Doosan Engine Co., Ltd. and its subsidiaries

Consolidated financial statements
for the year ended December 31, 2017
with the independent auditors' report

Doosan Engine Co., Ltd.

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Independent auditors' report

The Shareholders and Board of Directors
Doosan Engine Co., Ltd

We have audited the accompanying consolidated financial statements of Doosan Engine Co., Ltd.(the "company") and its subsidiaries (collectively, the "Group"), which comprise the consolidated statement of financial position as at December 31, 2017 and the consolidated statement of profit or loss, consolidated statement of comprehensive income or loss, consolidated statement of changes in equity and consolidated statement of cash flows for the year then ended, 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, and for such internal control as management determines is necessary to enable the preparation of the consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' responsibility

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

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

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

Opinion

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

Other matter

The consolidated financial statements of the Group as at December 31, 2016 and the year then ended, presented for comparative purposes, were audited by Deloitte Anjin LLC whose report dated March 22, 2017, expressed an qualified opinion on thereon.

Ernst & Young Han Young

March 07, 2018

This audit report is effective as at March 07 2018, the independent auditors' report date. Accordingly, certain material subsequent events or circumstances may have occurred during the period from the independent auditors' report date to the time this report is used. Such events and circumstances could significantly affect the accompanying separate financial statements and may result in modifications to this report.

Doosan Engine Co., Ltd. and its subsidiaries

Consolidated financial statements
for the years ended December 31, 2017 and 2016

“The accompanying consolidated financial statements, including all footnotes and disclosures, have been prepared by, and are the responsibility of, the Company.”

Dong Cheol Kim and Il-Do Kim
Chief Executive Officers
Doosan Engine Co., Ltd.

Doosan Engine Co., Ltd
Consolidated statements of financial position
as at December 31, 2017 and 2016
(Korean won)

	Notes		2017		2016
Assets					
Current assets					
Cash and cash equivalents	10	₩	72,235,836,412	₩	72,820,704,197
Short-term financial instruments	5,10		11,457,578,000		7,618,000,000
Short-term loans	10		611,513,302		879,872,362
Trades and other receivables. net	6,10,14,30,32		30,574,095,777		76,120,802,544
Due from customers for construction contracts	23		1,451,140,579		15,762,003,759
Current tax assets			314,452,270		86,976,180
Derivatives assets	9,10		18,053,931,598		508,056,490
Firm commitment assets	9		4,005,749,038		30,191,452,671
Inventories, net	7		170,562,946,597		203,788,760,831
Asset held for sale	34		-		4,912,999,994
Other current assets			8,990,232,584		17,188,307,029
Total current assets			318,257,476,157		429,877,936,057
Non-current assets					
Long-term financial instruments	5,10,31		6,000,000		6,000,000
Long-term investment securities	8,10		395,595,979,573		397,742,607,738
Investments in associates	11,31		12,165,255,095		7,214,902,281
Long-term loans	10		853,137,242		1,248,909,461
Long-term other receivables	6,10		3,869,832,363		3,883,005,014
Property, plant and equipment, net	12		489,528,748,593		498,194,693,878
Intangible assets	13		6,465,088,943		7,755,945,455
Assets of derivatives	9,10		1,191,688,478		126,767,145
Assets of firm commitment	9		81,626,216		6,659,599,148
Other non current assets			3,332,254,324		3,739,158,888
Total non-current assets			913,089,610,827		926,571,589,008
Total assets		₩	**1,231,347,086,984**	₩	**1,356,449,525,065**
Liabilities					
Current liabilities					
Trade and other payables	10,32	₩	82,052,221,343	₩	156,703,928,327
Current portion of bonds	10,14		89,933,788,907		99,907,752,422
Due to customers for construction contracts	23		11,492,218,599		16,562,496,578
Short-term borrowings	10,14,30		124,407,965,490		51,439,724,730
Advances from customers			134,889,275,081		239,157,081,846
Current portion of long-term borrowings	10,14		30,000,000,000		45,000,000,000
Derivatives liabilities	9,10		1,192,714,029		28,578,393,711
Firm commitment liabilities	9		22,089,944,070		5,404,842,462
Current portion of provisions	16		6,735,739,995		4,694,520,263
Other current liabilities			23,521,529,779		25,326,271,947
Total current liabilities			526,315,397,293		672,775,012,286
Non-current liabilities					
Long-term borrowings	10,14		-		30,000,000,000
Bonds	10,14		128,786,510,692		89,809,733,451
Long-term other debts	10		2,095,738,284		2,594,126,964
Defined benefit plan liabilities	15		2,950,623,382		6,519,461,393
Liabilities of derivatives	9,10		82,370,507		5,144,229,974
Liabilities of firm commitment	9		2,100,488,060		1,165,994,358
Provisions	16		4,141,244,651		3,840,512,312
Deferred tax liabilities	28		20,362,816,353		8,851,171,935
Other non-current liabilities			1,341,968,650		1,484,420,870
Total non-current liabilities			161,861,760,579		149,409,651,257
Total liabilities		₩	**688,177,157,872**	₩	**822,184,663,543**
Equity					
Equity attributable to owners of the Company					
Issued capital	1,17	₩	69,500,000,000	₩	69,500,000,000
Capital surplus	17		367,214,701,425		367,214,701,425
Other components of equity	18		621,477,800		621,477,800
Other accumulated comprehensive income	8,12,19		115,754,975,376		99,126,056,661
Retained earnings (deficits)	20		(9,921,225,489)		(2,197,374,364)
Equity attributable to owners of the Company			543,169,929,112		534,264,861,522
Non-controlling interests			-		-
Total equity		₩	**543,169,929,112**	₩	**534,264,861,522**
Total liabilities and equity		₩	**1,231,347,086,984**	₩	**1,356,449,525,065**

The accompanying notes are an integral part of the consolidated financial statements.

Doosan Engine Co., Ltd
Consolidated statements of profit or loss
for the years ended December 31, 2017 and 2016
(Korean won)

	Notes		2017		2016
Sales	21,22,23,32	₩	768,870,296,519	₩	802,916,582,708
Cost of sales	24,32		713,894,999,529		761,285,101,081
Gross profit			**54,975,296,990**		**41,631,481,627**
Selling and administrative expenses	24,25		41,497,873,814		37,394,208,049
Operating profit			**13,477,423,176**		**4,237,273,578**
Finance income	10,26		98,856,951,838		96,578,400,004
Finance costs	10,26		(117,162,870,917)		(115,012,081,870)
Other income	27		4,035,657,535		1,448,990,508
Other expenses	27		(3,527,821,716)		(303,982,239,325)
Gain or loss from equity method investees			(571,762,327)		128,935,583,318
Net income (loss) for the year before tax			**(4,892,422,411)**		**(187,794,073,787)**
Tax income (expense)	28		(5,450,817,243)		6,567,610,450
Net loss		₩	**(10,343,239,654)**	₩	**(181,226,463,337)**
Equity attributable to owners of the Company			(10,343,239,654)		(181,226,463,337)
Non-controlling interests			-		-
Earnings per share of equity attributable to Owners of the Company	29				
Basic earnings per share		₩	(149)	₩	(2,608)
Diluted earnings per share			(149)		(2,608)

The accompanying notes are an integral part of the consolidated financial statements.

Doosan Engine Co., Ltd
Statements of comprehensive income
for the years ended December 31, 2017 and 2016

(Korean won)

	Notes		2017		2016
Net loss		₩	(10,343,239,654)	₩	(181,226,463,337)
Consolidated other comprehensive income	19		19,248,307,244		140,820,167,470
Items that are not reclassified to profit or loss in the succeeding period					
-Remeasurement factor of net defined benefit liability	15		2,110,209,162		(479,400,533)
-Revaluation surplus	12,19		18,596,946,854		-
-Retained earnings of equity-method	11		-		(2,241,450,490)
Items that are reclassified to profit or loss in the succeeding period					
-Gain (loss) on overseas operations translation			432,180,236		(476,824,933)
-Negative capital variation of equity method	11		(263,884,859)		102,272,358,785
-Gain (loss) on valuation of available for sale financial assets	8		(1,627,144,149)		41,745,484,641
Total comprehensive income (loss)		₩	8,905,067,590	₩	(40,406,295,867)
Attribution of consolidated comprehensive income					
Equity attributable to owners of the Company			8,905,067,590		(40,406,295,867)
Non-controlling interests			-		-

The accompanying notes are an integral part of the consolidated financial statements.

Doosan Engine Co., Ltd
Consolidated statements of changes in equity
for the years ended December 31, 2017 and 2016
(Korean won)

	Issued capital	Capital surplus	Other components of equity	Other accumulated comprehensive income	Retained earnings (deficits)	Non-controlling interests	Total
As at Jan 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 (loss):							
-Consolidated net loss	-	-	-	-	(181,226,463,337)	-	(181,226,463,337)
-Remeasurement factor of net defined benefit liability	-	-	-	-	(479,400,533)	-	(479,400,533)
-Disposal of re-valued land	-	-	-	(7,028,711,830)	7,028,711,830	-	-
-Gain on valuation of available for sale financial assets	-	-	-	41,745,484,641	-	-	41,745,484,641
-Retained earnings of equity-method	-	-	-	-	(2,241,450,490)	-	(2,241,450,490)
-Loss on overseas operations translation	-	-	-	(476,824,933)	-	-	(476,824,933)
-Capital variation of equity method	-	-	-	102,272,358,785	-	-	102,272,358,785
Sub-Total	**-**	**-**	**-**	**136,512,306,663**	**(176,918,602,530)**	**-**	**(40,406,295,867)**
Transactions with owners directly reflected in capital:							
-Transactions of share-based payment	**-**	**-**	(1,564,740)	**-**	**-**	**-**	**(1,564,740)**
As at Dec 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**
As at Jan 1, 2017	**69,500,000,000**	**367,214,701,425**	**621,477,800**	**99,126,056,661**	**(2,197,374,364)**	**-**	**534,264,861,522**
Total comprehensive income:							
-Consolidated net loss	-	-	-	-	(10,343,239,654)	-	(10,343,239,654)
-Remeasurement factor of net defined benefit liability	-	-	-	0	2,110,209,162	-	2,110,209,162
-Disposal of re-valued land	-	-	-	(509,179,367)	509,179,367	-	-
-Reevaluation of land	`	-	-	18,596,946,854	-	-	18,596,946,854
-Loss on valuation of available for sale financial assets	-	-	-	(1,627,144,149)	-	-	(1,627,144,149)
-Gain on overseas operations translation	-	-	-	432,180,236	-	-	432,180,236
-Negative capital variation of equity method	-	-	-	(263,884,859)	-	-	(263,884,859)
As at Dec 31, 2017	**69,500,000,000**	**367,214,701,425**	**621,477,800**	**115,754,975,376**	**(9,921,225,489)**	**-**	**543,169,929,112**

The accompanyiny notes are an integral part of the consolidated financial statements.

