withdrawn from use and no future economic benefits are expected from the disposal. Any gain or loss arising on derecognition of the property (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in profit or loss in the period in which the property is derecognized.

(18) Intangible Assets

1) Intangible assets acquired separately

Intangible assets with finite useful lives that are acquired separately are carried at cost, less accumulated amortization and accumulated impairment losses. Amortization is recognized on a straight-line basis over their estimated useful lives. The estimated useful life and the amortization method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for on a prospective basis. Intangible assets with indefinite useful lives that are acquired separately are carried at cost, less accumulated impairment losses.

2) Internally generated intangible assets - research and development expenditure

Expenditure on research activities is recognized as an expense in the period in which it is incurred.

Expenditure arising from development (or from the development phase of an internal project) is recognized as an intangible asset if, only if, the development project is designed to produce new or substantially improved products and the Group can demonstrate the technical and economic feasibility and measure reliably the resources attributable to the intangible asset during its development.

Subsequent to initial recognition, internally generated intangible assets are reported at cost, less accumulated amortization and accumulated impairment losses, on the same basis as intangible assets that are acquired separately.

3) Intangible assets acquired in a business combination

Intangible assets that are acquired in a business combination are recognized separately from goodwill and are initially recognized at their fair value at the acquisition date (which is regarded as their cost). Subsequent to initial recognition, intangible assets acquired in a business combination are reported at cost, less accumulated amortization and accumulated impairment losses, on the same basis as intangible assets that are acquired separately.

4) Derecognition of intangible assets

An intangible asset is derecognized on disposal or when no future economic benefits are expected from its use. Gains or losses arising from derecognition of an intangible asset, measured as the difference between the net disposal proceeds and the carrying amount of the asset, are recognized in profit or loss when the asset is derecognized.

5) Depreciation of intangible assets

Intangible assets other than memberships with indefinite useful lives are amortized using the straight-line method with acquiring cost, except for residual value, with the amortization beginning when the asset is available for use. The estimated useful lives of the assets are as follows:

	Estimated useful lives (years)
Development costs	5
Right of utilization	16
Software	5
Others	5

(19) Impairment of tangible and intangible assets other than goodwill

At the end of each reporting period, the Group reviews the carrying amounts of its tangible and intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). When it is not possible to estimate the recoverable amount of an individual asset, the Group estimates the recoverable amount of the cash-generating unit to which the asset belongs.

Memberships with indefinite useful lives and intangible assets not yet available for use are tested for impairment at least annually, and whenever there is an indication that the asset may be impaired.

Recoverable amount is the higher of fair value, less costs to sell, or value in use. If the recoverable amount of an asset (or a cash-generating unit) is estimated to be less than its carrying amount, the carrying amount of the asset (or the cash-generating unit) is reduced to its recoverable amount and the reduced amount is recognized in profit or loss.

Where an impairment loss subsequently reverses, the carrying amount of the asset (or the cash-generating unit) is increased to the revised estimate of its recoverable amount, but so that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset (or the cash-generating unit) in prior years. Reversal of an impairment loss is recognized immediately in profit or loss.

(20) Inventories

Inventories are stated at the lower of cost or net realizable value. Cost of inventories, except for those in transit, is measured using the specific identification method for individual costs and consists of the purchase price, cost of conversion and other costs incurred in bringing the inventories to their present location and condition. Net realizable value represents the estimated selling price for inventories, less all estimated costs of completion and costs necessary to make the sale.

When inventories are sold, the carrying amount of those inventories is recognized as an expense (cost of sales) in the period in which the related revenue is recognized. The amount of any write-down of inventories to net realizable value and all losses of inventories are recognized as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realizable value, is recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

(21) Provisions

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

The amount recognized as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. When a provision is measured using the cash flows estimated to settle the present obligation, its carrying amount is the present value of those cash flows (where the effect of the time value of money is material). The discount rate used is a pretax rate that reflects current market assessments of the time value of money and the risks specific to the liability. Where discounting is used, the increase in the provision due to the passage is recognized in profit or loss as borrowing cost.

When some or all of the economic benefits required to settle a provision are expected to be recovered from a third party, a receivable is recognized as an asset if it is virtually certain that reimbursement will be received and the amount of the receivable can be measured reliably.

At the end of each reporting period, the remaining provision balance is reviewed and assessed to determine if the current best estimate is being recognized. If the existence of an obligation to transfer economic benefit is no longer probable, the related provision is reversed during the period.

(22) Financial Instruments

Financial assets and financial liabilities are recognized when a group entity becomes a party to the contractual provisions of the instruments. Financial assets and financial liabilities are initially measured at fair value. Transaction costs that are directly attributable to the acquisition or issue of financial assets and financial liabilities are added to or deducted from the fair value of the financial assets or financial liabilities, as appropriate, on initial recognition. Transaction costs directly attributable to the acquisition of financial assets or financial liabilities at fair value through profit or loss (“FVTPL”) are recognized immediately in profit or loss.

Financial assets are classified into the following specified categories: 'financial assets at FVTPL,' 'held-to-maturity investments,' 'available-for-sale ("AFS") financial assets' and 'loans and receivables.' The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition.

1) Effective interest method

The effective interest method is a method of calculating the amortized cost of a debt instrument and of allocating interest income over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipts (including all fees and points paid or received that form an integral part of the effective interest rate, transaction costs and other premiums or discounts) through the expected life of the debt instrument, or (where appropriate) a shorter period, to the net carrying amount on initial recognition.

Income is recognized on an effective interest basis for debt instruments other than those financial assets classified as at FVTPL.

2) Financial assets at FVTPL

Financial assets are classified as at FVTPL when a financial asset is either held for trading or designated as at FVTPL. A financial asset is classified as held for trading if it has been acquired principally for the purpose of selling it in the near term; or on initial recognition, it is part of a portfolio of identified financial instruments that the Group manages together and has a recent actual pattern of short-term profit taking; or it is a derivative that is not designated and effective as a hedging instrument. Financial assets at FVTPL are stated at fair value, with any gains or losses arising on remeasurement recognized in profit or loss.

A financial asset is classified as held for trading if:

- it has been acquired principally for the purpose of selling in the near term;
- on initial recognition, it is part of a portfolio of identified financial instruments that the Group manages together and has a recent actual pattern of short-term profit taking; or
- it is a derivative that is not designated and effective as a hedging instrument.

A financial asset other than a financial asset held for trading or a contingent consideration that may be paid by an acquirer as part of a business combination may be designated as at FVTPL upon initial recognition if:

- such designation eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise;
- the financial asset forms part of a group of financial assets or financial liabilities or both, which is managed and its performance is evaluated on a fair value basis, in accordance with the Group's documented risk management or investment strategy, and information about the grouping is provided internally on that basis; or
- it forms part of a contract containing one or more embedded derivatives, and K-IFRS 1039 permits the entire combined contract (asset or liability) to be designated as at FVTPL.

Financial assets at FVTPL are stated at fair value, with any gains or losses arising on remeasurement recognized in profit or loss. The net gain or loss recognized in profit or loss incorporates any dividend or interest earned on the financial assets and is included in the 'finance income and expense' line item in the consolidated statements of comprehensive income.

3) Held-to-maturity investments

Non-derivative financial assets with fixed or determinable payments and fixed maturity dates that the Group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are measured at amortized cost using the effective interest method, less any impairment, with revenue recognized on an effective yield basis.

4) AFS financial assets

AFS financial assets are non-derivatives that are either designated as AFS or not classified as (a) loans and receivables, (b) held-to-maturity investments or (c) financial assets at FVTPL.

They are subsequently measured at fair value at the end of each reporting period. Changes in the carrying amount of AFS monetary financial assets relating to changes in foreign currency rates (see below), interest income calculated using the effective interest method and dividends on AFS equity investments are recognized in profit or loss. Other changes in the carrying amount of AFS financial assets are recognized in other comprehensive income (as investments revaluation reserve). When the investment is disposed of or is determined to be impaired, the cumulative gain or loss previously accumulated in other comprehensive income is reclassified to profit or loss.

Dividends on AFS equity instruments are recognized in profit or loss when the Group's right to receive the dividends is established.

AFS equity investments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured and derivatives that are linked to and must be settled by delivery of such unquoted equity investments are measured at cost, less any identified impairment losses at the end of each reporting period.

5) Loans and receivables

Trade receivables, loans and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables.' Loans and receivables are measured at amortized cost using the effective interest method, less any impairment. Interest income is recognized by applying the effective interest rate, except for short-term receivables when the effect of discounting is immaterial.

6) Impairment of financial assets

Financial assets, other than those at FVTPL, are assessed for indicators of impairment at the end of each reporting period. Financial assets are considered to be impaired when there is objective evidence that, as a result of one or more events that occurred after the initial recognition of the financial asset, the estimated future cash flows of the investment have been affected.

For AFS equity investments, a significant or prolonged decline in the fair value of the security below its cost is considered to be objective evidence of impairment.

For certain categories of financial asset, such as trade receivables, assets that are assessed not to be impaired individually are, in addition, assessed for impairment on a collective basis. Objective evidence of impairment for a portfolio of receivables could include the Group's past experience of collecting payments, an increase in the number of delayed payments in the portfolio past the average credit period of 30 days as well as observable changes in national or local economic conditions that correlate with default on receivables.

For financial assets carried at amortized cost, the amount of the impairment loss recognized is the difference between the asset's carrying amount and the present value of estimated future cash flows, discounted at the financial asset's original effective interest rate.

For financial assets that are carried at cost, the amount of the impairment loss recognized is the difference between the asset's carrying amount and the present value of estimated future cash flows, discounted at the current market rate of return for a similar financial asset. Such impairment loss will not be reversed in subsequent periods.

When an AFS financial asset is considered to be impaired, cumulative gains or losses previously recognized in other comprehensive income are reclassified to profit or loss in the period.

For financial assets measured at amortized cost, if, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognized, the previously recognized impairment loss is reversed through profit or loss to the extent that the carrying amount of the investment at the date the impairment is reversed does not exceed what the amortized cost would have been had the impairment not been recognized.

In respect of AFS equity securities, impairment losses previously recognized in profit or loss are not reversed through profit or loss. Any increase in fair value subsequent to an impairment loss is recognized in other comprehensive income. In respect of AFS debt securities, impairment losses are subsequently reversed through profit or loss if an increase in the fair value of the investment can be objectively related to an event occurring after the recognition of the impairment loss.

7) Derecognition of financial assets

The Group derecognizes a financial asset only when the contractual rights to the cash flows from the asset expire or when it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity. If the Group neither transfers nor retains substantially all the risks and rewards of ownership and continues to control the transferred asset, it recognizes its retained interest in the asset and an associated liability for amounts it may have to pay. If the Group retains substantially all the risks and rewards of ownership of a transferred financial asset, it continues to recognize the financial asset and also recognizes a collateralized borrowing for the proceeds received.

On derecognition of a financial asset in its entirety, the difference between the asset's carrying amount and the sum of the consideration received and receivable and the cumulative gain or loss that had been recognized in other comprehensive income and accumulated in equity is recognized in profit or loss.

On derecognition of a financial asset other than in its entirety (e.g., when the Group retains an option to repurchase part of a transferred asset or retains a residual interest and such a retained interest indicates that the transferor has neither transferred nor retained substantially all the risks and rewards of ownership and has retained control of the transferred asset), the Group allocates the previous carrying amount of the financial asset between the part it continues to recognize under continuing involvement and the part it no longer recognizes on the basis of the relative fair value of those parts on the date of the transfer. The difference between the carrying amount allocated to the part that is no longer recognized and the sum of the consideration received for the part that is no longer recognized and any cumulative gain or loss allocated to it that had been recognized in other comprehensive income is recognized in profit or loss. A cumulative gain or loss that had been recognized in other comprehensive income is allocated between the part that continues to be recognized and the part that is no longer recognized on the basis of the relative fair value of those parts.

(23) Financial liabilities and equity instruments

1) Classification as debt or equity

Debt and equity instruments are classified as either financial liabilities or as equity in accordance with the substance of the contractual arrangement and the definitions of a financial liability and an equity instrument.

2) Equity instruments

An equity instrument is any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities. Equity instruments issued by the Group are recognized at the proceeds received, net of direct issue costs.

Repurchase of the Company’s own equity instruments is recognized and deducted directly in equity. No gain or loss is recognized in profit or loss on the purchase, sale, issue or cancellation of the Company’s own equity instruments.

3) Compound instruments

The component parts of compound instruments (convertible bonds) issued by the Group are classified separately as financial liabilities and equity in accordance with the substance of the contractual arrangements and the definitions of a financial liability and an equity instrument. The conversion option that will be settled by the exchange of a fixed amount of cash or another financial asset for a fixed number of the Company’s own equity instruments is an equity instrument.

At the date of issue, the fair value of the liability component is estimated using the prevailing market interest rate for a similar non-convertible instrument. This amount is recorded as a liability on an amortized cost basis using the effective interest method until extinguished upon conversion or at the instrument’s maturity date.