Doosan Engine Co., Ltd
Consolidated statements of cash flows
for the years ended December 31, 2017 and 2016
(Korean won)

	2017	2016
Ⅰ. Net cash provided by (used in) operating activities:	**₩ (69,384,651,452)**	**₩ 4,541,869,696**
1. Cash flows from operating activities:	(62,449,313,763)	17,815,142,922
(1) Net loss	(10,343,239,654)	(181,226,463,337)
(2) Adjustments	63,842,405,442	239,876,972,425
(3) Changes in operating assets and liabilities	(115,948,479,551)	(40,835,366,166)
2. Interest received:	1,485,246,452	741,921,725
3. Interest paid:	(15,567,076,481)	(14,119,443,970)
4. Dividends received:	7,404,649,000	-
5. Income tax refunded (paid):	(258,156,660)	104,249,019
Ⅱ. Net cash provided by (used in) investing activities:	**12,650,773,786**	**41,425,559,323**
1.Cash flows from investing activities:	25,607,132,568	65,629,160,161
(1) Decrease in short-term financial instruments	-	9,712,000,000
(2) Decrease in short-term loans	897,659,060	1,145,344,000
(3) Disposal of property, plant equipment	20,326,746,235	917,083,796
(4) Disposal of intangible assets	282,727,273	324,999,998
(5) Disposal of investment in associates	-	413,341,565
(6) Disposal of asset held for sale	4,100,000,000	53,116,390,802
2.Cash out-flows from investing activities:	(12,956,358,782)	(24,203,600,838)
(1) Increase of short-term financial instruments	3,839,578,000	-
(2) Increase of long-term loans	190,000,000	428,260,000
(3) Acquisition of investment stocks of Equity Method	5,786,000,000	4,155,084,864
(4) Acqusition of property and equipment	2,884,572,522	16,827,798,232
(5) Acqusition of intangible assets	256,208,260	2,792,457,742
Ⅲ. Net cash provided by (used in) financing activities:	**56,612,262,695**	**(18,650,765,841)**
1.Cash flows from financing activities:	202,762,059,801	-
(1) Proceeds from short-term borrowings	74,567,893,750	-
(2) Issuance of bonds	128,194,166,051	-
2.Cash out-flows from financing activities:	(146,149,797,106)	(18,650,765,841)
(1) Repayments of short-term borrowings	1,149,797,106	18,650,765,841
(2) Repayments of long-term borrowings	45,000,000,000	-
(3) Repayments of current portion of bonds	100,000,000,000	-
Ⅳ. Changes in cash and cash equivalents from net foreign exchange difference	**(463,252,814)**	**21,658,744**
Ⅴ. Net increase (decrease) in cash and cash equivalents	**(584,867,785)**	**27,338,321,922**
Ⅵ. Cash and cash equivalents at January 1	**72,820,704,197**	**45,482,382,275**
Ⅶ. Cash and cash equivalents at December 31	**₩ 72,235,836,412**	**₩ 72,820,704,197**

The accompanyiny notes are an integral part of the consolidated financial statements.

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 at 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 at December 31, 2017, the Group 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 Company's shares as at December 31, 2017, are owned as follows:

Name of stockholders		Number of shares owned	Ownership percentage (%)
Doosan Heavy Industries Construction Co., Ltd.	₩	29,650,000	42.66
Employee stock ownership association		605,443	0.87
Others		39,244,557	56.47
	₩	69,500,000	100.00

(2) Consolidated subsidiaries

1) The details of consolidated subsidiaries of the Company and its subsidiaries (collectively, the "Group") as at December 31, 2017 and 2016, are as follows:

Subsidiary	Type of business	Location	Ownership ratio of the Group (%)		Ownership ratio of non-controlling interests (%)		Financial closing date
			2017	2016	2017	2016	
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	100.00	-	-	December 31

2) Condensed financial information of the Group's consolidated subsidiaries as at December 31, 2017, is as follows (Korean won in thousands):

Subsidiary		Assets		Liabilities		Equity		Sales		Net income (loss)		Total comprehensive income (loss)
DMI	₩	20,812,967	₩	12,019,321	₩	8,793,646	₩	8,963,523	₩	(788,360)	₩	1,332,054
DEPNG	₩	459,363	₩	6,393,072	₩	(5,933,709)	₩	8,019,418	₩	1,818,259	₩	2,794,133

2. Statement of compliance and significant accounting policies

2.1 Statement of compliance

The consolidated financial statements have been prepared in accordance with Korean International Financial Reporting Standards ("KIFRS"), as prescribed in the *Act on External Audits of Stock Companies* in the Republic of Korea.

Consolidated financial statements are based on historical cost except for land, derivative financial instruments and available-for-sale financial assets which are valued at fair value. The carrying amount of an asset or a liability designated as items of fair value hedge accounting is not be recorded in an amortized cost but is recorded to reflect changes in the fair value corresponding to the hedged risk in an effective hedging relationship. These financial statements are presented in Korean won and are expressed in thousand Korean won unless otherwise stated.

2.2 Basis of consolidation

The consolidated financial statements comprise the financial statements of the Group as at December 31, 2017. Control is achieved when the Group is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee. Specifically, the Group controls an investee if, and only if, the Group has:

- Power over the investee (i.e., existing rights that give it the current ability to direct the relevant activities of the investee)
- Exposure, or rights, to variable returns from its involvement with the investee
- The ability to use its power over the investee to affect its returns

Generally, there is a presumption that a majority of voting rights results in control. To support this presumption and when the Group has less than a majority of the voting or similar rights of an investee, the Group considers all relevant facts and circumstances in assessing whether it has power over an investee, including:

- The contractual arrangement(s) with the other vote holders of the investee
- Rights arising from other contractual arrangements
- The Group's voting rights and potential voting rights

The Group re-assesses 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. Consolidation of a subsidiary begins when the Group obtains control over the subsidiary and ceases when the Group loses control of the subsidiary. Assets, liabilities, income and expenses of a subsidiary acquired or disposed of during the year are included in the statement of comprehensive income from the date the Group gains control until the date the Group ceases to control the subsidiary.

Profit or loss and each component of other comprehensive income (OCI) are attributed to the equity holders of the parent of the Group 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 assets and liabilities, equity, income, expenses and cash flows relating to transactions between members of the Group are eliminated in full on consolidation.

A change in the ownership interest of a subsidiary, without a loss of control, is accounted for as an equity transaction.

If the Company loses control over a subsidiary, it derecognizes the related assets (including goodwill), liabilities, non-controlling interest and other components of equity, while any resultant gain or loss is recognized in profit or loss. Any investment retained is recognized at fair value.

2.3 Significant accounting policies

2.3.1 Current versus non-current classification

The Group presents assets and liabilities in the statement of financial position based on current/non-current classification.

An asset is current when it is:

- Expected to be realized or intended to be sold or consumed in the normal operating cycle
- Held primarily for the purpose of trading
- Expected to be realized within twelve months after the reporting period, or
- Cash or cash equivalent unless restricted from being exchanged or used to settle a liability for at least twelve months after the reporting period

All other assets are classified as non-current.

A liability is current when:

- It is expected to be settled in the normal operating cycle
- It is held primarily for the purpose of trading
- It is due to be settled within twelve months after the reporting period, or
- There is no unconditional right to defer the settlement of the liability for at least twelve months after the reporting period

The Group classifies all other liabilities as non-current.

The Group classifies deferred income tax assets (liabilities) as non-current assets (liabilities

2.3.2 Fair value measurement

The Group measures financial instruments such as derivatives at fair value at each reporting date.

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. The fair value measurement is based on the presumption that the transaction to sell the asset or transfer the liability takes place either:

- In the principal market for the asset or liability, or
- In the absence of a principal market, in the most advantageous market for the asset or liability

The principal or the most advantageous market must be accessible by the Group.

The fair value of an asset or a liability is measured using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest.

A fair value measurement of a non-financial asset takes into account a market participant's ability to generate economic benefits by using the asset in its highest and best use or by selling it to another market participant that would use the asset in its highest and best use.

The Group uses valuation techniques that are appropriate in the circumstances and for which sufficient data are available to measure fair value, maximizing the use of relevant observable inputs and minimizing the use of unobservable inputs.

All assets and liabilities for which fair value is measured or disclosed in the financial statements are categorized within the fair value hierarchy, described as follows, based on the lowest level input that is significant to the fair value measurement as a whole:

2.3.2 Fair value measurement (cont'd)

- Level 1 — Quoted (unadjusted) market prices in active markets for identical assets or liabilities
- Level 2 — Valuation techniques for which the lowest level input that is significant to the fair value measurement is directly or indirectly observable
- Level 3 — Valuation techniques for which the lowest level input that is significant to the fair value measurement is unobservable

For assets and liabilities that are recognized in the financial statements at fair value on a recurring basis, The Group determines whether transfers have occurred between levels in the hierarchy by re-assessing categorization (based on the lowest level input that is significant to the fair value measurement as a whole) at the end of each reporting period.

External valuers are involved for valuation of significant assets and significant liabilities, such as properties and AFS financial assets. Selection criteria include market knowledge, reputation, independence and whether professional standards are maintained.

For the purpose of fair value disclosures, the Group has determined classes of assets and liabilities on the basis of the nature, characteristics and risks of the asset or liability and the level of the fair value hierarchy, as explained above.

Fair-value related disclosures for financial instruments and non-financial assets that are measured at fair value or where fair values are disclosed, are summarized in the following notes:

	Notes
➢ Disclosures for valuation methods, significant estimates and assumptions	3,12,18
➢ Quantitative disclosures of fair value measurement hierarchy	10
➢ Property, plant and equipment under revaluation model	12
➢ Financial instruments (including those carried at amortized cost)	10
➢ Share-based payment	18

2.3.3 Foreign currencies

1) Transactions and balances

The Group's financial statements are presented in Korean won, which is functional currency and reporting currency. Monetary assets and liabilities denominated in foreign currencies are retranslated at the functional currency spot rates of exchange at the reporting date. Differences arising on settlement or translation of monetary items are recognized in profit or loss.

Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rates at the dates of the initial transactions. Non-monetary items measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value is determined. The gain or loss arising on translation of non-monetary items measured at fair value is treated in line with the recognition of the gain or loss on the change in fair value of the item

2) Group companies

On consolidation, the assets and liabilities of foreign operations are translated into Korean won at the rate of exchange prevailing at the reporting date and their statements of profit or loss are translated at exchange rates prevailing at the dates of the transactions. The exchange differences arising on translation for consolidation are recognized in OCI. On disposal of a foreign operation, the component of OCI relating to that particular foreign operation is recognized in profit or loss.

Any goodwill arising on the acquisition of a foreign operation and any fair value adjustments to the carrying amounts of assets and liabilities arising on the acquisition are treated as assets and liabilities of the foreign operation and translated at the spot rate of exchange at the reporting date.

2.3.4 Property, plant and equipment

Construction in progress is stated at cost, net of accumulated impairment losses, and property, plant and equipment are stated at cost, net of accumulated depreciation and accumulated impairment losses, if any. Such cost includes the cost of replacing part of the property, plant and equipment and borrowing costs for long-term construction projects if the recognition criteria are met. When significant parts of property, plant and equipment are required to be replaced at intervals, the Group depreciates them separately based on their specific useful lives. Likewise, when a major inspection is performed, its cost is recognized in the carrying amount of the plant and equipment as a replacement if the recognition criteria are satisfied. All other repair and maintenance costs are recognized in profit or loss as incurred. The present value of the expected cost for the decommissioning of an asset after its use is included in the cost of the respective asset if the recognition criteria for a provision are met.

Property, plant and equipment transferred from customers are initially measured at fair value at the date on which control is obtained.

Land is stated at fair value, net of accumulated impairment losses recognized after revaluation. The revaluation is performed periodically to ensure that the carrying amount of the asset does not differ materially from its fair value at the end of the reporting period.

Depreciation is calculated on a straight-line basis over the estimated useful lives of the assets, as follows:

	Useful lives (years)
Buildings	20 ~ 40
Structures	10 ~ 20
Machinery	5 ~ 20
Others	3 ~ 10

An item of property, plant and equipment and any significant part initially recognized is derecognized upon disposal or when no future economic benefits are expected from its use or disposal. Any gain or loss arising on derecognition of the asset (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in the income statement when the asset is derecognized.

The residual values, useful lives and methods of depreciation of property, plant and equipment are reviewed at each financial year end and adjusted prospectively, if appropriate.

2.3.5 Leases

As a lessee
The determination of whether an arrangement is, or contains, a lease is based on the substance of the arrangement at the inception of the lease. The arrangement is, or contains, a lease if fulfilment of the arrangement is dependent on the use of a specific asset or assets and the arrangement conveys a right to use the asset or assets, even if that right is not explicitly specified in an arrangement.

A lease is classified at the inception date as a finance lease or an operating lease. A lease that transfers substantially all the risks and rewards incidental to ownership to The Group is classified as a finance lease. Finance leases are capitalized at the commencement of the lease at the inception date fair value of the leased property or, if lower, at the present value of the minimum lease payments. Lease payments are apportioned between finance charges and reduction of the lease liability so as to achieve a constant rate of interest on the remaining balance of the liability. Finance charges are recognized in finance costs in the statement of profit or loss.

2.3.5 Leases (cont'd)

A leased asset is depreciated over the useful life of the asset. However, if there is no reasonable certainty that The Group will obtain ownership by the end of the lease term, the asset is depreciated over the shorter of the estimated useful life of the asset and the lease term.

An operating lease is a lease other than a finance lease. Operating lease payments are recognized as an operating expense in the statement of profit or loss on a straight-line basis over the lease term.

2.3.6 Intangible assets

Intangible assets acquired separately are measured on initial recognition at cost. The cost of intangible assets acquired in a business combination is their fair value at the date of acquisition. Following initial recognition, intangible assets are carried at cost less any accumulated amortization and accumulated impairment losses.

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

Intangible assets with indefinite useful lives are not amortized, but are tested for impairment annually, either individually or at the CGU level. The assessment of indefinite life is reviewed annually to determine whether the indefinite life continues to be supportable. If not, the change in useful life from indefinite to finite is made on a prospective basis.

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

Research and development costs
Research costs are expensed as incurred. Development expenditures on an individual project are recognized as an intangible asset when the Group can demonstrate:

- The technical feasibility of completing the intangible asset so that the asset will be available for use or sale
- Its intention to complete and its ability to use or sell the asset
- How the asset will generate future economic benefits
- The availability of resources to complete the asset
- The ability to measure reliably the expenditure during development

Following initial recognition of the development expenditure as an asset, the asset is carried at cost less any accumulated amortization and accumulated impairment losses. Amortization of the asset begins when development is complete and the asset is available for use. It is amortized over the period of expected future benefit. Amortization is recorded in cost of sales. During the period of development, the asset is tested for impairment annually.

Amortization is calculated on a straight-line basis over the estimated useful lives of the assets, as follows

	Useful lives (years)
Development costs	5
Software	5
Other intangible assets	5~10

2.3.7 Inventories

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

2.3.8 Impairment of non-financial assets

The Group assesses, at each reporting date, whether there is an indication that an asset may be impaired. If any indication exists, or when annual impairment testing for an asset is required, The Group estimates the asset's recoverable amount. An asset's recoverable amount is the higher of an asset's or CGU's fair value less costs of disposal and its value in use. The recoverable amount is determined for an individual asset, unless the asset does not generate cash inflows that are largely independent of those from other assets or groups of assets. When the carrying amount of an asset or CGU exceeds its recoverable amount, the asset is considered impaired and is written down to its recoverable amount.

In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. In determining fair value less costs of disposal, recent market transactions are taken into account. If no such transactions can be identified, an appropriate valuation model is used. These calculations are corroborated by valuation multiples, quoted share prices for publicly traded companies or other available fair value indicators.

The Group bases its impairment calculation on detailed budgets and forecast calculations, which are prepared separately for each of The Group's CGUs to which the individual assets are allocated. These budgets and forecast calculations generally cover a period of five years. A long-term growth rate is calculated and applied to project future cash flows after the fifth year.

Impairment losses of continuing operations, including impairment on inventories, are recognized in the statement of profit or loss and other comprehensive income in expense categories consistent with the function of the impaired asset, except for properties previously revalued with the revaluation taken to OCI. For such properties, the impairment is recognized in OCI up to the amount of any previous revaluation.

For assets excluding goodwill, an assessment is made at each reporting date to determine whether there is an indication that previously recognized impairment losses no longer exist or have decreased. If such indication exists, the Group estimates the asset's or CGU's recoverable amount. A previously recognized impairment loss is reversed only if there has been a change in the assumptions used to determine the asset's recoverable amount since the last impairment loss was recognized. The reversal is limited so that the carrying amount of the asset does not exceed its recoverable amount, nor exceed the carrying amount that would have been determined, net of depreciation, had no impairment loss been recognized for the asset in prior years. Such reversal is recognized in the statement of profit or loss and other comprehensive income unless the asset is carried at a revalued amount, in which case, the reversal is treated as a revaluation increase.

The following assets have specific characteristics for impairment testing:

Intangible assets
Intangible assets with indefinite useful lives are tested for impairment annually as at December 31 at the CGU level, as appropriate, and when circumstances indicate that the carrying value may be impaired.

2.3.9 Cash and cash equivalents

Cash and cash equivalents comprise cash balances and demand deposits with maturities of three months or less from the acquisition date that are subject to an insignificant risk of changes in their fair value. Cash and cash equivalents in the consolidated statements of cash flows represent the amounts of these cash and cash equivalents, net of any overdrafts.

2.3.10 Financial instruments – initial recognition and subsequent measurement

A financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity.

Financial assets

Initial recognition and measurement
Financial assets are classified, at initial recognition, as financial assets at fair value through profit or loss, loans and receivables, held-to-maturity financial assets, available-for-sale financial assets, or as derivatives designated as hedging instruments in an effective hedge, as appropriate. All financial assets are recognized initially at fair value plus, in the case of financial assets not recorded at fair value through profit or loss, transaction costs that are attributable to the acquisition of the financial asset.
Purchases or sales of financial assets that require delivery of assets within a time frame established by regulation or convention in the market place (regular way trades) are recognized on the trade date, i.e., the date that The Group commits to purchase or sell the asset.

Subsequent measurement
For purposes of subsequent measurement, financial assets are classified in four categories:

- Financial assets at fair value through profit or loss
Financial assets at fair value through profit or loss include financial assets held for trading and financial assets designated upon initial recognition at fair value through profit or loss. Financial assets are classified as held for trading if they are acquired for the purpose of selling or repurchasing in the near term. Derivatives, including separated embedded derivatives, are also classified as held for trading unless they are designated as effective hedging instruments.

Financial assets at fair value through profit or loss are stated at fair value in the statement of financial position and the gain or loss is reflected in the profit or loss.

Derivatives embedded in host contracts are accounted for as separate derivatives and recorded at fair value if their economic characteristics and risks are not closely related to those of the host contracts and the host contracts are not held for trading or designated at fair value though profit or loss. These embedded derivatives are measured at fair value with changes in fair value recognized in profit or loss. Re-assessment only occurs if there is a change in the terms of the contract that significantly modifies the cash flows that would otherwise be required.

- Loans and receivables
Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. After initial measurement, such financial assets are subsequently measured at amortized cost using the effective interest rate method (EIR), less impairment. Amortized cost is calculated by taking into account any discount or premium on acquisition and fee or costs that are an integral part of the EIR. The EIR amortization is included in finance income in the statement of comprehensive income. The losses arising from impairment of loans are recognized in the statement of comprehensive income in finance costs. The losses arising from impairment of receivables are recognized in the statement of comprehensive income as cost of sales or other operating expenses.

2.3.10 Financial instruments – initial recognition and subsequent measurement (cont'd)

- Held-to-maturity financial assets
Non-derivative financial assets with fixed or determinable payments and fixed maturities are classified as held-to-maturity when The Group has the positive intention and ability to hold them to maturity. After initial measurement, held-to-maturity investments are measured at amortized cost using the EIR, less impairment. Amortized cost is calculated by taking into account any discount or premium on acquisition and fees or costs that are an integral part of the EIR. The EIR amortization is included as finance income in the statement of comprehensive income.

The Group does not have any held-to-maturity financial assets.