The conversion option classified as equity is determined by deducting the amount of the liability component from the fair value of the compound instrument as a whole. This is recognized and included in equity, net of income tax effects, and is not subsequently remeasured. In addition, the conversion option classified as equity will remain in equity until the conversion option is exercised, in which case the balance recognized in equity will be transferred to share premium. No gain or loss is recognized in profit or loss upon conversion or expiration of the conversion option.

4) Financial liabilities

Financial liabilities are recognized when the Group becomes a party to the contractual provisions of the instruments. Financial liabilities are initially measured at fair value. Transaction cost that is directly attributable to the issue of financial liabilities is deducted from the fair value of the financial liabilities on initial recognition. Transaction costs directly attributable to acquisition of financial liabilities at FVTPL are recognized immediately in profit or loss.

Financial liabilities are classified as either financial liabilities at FVTPL or other financial liabilities.

5) Financial liabilities at FVTPL

Financial liabilities are classified as at FVTPL when a financial liability is a contingent consideration that may be paid by an acquirer as part of a business combination to which K-IFRS 1103 applies, is held for trading or is designated as at FVTPL.

A financial liability is classified as held for trading if:

- it has been acquired principally for the purpose of repurchasing it in the near term;
- on initial recognition, it is part of a portfolio of identified financial instruments that the Group manages together and has a recent actual pattern of short-term profit taking; or
- it is a derivative that is not designated and effective as a hedging instrument.

A financial liability other than a financial liability held for trading or a contingent consideration that may be paid by an acquirer as part of a business combination may be designated as at FVTPL upon initial recognition if:

- such designation eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise;
- the financial liability forms part of a group of financial assets or financial liabilities or both, which is managed and its performance is evaluated on a fair value basis, in accordance with the Group's documented risk management or investment strategy, and information about the grouping is provided internally on that basis; or
- it forms part of a contract containing one or more embedded derivatives, and K-IFRS 1039 permits the entire combined contract (asset or liability) to be designated as at FVTPL.

Financial liabilities at FVTPL are stated at fair value, with any gains or losses arising on remeasurement recognized in profit or loss. The net gain or loss recognized in profit or loss incorporates any interest paid on the financial liability and is included in the ‘other non-operating income and expense’ line item in the consolidated statements of comprehensive income.

6) Other financial liabilities

Other financial liabilities are subsequently measured at amortized cost using the effective interest method, with interest expense recognized on an effective yield basis.

7) Financial guarantee contracts

A financial guarantee contract is a contract that requires the issuer to make specified payments to reimburse the holder for a loss it incurs because a specified debtor fails to make payments when due in accordance with the terms of a debt instrument.

Financial guarantee contract liabilities are initially measured at their fair values and, if not designated as at FVTPL, are subsequently measured at the higher of:

- the amount of the obligation under the contract, as determined in accordance with K-IFRS 1037, or
- the amount initially recognized, less cumulative amortization recognized in accordance with K-IFRS 1018.

8) Derecognition of financial liabilities

The Group derecognizes financial liabilities when its obligations are discharged, cancelled or expired. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable is recognized in profit or loss.

(24) Derivative financial instruments

The Group enters into a variety of derivative financial instruments to manage its exposure to foreign exchange rate risk and others, including foreign exchange forward contracts and others.

Derivatives are initially recognized at fair value at the date the derivative contract is entered into and are subsequently remeasured to their fair value at the end of each reporting period. The resulting gain or loss is recognized in profit or loss immediately, unless the derivative is designated and effective as a hedging instrument; in such case, the timing of the recognition in profit or loss depends on the nature of the hedge relationship.

A derivative with a positive fair value is recognized as a financial asset, and a derivative with a negative fair value is recognized as a financial liability. A derivative is presented as a non-current asset or a non-current liability if the remaining maturity of the instrument is more than 12 months and it is not expected to be realized or settled within 12 months. Other derivatives are presented as current assets or current liabilities.

1) Embedded derivatives

Derivatives embedded in non-derivative host contracts are treated as separate derivatives when they meet the definition of a derivative, their risks and characteristics are closely related to those of the host contracts and the contracts are not measured at FVTPL.

2) Hedge accounting

The Group designates certain hedging instruments, which include derivatives, embedded derivatives and non-derivatives in respect of foreign currency risk, as either fair value hedges, cash flow hedges or hedges of net investments in foreign operations. Hedges of foreign exchange risk on firm commitments are accounted for as cash flow hedges.

At the inception of the hedge relationship, the entity documents the relationship between the hedging instrument and the hedged item, along with its risk management objectives and its strategy for undertaking various hedge transactions. Furthermore, at the inception of the hedge and on an ongoing basis, the Group documents whether the hedging instrument is highly effective in offsetting changes in fair values or cash flows of the hedged item.

3) Fair value hedges

Changes in the fair value of derivatives that are designated and qualify as fair value hedges are recognized in profit or loss immediately, together with any changes in the fair value of the hedged asset or liability, which are attributable to the hedged risk. The change in the fair value of the hedging instrument and the change in the hedged item attributable to the hedged risk are recognized in the 'finance income and expense' line item of the consolidated statements of comprehensive income.

Hedge accounting is discontinued when the Group revokes the hedging relationship; when the hedging instrument expires or is sold, terminated or exercised; or when it no longer qualifies for hedge accounting. The fair value adjustment to the carrying amount of the hedged item arising from the hedged risk is amortized to profit or loss from that date.

4) Cash flow hedges

The effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges is recognized in other comprehensive income. The gain or loss relating to the ineffective portion is recognized immediately in profit or loss and is included in the 'finance income and expense' line item.

Amounts previously recognized in other comprehensive income and accumulated in equity are reclassified to profit or loss in the periods when the hedged item is recognized in profit or loss, in the same line of the consolidated statements of comprehensive income as the recognized hedged item.

Hedge accounting is discontinued when the Group revokes the hedging relationship; when the hedging instrument expires or is sold, terminated or exercised; or it no longer qualifies for hedge accounting. Any gain or loss accumulated in equity at that time remains in equity and is recognized when a forecasted transaction is ultimately recognized in profit or loss. When the forecasted transaction is no longer expected to occur, the gain or loss accumulated in equity is recognized immediately in profit or loss.

(25) Fair value

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, regardless of whether that price is directly observable or estimated using another valuation technique. In estimating the fair value of an asset or a liability, the Group takes into account the characteristics of the asset or the liability if market participants would take those characteristics into account when pricing the asset or the liability at the measurement date. Fair value for measurement and/or disclosure purposes in these consolidated financial statements is determined on such a basis, except for share-based payment transactions that are within the scope of K-IFRS 1102; leasing transactions that are within the scope of K-IFRS 1017 *Leases*; and measurements that have some similarities to fair value but are not fair value, such as net realizable value in K-IFRS 1002 *Inventories* or value in use in K-IFRS 1036.

In addition, for financial reporting purposes, fair value measurements are categorized into Levels 1, 2 or 3 based on the degree to which the inputs to the fair value measurement are observable and the significance of the inputs to the fair value measurement in its entirety, which are described in Note 10.

(26) Accounting Treatment related to the Emission Rights Cap and Trade Scheme

The Group classifies the emission rights as intangible assets. Emission rights allowances the government allocated free of charge are measured at nil, and emission rights allowances purchased are measured at cost, which the Group paid to purchase the allowances. If emission rights allowances the government allocated free of charge are sufficient to settle the emission rights allowances allotted for vintage year, the emission liabilities are measured at nil. However, for the emission liabilities that exceed the allowances allocated free of charge, the shortfall is measured at the best estimate at the end of the reporting period.

(27) Approval of consolidated financial statements

The consolidated financial statements for the year ended December 31, 2016, were approved by the board of directors on March 13, 2017.

3. SIGNIFICANT ACCOUNTING JUDGMENTS AND KEY SOURCES OF ESTIMATION UNCERTAINTIES:

In the application of the Group's accounting policies, which are described in Note 2, management is required to make judgments, estimates and assumptions about the carrying amounts of assets and liabilities that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from those estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimate is revised if the revision affects only that period or in the period of the revision and future periods if the revision affects both current and future periods.

(1) Revenue recognition

Revenue from a contract to provide services is recognized by reference to the stage of completion of the contract. The stage of completion of the contract is determined as reasonable estimation and is subject to change as related factors change

(2) Defined benefit obligation

The Group's defined benefit obligation is determined based on the actuarial valuation carried out at the end of each annual reporting period. Actuarial assumptions are the Group's best estimates of the variables, such as discount rates, rates of expected future salary increases and mortality rates.

(3) Provision for construction losses

Provisions for the expected cost of warranty obligations are recognized at the best estimate of the past expenditure experiences periodically.

(4) Revaluation model on land

As stated in Note 12, the Group uses evaluation technique, including inputs that are not based on observable market data, to approximate revalued amount of land classified as property, plant and equipment and fair value of investment property. The Group's management believes that evaluation technique and assumptions that are used for revaluation model on land and fair value model on investment in real properties are fair.

(5) Deferred tax

Recognition and measurement of deferred tax assets and liabilities require the management's judgment, in particular, to recognize if the scope of deferred tax assets is affected by management's judgment and assumption in the future.

(6) Useful lives of property, plant and equipment and intangible assets

It is required to estimate useful lives for depreciation and amortization.

4. FINANCIAL RISK MANAGEMENT:

The Group is exposed to various financial risks, such as market (foreign currency risk and interest rate risk), credit and liquidity, relating to its operations. The purpose of risk management policy is to minimize potential risks, which could have adverse effect on financial performance.

Financial risk management activities are performed by Treasury Department in accordance with the aforementioned documented risk management policies. In addition, the Group enters into derivative contracts to hedge against certain risks.

(1) Market risk

1) Foreign currency risk

The Group is exposed to foreign currency risk since it makes transactions in foreign currencies. Foreign currency risk arises from forecasted transactions, recognized assets and liabilities and net investments in foreign operations.

Foreign currency risk is managed by the Group's policy on foreign currencies. The Group's basis for foreign currency management is to reduce income/loss volatility. The Group reduces exposure to foreign currency risk by matching the inflow and the outflow of foreign currencies (natural hedge) and manages foreign currency risk by using currency derivatives, such as currency forwards, for the remaining exposure.

The book value of the Group's monetary assets and liabilities denominated in foreign currencies, which represents the maximum exposure to foreign currency risk, as of December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	December 31, 2016				
	USD	EUR	CNY	Others (*)	Total
Assets	₩78,815,278	₩384,859	₩7,604,976	₩77,376	₩86,882,489
Liabilities	(13,750,985)	(18,778,643)	(158,989)	(6,821,632)	(39,510,249)
Net assets (liabilities)	₩65,064,293	₩(18,393,784)	₩7,445,987	₩(6,744,256)	₩47,372,240

	December 31, 2015				
	USD	EUR	CNY	Others (*)	Total
Assets	₩73,714,300	₩1,087,007	₩234,692	₩77,763	₩75,113,762
Liabilities	(13,303,853)	(31,142,731)	(55,169)	(5,865,305)	(50,367,058)
Net assets (liabilities)	₩60,410,447	₩(30,055,724)	₩179,523	₩(5,787,542)	₩24,746,704

(*) Others are assets and liabilities denominated in foreign currencies other than USD, EUR and CNY.

Net foreign currency translation gain (loss) for the years ended December 31, 2016 and 2015, is ₩821,222 thousand and ₩(88,992) thousand, respectively.

A sensitivity analysis on the Group's income before tax, assuming a 10% increase and decrease in currency exchange rates, for the years ended December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	December 31, 2016		December 31, 2015	
	10% increase in Korean won against foreign currency	10% decrease in Korean won against foreign currency	10% increase in Korean won against foreign currency	10% decrease in Korean won against foreign currency
Income before tax impact	₩4,737,224	₩(4,737,224)	₩2,474,670	₩(2,474,670)

The above sensitivity analysis is based on monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency as of December 31, 2016 and 2015.

2) Interest rate risk

The Group's interest rate risk is related to borrowings and bank deposits with floating interest rates, and related interest income and expense are exposed to interest rate risk. The Group is exposed to interest rate risk mainly due to its borrowing with floating interest rates. The purpose of interest rate risk management is to minimize uncertainty and financial expense arising from interest rate fluctuation.

To manage its interest rate risk, the Group minimizes external borrowings using internal funds and reduces borrowings with high interest rates, and maintains an appropriate balance between borrowings with floating interest rate and fixed interest rate and short-term and long-term borrowings. The Group manages its interest rate risk preemptively through regular monitoring and adjustments to the changing domestic and overseas market conditions and nature of its interest rates.

The book value of the Group's financial assets and liabilities with floating interest rates exposed to interest rate risk as of December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	December 31, 2016	December 31, 2015
Financial assets	₩71,886,762	₩27,282,368
Financial liabilities	(54,807,617)	(56,768,404)
Net assets (liabilities)	₩17,079,145	₩(29,486,036)

A sensitivity analysis on the Group's income before tax assuming a 1% increase and decrease in interest rates as of December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	December 31, 2016		December 31, 2015	
	1% increase	1% decrease	1% increase	1% decrease
Income before tax impact	₩170,791	₩(170,791)	₩(294,860)	₩294,860

3) Price risk

The Group is exposed to equity price risks arising from its listed equity investments among AFS equity investments. The Group periodically measures the risk as the fair value or future cash flows of equity investments may fluctuate due to the changes in market prices. Important investments in the Group's portfolio are individually managed, and acquisition and disposal are approved by the board of directors.