- Available-for-sale financial assets
Available-for-sale financial assets include equity and debt securities. Equity investments classified as available-for sale are those, which are neither classified as held for trading nor designated at fair value through profit or loss. Debt securities in this category are those which are intended to be held for an indefinite period of time and which may be sold in response to needs for liquidity or in response to changes in the market conditions.

After initial measurement, available-for-sale financial investments are subsequently measured at fair value with unrealized gains or losses recognized as other comprehensive income in the available-for-sale reserve until the investments are derecognized, at which time the cumulative gain or loss is recognized in finance income, or determined to be impaired, at which time the cumulative loss is recognized in the statement of comprehensive income in finance costs and removed from the available-for-sale reserve.

The Group evaluates its available-for-sale financial assets whether the ability and intention to sell them in the near term is still appropriate. When The Group is unable to trade these financial assets due to inactive markets and management's intent significantly changes to do so in the foreseeable future, The Group may elect to reclassify these financial assets in rare circumstances. Reclassification to loans and receivables is permitted when the financial asset meets the definition of loans and receivables and The Group has the intent and ability to hold the asset for the foreseeable future or maturity. The reclassification to held-to-maturity is permitted only when the entity has the ability and intent to hold the financial asset until it matures accordingly.

For a financial asset reclassified out of the available-for-sale category, any previous gain or loss on that asset that has been recognized in equity is amortized to profit or loss over the remaining life of the investment using the EIR. Any difference between the new amortized cost and the expected cash flows is also amortized over the remaining life of the asset using the EIR. If the asset is subsequently determined to be impaired, the amount recorded in equity is reclassified to profit or loss.

Derecognition

A financial asset (or, where applicable, a part of a financial asset or part of a company of similar financial assets) is derecognized when:

- The rights to receive cash flows from the asset have expired, or
- The Group has transferred its rights to receive cash flows from the asset or has assumed an obligation to pay the received cash flows in full without material delay to a third party under a 'pass-through' arrangement; and either (a) The Group has transferred substantially all the risks and rewards of the asset, or (b) The Group has neither transferred nor retained substantially all the risks and rewards of the asset, but has transferred control of the asset.

When The Group has transferred its rights to receive cash flows from an asset or has entered into a pass-through arrangement, it evaluates if, and to what extent, it has retained the risks and rewards of ownership. When it has neither transferred nor retained substantially all of the risks and rewards of the asset, nor transferred control of the asset, The Group continues to recognize the transferred asset to the extent of its continuing involvement. In that case, The Group also recognizes an associated liability. The transferred asset and the associated liability are measured on a basis that reflects the rights and obligations that The Group has retained.

2.3.10 Financial instruments – initial recognition and subsequent measurement (cont'd)

Impairment of financial assets

Further disclosures relating to impairment of financial assets are also provided in the following notes:

	Notes
➢ Significant accounting judgments, estimates and assumptions	3
➢ Trade and other receivables	6
➢ Financial instruments	10

The Group assesses, at each reporting date, whether there is objective evidence that a financial asset or a group of financial assets is impaired. An impairment exists if one or more events that has occurred since the initial recognition of the asset (an incurred 'loss event') has an impact on the estimated future cash flows of the financial asset or the group of financial assets that can be reliably estimated. Evidence of impairment may include indications that the debtors or a group of debtors is experiencing significant financial difficulty, default or delinquency in interest or principal payments, the probability that they will enter bankruptcy or other financial reorganization and observable data indicating that there is a measurable decrease in the estimated future cash flows, such as changes in arrears or economic conditions that correlate with defaults.

- Financial assets carried at amortized cost
For financial assets carried at amortized cost, The Group first assesses whether impairment exists individually for financial assets that are individually significant, or collectively for financial assets that are not individually significant. If the Group determines that no objective evidence of impairment exists for an individually assessed financial asset, whether significant or not, it includes the asset in a group of financial assets with similar credit risk characteristics and collectively assesses them for impairment. Assets that are individually assessed for impairment and for which an impairment loss is, or continues to be, recognized are not included in a collective assessment of impairment.

If there is objective evidence that impairment has occurred, the amount of any impairment loss identified is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows (excluding future expected credit losses that have not yet been incurred). The present value of the estimated future cash flows is discounted at the financial asset's original EIR.

The carrying amount of the asset is reduced through the use of an allowance account and the loss is recognized in the statement of comprehensive income. Interest income (recorded as finance income in the statement of comprehensive income) continues to be accrued on the reduced carrying amount and is accrued using the rate of interest used to discount the future cash flows for the purpose of measuring the impairment loss. Loans, together with the associated allowance, are written off when there is no realistic prospect of future recovery and all collateral has been realized or has been transferred to The Group. If, in a subsequent year, the amount of the estimated impairment loss increases or decreases because of an event occurring after the impairment was recognized, the previously recognized impairment loss is increased or reduced by adjusting the allowance account. If a write-off is later recovered, the recovery is credited to finance costs in the statement of comprehensive income.

2.3.10 Financial instruments – initial recognition and subsequent measurement (cont'd)

Impairment of financial assets (cont'd)

- Available-for-sale financial assets
For available-for-sale financial assets, The Group assesses at each reporting date whether there is objective evidence that an investment or a group of investments is impaired.

In the case of equity investments classified as available-for-sale, objective evidence would include a significant or prolonged decline in the fair value of the investment below its cost. 'Significant' is to be evaluated against the original cost of the investment and 'prolonged' against the period in which the fair value has been below its original cost. When there is evidence of impairment, the cumulative loss – measured as the difference between the acquisition cost and the current fair value, less any impairment loss on that investment previously recognized in the statement of comprehensive income – is removed from other comprehensive income and recognized in the statement of comprehensive income. Impairment losses on equity investments are not reversed through the statement of comprehensive income; increases in their fair value after impairment are recognized directly in other comprehensive income.

In the case of debt instruments classified as available-for-sale, impairment is assessed based on the same criteria as financial assets carried at amortized cost. However, the amount recorded for impairment is the cumulative loss measured as the difference between the amortized cost and the current fair value, less any impairment loss on that investment previously recognized in the statement of comprehensive income.

Future interest income continues to be accrued based on the reduced carrying amount of the asset, using the rate of interest used to discount the future cash flows for the purpose of measuring the impairment loss. The interest income is recorded as part of finance income. If, in a subsequent year, the fair value of a debt instrument increases and the increase can be objectively related to an event occurring after the impairment loss was recognized in the statement of comprehensive income, the impairment loss is reversed through the statement of comprehensive income.

Financial liabilities

Initial recognition and measurement
Financial liabilities within the scope of KIFRS 1039 are classified at initial recognition, as financial liabilities at fair value through profit or loss, borrowings, or as derivatives designated as hedging instruments in an effective hedge, as appropriate.

All financial liabilities are recognized initially at fair value and, in the case of borrowings, less directly attributable transaction costs.

The Group's financial liabilities include trade and other payables, borrowings including bank overdrafts and derivative financial instruments.

Subsequent measurement
The measurement of financial liabilities depends on their classification, as described below:

- Financial liabilities at fair value through profit or loss
Financial liabilities at fair value through profit or loss include financial liabilities held for trading and financial liabilities designated upon initial recognition as at fair value through profit or loss.

Financial liabilities are classified as held for trading if they are incurred for the purpose of repurchasing in the near term. This category includes derivative financial instruments entered into by The Group that are not designated as hedging instruments in hedge relationships as defined by KIFRS 1039. Separated embedded derivatives are also classified as held for trading unless they are designated as effective hedging instruments. Gains or losses on liabilities held for trading are recognized in the statement of comprehensive income.

2.3.10 Financial instruments – initial recognition and subsequent measurement (cont'd)

Financial liabilities (cont'd)

The Group has not designated any financial liabilities upon initial recognition as at fair value through profit or loss.

- Borrowings
After initial recognition, interest-bearing borrowings are subsequently measured at amortized cost using the EIR method. Gains and losses are recognized in profit or loss when the liabilities are derecognized as well as through the EIR amortization process.

Amortized cost is calculated by taking into account any discount or premium on acquisition and fees or costs that are an integral part of the EIR. The EIR amortization is included as finance costs in the statement of profit or loss and other comprehensive income.

- Financial guarantee contracts
Financial guarantee contracts issued by The Group are those contracts that require a payment to be made to reimburse the holder for a loss it incurs because the specified debtor fails to make a payment when due in accordance with the terms of a debt instrument. Financial guarantee contracts are recognized initially as a liability at fair value, adjusted for transaction costs that are directly attributable to the issuance of the guarantee. Subsequently, the liability is measured at the higher of the best estimate of the expenditure required to settle the present obligation at the reporting date and the amount recognized less cumulative amortization.

Derecognition
A financial liability is derecognized when the obligation under the liability is discharged or cancelled or expires. When an existing financial liability is replaced by another from the same lender on substantially different terms, or the terms of an existing liability are substantially modified, such an exchange or modification is treated as the derecognition of the original liability and the recognition of a new liability. The difference in the respective carrying amounts is recognized in the statement of comprehensive income.

Offsetting of financial instruments

Financial assets and financial liabilities are offset and the net amount is reported in the statement of financial position if there is a currently enforceable legal right to offset the recognized amounts and there is an intention to settle on a net basis, to realize the assets and settle the liabilities simultaneously.

2.3.11 Derivative financial instruments and hedge accounting

Initial recognition and subsequent measurement

The Group uses derivative financial instruments, such as forward currency contracts, interest rate swaps and forward commodity contracts, to hedge its foreign currency risks, interest rate risks and commodity price risks, respectively. Such derivative financial instruments are initially recognized at fair value on the date on which a derivative contract is entered into and are subsequently remeasured at fair value. Derivatives are carried as financial assets when the fair value is positive and as financial liabilities when the fair value is negative.

The purchase contracts that meet the definition of a derivative under KIFRS 1039 are recognized in the statement of profit or loss and other comprehensive income as cost of sales. Commodity contracts that are entered into and continue to be held for the purpose of the receipt or delivery of a non-financial item in accordance with the Group's expected purchase, sale or usage requirements are held at cost.

Any gains or losses arising from changes in the fair value of derivatives are taken directly to profit or loss, except for the effective portion of cash flow hedges, which is recognized in OCI and later reclassified to profit or loss when the hedge item affects profit or loss.

For the purpose of hedge accounting, hedges are classified as:
- Fair value hedges when hedging the exposure to changes in the fair value of a recognized asset or liability or an unrecognized firm commitment
- Cash flow hedges when hedging the exposure to variability in cash flows that is either attributable to a particular risk associated with a recognized asset or liability or a highly probable forecast transaction or the foreign currency risk in an unrecognized firm commitment
- Hedges of a net investment in a foreign operation

At the inception of a hedge relationship, The Group formally designates and documents the hedge relationship to which the Group wishes to apply hedge accounting and the risk management objective and strategy for undertaking the hedge. The documentation includes identification of the hedging instrument, the hedged item or transaction, the nature of the risk being hedged and how the entity will assess the effectiveness of changes in the hedging instrument's fair value in offsetting the exposure to changes in the hedged item's fair value or cash flows attributable to the hedged risk. Such hedges are expected to be highly effective in achieving offsetting changes in fair value or cash flows and are assessed on an ongoing basis to determine that they actually have been highly effective throughout the financial reporting periods for which they were designated.

Hedges that meet the strict criteria for hedge accounting are accounted for, as described below:

Fair value hedges
The change in the fair value of a hedging derivative is recognized in the statement of profit or loss and other comprehensive income as finance costs. The change in the fair value of the hedged item attributable to the risk hedged is recorded as part of the carrying value of the hedged item and is also recognized in the statement of profit or loss and other comprehensive income as finance costs.

For fair value hedges relating to items carried at amortized cost, any adjustment to carrying value is amortized through profit or loss over the remaining term of the hedge using the EIR method. EIR amortization may begin as soon as an adjustment exists and no later than when the hedged item ceases to be adjusted for changes in its fair value attributable to the risk being hedged.

If the hedged item is derecognized, the unamortized fair value is recognized immediately in profit or loss.
When an unrecognized firm commitment is designated as a hedged item, the subsequent cumulative change in the fair value of the firm commitment attributable to the hedged risk is recognized as an asset or liability with a corresponding gain or loss recognized in profit and loss.

Cash flow hedges
The effective portion of the gain or loss on the hedging instrument is recognized in OCI in the cash flow hedge reserve, while any ineffective portion is recognized immediately in the statement of profit or loss and other comprehensive income.

2.3.11 Derivative financial instruments and hedge accounting (cont'd)

Amounts recognized as OCI are transferred to profit or loss when the hedged transaction affects profit or loss, such as when the hedged financial income or financial expense is recognized or when a forecast sale occurs. When the hedged item is the cost of a non-financial asset or non-financial liability, the amounts recognized as OCI are transferred to the initial carrying amount of the non-financial asset or liability.

If the hedging instrument expires or is sold, terminated or exercised without replacement or rollover (as part of the hedging strategy), or if its designation as a hedge is revoked, or when the hedge no longer meets the criteria for hedge accounting, any cumulative gain or loss previously recognized in OCI remains separately in equity until the forecast transaction occurs or the foreign currency firm commitment is met.

Hedges of a net investment
Hedges of a net investment in a foreign operation, including a hedge of a monetary item that is accounted for as part of the net investment, are accounted for in a way similar to cash flow hedges. Gains or losses on the hedging instrument relating to the effective portion of the hedge are recognized as OCI while any gains or losses relating to the ineffective portion are recognized in the statement of profit or loss and other comprehensive income. On disposal of the foreign operation, the cumulative value of any such gains or losses recorded in equity is transferred to the statement of profit or loss and other comprehensive income.

2.3.12 Non-current assets held for sale or distribution to equity holders of the parent and discontinued operations

The Group classifies non-current assets or disposal groups as held for sale if their carrying amounts will be recovered principally through a sale or distribution rather than through continuing use. Such non-current assets and disposal groups classified as held for sale or as held for distribution are measured at the lower of their carrying amount and fair value less costs to sell or to distribute. Costs to distribute are the incremental costs directly attributable to the disposal of an asset (disposal group), excluding the finance costs and income tax expense.

The criteria for held for distribution classification is regarded as met only when the distribution is highly probable and the asset or disposal group is available for immediate distribution in its present condition. Actions required to complete the distribution should indicate that it is unlikely that significant changes to the distribution will be made or that the decision to distribute will be withdrawn. Management must be committed to the distribution expected within one year from the date of the classification.

Property, plant and equipment and intangible assets are not depreciated or amortized once classified as held for sale or as held for distribution.

Assets and liabilities classified as held for sale or for distribution are presented separately as current items in the statement of financial position.

A disposal group qualifies as discontinued operation if it is a component of an entity that either has been disposed of, or is classified as held for sale, and:

- Represents a separate major line of business or geographical area of operations
- Is part of a single co-ordinated plan to dispose of a separate major line of business or geographical area of operations, or
- Is a subsidiary acquired exclusively with a view to resale

Discontinued operations are excluded from the results of continuing operations and are presented as a single amount as profit or loss after tax from discontinued operations in the statement of profit or loss and other comprehensive income.

2.3.13 Pension benefits

The Group operates a defined benefit pension plan, which requires contributions to be made to a separately administered fund
The cost of providing benefits under the defined benefit plan is determined using the projected unit credit method. Remeasurements, comprising of actuarial gains and losses, the effect of the asset ceiling, excluding amounts included in net interest on the net defined benefit liability and the return on plan assets (excluding amounts included in net interest on the net defined benefit liability), are recognized immediately in the statement of financial position with a corresponding debit or credit to retained earnings through OCI in the period in which they occur. Remeasurements are not reclassified to profit or loss in subsequent periods.
Past service costs are recognized in profit or loss on the earlier of:

- The date of the plan amendment or curtailment, and
- The date that The Group recognizes restructuring-related costs

Net interest is calculated by applying the discount rate to the net defined benefit liability or asset. The Group recognizes the following changes in the net defined benefit obligation under ‘cost of sales’ and ‘selling and administrative expenses’ in the statement of comprehensive income.

2.3.14 Share-based payments

The Consolidated Company provides share-based compensation for employees' work services. The Company provides share-based payment options (stock-based settlement-based compensation transactions) to its employees and cash settlement type share price compensation (Cash-settled share-based payment transactions) to employees of New Business Development.

(1) Equity-settled transactions
The cost of equity-settled transactions is determined by the fair value at the date when the grant is made using an appropriate valuation model (See Note 18). That cost is recognized in employee benefits expense, together with a corresponding increase in equity (other capital reserves), over the period in which the service and, where applicable, the performance conditions are fulfilled (the vesting period). The cumulative expense recognized for equity-settled transactions at each reporting date until the vesting date reflects the extent to which the vesting period has expired and the Group’s best estimate of the number of equity instruments that will ultimately vest. The expense or credit in the statement of profit or loss and other comprehensive income for a period represents the movement in cumulative expense recognized as at the beginning and end of that period.

Service and non-market performance conditions are not taken into account when determining the grant date fair value of awards, but the likelihood of the conditions being met is assessed as part of the Group’s best estimate of the number of equity instruments that will ultimately vest. Market performance conditions are reflected within the grant date fair value. Any other conditions attached to an award, but without an associated service requirement, are considered to be non-vesting conditions. Non-vesting conditions are reflected in the fair value of an award and lead to an immediate expensing of an award unless there are also service and/or performance conditions.

No expense is recognized for awards that do not ultimately vest because non-market performance and/or service conditions have not been met. Where awards include a market or non-vesting condition, the transactions are treated as vested irrespective of whether the market or non-vesting condition is satisfied, provided that all other performance and/or service conditions are satisfied.

When the terms of an equity-settled award are modified, the minimum expense recognized is the grant date fair value of the unmodified award, provided the original terms of the award are met. An additional expense, measured as at the date of modification, is recognized for any modification that increases the total fair value of the share-based payment transaction, or is otherwise beneficial to the employee.

2.3.14 Share-based payments (cont'd)

Where an award is cancelled by the entity or by the counterparty, any remaining element of the fair value of the award is expensed immediately through profit or loss.

The dilutive effect of outstanding options is reflected as additional share dilution in the computation of diluted earnings per share (further details are given in Note 29).

(2) Cash-settled share-based payment transactions
The Group measures the goods and services provided in the cash-settled share-based payment transactions and the liabilities incurred in cash-settled share-based payment transactions as the fair value of the liability. Fair value is re-measured at the end of each reporting period from the initial grant date until the settlement of the liability, and changes in fair value are recognized in profit or loss. Fair value is recognized as an expense over the vesting period and recognizes a corresponding liability.

2.3.15 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 an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation. When The Group expects some or all of a provision to be reimbursed, for example, under an insurance contract, the reimbursement is recognized as a separate asset, but only when the reimbursement is virtually certain. The expense relating to a provision is presented in the statement of profit or loss and other comprehensive income net of any reimbursement.

If the effect of the time value of money is material, provisions are discounted using a current pre-tax rate that reflects, when appropriate, the risks specific to the liability. When discounting is used, the increase in the provision due to the passage of time is recognized as a finance cost.

Warranty provisions
Provisions for warranty-related costs are recognized when the product is sold or service provided to the customer. Initial recognition is based on historical experience. The initial estimate of warranty-related costs is revised annually.

Greenhouse gas emissions
The Group receives free emission rights as a result of emission trading schemes. The rights are received on an annual basis and, in return, The Group is required to remit rights equal to its actual emissions. The Group has adopted the net liability approach to the emission rights granted. Therefore, a provision is recognized only when actual emissions exceed the emission rights granted and still held. The emission costs are recognized as other operating costs. Where emission rights are purchased from other parties, they are recorded at cost, and treated as a reimbursement right, whereby they are matched to the emission liabilities and remeasured to fair value. The changes in fair value are recognized in the statement of profit or loss and other comprehensive income.

Contingent liabilities recognized in a business combination
A contingent liability recognized in a business combination is initially measured at its fair value. Subsequently, it is measured at the higher of the amount that would be recognized in accordance with the requirements for provisions above or the amount initially recognized less, when appropriate, cumulative amortization recognized in accordance with the requirements for revenue recognition.

2.3.16 Revenue recognition

Revenue is the fair value of the consideration received or receivable taking into account contractually defined terms of payment and excluding taxes or duty. Revenue is recognized to the extent that it is probable that the economic benefits will flow to the Group and the revenue can be reliably measured and certain specific requirements for each of the activities described below are met. Our estimates are based on historical data such as customer type, transaction type and individual transaction terms.

Sale of goods
Revenue from the sale of goods is recognized when the significant risks and rewards of ownership of the goods have passed to the buyer, usually on delivery of the goods.

Interest income
For all financial instruments measured at amortized cost and interest-bearing financial assets classified as AFS, interest income is recorded using the EIR. The EIR is the rate that exactly discounts the estimated future cash payments or receipts over the expected life of the financial instrument or a shorter period, where appropriate, to the net carrying amount of the financial asset or liability. Interest income is included in finance income in the statement of profit or loss and other comprehensive income.