(2) Credit risk

The credit risk refers to risk of financial losses to the Group when the counterparty defaults on the obligations of the contract. The credit risk arises from AFS financial assets that are not equity securities, deposits in financial institution, financial derivatives and guarantee limit, as well as from the Group's normal transaction and investing activity. To manage credit risk, the Group evaluates the creditworthiness of each customer or counterparty considering the financial status, past experience and other factors. The Group establishes credit limit for each customer and counterparty.

The Group evaluates the creditworthiness using opened financial information and information provided by credit rating institutions when it contracts with new customers. The Group decides credit transaction limit and is provided with collateral and guarantee based on evaluation.

Also, the Group revaluates customers' creditworthiness periodically, reassesses credit transaction limit and readjusts level of collateral. The Group reports the present condition of delayed collection and collection measures periodically to financial assets, which has delayed collection, and takes measures by causes of delay.

1) The maximum credit risk exposure

The maximum exposure amount of credit risk of financial assets maintained by the Group and the book value for the financial assets as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	December 31, 2016	December 31, 2015
Loans and receivables:		
Cash and cash equivalents	₩72,820,704	₩45,482,382
Financial instruments	7,624,000	17,336,000
Trade and other receivables	76,120,803	53,264,510
Long-term and short-term loans	2,128,782	2,926,453
Long-term other receivables	3,883,005	14,056,919
Derivative assets	634,824	2,732,393
Total	₩163,212,118	₩135,798,657

Apart from the above financial assets, the maximum exposure of the Group related to financial guarantee contract is the maximum amount to be paid if the guarantee will be charged (see Note 31).

2) The Group's receivables' aging analysis as of December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	December 31, 2016						
	Individually assessed receivables	Receivables assessed for impairment on a collective basis					Total
		Within due	0–3 months	3–6 months	6–12 months	More than 12 months	
Short-term loans	₩-	₩879,872	₩-	₩-	₩-	₩-	₩879,872
Trade receivables	2,599,402	57,483,648	2,076,633	34,245	80,433	141,410	62,415,771
Other receivables	5,794,795	10,520,286	-	-	-	-	16,315,081
Accrued income	-	16,133	-	-	-	-	16,133
Long-term loans	-	1,361,850	-	-	-	-	1,361,850
Total	₩8,394,197	₩70,261,789	₩2,076,633	₩34,245	₩80,433	₩141,410	₩80,988,707

	December 31, 2015						
	Individually assessed receivables	Receivables assessed for impairment on a collective basis					Total
		Within due	0–3 months	3–6 months	6–12 months	More than 12 months	
Short-term loans	₩-	₩1,206,666	₩-	₩-	₩-	₩-	₩1,206,666
Trade receivables	2,599,402	49,886,038	1,611,196	179,720	928,924	192,185	55,397,465
Other receivables	6,236	456,217	-	-	-	-	462,453
Accrued income	-	55,425	-	-	-	-	55,425
Long-term loans	-	1,890,400	-	-	-	-	1,890,400
Long-term other receivables	5,964,941	4,616,869	-	-	-	-	10,581,810
Total	₩8,570,579	₩58,111,615	₩1,611,196	₩179,720	₩928,924	₩192,185	₩69,594,219

An allowance account is recognized by applying appropriate allowance rate for receivables that can be assessed for impairment individually due to insolvency, bankruptcy and others. Group of financial assets that are not individually significant and have similar credit risk characteristics are assessed for impairment on a collective basis. An allowance account is recognized based on aging analysis and the Group's past experience of receivables collection.

AFS financial assets, held-to-maturity financial assets, deposits in financial institutions and derivative instruments are individually assessed for impairment.

(3) Liquidity risk

Liquidity risk is the risk that the Group will encounter difficulty in meeting its financial liability obligations related to its financing for its operation.

The Group forecasts cash flows from operating, investing and financing activities through a cash flow budget regularly. This secures and retains a necessary liquidity scale in advance. Also, this manages a possible liquidity risk for the future.

	December 31, 2016					
		Nominal cash flows according to contract				
	Book value	Total	Less than 1 year	1 year–2 years	2–5 years	More than 5 years
Financial liabilities	₩475,455,266	₩475,737,780	₩353,143,653	₩122,594,127	₩-	₩ -
Interest expense	-	15,219,835	11,304,835	3,915,000	-	-
	₩475,455,266	₩490,957,615	₩364,448,488	₩126,509,127	₩-	₩ -

	December 31, 2015					
		Nominal cash flows according to contract				
	Book value	Total	Less than 1 year	1 year–2 years	2–5 years	More than 5 years
Financial liabilities	₩465,158,028	₩465,674,782	₩192,547,840	₩153,126,942	₩120,000,000	₩ -
Interest expense	-	26,810,394	12,151,477	10,724,417	3,934,500	-
	₩465,158,028	₩492,485,176	₩204,699,317	₩163,851,359	₩123,934,500	₩ -

The above-mentioned maturity analysis is based on undiscounted cash flow according to the contract, which is different from non-derivative liabilities in the consolidated statements of financial position.

Apart from the above non-derivative liabilities as of December 31, 2016, financial guarantee contract liabilities of the Group are explained in Note 31.

(4) Capital risk

The Group performs capital risk management to maintain its ability to continuously provide profits to stockholders and parties in interest and to maintain optimum capital structure to reduce capital expenses.

Debt-to-equity ratio, calculated as total liabilities divided by equity, is used as an index to manage the Group’s capital similar to overall industry practice.

Debt-to-equity ratios as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	December 31, 2016	December 31, 2015
Total liabilities	₩822,184,664	₩831,368,789
Total equity	534,264,862	574,672,722
Debt-to-equity ratio	153.89%	144.67%

5. RESTRICTED FINANCIAL INSTRUMENTS:

Details of restricted financial instruments as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Account	December 31, 2016	December 31, 2015	Remarks
Short-term financial instruments	₩268,000	₩330,000	Establishment of a pledge to Korea Gas Corporation
Long-term financial instruments	6,000	6,000	Guarantee deposits for checking account
Total	₩274,000	₩336,000	

6. TRADE AND OTHER RECEIVABLES:

(1) Trade and other receivables as of December 31, 2016 and 2015, consist of the following (in thousands of Korean won):

	December 31, 2016			December 31, 2015		
	Gross	Allowance for doubtful accounts	Carrying value	Gross	Allowance for doubtful accounts	Carrying value
CURRENT:						
Trade receivables	₩62,415,772	₩(2,682,012)	₩59,733,760	₩55,397,465	₩(2,706,662)	₩52,690,803
Other receivables	16,315,081	(6,236)	16,308,845	462,453	(6,236)	456,217
Accrued income	16,133	-	16,133	55,425	-	55,425
Guarantee deposits	62,065	-	62,065	62,065	-	62,065
Subtotal	78,809,051	(2,688,248)	76,120,803	55,977,408	(2,712,898)	53,264,510
NON-CURRENT:						
Other receivables	-	-	-	10,137,429	-	10,137,429
Guarantee deposits	3,883,005	-	3,883,005	3,919,490	-	3,919,490
Subtotal	3,883,005	-	3,883,005	14,056,919	-	14,056,919
Total	₩82,692,056	₩(2,688,248)	₩80,003,808	₩70,034,327	₩(2,712,898)	₩67,321,429

(2) The changes in allowance for doubtful accounts for the year ended December 31, 2016, are as follows (in thousands of Korean won):

	January 1, 2016	Increase	Reversal	December 31, 2016
Trade receivables	₩(2,706,662)	₩-	₩24,650	₩(2,682,012)
Other receivables	(6,236)	-	-	(6,236)
	₩(2,712,898)	₩-	₩24,650	₩(2,688,248)

Bad debt expense to impaired trade receivables is included in selling, general and administrative expenses and bad debt expense to impaired other receivables is included in other non-operating expenses in the consolidated statements of income.

7. INVENTORIES:

Inventories as of December 31, 2016 and 2015, are summarized as follows (in thousands of Korean won):

	December 31, 2016			December 31, 2015		
	Acquisition cost	Valuation allowance	Book value	Acquisition cost	Valuation allowance	Book value
Work in progress	₩164,194,968	₩(36,098,526)	₩128,096,442	₩140,307,251	₩(20,223,815)	₩120,083,436
Raw materials	89,160,448	(17,456,402)	71,704,046	86,621,540	(11,202,931)	75,418,609
Materials in transit	3,988,273	-	3,988,273	3,479,359	-	3,479,359
Total	₩257,343,689	₩(53,554,928)	₩203,788,761	₩230,408,150	₩(31,426,746)	₩198,981,404

Losses on inventory valuation amounted to ₩21,977,195 thousand and ₩12,777,361 thousand for the years ended December 31, 2016 and 2015, respectively.

8. LONG-TERM INVESTMENT SECURITIES:

(1) Long-term investment securities as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	December 31, 2016	December 31, 2015
AFS financial assets:		
Investment in capital of partnership:		
Korea Marine Equipment Association	₩20,000	₩20,000
Electronic Contractors' Financial Cooperative	52,047	52,047
Equity securities in listed company:		
Doosan Bobcat (*1)	379,223,810	-
Equity securities in non-listed company:		
Doosan Engineering & Construction Co., Ltd. ("Doosan E&C")	18,446,750	-
Casco	1	1
Total	₩397,742,608	₩72,048

(*1) The Group transferred equities in Doosan Infracore International, Inc. ("DII") and Doosan Holdings Europe Ltd. ("DHEL") in exchange for shares in Doosan Bobcat (see Note 11). As the Company no longer has significant influence over Doosan Bobcat, it is classified as AFS financial asset. Meanwhile, the Company recognized an impairment loss of ₩261,450,872 thousand for the year ended December 31, 2016.

(2) Changes in fair value of AFS financial assets for the year ended December 31, 2016, are as follows (in thousands of Korean won):

	January 1, 2016	Valuation	December 31, 2016
Equity securities in listed company	₩-	₩61,881,710	₩61,881,710
Equity securities in non-listed company	-	(6,808,511)	(6,808,511)
Corporate tax effect	-	(13,327,714)	(13,327,714)
	₩-	₩41,745,485	₩41,745,485

9. DERIVATIVES:

(1) Details of the derivatives and risk aversion accounting are as follows:

Purpose	Derivative instrument	Contract description
Risk aversion of fair value	Foreign currency forwards	When receiving the foreign receivables, determine foreign payables to fix the value of Korean won at maturity about exposed fluctuation risk of exchange rate.

(2) Details of gain and loss on valuation of derivatives as of December 31, 2016 and 2015, are as follows (in foreign currencies and in thousands of Korean won):

December 31, 2016

Buy		Sell		Assets (liabilities)	Gains (losses)	Firm commitment
Currency	Amount	Currency	Amount			
KRW	675,516,089	USD	586,553,500	₩(31,870,888)	₩(25,368,849)	₩26,423,956
EUR	58,387,000	KRW	75,958,401	(1,338,156)	(1,258,218)	3,906,150
CHF	10,153,000	KRW	12,070,976	121,244	81,748	(49,891)
Total				₩(33,087,800)	₩(26,545,319)	₩30,280,215

December 31, 2015

Buy		Sell		Assets (liabilities)	Gains (losses)	Firm commitment
Currency	Amount	Currency	Amount			
KRW	906,562,580	USD	801,216,060	₩(34,283,414)	₩(28,214,013)	₩40,539,987
EUR	69,646,000	KRW	92,079,679	(1,784,714)	(845,623)	4,997,724
CHF	7,624,000	KRW	9,130,045	135,633	174,342	(132,195)
Total				₩(35,932,495)	₩(28,885,294)	₩45,405,516

10. FINANCIAL INSTRUMENTS:

(1) Categories of financial instruments as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	December 31, 2016						
	Financial assets at FVTPL	Loans and receivables	AFS financial assets	Held-to-maturity investments	Derivatives designated as hedging instruments	Book value	Fair value
Cash and cash equivalents	₩-	₩72,820,704	₩-	₩-	₩-	₩72,820,704	₩72,820,704
Long- and short-term financial instruments	-	7,624,000	-	-	-	7,624,000	7,624,000
Trade and other receivables	-	76,120,803	-	-	-	76,120,803	76,120,803
Derivative assets	-	-	-	-	634,824	634,824	634,824
Long- and short-term loans	-	2,128,782	-	-	-	2,128,782	2,128,782
Long-term investment securities	-	-	397,742,608	-	-	397,742,608	397,742,608
Long-term other receivables	-	3,883,005	-	-	-	3,883,005	3,883,005
Total	₩-	₩162,577,294	₩397,742,608	₩-	₩634,824	₩560,954,726	₩560,954,726