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 services performed to date as a percentage of total services to be performed or the proportion that costs incurred to date bear to the estimated total costs of the transaction, as applicable.

Dividends
Revenue is recognized when The Group’s right to receive the payment is established, which is generally when shareholders approve the dividend.

Rental income
Rental income arising from operating leases on investment properties is accounted for on a straight-line basis over the lease terms and is included in revenue in the statement of profit or loss and other comprehensive income due to its operating nature.

2.3.17 Taxes

Current income tax

Current income tax assets and liabilities are measured at the amount expected to be recovered from or paid to the taxation authorities. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted at the reporting date in the countries where The Group operates and generates taxable income.

Current income tax relating to items recognized directly in equity is recognized in equity and not in the statement of profit or loss and other comprehensive income. Management periodically evaluates positions taken in the tax returns with respect to situations in which applicable tax regulations are subject to interpretation and establishes provisions where appropriate.

Deferred tax

Deferred tax is provided using the liability method on temporary differences between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes at the reporting date. Deferred tax liabilities are recognized for all taxable temporary differences, except:

- When the deferred tax liability arises from the initial recognition of goodwill or an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss
- In respect of taxable temporary differences associated with investments in subsidiaries, associates and interests in joint arrangements, when the timing of the reversal of the temporary differences can be controlled and it is probable that the temporary differences will not reverse in the foreseeable future

Deferred tax assets are recognized for all deductible temporary differences, the carry forward of unused tax credits and any unused tax losses. Deferred tax assets are recognized to the extent that it is probable that taxable profit will be available against which the deductible temporary differences, and the carry forward of unused tax credits and unused tax losses can be utilized, except:

- When the deferred tax asset relating to the deductible temporary difference arises from the initial recognition of an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss.
- In respect of deductible temporary differences associated with investments in subsidiaries, associates and interests in joint arrangements, deferred tax assets are recognized only to the extent that it is probable that the temporary differences will reverse in the foreseeable future and taxable profit will be available against which the temporary differences can be utilized.

The carrying amount of deferred tax assets is reviewed at each reporting date and reduced to the extent that it is no longer probable that sufficient taxable profit will be available to allow all or part of the deferred tax asset to be utilized. Unrecognized deferred tax assets are re-assessed at each reporting date and are recognized to the extent that it has become probable that future taxable profits will allow the deferred tax asset to be recoveredDeferred tax assets and liabilities are measured at the tax rates that are expected to apply in the year when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted at the reporting date.

Deferred tax relating to items recognized outside profit or loss is recognized outside profit or loss. Deferred tax items are recognized in correlation to the underlying transaction either in OCI or directly in equity.

Tax benefits acquired as part of a business combination, but not satisfying the criteria for separate recognition at that date, are recognized subsequently if new information about facts and circumstances change. The recognized deferred tax benefits are applied to reduce the carrying amount of goodwill related to the acquisition. If the carrying amount of goodwill is zero, the deferred tax benefit is recognized in profit or loss.

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

2.3.17 Taxes (cont'd)

The Group offsets deferred tax assets and deferred tax liabilities if and only if it has a legally enforceable right to set off current tax assets and current tax liabilities and the deferred tax assets and deferred tax 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 realise 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.

2.4 New and amended standards and interpretations

2.4.1 Enforcements of new and amended standards and interpretations

The Group applied for the first time certain standards and amendments, which are effective for annual periods beginning on or after January 1, 2017.

Amendments to KIFRS 1007 *Statement of Cash Flows: Disclosure Initiative*
The amendments require entities to provide disclosure of changes in their liabilities arising from financing activities, including both changes arising from cash flows and non-cash changes (such as foreign exchange gains or losses). The Group has provided the information on Note 4-(5)

Amendments to KIFRS 1012 *Income Taxes: Recognition of Deferred Tax Assets for Unrealised Losses*
The amendments clarify that an entity needs to consider whether tax law restricts the sources of taxable profits against which it may make deductions on the reversal of deductible temporary difference related to unrealized losses. Furthermore, the amendments provide guidance on how an entity should determine future taxable profits and explain the circumstances in which taxable profit may include the recovery of some assets for more than their carrying amount.

However, their application has no effect on The Group's financial statements as The Group has no deductible temporary differences or assets that are in the scope of the amendments.

Annual Improvements Cycle - 2014-2016
Amendments to KIFRS *1112 Disclosure of Interests in Other Entities: Clarification of the scope of disclosure requirements in KIFRS 1112*
The amendments clarify that the disclosure requirements in KIFRS 1112, other than those in paragraphs B10–B16, apply to an entity's interest in a subsidiary, a joint venture or an associate (or a portion of its interest in a joint venture or an associate) that is classified (or included in a disposal group that is classified) as held for sale

2.4.2 Standards issued but not yet effective

The standards and interpretations that are issued, but not yet effective, up to the date of issuance of the Group's financial statements are disclosed below.

KIFRS 1109 *Financial Instruments*

The KASB issued the final version of KIFRS 1109 *Financial Instruments* that replaces KIFRS 1039 *Financial Instruments: Recognition and Measurement* and all previous versions. KIFRS 1109 brings together all three aspects of the accounting for financial instruments project: classification and measurement, impairment and hedge accounting. KIFRS 1109 is effective for annual periods beginning on or after January 1, 2018, with early application permitted. Except for hedge accounting, retrospective application is required but providing comparative information is not compulsory. For hedge accounting, the requirements are generally applied prospectively, with some limited exceptions. The Group plans to adopt the new standard on the required effective date.

Under the standard, retrospective application is required, but providing comparative information is not compulsory for certain cases such as classification and measurement of financial instruments, and impairment. For hedge accounting, the requirements are generally applied prospectively, with some limited exceptions such as accounting for time value of options.

The main features of the standard include: a business model for the managing financial assets; classification and measurement of financial assets based on contractual cash flow characteristics of financial assets; an impairment model for financial instruments based on expected credit losses; the hedged item that meet the requirements of hedge accounting, increases in hedging instruments, or changes in the evaluation method for hedge effectiveness.

2.4.2 Standards issued but not yet effective (cont'd)

KIFRS 1109 *Financial Instruments* (cont'd)

The effective implementation of the standard will likely require analyses on financial effects, establishment of accounting policies, development of an accounting system, and stabilization of the system. The effect on the financial statements for the first-time adoption of the standard may differ depending on the selection and judgment of accounting policies in accordance with the standard, as well as The Group's financial instruments and economic conditions during the period.

The Group has conducted a preliminary assessment of the potential impact on the 2017 financial statements based on the current status and information available as at December 31, 2017 to assess the financial impact of the first adoption of KIFRS 1109. The financial impacts on the financial statements upon the application of the standard are as follows.

(1) Classification and measurement

KIFRS 1109 requires The Group to classify financial instruments as subsequently measured at amortized cost, fair value through other comprehensive income (FVOCI), or fair value through profit or loss (FVTPL), on the basis of the holder's business model and instrument's contractual cash flow characteristics as shown below. Hybrid contracts with hosts that are assets, are classified in their entirety instead of bifurcating the embedded derivatives.

	Characteristics of contractual cash flows	
Objective of the business model	Composed solely of principal and interest	Others
Collecting contractual cash flows	Subsequently measured at amortized cost (*1)	
Collecting contractual cash flows and selling	FVOCI (*1)	FVTPL (*2)
Selling or other purposes	FVTPL	

(*1) An entity may irrevocably designate a financial asset as measured at FVTPL if doing so eliminates or reduces an accounting mismatch

(*2) An entity may make an irrevocable election to present in other comprehensive income changes in the fair value of an investment in an equity instrument that is not held for trading.

The requirements for classifying the financial assets as measured at amortized cost or FVOCI under the standard are more stringent than the requirements of the current KIFRS 1039; as a result, the increase in the proportion of financial assets subject to FVTPL measurement may increase the volatility in profit or loss upon adoption of KIFRS 1109.

The Group has loans and receivables of 119,608 million, available-for-sale financial assets of 395,596 million and hedging derivativesas of 19,246 million at December 31, 2017.

According to KIFRS 1109, a financial asset that is held within a business model whose objective is to hold the financial asset in order to collect contractual cash flows, and the contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding, is measured at amortized cost. As at December 31, 2017, The Group measures loans and receivables of 119,608 million at amortized cost.

According to KIFRS 1109, a financial asset that is held within a business model whose objective is achieved by both collecting contractual cash flows and selling the financial asset, and the contractual terms of the debt instruments give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding, is measured at FVOCI. As at December 31, 2017, The Group does not hold debt instruments classified as AFS financial assets.

2.4.2 Standards issued but not yet effective (cont'd)

KIFRS 1109 *Financial Instruments* (cont'd)

According to KIFRS 1109, an entity may make an irrevocable election to present in other comprehensive income changes in the fair value of an investment in an equity instrument that is not held for trading. Items of comprehensive income are not subsequently recycled to profit or loss. As at December 31, 2017, The Group has equity instruments classified as available-for-sale financial instruments of 395,596 million.

According to KIFRS 1109, a financial asset whose contractual terms do not give rise to cash flows that are solely payments of principal and interest on the principal amount outstanding, or a debt instrument that is held for trading, or an equity instrument that is not designated as a financial asset measured at FVOCI, are measured at FVTPL.

(2) Classification and measurement of financial liabilities

Under KIFRS 1109, changes in the fair value of a financial liability designated as measured at FVTPL that arise from changes in the liability's credit risk are presented in other comprehensive income, instead of profit or loss. The changes in the liability's credit risk are recognized in profit or loss if the changes create or enlarge an accounting mismatch had it been presented in other comprehensive income.

Some of the changes in the fair value of financial liabilities designated as at FVTPL, which were recognized in profit or loss under the current KIFRS 1039, are presented in other comprehensive income; therefore, gains and losses on valuation of financial liabilities may decrease.

(3) Impairment: financial assets and contract assets

Under KIFRS 1039, impairment losses are recognized when there is objective evidence of impairment based on the incurred loss model. However, under KIFRS 1109, impairment losses are recognized on debt instruments, lease receivables, contract assets, loan commitment, and financial guarantee contracts that were accounted for at amortized cost, or FVOCI, based on the expected credit loss (ECL) impairment model.

KIFRS 1109 outlines a three-stage model for 12-month expected credit losses, or lifetime expected credit losses based on changes in credit risk since initial recognition of financial assets; as a result, credit losses can be recognized earlier than the current KIFRS 1039.

	Classification (*1)	Loss allowance
Stage 1	The credit risk on a financial instrument has not increased significantly since initial recognition (*2)	12-month ECL: The expected credit losses that result from default events on a financial instrument that are possible within the 12 months after the reporting date.
Stage 2	The credit risk on a financial instrument has increased significantly since initial recognition	Lifetime ECL: The expected credit losses that result from all possible default events over the expected life of a financial instrument.
Stage 3	Credit-impaired	

(*1) For trade receivables or contract assets that arise from transactions within the scope of KIFRS 1115 *Revenue from Contracts with Customers* and that do not contain a significant financing component, loss allowance is measured at an amount equal to lifetime expected credit losses. If the trade receivables or contract assets contain a significant financial component, a policy election may be made such that the loss allowance is measured at an amount equal to lifetime expected credit losses. Also, for lease receivables, a policy election may be made such that the loss allowance is measured at an amount equal to lifetime expected credit losses.

(*2) Low credit risk at the reporting date may be deemed as no significant increase in credit risk.

2.4.2 Standards issued but not yet effective (cont'd)

KIFRS 1109 *Financial Instruments* (cont'd)

Under KIFRS 1109, the cumulative changes in lifetime expected credit losses since initial recognition are recognised as loss allowance for a financial asset that is considered credit-impaired at initial recognition.

As at December 31, 2017, The Group holds debt instruments, Loans and receivables, of 119,608 million designated as measured at amortized cost, and recognized a loss allowance of 2,944 million for the instrument.

KIFRS 1115 *Revenue from Contracts with Customers*

The amendments are effective for annual periods beginning on or after 1 January 2018, with early application permitted. The new standard will supersede the following KIFRS: KIFRS 1018 *Revenue*, KIFRS 1011 *Construction Contracts*, KIFRS 2031 *Revenue-Barter Transactions Involving Advertising Services*, KIFRS 2113 *Customer Loyalty Programmes*, KIFRS 2115 *Agreements for the Construction of Real Estate*, and KIFRS 2118 *Transfers of Assets from Customers*. The Group applies KIFRS 1115 beginning on or after January 1, 2018 and will make the amendments retrospectively on the statement of the pervious reporting period, presented for comparative purposes in accordance with KIFRS 1008 *Accounting Policies, Changes in Accounting Estimates and Errors*. As at January 1, 2017, The Group plans to apply a practical expedient for completed contracts, under which The Group does not restate its financial statements.

The current KIFRS 1018 provides the criteria for recognition of revenue relating to sale of goods, rendering of services, interest income, royalties, dividends and construction contracts. However, under the new KIFRS 1115, revenue is recognized by applying a five-stage revenue recognition model (Identification of a contract with a customer → Identification of performance obligations in the contract → Determination of the transaction price → Allocation of the transaction price to the separate performance obligations in the contract → Recognition of revenue upon satisfying the performance obligations) to all of its contracts with customers.

For the purpose of adopting KIFRS 1115, The Group has formed a task force team comprised of members from the accounting and IT division as at December 31, 2017. The team is also supported by other relevant divisions.

Based on the current status and information available as at December 31, 2017 The Group conducted a preliminary assessment of the potential impact on the 2017 financial statements upon the adoption of KIFRS 1115. The results are as follows:

The results of the preliminary assessment as at December 31, 2017 may be subject to change as additional information becomes available to The Group.

(1) Determination of the transaction price

In applying K-IFRS 1115, the Group estimates the variable cost using a method that is expected to better anticipate the consideration it will receive, and when the uncertainty is resolved later, revenue is recognized by including variable consideration in the transaction price only to the extent that it is highly unlikely that a significant portion of the cumulative revenue already recognized is reversed. Of the amount of money (that we received or will receive) we do not expect to be entitled to have rights is calculated as liabilities

The adoption of KIFRS 1115 is not expected to have any significant impact on The Group's revenue and profit or loss.

2.4.2 Standards issued but not yet effective (cont'd)

KIFRS 1115 *Revenue from Contracts with Customers* (cont'd)

(2) Identification of performance obligations in the contract and Allocating transaction price

If multiple performance obligations are identified when applying the KIFRS 1115, depending on whether the respective performance obligations are fulfilled at one point in time or over time, The Group's point of view of revenue may change, and the transaction price will be allocated to each performance obligation based on the relative individual selling price.

We will apply the most reasonable approach to estimate the individual selling price of each performance obligation to allocate the transaction price to each performance obligation, and will recognize the revenue for each performance obligation performed

The adoption of KIFRS 1115 is not expected to have any significant impact on The Group's revenue and profit or loss.

Sales or Contribution of Assets between an Investor and its Associate or Joint Venture
—Amendments to KIFRS 1110 and KIFRS 1028

The amendments address the conflict between KIFRS 1110 and KIFRS 1028 in dealing with the loss of control of a subsidiary that is sold or contributed to an associate or joint venture. The amendments clarify that the gain or loss resulting from the sale or contribution of assets that constitute a business, as defined in KIFRS 1103, between an investor and its associate or joint venture, is recognized in full. Any gain or loss resulting from the sale or contribution of assets that do not constitute a business, however, is recognized only to the extent of unrelated investors' interests in the associate or joint venture. The KASB has deferred the effective date of these amendments indefinitely, but an entity that early adopts the amendments must apply them prospectively. The Group will apply these amendments when they become effective.

KIFRS 1102 *Classification and Measurement of Share-based Payment Transactions*
—Amendments to KIFRS 1102

The KASB issued amendments to KIFRS 1102 *Share-based Payment* that address three main areas: the effects of vesting conditions on the measurement of a cash-settled share-based payment transaction; the classification of a share-based payment transaction with net settlement features for withholding tax obligations; and accounting where a modification to the terms and conditions of a share-based payment transaction changes its classification from cash settled to equity settled.

On adoption, entities are required to apply the amendments without restating prior periods, but retrospective application is permitted if elected for all three amendments and other criteria are met. The amendments are effective for annual periods beginning on or after 1 January 2018, with early application permitted. The Group is assessing the potential effect of the amendments on financial
statements and plans to apply the amendments on the effective date.

KIFRS 1116 *Leases*

KIFRS 1116 was issued in January 2016 and it replaces KIFRS 1017 *Leases*, KIFRS 2104 *Determining whether an Arrangement contains a Lease*, KIFRS 2015 *Operating Leases-Incentives* and KIFRS 2027 *Evaluating the Substance of Transactions* Involving the Legal Form of a Lease. KIFRS 1116 sets out the principles for the recognition, measurement, presentation and disclosure of leases and requires lessees to account for all leases under a single on-balance sheet model similar to the accounting for finance leases under KIFRS 1017. The standard includes two recognition exemptions for lessees – leases of 'low-value' assets (e.g., personal computers) and short-term leases (i.e., leases with a lease term of 12 months or less). At the commencement date of a lease, a lessee will recognise a liability to make lease payments (i.e., the lease liability) and an asset representing the right to use the underlying asset during the lease term (i.e., the right-of-use asset). Lessees will be required to separately recognise the interest expense on the lease liability and the depreciation expense on the right-of-use asset.

Lessees will be also required to remeasure the lease liability upon the occurrence of certain events (e.g., a change in the lease term, a change in future lease payments resulting from a change in an index or rate used to determine those payments). The lessee will generally recognize the amount of the remeasurement of the lease liability as an adjustment to the right-of-use asset. Lessor accounting under KIFRS 1116 is substantially unchanged from today's accounting under KIFRS 1017. Lessors will continue to classify all leases using the same classification principle as in KIFRS 1017 and distinguish between two types of leases: operating and finance leases.

KIFRS 1116 also requires lessees and lessors to make more extensive disclosures than under KIFRS 1017.

KIFRS 1116 is effective for annual periods beginning on or after January 1, 2019. Early application is permitted, but not before an entity applies KIFRS 1115. A lessee can choose to apply the standard using either a full retrospective or a modified retrospective approach. The standard's transition provisions permit certain reliefs.

The Group is assessing the potential effect of the amendments on its financial statements. The Group will apply these amendments on the required effective date.

Transfers of Investment Property — Amendments to KIFRS 1040

The amendments clarify when an entity should transfer property, including property under construction or development into, or out of investment property. The amendments state that a change in use occurs when the property meets, or ceases to meet, the definition of investment property and there is evidence of the change in use. A mere change in management's intentions for the use of a property does not provide evidence of a change in use. Entities should apply the amendments prospectively to changes in use that occur on or after the beginning of the annual reporting period in which the entity first applies the amendments. An entity should reassess the classification of property held at that date and, if applicable, reclassify property to reflect the conditions that exist at that date. Retrospective application in accordance with KIFRS 1008 is only permitted if it is possible without the use of hindsight. These amendments are effective for annual periods beginning on or after January 1, 2018. Early application of the amendments is permitted and must be disclosed. The Group will apply amendments when they become effective. The Group does not expect any effect on its financial statements.

Annual Improvements 2014-2016 Cycle

KIFRS 1101 *First-time Adoption of International Financial Reporting Standards - Deletion of short-term exemptions for first-time adopters*
Short-term exemptions in paragraphs E3–E7 of KIFRS 1101 were deleted because they have now served their intended purpose. The amendment is effective from January 1, 2018. This amendment is not applicable to The Group.

KIFRS 1028 *Investments in Associates and Joint Ventures - Clarification that measuring investees at fair value through profit or loss is an investment-by-investment choice*

The amendments clarify that:

- An entity that is a venture capital organization, or other qualifying entity, may elect, at initial recognition on an investment-by-investment basis, to measure its investments in associates and joint ventures at fair value through profit or loss.
- If an entity, that is not itself an investment entity, has an interest in an associate or joint venture that is an investment entity, the entity may, when applying the equity method, elect to retain the fair value measurement applied by that investment entity associate or joint venture to the investment entity associate's or joint venture's interests in subsidiaries. This election is made separately for each investment entity associate or joint venture, at the later of the date on which: (a) the investment entity associate or joint venture is initially recognized; (b) the associate or joint venture becomes an investment entity; and (c) the investment entity associate or joint venture first becomes a parent.

The amendments should be applied retrospectively and are effective from January 1, 2018, with earlier application permitted. If an entity applies those amendments for an earlier period, it must disclose that fact.

Any significant effect is not expected to impact on The Group's financial statements.