	December 31, 2016					
	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Derivatives designated as hedging instruments	Financial guarantee contract	Book value	Fair value
Trade and other payables	₩-	₩156,703,928	₩-	₩-	₩156,703,928	₩156,703,928
Borrowings and bonds	-	316,157,211	-	-	316,157,211	316,157,211
Derivative liabilities	-	-	33,722,624	-	33,722,624	33,722,624
Long-term non-trade payables	-	2,594,127	-	-	2,594,127	2,594,127
Financial guarantee liabilities	-	-	-	-	-	-
Total	₩-	₩475,455,266	₩33,722,624	₩-	₩509,177,890	₩509,177,890

	December 31, 2015						
	Financial assets at FVTPL	Loans and receivables	AFS financial assets	Held-to-maturity investments	Derivatives designated as hedging instruments	Book value	Fair value
Cash and cash equivalents	₩-	₩45,482,382	₩-	₩-	₩-	₩45,482,382	₩45,482,382
Long- and short-term financial instruments	-	17,336,000	-	-	-	17,336,000	17,336,000
Trade and other receivables	-	53,264,510	-	-	-	53,264,510	53,264,510
Derivative assets	-	-	-	-	2,732,393	2,732,393	2,732,393
Long- and short-term loans	-	2,926,453	-	-	-	2,926,453	2,926,453
Long-term and short-term investment securities	-	-	72,048	-	-	72,048	72,048
Long-term other receivables	-	14,056,919	-	-	-	14,056,919	14,056,919
Total	₩-	₩133,066,264	₩72,048	₩-	₩2,732,393	₩135,870,705	₩135,870,705

	December 31, 2015					
	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Derivatives designated as hedging instruments	Financial guarantee contract	Book value	Fair value
Trade and other payables	₩-	₩122,440,914	₩-	₩-	₩122,440,914	₩122,440,914
Borrowings and bonds	-	334,590,172	-	-	334,590,172	334,590,172
Derivative liabilities	-	-	38,664,888	-	38,664,888	38,664,888
Long-term non-trade payables	-	8,126,942	-	-	8,126,942	8,126,942
Financial guarantee liabilities	-	-	-	3,865,652	3,865,652	3,865,652
Total	₩-	₩465,158,028	₩38,664,888	₩3,865,652	₩507,688,568	₩507,688,568

(2) Fair value measurements of financial instruments by fair value hierarchy levels as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	December 31, 2016			
	Level 1	Level 2	Level 3	Total
Financial assets:				
AFS financial assets	₩379,223,810	₩18,446,750	₩ -	₩397,670,560
Derivatives designated as hedging instruments	-	634,824	-	634,824
Financial liabilities:				
Derivatives designated as hedging instruments	-	(33,722,624)	-	(33,722,624)
Total	₩379,223,810	₩(14,641,050)	₩ -	₩364,582,760

	December 31, 2015			
	Level 1	Level 2	Level 3	Total
Financial assets:				
Derivatives designated as hedging instruments	₩ -	₩2,732,393	₩ -	₩2,732,393
Financial liabilities:				
Derivatives designated as hedging instruments	-	(38,664,888)	-	(38,664,888)
Total	₩ -	₩(35,932,495)	₩ -	₩(35,932,495)

The Group uses the following hierarchy for determining and disclosing the fair value of financial instruments by valuation technique. The level of hierarchy of fair value is as follows:

Level 1:	Unadjusted quoted prices in active markets for identical assets or liabilities
Level 2:	Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly
Level 3:	Inputs that are not based on observable market data (unobservable inputs)

The fair value of financial instruments traded in active markets is based on quoted market prices at the dates of the consolidated statements of financial position. These instruments are included in Level 1. Instruments included in Level 1 comprise primarily listed equity investments classified as trading securities or AFS securities.

The fair value of financial instruments that are not traded in an active market (for example, over-the-counter derivatives) is determined by using valuation techniques. These valuation techniques maximize the use of observable market data where it is available and rely as little as possible on entity-specific estimates. If all significant inputs required for fair value of an instrument are observable, the instrument is included in Level 2.

If one or more of the significant inputs is not based on observable market data, the instrument is included in Level 3.

(3) Valuation techniques and inputs used for derivatives designated as hedging instruments (Level 2) are as follows:

Valuation methodology	Observable inputs	Explanation of inputs
Discounted cash flow method	Forward exchange rate	It is based on forward exchange rate, disclosed on the market; its remaining period is the same to maturity of forward contracts. If the forward exchange rate is not disclosed on the market, it is calculated by using the interpolation method.
	Discount rate	It is determined by using yield curve that is disclosed at the end of the reporting period.

(4) Valuation techniques and inputs used for AFS financial assets designated as hedging instruments (Level 2) are as follows:

Valuation methodology	Observable inputs	Explanation of inputs
Black-Scholes valuation model	Closing price of common stock	Based on the closing price of common stock disclosed in the market

(5) Comprehensive income (loss) by categories of financial instruments for the years ended December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	2016							
	Profit or loss							Other comprehensive income (*1)
	Interest	Dividend	Valuation	Impairment /Reversal	Disposal	Foreign exchange	Others	
Financial instruments:								
Financial asset at FVTPL	₩-	₩-	₩-	₩-	₩-	₩-	₩-	₩-
Loans and receivables	984,911	-	-	24,650	(20,086)	5,732,405	-	-
AFS financial assets	-	-	-	(261,450,872)	(578,098)	-	-	55,073,199
Held-to-maturity investments	-	-	-	-	-	-	-	-
Total	₩984,911	₩-	₩-	₩(261,426,222)		₩5,732,405	₩-	₩55,073,199
Financial liabilities:								
Financial liabilities at FVTPL	₩-	₩-	₩-	₩-	₩-	₩-	₩-	₩-
Financial liabilities at amortized cost	(14,408,241)	-	-	-	-	(329,130)	-	-
Financial guarantee contracts	-	-	-	-	-	-	265,132	-
Total	₩(14,408,241)	₩-	₩-	₩-	₩-	₩(329,130)	₩265,132	₩-

(*1) Amount before income tax effect.

	2015							
	Profit or loss							Other comprehensive income
	Interest	Dividend	Valuation	Impairment /Reversal	Disposal	Foreign exchange	Others	
Financial instruments:								
Financial asset at FVTPL	₩-	₩-	₩ -	₩ -	₩-	₩-	₩-	₩-
Loans and receivables	1,179,454	-	-	(2,509,350)	-	15,012,474	-	-
AFS financial assets	-	600	-	-	-	-	-	-
Held-to-maturity investments	141,764	-	-	-	-	-	-	-
Total	₩1,321,218	₩600	₩ -	₩(2,509,350)	₩-	₩15,012,474	₩-	₩-
Financial liabilities:								
Financial liabilities at FVTPL	₩-	₩-	₩-	₩-	₩-	₩-	₩-	₩-
Financial liabilities at amortized cost	(13,189,831)	-	-	-	-	(10,903,952)	-	-
Financial guarantee contracts	-	-	-	-	-	-	1,247,264	-
Total	₩(13,189,831)	₩-	₩-	₩-	₩-	₩(10,903,952)	₩1,247,264	₩-

Apart from the above financial instruments, comprehensive income (loss) by derivatives for the years ended December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	December 31, 2016			December 31, 2015		
	Profit or loss		Other comprehensive income	Profit or loss		Other comprehensive income
	Valuation	Disposal		Valuation	Disposal	
Derivatives designated as hedging instruments	₩(26,545,319)	₩7,532,916	-	₩(28,885,294)	₩(19,473,616)	-

11. INVESTMENTS IN ASSOCIATES:

(1) Investment in associates as of December 31, 2016 and 2015, consists of the following (in thousands of Korean won):

			Acquisition cost		Book value		Proportionate share of net assets	
Company	Country	Percentage of ownership (%)	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Dalian Samyoung Doosan Metal Product Co., Ltd. ("DSDMP") (*1)	China	10.80	₩2,675,402	₩2,675,402	₩3,043,907	₩3,452,946	₩3,043,907	₩3,452,946
DII (*2)	America	11.59	-	355,596,311	-	338,483,565	-	332,769,068
DHEL (*2)	Island	21.73	-	382,594,143	-	49,446,029	-	49,446,029
Doosan Cuvex Co., Ltd. (*3)	Korea	2.99	4,155,085	-	4,170,995	-	4,170,995	-
Total			₩6,830,487	₩740,865,856	₩7,214,902	₩391,382,540	₩7,214,902	₩385,668,043

(*1) Although the Group's ownership in each of these companies is less than 20%, the Group has significant influence over these companies through participation in various management decisions of these companies. As a result, the Group accounts for these investments using the equity method.

(*2) The Group contributed equities in DII and DHEL in exchange for shares in Doosan Bobcat. As the Company no longer has significant influence over Doosan Bobcat, it is classified as AFS financial asset (see Note 8).

(*3) The Group has a direct ownership interest of less than 20%, but it is classified as an associate because the Company has entered into a joint agreement for the appointment of a representative director.

The Group does not have securities of associates with posted market price.

(2) Changes in investments in associates for the years ended December 31, 2016 and 2015, consist of the following (in thousands of Korean won):

Company	Year ended December 31, 2016						
	January 1, 2016	Acquisition	Share of profit (loss)	Increase (decrease) in equity of associates	Other	Disposal	December 31, 2016
DSDMP	₩3,452,946	₩-	₩(310,077)	₩(98,961)	₩-	₩-	₩3,043,907
DII	338,483,565	-	10,745,010	9,475,728	(1,933,117)	(356,771,186)	-
DHEL	49,446,029	-	222,503	8,716,590	(308,334)	(58,076,788)	-
Doosan Cuvex Co., Ltd	-	4,155,085	15,910	-	-	-	4,170,995
Total	₩391,382,540	₩4,155,085	₩10,673,346	₩18,093,356	₩(2,241,451)	₩(414,847,974)	₩7,214,902

Company	Year ended December 31, 2015				
	January 1, 2015	Share of profit (loss)	Increase (decrease) in equity of associates	Other	December 31, 2015
DSDMP	₩3,647,199	₩(229,983)	₩35,730	₩-	₩3,452,946
DII	302,483,746	27,145,318	7,177,481	1,677,020	338,483,565
DHEL	102,435,138	(16,415,795)	(37,845,608)	1,272,294	49,446,029
Total	₩408,566,083	₩10,499,540	₩(30,632,397)	₩2,949,314	₩391,382,540

(3) The condensed financial information of the investees as of and for the years ended December 31, 2016 and 2015, is as follows (in thousands of Korean won):

Group	As of and for the year ended December 31, 2016							
	Assets		Liabilities					
	Current	Non-current	Current	Non-current	Sales	Net income (loss)	Comprehensive income (loss)	Dividends
DSDMP	₩25,465,952	₩19,892,469	₩7,558,858	₩9,615,237	₩14,012,296	₩(2,871,088)	₩(3,787,397)	₩-
DII (*1)	1,192,793,164	3,697,754,588	643,171,078	1,217,925,162	1,286,558,445	94,036,903	157,813,450	-
DHEL (*1)	662,845,138	1,834,373,339	1,143,563,974	1,086,378,926	590,643,637	1,038,476	39,719,670	-
Doosan Cuvex Co., Ltd.	16,119,976	202,923,401	63,339,392	16,273,440	19,568,589	14,293	(258,647)	-

(*1) The condensed financial information used in equity method valuation until the time of spot investment (May 31, 2016).

Group	As of and for the year ended December 31, 2015							
	Assets		Liabilities					
	Current	Non-current	Current	Non-current	Sales	Net income (loss)	Comprehensive income (loss)	Dividends
DSDMP	₩27,246,090	₩22,362,728	₩8,365,273	₩9,271,822	₩21,986,456	₩(2,129,470)	₩(1,798,638)	₩-
DII	1,071,874,356	3,624,023,786	585,670,495	1,238,589,585	3,028,186,778	234,251,123	310,661,230	-
DHEL	577,215,352	1,762,821,832	952,688,171	1,159,793,104	1,179,515,918	(75,547,241)	(243,861,534)	-

(4) Reconciliation of book value of investments in associates as of December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	2016				
	Net assets (a)	Ratio% (b)	Net asset value (a*b)	Investment balance	Book value
DSDMP	₩28,184,326	10.80	₩3,043,907	₩-	₩3,043,907
Doosan Cuvex Co., Ltd.	139,430,545	2.99	4,170,995	-	4,170,995
Total	₩167,614,871		₩7,214,902	₩-	₩7,214,902

	2015				
	Net assets (a)	Ratio% (b)	Net asset value (a*b)	Investment balance	Book value
DSDMP	₩31,971,723	10.80	₩3,452,946	₩-	₩3,452,946
DII	2,871,638,062	11.59	332,769,068	5,714,497	338,483,565
DHEL	227,555,909	21.73	49,446,029	-	49,446,029
Total	₩3,131,165,694		₩385,668,043	₩5,714,497	₩391,382,540

12. PROPERTY, PLANT AND EQUIPMENT:

(1) Changes in property, plant and equipment for the years ended December 31, 2016 and 2015, consist of the following (in thousands of Korean won):

	2016					
	Land	Buildings and structures	Machinery	Others	Construction in progress	Total
January 1, 2016	₩275,996,165	₩156,938,263	₩66,914,340	₩2,586,432	₩3,560,572	₩505,995,773
Acquisition	8,599	56,868	4,695,620	260,943	12,218,609	17,240,639
Transfer (*1)	(4,279,791)	142,136	2,317,332	20,660	(3,384,002)	(5,183,665)
Disposal	-	(12,999)	(2,549,591)	(28,959)	-	(2,591,550)
Depreciation	-	(6,009,453)	(9,636,088)	(1,068,737)	-	(16,714,278)
Foreign difference	-	(418,923)	(115,683)	(17,619)	-	(552,225)
December 31, 2016	₩271,724,973	₩150,695,892	₩61,625,930	₩1,752,720	₩12,395,179	₩498,194,694
-Acquisition cost	₩197,800,282	₩207,785,251	₩194,486,493	₩53,909,919	₩12,395,179	₩666,377,124
-Accumulated depreciation	-	(57,089,359)	(132,860,563)	(52,157,199)	-	(242,107,121)
-Revaluation surplus	73,924,691	-	-	-	-	73,924,691

	2015					
	Land	Buildings and structures	Machinery	Others	Construction in progress	Total
January 1, 2015	₩283,761,955	₩210,688,267	₩108,579,758	₩3,218,619	₩855,737	₩607,104,336
Acquisition	215,248	700,581	775,950	474,691	3,265,292	5,431,762
Transfer (*1)	(43,351,982)	(46,821,919)	(29,107,490)	78,820	(560,778)	(119,763,349)
Net changes from revaluation	35,465,744	-	-	-	-	35,465,744
Disposal	(94,800)	(121,381)	(6,446)	(319)	-	(222,946)
Depreciation	-	(7,652,160)	(13,373,051)	(1,187,820)	-	(22,213,031)
Foreign difference	-	144,875	45,619	2,441	321	193,256
December 31, 2015	₩275,996,165	₩156,938,263	₩66,914,340	₩2,586,432	₩3,560,572	₩505,995,772
-Acquisition cost	₩202,071,474	₩208,094,452	₩192,797,171	₩58,286,629	₩3,560,572	₩664,810,298
-Accumulated depreciation	-	(51,156,189)	(125,882,831)	(55,700,197)	-	(232,739,217)
-Revaluation surplus	73,924,691	-	-	-	-	73,924,691

(*1) The transfer includes a replacement for the assets held for sale, amounting to ₩4,526,814 thousand and ₩119,338,591 thousand as of December 31, 2016 and 2015, respectively.

The Group recognized the land subsequently measured at revaluation amount; if the land is stated at cost, the land would amount to ₩197,800,282 thousand and ₩202,071,474 thousand as of December 31, 2016 and 2015, respectively.

Part of the land listed above is collateralized to Korea Development Bank in relation to the opening of an import credit (see Note 31-(2)).

(2) The details of revaluation model, which the Group applies to measurement of the land, are as follows:

The Group measured all land assets using fair value at the date of the revaluation. As of December 31, 2015, the fair value of land assets was determined from the appraisal that was undertaken by independently qualified valuator, Pacific Appraisal Group Limited ("Pacific"), on November 31, 2015.

Pacific is a member of Korea Association of Property Appraisers and comprises of certified professionals that have a significant amount of industry experience.

(3) Fair value measurements of land assets by fair value hierarchy level as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	2016			2015		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Land	₩ -	₩ -	₩271,724,973	₩ -	₩ -	₩275,996,165

Valuation techniques and inputs used for fair value measurement of land assets (Level 3) are as follows:

Valuation technique	Significant inputs that are not based on observable market data (unobservable inputs)	Correlation between unobservable inputs and fair value arguments
Official Assessed Reference Land Price ("OARLP"): OARLP of similar parcels nearby the subject land and reflating corrections necessary for differences between the subject and the comparable	a. Fluctuation rate of land price and others	Fair value increases (decreases) if rate of land price increases (decreases).
	b. Parcel conditions and others	Fair value increases (decreases) if correction of parcel conditions and others increase (decrease).
	c. Land conditions affecting the sales price and others	Fair value increases (decreases) if correction of land conditions affecting the sales price increases (decreases).

(4) Changes in land whose degree of fair value is classified as Level 3 for the year ended December 31, 2016, are as follows (in thousands of Korean won):

					Revaluation increase		
January 1, 2016	Acquisition	Disposal	Transfer from construction in progress	Reclassification to assets held for sale	Other comprehensive income	Profit (loss)	December 31, 2016
₩275,996,165	₩8,599	₩ -	₩2,809	₩(4,282,600)	₩ -	₩ -	₩271,724,973

(5) Changes in revaluation surplus and classification of assets for the years ended December 31, 2016, are as follows (in thousands of Korean won):

		Disposal			Classification	
January 1, 2016	Increase	Property, plant and equipment	Assets held for sale	December 31, 2016	Property, plant and equipment	Assets held for sale
₩83,197,398	₩-	₩-	₩9,272,707	₩73,924,691	₩73,924,691	₩-

(6) Classification of depreciation expenses for the years ended December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	2016	2015
Cost of sales	₩16,314,100	₩21,789,435
Selling and administrative expenses	191,184	217,993
Development costs	208,994	205,603
Total	₩16,714,278	₩22,213,031

13. INTANGIBLE ASSETS:

(1) Changes in intangible assets for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	2016				
	Development costs	Rights of utilization	Software	Others	Total
January 1, 2016	₩21,050,373	₩-	₩3,508,874	₩3,984,362	₩28,543,609
Acquisition	2,600,812	-	275,300	-	2,876,112
Transfer	1,304,613	-	656,850	-	1,961,463
Disposal	-	-	-	(335,500)	(335,500)
Amortization	(401,584)	-	(2,780,330)	(191,195)	(3,373,109)
Impairment	(21,808,122)	-	-	(108,500)	(21,916,622)
Foreign difference	-	-	(8)	-	(8)
December 31, 2016	₩2,746,092	₩-	₩1,660,686	₩3,349,167	₩7,755,945
-Acquisition cost	₩47,192,098	₩-	₩14,125,627	₩4,502,015	₩65,819,740
-Accumulated amortization	(44,446,006)	-	(12,464,941)	(1,152,848)	(58,063,795)

	2015				
	Development costs	Rights of utilization	Software	Others	Total
January 1, 2015	₩31,015,578	₩208,096	₩5,624,483	₩4,831,877	₩41,680,034
Acquisition	11,135,059	-	460,057	393,758	11,988,874
Transfer	2,147,978	-	-	-	2,147,978
Disposal	-	-	-	(741,389)	(741,389)
Amortization	(66,931)	(208,096)	(2,575,680)	(457,863)	(3,308,570)
Impairment	(23,181,311)	-	-	(42,021)	(23,223,332)
Foreign difference	-	-	14	-	14
December 31, 2015	₩21,050,373	₩-	₩3,508,874	₩3,984,362	₩28,543,609
-Acquisition cost	₩43,286,673	₩3,329,540	₩15,171,157	₩5,421,260	₩67,208,630
-Accumulated amortization	(22,236,300)	(3,329,540)	(11,662,283)	(1,436,898)	(38,665,021)

The carrying amount of membership with indefinite useful lives in other intangible assets item is ₩2,042,113 thousand and ₩2,486,113 thousand as of December 31, 2016 and 2015, respectively.

Expenditure on research and development, which was recognized as expenses, amounted to ₩6,547,995 thousand and ₩6,939,200 thousand for the years ended December 31, 2016 and 2015, respectively.

(2) Borrowing costs added to the cost of intangible assets for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	2016	2015
Borrowing costs added to the cost of intangible assets	₩889,458	₩1,180,666
Interest rate (%)	4.30%	4.45%

(3) Classification of amortization expense for the years ended December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	2016	2015
Cost of sales	₩2,564,474	₩2,249,550
Selling and administrative expenses	688,635	939,020
Development costs	120,000	120,000
Total	₩3,373,109	₩3,308,570

14. BORROWINGS AND BONDS:

(1) Bonds as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Details	Interest rate (%)	December 31, 2016	December 31, 2015
The 6th	4.16	₩100,000,000	₩100,000,000
The 7th	5.00	90,000,000	90,000,000
Subtotal		190,000,000	190,000,000
Less current portion		(99,907,752)	-
Less: Discount on bonds		(282,515)	(516,754)
Net		₩89,809,733	₩189,483,246

(2) Short-term and long-term borrowings as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

1) Short-term borrowings

	Interest rate (%)	December 31, 2016	December 31, 2015
Short-term borrowings in foreign			
KEB Hana Bank (*1)	-	₩-	₩6,304,130
	-	-	8,819,192
Woori Bank (*1)	1.72	2,432,106	-
Korea Export-Import Bank	3.99+LIBOR	4,807,617	4,983,604
Subtotal		7,239,723	20,106,926
Short-term borrowings in Korean won			
NH Bank	3.30	19,200,000	10,000,000
Korea Development Bank	3.73	25,000,000	-
Kookmin Bank	4.05	-	10,000,000
Woori Bank	5.19	-	30,000,000
Subtotal		44,200,000	50,000,000
Total		₩51,439,724	₩70,106,926

(*1) Short-term borrowings in foreign currency are provided as collateral for the accounts receivable debt transactions that occurred in assigning receivables that do not meet the requirements for removal of financial instruments (see Note 30-(2)).

2) Long-term borrowings

	Interest rate (%)	December 31, 2016	December 31, 2015
Long-term borrowings in Korean won			
NH Bank	MOR+2.0	₩20,000,000	₩20,000,000
Korea Development Bank	4.42	25,000,000	25,000,000
	3M CD+2.06	30,000,000	30,000,000
Subtotal		75,000,000	75,000,000
Less: Current portion		(45,000,000)	-
Net		₩30,000,000	₩75,000,000

15. RETIREMENT BENEFIT OBLIGATION:

The Group operates a defined benefit plan for employees, and the actuarial valuation of plan assets and defined benefit liability is performed by a reputable actuary using the projected unit credit method.

(1) Details of retirement benefit obligation as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	December 31, 2016	December 31, 2015
Present value of defined benefit obligation	₩33,728,883	₩29,549,919
Fair value of plan assets	(27,209,422)	(21,617,042)
Total	₩6,519,461	₩7,932,877

(2) Expenses recognized in profit and loss for the years ended December 31 2016 and 2015, are as follows (in thousands of Korean won):

Description	2016	2015
Current service cost	₩4,047,021	₩4,597,591
Past service cost	-	(31,881)
Net interest cost (interest cost – expected return on plan assets)	266,597	426,428
Total	₩4,313,618	₩4,992,138

(3) Classification of the expenses related to the retirement benefit obligation recognized in the consolidated statements of income for the years ended December 31, 2016 and 2015, is as follows (in thousands of Korean won):

Description	2016	2015
Cost of sales	₩3,138,463	₩3,471,470
Selling and administrative expenses	1,088,994	1,282,179
Development	86,161	238,489
Total	₩4,313,618	₩4,992,138

(4) Changes in defined benefit obligations for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	2016	2015
Beginning balance	₩29,549,919	₩31,811,723
Current service cost	4,047,021	4,597,591
Past service cost	-	(31,881)
Transfer in	67,783	-
Transfer out	(261,440)	(246,934)
Interest cost	713,660	958,107
Remeasurements of defined benefit liabilities:	482,789	(262,310)
- Changes in demographic assumptions	(735,843)	146,372
- Changes in financial assumptions	179,806	485,499
- Others	1,038,826	(894,181)
Benefit paid	(870,849)	(7,276,377)
Ending balance	₩33,728,883	₩29,549,919

(5) Changes in plan assets for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	2016	2015
Beginning balance	₩21,617,042	₩19,946,058
Expected return on plan assets	447,063	531,680
Remeasurements of plan assets	(149,666)	(214,106)
Contributions by employer directly to plan assets	6,311,338	8,709,701
Benefit paid	(870,849)	(7,276,377)
Transfer out	(145,506)	(79,914)
Ending balance	₩27,209,422	₩21,617,042

(6) Assumptions used for actuarial valuation as of December 31, 2016 and 2015, are as follows:

Description	December 31, 2016	December 31, 2015
Discount rate for defined benefit obligations	2.50%	2.60%
Expected rate of salary increase:		
Employee	2.00%	2.00%
Officer	3.20%	2.80%

(7) Details of plan assets as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	December 31, 2016	December 31, 2015
Debt securities	₩2,894,079	₩430,672
Equity securities	1,997,085	61,421
Loans	95,157	91,723
Deposits	21,468,413	20,938,266
Others	754,688	94,960
Total	₩27,209,422	₩21,617,042

Plan assets are mostly invested in assets that have a quoted market price in an active market.

(8) The sensitivity analysis for the significant actuarial assumptions as of December 31, 2016 and 2015, is as follows (in thousands of Korean won):

Description	December 31, 2016		December 31, 2015	
	Amount	Rate	Amount	Rate
Discount rate:				
1% increase	₩(1,521,422)	(-)4.62%	₩(1,187,266)	(-)4.02%
1% decrease	1,692,394	4.90%	1,310,547	4.44%
Salary increase rate:				
1% increase	1,490,794	4.30%	1,305,094	4.42%
1% decrease	(1,374,102)	(-)4.17%	(1,205,070)	(-)4.08%

(9) Information about the maturity profile of the defined benefit obligation as of December 31, 2016 and 2015, is as follows (in thousands of Korean won):

Description	2016			
	0–1 year	1 year–2 years	2–5 years	More than 5 years
Expected payment	₩4,818,679	₩6,453,650	₩14,633,269	₩17,130,976

Description	2015			
	0–1 year	1 year–2 years	2–5 years	More than 5 years
Expected payment	₩4,202,871	₩7,881,253	₩12,307,562	₩16,022,186

The Group plans to contribute ₩4,048,057 thousand for the defined benefit plans in 2017.

16. PROVISIONS:

Changes in provisions for construction warranties for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	2016 Warranty	2016 Litigation	2016 Compensation of deferment	2016 Subtotal	2015 Warranty
Beginning balance	₩7,467,932	₩-	₩-	₩7,467,932	₩3,866,035
Accrual	(618,508)	-	1,537,077	918,569	1,413,918
Use	(2,113,264)	-	-	(2,113,264)	(2,226,377)
Others (*1)	1,616,519	608,904	-	2,225,423	4,414,356
Foreign difference	-	-	36,372	36,372	-
Ending balance	₩6,352,679	₩608,904	₩1,573,449	₩8,535,032	₩7,467,932
Current	₩2,512,167	₩608,904	₩1,573,449	₩4,694,520	₩4,433,212
Non-current	3,840,512	-	-	3,840,512	3,034,720

(*1) The amounts represent those settled by professional engineers who are responsible for the warranty and allowance according to regular wage lawsuit.

The Group estimates expenditure required to settle its obligation for product warranty, refund, related after-sales service and other based on warranty period, historical claim rate and other.

17. SHARE CAPITAL AND CAPITAL SURPLUS:

Changes in share capital and capital surplus for the year ended December 31, 2016, are as follows (in thousands of Korean won):

Description	Number of shares	Capital stock	Capital surplus
Balance at December 31, 2016	69,500,000	₩69,500,000	₩367,214,701

The Company's number of shares authorized amounted to 120,000,000 shares with a par value of ₩1,000 per share. There are no issued shares with restricted voting rights under commercial law.

18. OTHER CAPITAL ITEMS:

(1) Other capital items as of December 31, 2016 and 2015, are summarized as follows (in thousands of Korean won):

Description	December 31, 2016	December 31, 2015
Share options	₩621,478	₩623,043

(2) Share-based payment

The Company granted share options to its directors several times. Share options are settled based on the board of directors' decision by issuance of new stock, treasury stock or cash settlement. Vesting condition offers two-year service after the resolution at the stockholders' meeting.

1) The number of granted options as of December 31, 2016, is as follows:

	Date of grant	Number of granted options	Exercisable period	Exercisable price	Expected fair value at the date of grant
1st	2011.3.25	6,500	2014.3.25–2021.3.24	₩21,600	₩10,343
2nd	2012.3.30	19,700	2015.3.30–2022.3.29	13,300	4,653
3rd	2013.3.29	83,700	2016.3.29–2023.3.28	9,050	3,383
4th	2014.3.28	24,000	2017.3.28–2024.3.27	9,490	3,583

2) The Company calculated expenses by applying fair value approach. Assumptions used in determining fair value of share options are as follows:

	Risk-free interest rate (*1)	Expected exercisable period	Expected volatility	Expected dividend yield ratio
1st	3.66%	3 years	68.77%	0.00%
2nd	3.57%	3 years	55.03%	0.00%
3rd	2.45%	3 years	52.35%	0.00%
4th	2.88%	3 years	52.27%	0.00%

(*1) Risk-free interest rate is based on a three-year treasury bond yield rate.

3) Changes in share options for the year ended December 31, 2016, are as follows:

a) Number of common shares to be issued:

	January 1, 2016	Granted	Exercised	Canceled	December 31, 2016
1st	10,900	-	-	(4,400)	6,500
2nd	30,000	-	-	(10,300)	19,700
3rd	83,700	-	-	-	83,700
4th	27,700	-	-	(3,700)	24,000
Total	152,300	-	-	(18,400)	133,900

b) Valuation amount (in thousands of Korean won):

	January 1, 2016	Granted	Exercised	Forfeited	December 31, 2016
1st	₩112,739	₩ -	₩ -	₩ -	₩112,739
2nd	139,590	-	-	-	139,590
3rd	283,157	-	-	-	283,157
4th	87,557	8,157	-	(9,722)	85,992
Total	₩623,043	₩8,157	₩ -	₩ (9,722)	₩621,478

Expense of a controlling company recognized, related to the share option grant, amounted to ₩(1,565) thousand and ₩72,883 thousand for the years ended December 31, 2016 and 2015, respectively. No more expense to be recognized in the future period.

19. ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS):

Accumulated other comprehensive income (loss) as of December 31, 2016 and 2015, is as follows (in thousands of Korean won):

	December 31, 2016	December 31, 2015
Gain on valuation of AFS financial assets	₩41,745,485	₩-
Overseas operation translation credit	134,214	611,039
Decrease in equity of associates	1,211,442	(101,060,916)
Revaluation surplus of land	56,034,916	63,063,627
Total	₩99,126,057	₩(37,386,250)

20. RETAINED EARNINGS:

(1) Retained earnings as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	December 31, 2016	December 31, 2015
Legal reserve	₩1,200,000	₩1,200,000
Optional reserve	2,700,000	2,700,000
Retained earnings before appropriations	(6,097,374)	170,821,228
Total	₩(2,197,374)	₩174,721,228

(2) Changes in retained earnings for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	2016	2015
Beginning balance	₩174,721,228	₩297,161,056
Net loss for the period	(181,226,463)	(125,442,489)
Remeasurements of defined benefit liabilities	(479,401)	36,539
Change of retained earnings in associates	(2,241,450)	2,949,314
Revaluation surplus of land	7,028,712	16,808
Ending balance	₩(2,197,374)	₩174,721,228

21. SALES:

Details of sales for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	2016	2015
Sales of goods	₩762,695,737	₩651,295,426
Construction sales	34,446,339	36,754,714
Others	5,774,507	5,594,946
Total	₩802,916,583	₩693,645,086

22. SEGMENT INFORMATION:

The Group has a single reportable segment determined by considering the characteristics of the nature of goods and assets to create sales.

(1) The following table provides sale information by geographical segment for the years ended December 31, 2016 and 2015 (in thousands of Korean won):

Description	2016	2015
Domestic	₩626,488,252	₩406,461,542
Overseas	191,733,473	297,627,007
Subtotal	818,221,725	704,088,549
Adjustments	(15,305,142)	(10,443,463)
After consolidation	₩802,916,583	₩693,645,086

(2) There is a single external customer who accounted for 10% or more of the Group's sales for the years ended December 31, 2016 and 2015 (in thousands of Korean won):

Description	2016	2015
Samsung Heavy Industries Co., Ltd.	₩263,185,354	₩115,010,665
Daewoo Shipbuilding & Marine Engineering Co., Ltd.	206,700,312	101,007,893
Total	₩469,885,666	₩216,018,558

23. CONSTRUCTION CONTRACTS:

(1) Details of profit and unbilled (overbilled) construction receivables (payables) under construction contract for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	2016					
				Contract receivables		
Description	Construction revenue	Construction cost	Construction profit	Claimed	Not claimed	Gross amount due to customers
Diesel engine	₩233,372,150	₩187,819,298	₩45,552,852	₩451,602	₩15,762,004	₩16,562,497

	2015					
				Contract receivables		
Description	Construction revenue	Construction cost	Construction profit	Claimed	Not claimed	Gross amount due to customers
Diesel engine	₩226,099,696	₩177,912,875	₩48,186,821	₩-	₩2,331,456	₩9,702,365

(2) Details of construction contract for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	2016				
Order	Description	January 1, 2016	Increase by contract	Decrease by sales	December 31, 2016
KHNP and six other companies	Singori No. 3 and No. 4 emergency generators, alternative AC power diesel engine and 10 other	₩85,207,761	₩(830,838)	₩(34,446,339)	₩49,930,584

	2015				
Order	Description	January 1, 2015	Increase by contract	Decrease by sales	December 31, 2015
KHNP and five other companies	Singori No. 3 and No. 4 emergency generators, alternative AC power diesel engine and 13 other	₩97,502,112	₩24,460,363	₩(36,754,714)	₩85,207,761

(3) Effect of change in accounting estimates in connection to construction contracts

As of December 31, 2016, amounts with the exclusion of the effect of foreign exchange rates that affect profit or loss in current and future periods, unbilled construction due to changes in total construction revenues and total estimated contract costs are as follows (in thousands of Korean won):

Description	Changes in estimated total contract cost	Changes in estimated total contract costs	Impact on the current profit (loss)	Impact on the future profit (loss)	Changes in unbilled construction receivables
Diesel engine	₩-	₩1,440,601	₩(1,415,333)	₩(25,268)	₩(1,415,333)

The effect on profit or loss in current and future periods was estimated based on total contract revenues and total estimated contract costs in consideration of facts and circumstances available as of December 31, 2016. Total contract revenues and total estimated contract costs may change in future periods.

(4) As of December 31 2016, details of contracts for which the revenue was recognized based on the percentage of completion measured by contract cost incurred, which is more than 5% of sales for the year ended December 31, 2016, are as follows (in thousands of Korean won):

				Unbilled construction receivables		Trade receivables	
Description	Contract date	Expected date of completion	Stage of completion	Total amount	Impairment losses	Total amount	Allowance for doubtful accounts
Singori No. 3 and No. 4 emergency generators, alternative AC power diesel engine	2009-07-17	2017-03-31	99.8%	₩2,490,373	₩-	₩-	₩-

24. EXPENSES CLASSIFIED BY NATURE:

Expenses classified by nature for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	2016	2015
Changes in inventories	₩(4,807,356)	₩(454,557)
Purchase of raw materials	522,034,581	497,419,986
Employee benefits	71,888,691	90,129,245
Other employee benefits	11,180,859	15,033,563
Depreciation and amortization	19,758,392	25,195,998
Commission expenses	54,572,185	55,313,571
Others	124,051,957	74,760,857
Total	₩798,679,309	₩757,398,663

25. SELLING AND ADMINISTRATIVE EXPENSES:

Selling and administrative expenses for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Account	2016	2015
Salaries	₩16,821,194	₩19,321,097
Other employee benefits	2,508,710	5,441,565
Provision for retirement and severance benefits	1,088,994	16,352,447
Commission expenses	4,936,005	5,507,957
Depreciation	191,184	217,993
Amortization	688,635	939,020
Advertising and marketing expenses	517,523	490,418
Rental expenses	1,233,200	1,293,497
Reversal of allowance for bad debt	(24,650)	2,509,350
Research and ordinary development costs	6,547,995	6,939,200
Others	2,885,418	3,588,802
Total	₩37,394,208	₩62,601,346

26. FINANCE INCOME AND EXPENSES:

Finance income and expenses for the years ended December 31, 2016 and 2015, are summarized as follows (in thousands of Korean won):

Account	2016	2015
Finance income:		
Interest income	₩984,911	₩1,321,218
Dividend income	-	600
Income from financial guarantee	265,132	1,247,264
Gain on foreign currency transaction	31,438,725	23,946,468
Gain on foreign currency translation	1,785,822	1,491,829
Gain on derivative transaction	25,632,422	8,864,243
Gain on valuation of derivatives	687,349	2,838,556
Gain on valuation of firm commitments	35,784,039	54,688,212
Subtotal	96,578,400	94,398,390
Finance expenses:		
Interest expenses	14,408,241	13,189,831
Expense for financial guarantee	501,642	470,577
Loss on foreign currency transaction	26,856,671	19,748,954
Loss on foreign currency translation	964,600	1,580,821
Loss on derivative transaction	18,099,506	28,337,859
Loss on valuation of derivatives	27,232,668	31,723,850
Loss on valuation of firm commitments	26,948,754	29,599,229
Subtotal	(115,012,082)	(124,651,121)
Net finance expenses	₩(18,433,682)	₩(30,252,731)

27. OTHER NON-OPERATING INCOME AND EXPENSES:

Other non-operating income and expenses for the years ended December 31, 2016 and 2015, consist of the following (in thousands of Korean won):

Account	2016	2015
Other non-operating income:		
Rental income	₩329,864	₩255,935
Gain on disposal of property, plant and equipment	267,497	94,475
Gain on disposal of intangible assets	-	54,550
Recovery of impairment losses on intangible assets	17,500	-
Recovery of impairment losses on assets held for sale	311,227	-
Gain on revaluation of land	-	13,376
Other income	522,903	1,729,152
Subtotal	1,448,991	2,147,488
Other non-operating expenses:		
Loss on disposal of trade receivables	20,086	-
Loss on disposal of property, plant and equipment	1,941,964	6,120
Loss on disposal of intangible assets	10,500	52,758
Impairment loss of intangible assets	21,934,122	23,223,332
Loss on disposal of assets held for sale	508,306	-
Impairment loss of assets held for sale	12,650,120	54,983,092
Loss on disposal of AFS financial assets	578,098	-
Impairment loss of AFS financial assets	261,450,872	-
Donations	679,429	221,340
Other loss	4,208,742	5,857,975
Subtotal	(303,982,239)	(84,344,617)
Net non-operating expenses	₩(302,533,248)	₩(82,197,129)

28. INCOME TAX EXPENSE:

(1) Components of income tax expense for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Details	2016	2015
Current income tax expense	₩117,426	₩770,608
Changes in deferred income tax assets (liabilities) related to temporary differences	6,489,624	(32,446,242)
Deferred income tax assets (liabilities) directly reflected in stockholders' equity	(13,174,660)	(8,585,773)
Income tax expense (profit)	₩(6,567,610)	₩(40,261,407)

(2) Changes in deferred tax assets and liabilities for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Details	January 1, 2016	Change		December 31, 2016
		Income	Capital	
Foreign currency translation, net	₩(44,535)	₩(206,527)	₩-	₩(251,062)
Depreciation	3,051,214	(574,795)	-	2,476,419
Allowance for doubtful accounts	496,130	262,590	-	758,720
Accrued income	(5,159)	1,255	-	(3,904)
Loss on inventory obsolescence	7,926,478	3,809,681	-	11,736,159
Currency forwards	8,695,664	(688,416)	-	8,007,248
Firm commitment assets	(10,988,135)	3,660,323	-	(7,327,812)
Loss on equity-accounted investees	970,458	-	(13,327,714)	(12,357,256)
Other intangible assets	145,492	6,721	-	152,213
Accrued expenses	4,845,038	993,360	-	5,838,398
Unearned revenue	(1,454,270)	647,408	-	(806,862)
Financial guarantee liabilities	(76,680)	76,680	-	-
Provision for construction warranties	1,807,240	(269,892)	-	1,537,348
Provision for severance indemnities	1,609,097	(584,697)	153,054	1,177,454
Gain on revaluation of land and buildings	(61,838,978)	10,003,878	-	(51,835,100)
Advance payments	272,815	(255,528)	-	17,287
Legal proceedings provision	-	147,355	-	147,355
Development costs	5,364,987	5,277,566	-	10,642,553
Assets held for sale	13,305,908	(10,262,500)	-	3,043,408
Investments in equity method	-	(3,850)	-	(3,850)
Others	47,117	(51,286)	-	(4,169)
Subtotal	(25,870,119)	11,989,326	(13,174,660)	(27,055,453)
Tax credits	1,228,695	(1,228,695)	-	-
Donations in excess of tax limit	90,890	(90,890)	-	-
Tax loss	22,188,986	(3,984,705)	-	18,204,281
Subtotal	23,508,571	(5,304,290)	-	18,204,281
Total	₩(2,361,548)	₩6,685,036	₩(13,174,660)	₩(8,851,172)

Details	January 1, 2015	Change		December 31, 2015
		Income	Capital	
Foreign currency translation, net	₩(187,817)	₩143,282	₩-	₩(44,535)
Depreciation	2,338,163	713,051	-	3,051,214
Allowance for doubtful accounts	-	496,130	-	496,130
Accrued income	(105,444)	100,285	-	(5,159)
Loss on inventory obsolescence	4,795,311	3,131,167	-	7,926,478
Currency forwards	4,588,440	4,107,224	-	8,695,664
Firm commitment assets	(9,491,310)	(1,496,825)	-	(10,988,135)
Loss on equity-accounted investees	970,458	-	-	970,458
Other intangible assets	177,079	(31,587)	-	145,492
Accrued expenses	1,075,120	3,769,918	-	4,845,038
Unearned revenue	(2,242,990)	788,720	-	(1,454,270)
Financial guarantee liabilities	(66,382)	(10,298)	-	(76,680)
Provision for construction warranties	935,580	871,660	-	1,807,240
Provision for severance indemnities	2,102,551	(481,788)	(11,666)	1,609,097
Gain on revaluation of land and buildings	(53,261,636)	(3,237)	(8,574,107)	(61,838,980)
Advance payments	444,427	(171,612)	-	272,815
Development costs	-	5,364,987	-	5,364,987
Assets held for sale	-	13,305,908	-	13,305,908
Others	64,401	(17,281)	-	47,120
Subtotal	(47,864,049)	30,579,704	(8,585,773)	(25,870,118)
Tax credits	1,675,802	(447,106)	-	1,228,696
Donations in excess of tax limit	697,356	(606,466)	-	90,890
Tax loss	10,683,103	11,505,883	-	22,188,986
Subtotal	13,056,261	10,452,311	-	23,508,572
Total	₩(34,807,788)	₩41,032,015	₩(8,585,773)	₩(2,361,546)

(3) Deductible temporary differences, tax deficit and unused tax credit, which have not been recognized as deferred income tax assets expired and unused, as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	December 31, 2016	December 31, 2015
Deductible temporary differences		
Loss on equity-accounted investees	₩233,437,065	₩-
Donations in excess of tax limit	1,174,039	2,726,776
Tax deficit	187,473,027	9,155,757
Unused tax credit	2,028,476	882,554

Maturities of deductible temporary differences, tax deficit and unused tax credit, which have not been recognized as deferred income tax assets, are as follows (in thousands of Korean won):

	0–1 years	1 year–2 years	2–3 years	More than 3 years	Total
Deductible temporary differences					
Loss on equity-accounted investees	₩-	₩-	₩-	₩233,437,065	₩233,437,065
Donations in excess of tax limit	15,320	134,128	654,669	369,922	1,174,039
Tax deficit	9,611,563	4,662,210	2,186,765	171,012,489	187,473,027
Unused tax credit	-	882,554	793,248	352,674	2,028,476

The probability of deferred tax assets being realized depends on the Group's ability to generate taxable income in future years, the economic situation and the industry forecast. The Group periodically reviews such matters.

(4) Temporary differences associated with investments in subsidiary, which are not recognized as deferred tax assets, as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Details	December 31, 2016	December 31, 2015	Remarks
Subsidiaries	₩10,939,878	₩2,908,709	It is probable that the temporary difference will not reverse in the foreseeable future.
Associates	(384,415)	349,483,317	It is probable that the temporary difference will not reverse in the foreseeable future.
Total	₩10,555,463	₩352,392,026	

(5) Deferred income tax assets (liabilities) and income tax benefits (expenses) added to (deducted from) stockholders' equity as of December 31, 2016 and 2015, are as follows (in thousands of Korean won):

	December 31, 2016			December 31, 2015		
Details	Before tax	Deferred income tax assets (liabilities)	After tax	Before tax	Deferred income tax assets (liabilities)	After tax
Remeasurements of net defined benefit liabilities	₩(5,013,465)	₩1,213,258	(3,800,207)	₩(4,381,010)	₩1,060,204	₩(3,320,806)
Revaluation surplus of land	73,924,691	(17,889,775)	56,034,916	83,197,397	(20,133,770)	63,063,627
Gains on valuation of AFS financial assets	61,881,710	(14,975,374)	46,906,336	-	-	-
Losses on valuation of AFS financial assets	(6,808,511)	1,647,660	(5,160,851)	-	-	-
Total	₩123,984,425	₩(30,004,231)	₩93,980,194	₩78,816,387	₩(19,073,566)	₩59,742,821

(6) An explanation of the relationship between income tax expense and accounting income (loss) before income tax expense for the years ended December 31, 2016 and 2015, is as follows (in thousands of Korean won):

Details	2016	2015
Loss before income tax expense	₩(187,794,074)	₩(165,703,896)
Income tax expense at statutory income tax rate	(45,446,166)	(40,100,343)
Adjustments (Note 1)	38,878,556	(161,064)
Income tax profit	₩(6,567,610)	₩(40,261,407)
Effective tax rate	(Note 2)	(Note 2)

	2016	2015
(Note 1) Adjustments:		
Additional payment of income tax	₩117,423	₩ 770,607
Non-temporary difference	93,927	286,125
Tax credits	82,773	(435,447)
Temporary difference not recognized as deferred income tax	39,476,917	(767,818)
Others	(892,484)	(14,531)
Total	₩38,878,556	₩(161,064)

(Note 2) Net loss before tax does not calculate the effective tax rate.

29. EARNINGS PER SHARE:

(1) Basic earnings per share

Basic earnings per share are computed by dividing net income attributable to owners of the Group by the weighted-average number of common shares outstanding during the period (in thousands of Korean won, except for share data).

	2016	2015
Net income (loss) available to common shares	₩181,226,463	₩(125,442,489)
Weighted-average number of common shares outstanding (*)	69,500,000	69,500,000
Basic net loss per share	₩(2,608)	₩(1,805)

(*) The weighted-average number of common shares outstanding for the years ended December 31, 2016 and 2015, is equal to the number of shares outstanding.

(2) Diluted earnings per share

The Group does not compute diluted earnings per common share for the years ended December 31, 2016 and 2015, because there is no item related to dilution. Diluted earnings per share are equal to earnings per share for the years ended December 31, 2016 and 2015.

Due to the antidilutive effect for the years ended December 31, 2016 and 2015, the Group is not considering share option, which could dilute the basic earnings per share in the future.

	2016	2015
Number of common shares to be issued	133,900	152,300

30. COMMITMENTS AND CONTINGENCIES:

(1) Notes and checks provided as collateral

As of December 31, 2016, the Group has provided six (as of December 31, 2015: six) blank promissory notes and 20 (as of December 31, 2015: 20) promissory notes amounting to USD 10,829,062 (as of December 31, 2015: USD 10,829,062) to Daewoo Shipbuilding & Marine Engineering Co., Ltd. and five other companies as security in connection with contract performance guarantees and guarantees for advance receipts.

(2) Transferred trade receivables

Outstanding trade receivables sold with recourse by the Group are in the amount of ₩2,432,106 thousand and ₩6,304,129 thousand as of December 31, 2016 and 2015, respectively. Because the Group retains some level of risks and rewards relating to trade receivables, it has recognized its carrying amount and cash receipt from transfer as short-term borrowings in consolidated statements of financial position (see Note 14-(2)).

(3) Pending litigations as of December 31, 2016, are as follows (in foreign currency and thousands of Korean won):

Site	Plaintiff	Defendant	Claim	Claimed amount	Progress
Greece	Guam Advance Enterprises. Inc.	Doosan Engine Co., Ltd.	Damages for cancellation of contract (related to Greece Chios diesel plant)	EUR 2,181,541	Pending in the court of first instance (Note 1)
				EUR 473,162	Pending in the court of first instance
				EUR 2,000,000	Pending in the court of first instance
Seoul Central District Court	Steamar Transportes Maritimos LDA and one other	Doosan Engine Co., Ltd. and other 1	Damages for stopping sailing	USD 125,163	Pending in the court of first instance
				EUR 266,865	Pending in the court of first instance
Chang won District Court	Kang, Kyuyoung and 454 others	Doosan Engine Co., Ltd.	Wage claims for normal wage of workers	₩7,214,429	Pending in the court of second instance
	Kim, Kyoungho and 52 others			₩423,277	Pending in the court of second instance
	Magnolia Shipping PTE LTD. and 20 others	Doosan Engine Co., Ltd.	Compensation for damages	₩8,730,420	Pending in the court of first instance
	Kim, Jeongsub and four others	Doosan Engine Co., Ltd.	Wage claims for incentive	₩20,001	Pending in the court of first instance
Korean Commercial Arbitration Board	SPP Shipbuilding Co., Ltd.	Doosan Engine Co., Ltd	Arbitration for request to return advance payment due to cancellation of a contract	USD 10,783,053	Pending in the court of first instance
				₩1,686,280	

As of December 31, 2016, the outcome of the cases is unpredicted.

(Note 1) The Group won the previous suit, and the lawsuit of Greece Chios was newly filed on December 30, 2015.

(4) Commitments with financial institutions

As of December 31, 2016, major commitments with various financial institutions are as follows (in foreign currencies and thousands of Korean won):

Commitment	Financial institution	Credit limit		Used amount	
General loan facilities	Korea Development Bank		₩25,000,000		₩25,000,000
	NH Bank		19,200,000		19,200,000
	The Export-Import Bank of Korea		25,000,000	USD	4,000,000
Electronic loan facilities	Woori Bank		10,000,000		8,094,270
	Kookmin Bank		2,000,000		244,023
Issuance of letter of credit	Woori Bank	USD	19,000,000	USD	15,693,591
	Korea Development Bank	USD	15,000,000	USD	13,535,783
Other guarantees in foreign currency	KEB Hana Bank	USD	9,548,496	USD	9,548,496
		EUR	100,000	EUR	100,000
	Woori Bank	USD	11,500,000	USD	9,576,128
	NH Bank	USD	23,000,000	USD	21,977,900
	Kookmin Bank	USD	10,410,020	USD	10,410,020
	Seoul Guarantee Insurance	USD	-	USD	4,195,598
		EUR	-	EUR	413,000
Other guarantees in Korean won	Seoul Guarantee Insurance		-		22,709,928
	Woori Bank		4,400,000		4,172,936

(5) Technology transfer contract

The Group has eight technical license agreements with several foreign companies for the purpose of manufacturing engines. In accordance with the agreements, the Group is committed to pay a royalty calculated based on the cumulative horse power of engines manufactured during the year. The royalty amounted to ₩54,572,185 thousand and ₩55,313,571 thousand for the years ended December 31, 2016 and 2015, respectively.

(6) Wage claims for normal wage of workers in accordance with the Supreme Court ruling

The Group has paid a regular salary in past, including bonuses that were not included in the existing ordinary wages paid. If the item is usually available for wages paid in future, then it can be classified as additionally payable. The Supreme Court ruling dated December 18, 2013, is usually associated with wages on the basis of additional benefits associated with regular bonuses and other payments to the excessive financial burden due to the expected management group that will likely result in accounting difficulties; therefore, the Group has presumed the amount to be low. On the other hand, related impact on the consolidated financial statements of K-IFRS 1037 – *Provisions, Contingent Liabilities and Contingent Assets*, paragraph 92 according to the comments is omitted. The Group has prevailed some lawsuits after the reporting period and recognized provisions for litigation losses (see Note 16).

31. GUARANTEES AND PLEDGED ASSETS:

(1) Guarantees

Guarantees received by the Group from third parties as of December 31, 2016, are as follows (in foreign currencies and thousands of Korean won):

Guarantee received from	Guaranteed amount (foreign currency)		Description of guarantee
KEB Hana Bank	USD	9,548,496	Guarantee for advance receipts, bidding, defect and fulfillment of a contract
	EUR	100,000	
Woori Bank	USD	9,576,128	Guarantee for advance receipts, defect and fulfillment of a contract
		₩4,172,936	
NH Bank	USD	21,977,900	Guarantee for advance receipts
Kookmin Bank	USD	10,410,020	Guarantee for advance receipts, defect and fulfillment of a contract
Seoul Guarantee Insurance	USD	4,195,598	Guarantee for advance receipts, bidding, defect and fulfillment of a contract
	EUR	413,000	
		₩22,709,928	
Total	USD	55,708,142	
	EUR	513,000	
		₩26,882,864	

(2) Pledged assets

The Group has pledged fixed assets as collateral in relation to the import credit opened at Korea Development Bank. Details of collateralized items are as follows (see Note 12):

Institution	Asset	Book value	Collateralized value	Collateral-provided value
Korea Development Bank	Land	₩31,128,484	EUR 5,983,200	EUR 4,986,000

32. TRANSACTIONS AND BALANCES WITH RELATED PARTIES:

Related-party disclosures for the years ended December 31, 2016 and 2015, are as follows:

(1) Nature of relationship:

Relationship with the Company	Company name
Ultimate controlling party	Doosan Corporation ("DS")
Next most senior parent	DHIC
Associates	DSDMP
	DII
	DHEL
Other related parties	Doosan Infracore Co., Ltd.
	Doosan Infracore Bobcat Holdings Co., Ltd. ("DIBH")
	Doosan E&C
	Doosan Cuvex Co., Ltd.
	Doosan Tower Co., Ltd. ("Doosan Tower")
	Doosan Defense Systems & Technology Co., Ltd.
	Oricom Inc. ("Oricom")
	Doosan Bears Inc.
Large-scale conglomerate (Note a)	Neo Holdings, The Big Ant, etc.

(Note a) Although these companies are not applicable to related parties defined in K-IFRS 1024 paragraph 9, a group of large-size affiliates designated by the Korea Fair Trade Commission are classified as related parties according to the resolution by the Securities & Futures Commission in accordance with substantial relationship defined in K-IFRS 1024 paragraph 10.

(2) Significant transactions with related parties for the years ended December 31, 2016 and 2015, are summarized as follows (in thousands of Korean won):

		December 31, 2016					
Description	The name of the related parties	Sales	Disposal of property, plant and equipment and intangible assets	Other income	Purchases	Acquisition of property, plant and equipment and intangible assets	Other expenses
Ultimate controlling party	DS	₩1,797,433	₩-	₩910,566	₩5,106,768	₩588,391	₩4,898,278
Next most senior parent	DHIC	-	-	-	96,665,660	-	441,686
Associates	DSDMP	261,556	-	-	-	-	-
Other related parties	Doosan Cuvex Co., Ltd.	-	-	-	-	-	1,345
	Doosan E&C (*1)	1,452,628	50,510,530	290,986	177,796	5,619,880	-
	Others	1,799,577	-	274,717	169,145	-	1,254,203
Total		₩5,311,194	₩50,510,530	₩1,476,269	₩102,119,369	₩6,208,271	₩6,595,512

Description	The name of the related parties	December 31, 2015 Sales	Disposal of property, plant and equipment and intangible assets	Other income	Purchases	Acquisition of property, plant and equipment and intangible assets	Other expenses
Ultimate controlling party	DS	₩2,071,384	₩-	₩849,137	₩5,447,472	₩1,413,874	₩4,544,680
Next most senior parent	DHIC	-	-	-	86,332,211	-	-
Associates	DSDMP	172,440	-	-	-	-	-
	DII	-	-	654,314	-	-	-
	DHEL	-	-	567,614	-	-	-
Other related parties	Doosan E&C	2,793,378	-	280	180,731	738,849	-
	Others	-	-	1,680	231,261	254,231	336,091
Total		₩5,037,202	₩-	₩2,073,025	₩92,191,675	₩2,406,954	₩4,880,771

(*1) The disposal of property, plant and equipment and intangible assets includes the amount of in-kind contribution of ₩25,255,265 thousand.

(3) Significant balances related to the transactions between the Group and related parties are as follows (in thousands of Korean won):

Description	The name of the related parties	December 31, 2016 Trade receivables	Other receivables	Loans	Trade payables	Other payables
Ultimate controlling party	DS	₩-	₩-	₩-	₩1,666,731	₩1,976,677
Next most senior parent	DHIC	-	-	-	3,521,115	570
Associates	DSDMP	2,719	-	-	-	-
	Doosan Cuvex Co., Ltd.	-	471,000	-	-	-
Other related parties	Doosan E&C	-	12,798,613	-	5,114	18,381
	Others	-	5,985,214	-	248,133	47,611
Total		₩2,719	₩19,254,827	₩-	₩5,441,093	₩2,043,239

Description	The name of the related parties	December 31, 2015 Trade receivables	Other receivables	Loans	Trade payables	Other payables
Ultimate controlling party	DS	₩-	₩-	₩-	₩545,699	₩2,040,582
Next most senior parent	DHIC	-	-	-	1,577,472	3,144
Associates	DSDMP	75,451	-	-	-	-
	DII	-	2,237,230	-	-	-
	DHEL	-	1,935,257	-	-	-
Other related parties	Doosan E&C	-	8,508,289	-	-	3,034
	Others	-	643,406	-	386,666	66,347
Total		₩75,451	₩13,324,182	₩-	₩2,509,837	₩2,113,107

The Group does not recognize amount of allowance for doubtful accounts of the related party's receivables.

(4) Loan and borrowings, and equity contribution for the year ended December 31, 2016, with related parties are as follows (in thousands of Korean won):

Description	The name of the related parties	Loan		Capital transaction	
		Loan	Collection	Issue	Acquisition
Subsidiary	DMI	₩7,276,920	₩-	₩-	₩-
Other related parties	Doosan E&C (*1)	-	-	25,255,265	4,155,085
	Doosan Bobcat (*2)	-	-	616,875,872	-
Total		₩7,276,920	₩-	₩642,131,137	₩4,155,085

(*1) The Group acquired equity in Doosan Cuvex Co., Ltd. from Doosan E&C (see Note 11) and transferred a part of held-for-sale assets in exchange for convertible preferred stock (see Note 8).

(*2) The Group contributed DII and DHEL shares to Doosan Bobcat (see Note 11).

(5) The Group defines key management personnel as registered officer and non-registered officer who have the authority and responsibility for planning, operation and control and are in charge of business or division unit. Compensation to key management personnel of the Group for the years ended December 31, 2016 and 2015, is as follows (in thousands of Korean won):

Description	2016	2015
Employee benefits	₩4,166,961	₩6,527,755
Retirement benefits	325,268	415,349
Share-based payment	(1,565)	72,883
Total	₩4,490,664	₩7,015,987

33. CONSOLIDATED STATEMENTS OF CASH FLOWS:

(1) The adjustments and changes in operating assets and liabilities in the consolidated statements of cash flows for the years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	2016	2015
Adjustments:		
Expenses not involving cash outflows:		
Interest expenses	₩14,408,241	₩13,189,831
Retirement benefits	4,227,457	4,753,649
Bad debt expense	(24,650)	12,777,361
Loss from valuation of inventories	21,977,195	22,007,428
Depreciation	16,505,283	3,188,570
Amortization	3,253,109	2,509,350
Share-based payment	-	72,883
Loss on foreign currency translation	964,600	1,580,821
Loss on valuation of derivatives	27,232,668	31,723,850
Loss on valuation of firm commitments	26,948,754	29,599,229
Loss on disposal of AFS financial assets	578,098	-
Impairment loss of AFS financial assets	261,450,872	-
Loss on disposal of property, plant and equipment	1,941,964	6,120
Loss on disposal of intangible assets	10,500	52,758
Impairment loss of intangible assets	21,934,122	23,223,332
Transfer to reserve	1,537,077	1,413,918
Loss on disposal of assets held for sale	508,306	-
Impairment loss of assets held for sale	12,650,120	54,983,092
Loss on equity method	310,077	16,645,778
Income not involving cash inflows:		
Interest income	(984,911)	(1,321,218)
Dividend income	-	(600)
Income tax profit	(6,567,610)	(40,261,407)
Reversal of allowance for doubtful accounts	(618,508)	-
Income on financial guarantee	(265,132)	(1,247,264)
Gain on foreign currency translation	(1,785,822)	(1,491,829)
Gain on valuation of derivatives	(687,349)	(2,838,556)
Gain on valuation of firm commitments	(35,784,039)	(54,688,212)
Gain on disposal of property, plant and equipment	(267,497)	(94,475)
Recovery of impairment losses on intangible assets	(17,500)	-
Recovery of impairment losses on assets held for sale	(311,227)	-
Gain on disposal of equity method securities	(118,262,237)	-
Reversal of share-based payment	(1,565)	-
Gain on disposal of intangible assets	-	(54,550)
Gain from revaluation of land	-	(13,376)
Gain on equity method	(10,983,424)	(27,145,318)
Total	₩239,876,972	₩88,571,165

Description	2016	2015
Changes in operating assets and liabilities:		
Trade receivables	₩(5,564,452)	₩9,266,594
Other receivables	156,916	787,518
Unbilled construction receivables	(13,430,548)	10,668,518
Inventories	(26,790,051)	(13,219,378)
Other current assets	(675,571)	6,718,827
Long-term accounts receivable – other	1,224,226	3,057,619
Other non-current assets	(19,767)	(6,002,559)
Derivative instruments	(29,390,014)	(11,913,295)
Firm commitments	23,960,586	18,903,757
Trade payables	39,043,355	(13,866,925)
Other payables	(6,476,760)	6,992,862
Overbilled construction payables	6,860,131	(4,866,092)
Advance receipts	(23,902,392)	(8,718,288)
Other current liabilities	4,461,019	4,361,848
Other long-term liabilities	(5,529,136)	6,084,549
Other non-current liabilities	1,484,421	-
Plan assets	(5,440,488)	(1,433,324)
Payment of severance benefits	(870,849)	(7,276,377)
Transfer in	67,783	-
Transfer out	(115,934)	(167,020)
Provision for construction warranties	112,159	2,187,979
Total	₩(40,835,366)	₩1,566,813

(2) Significant non-cash transactions for years ended December 31, 2016 and 2015, are as follows (in thousands of Korean won):

Description	2016	2015
Reclassification of non-current other accounts receivable to current portion of other accounts receivable	₩5,788,558	₩5,964,941
Reclassification of construction in progress to property, plant and equipment	3,384,002	539,240
Reclassification of non-current bonds to current bonds	100,000,000	-
Reclassification of long-term borrowings to current portion of long-term borrowings	45,000,000	-
Acquisition of property, plant and equipment	412,841	382,180
Acquisition of intangible assets	83,654	58,900
Reclassification of property, plant and equipment to assets held for sale	4,526,814	119,338,591
Ordinary shares issued in kind	616,875,872	-
Reclassification of depreciation to development costs	208,994	205,603

34. ASSETS HELD FOR SALE:

(1) The assets held for sale as of December 31, 2016 and 2015, are as follows (in thousands of Korean won) :

Description	2016	2015
Land	₩-	₩42,005,000
Buildings and structures	-	12,100,500
Machinery	4,913,000	10,250,000
Total	₩4,913,000	₩64,355,500

The Group concluded disposal of the asset agreement in 2016 and expected the assets to be sold in 2017.