KIFRS 2122 *Foreign Currency Transactions and Advance Consideration*

The interpretation clarifies that, in determining the spot exchange rate to use on initial recognition of the related asset, expense or income (or part of it) on the derecognition of a non-monetary asset or non-monetary liability relating to advance consideration, the date of the transaction is the date on which an entity initially recognizes the non-monetary asset or non-monetary liability arising from the advance consideration. If there are multiple payments or receipts in advance, then the entity must determine the transaction date for each payment or receipt of advance consideration. Entities may apply the amendments on a fully retrospective basis. Alternatively, an entity may apply the Interpretation prospectively to all assets, expenses and income in its scope that are initially recognized on or after:

(i) The beginning of the reporting period in which the entity first applies the interpretation, or

(ii) The beginning of the prior reporting period presented as comparative information in the financial statements of the reporting period in which the entity first applies the interpretation.

The interpretation is effective for annual periods beginning on or after January 1, 2018. Early application of interpretation is permitted and must be disclosed. However, since The Group's current practice is in line with the Interpretation, The Group does not expect any effect on its separate financial statements.

3. Significant accounting judgments, estimates and assumptions

The preparation of The Group's financial statements requires management to make judgments, estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities, and the accompanying disclosures, and the disclosure of contingent liabilities. Uncertainty about these assumptions and estimates could result in outcomes that require a material adjustment to the carrying amount of assets or liabilities affected in future periods.

Other disclosures relating to The Group's exposure to risks and uncertainties includes:

➢ Capital management	Note 4
➢ Financial instruments risk management and policies	Note 4
➢ Sensitivity analyses disclosures	Notes 4 and 15

3.1 Estimates and assumptions

The key assumptions concerning the future and other key sources of estimation uncertainty at the reporting date, that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year, are described below. The Group based its assumptions and estimates on parameters available when the consolidated financial statements were prepared. Existing circumstances and assumptions about future developments, however, may change due to market changes or circumstances arising beyond the control of the Group. Such changes are reflected in the assumptions when they occur.

Revaluation of property, plant and equipment and investment properties
The Group carries its investment properties at fair value, with changes in fair value being recognized in the statement of profit or loss and other comprehensive income. The Group engaged an independent valuation specialist to assess fair value as at December 31, 2017 for investment properties

Impairment of non-financial assets
The Group assesses, at each reporting date, whether there is an indication that an asset may be impaired. Goodwill and intangible assets with indefinite useful lives are tested for impairment annually, or when circumstances indicate that the carrying value may be impaired. Other non-financial assets are tested for impairment when circumstances indicate that its carrying amount may not be recoverable. In determining a value in use, management estimates future cash flows to be derived from the asset or CGU, and applies the appropriate discount rate to those future cash flows

Share-based payments
The Group measures the cost of equity-settled transactions with employees by reference to the fair value of the equity instruments at the date at which they are granted. Estimating fair value for share-based payment transactions requires determination of the most appropriate valuation model, which depends on the terms and conditions of the grant. This estimate also requires determination of the most appropriate inputs to the valuation model including the expected life of the share option, volatility and dividend yield and making assumptions about them. The assumptions and models used for estimating fair value for share-based payment transactions are disclosed in Note 18.

Taxes
Deferred tax assets are recognized for unused tax losses to the extent that it is probable that taxable profit will be available against which the losses can be utilized. Significant management judgment is required to determine the amount of deferred tax assets that can be recognized, based upon the likely timing and the level of future taxable profits together with future tax planning strategies.

3. Significant accounting judgments, estimates and assumptions. (cont'd)

Defined benefit plans (pension benefits)
The cost of the defined benefit pension plan and other post-employment medical benefits and the present value of the pension obligation are determined using actuarial valuations. An actuarial valuation involves making various assumptions that may differ from actual developments in the future. These include the determination of the discount rate, future salary increases, mortality rates and future pension increases. Due to the complexities involved in the valuation and its long-term nature, a defined benefit obligation is highly sensitive to changes in these assumptions. All assumptions are reviewed at each reporting date.

In determining the appropriate discount rate, management considers the interest rates of corporate bonds in currencies consistent with the currencies of the post-employment benefit obligation with at least an 'AA' rating or above, as set by an internationally acknowledged rating agency. The mortality rate is based on publicly available mortality tables for the specific countries. Future salary increases and pension increases are based on expected future inflation rates for the respective countries.

Development costs
Development costs are capitalized in accordance with the accounting policy. Initial capitalization of costs is based on management's judgment that technological and economic feasibility is confirmed, usually when a product development project has reached a defined milestone according to an established project management model. In determining the amounts to be capitalized, management makes assumptions regarding the expected future cash generation of the project, discount rates to be applied and the expected period of benefits. As at December 31, 2017, the carrying amount of capitalized development costs was ₩2,186 million (December 31, 2016: ₩2,746 million).

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 related to its operations. The purpose of risk management policy is to minimize potential risks, which could have an 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 exchange 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 at December 31, 2017 and 2016, is as follows (Korean won in thousands):

	December 31, 2017				
	USD	EUR	CNY	Others (*1)	Total
Assets	₩ 67,948,922	₩ 1,836,867	₩ 7,060,647	₩ 92,594	₩ 76,939,030
Liabilities	(9,716,606)	(8,880,782)	(156,097)	(3,773,760)	(22,527,245)
Net assets (liabilities)	₩ 58,232,316	₩ (7,043,915)	₩ 6,904,550	₩ (3,681,166)	₩ 54,411,785

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

	December 31, 2016				
	USD	EUR	CNY	Others (*1)	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

(*1) 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, 2017 and 2016, is ₩(1,220,315) thousand and ₩821,222 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, 2017 and 2016, is as follows (Korean won in thousands):

	2017		2016	
	10% increase	10% decrease	10% increase	10% decrease
Income before tax	₩ 5,441,178	₩ (5,441,178)	₩ 4,737,224	₩ (4,737,224)

The above-mentioned sensitivity analysis is based on monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency as at December 31, 2017 and 2016.

4. Financial risk management (cont'd)

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 deposits and 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 at December 31, 2017 and 2016, is as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016
Assets	₩ 66,406,062	₩ 71,886,762
Liabilities	(45,207,965)	(54,807,617)
Net assets (liabilities)	₩ 21,198,097	₩ 17,079,145

A sensitivity analysis on the Group's income before tax assuming 1% increase and decrease in interest rates for the years ended December 31, 2017 and 2016, is as follows (Korean won in thousands):

	2017		2016	
	1% increase	1% decrease	1% increase	1% decrease
Income before tax	₩ 211,981	₩ (211,981)	₩ 170,791	₩ (170,791)

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.

4. Financial risk management (cont'd)

The maximum credit risk exposure for financial assets maintained by the Group and the book value for the financial assets as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016
Loans and receivables:		
Cash and cash equivalents	₩ 72,235,836	₩ 72,820,704
Financial instruments	11,463,578	7,624,000
Trade and other receivables	30,574,096	76,120,803
Long-term and short-term loans	1,464,651	2,128,782
Long-term other receivables	3,869,832	3,883,005
Derivative assets	19,245,620	634,824
	₩ 138,853,613	₩ 163,212,118

The Group's receivables' aging analysis as at December 31, 2017 and 2016, is as follows (Korean won in thousands):

	December 31, 2017						
	Individually assessed receivables	Receivables assessed for impairment on a collective basis					
		Within due	0–3 months	3 months–6 months	6 months–12 months	More than 12 months	Total
Short-term loans	₩ -	₩ 611,513	₩ -	₩ -	₩ -	₩ -	₩ 611,513
Trade receivables	2,599,402	25,241,251	3,781,681	344,410	782,522	252,567	33,001,833
Other receivables	249,930	166,931	-	-	-	-	416,861
Accrued income	-	37,042	-	-	-	-	37,042
Long-term loans	-	922,550	-	-	-	-	922,550
	₩ 2,849,332	₩ 26,979,287	₩ 3,781,681	₩ 344,410	₩ 782,522	₩ 252,567	₩ 34,989,799

	December 31, 2016						
	Individually assessed receivables	Receivables assessed for impairment on a collective basis					
		Within due	0–3 months	3 months–6 months	6 months–12 months	More than 12 months	Total
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
	₩ 8,394,197	₩ 70,261,789	₩ 2,076,633	₩ 34,245	₩ 80,433	₩ 141,410	₩ 80,988,707

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. A 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, deposits in financial institutions and derivative instruments are individually assessed for impairment.

4. Financial risk management (cont'd)

(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.

The Group's major non-derivative liabilities as at December 31, 2017 and 2016, which have matured, are as follows (Korean won in thousand):

	December 31, 2017					
		Nominal cash flows according to the contract				
	Book value	Total	Less than 1 year	1 year-2 years	2 years -5 years	More than 5 years
Financial liabilities	₩ 457,276,225	₩ 458,555,925	₩ 326,460,187	₩ 132,095,738	₩ -	₩ -
Interest expense	-	16,669,763	13,205,263	3,464,500	-	-
	₩ 457,276,225	₩ 475,225,688	₩ 339,665,450	₩ 135,560,238	₩ -	₩ -

	December 31, 2016					
		Nominal cash flows according to the contract				
	Book value	Total	Less than 1 year	1 year-2 years	2 years -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	₩ -	₩ -

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.

(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 at December 31, 2017 and 2016, are as follows (Korean won in thousand):

	December 31, 2017	December 31, 2016
Total liabilities	₩ 688,177,158	₩ 822,184,664
Total equity	543,169,929	534,264,862
Debt-to-equity ratio	126.70%	153.89%

4. Financial risk management (cont'd)

(5) Changes in liabilities from financial activities

	Jan. 1	Cash flow	Non-cash fluctuation: Acquisition	Non-cash fluctuation: Foreign exchange movement	Non-cash fluctuation: Changes in fair values	Non-cash fluctuation: Replacement of current portion	Others	Dec. 31
Short-term borrowings	₩ 51,439,725	₩ 73,418,097	₩ -	₩ (214,232)	₩ -	₩ -	₩ (235,624)	₩ 124,407,966
Current portion of long-term borrowings	45,000,000	(45,000,000)	-	-	-	30,000,000	-	30,000,000
	99,907,752	(100,000,000)	-	-	-	89,870,950	155,087	89,933,789
Long-term borrowings	30,000,000	-	-	-	-	(30,000,000)	-	-
Bonds	89,809,733	128,194,166	-	-	-	(89,870,950)	653,561	128,786,510
	₩ 316,157,210	₩ 56,612,263	₩ -	₩ (214,232)	₩ -	₩ -	₩ 573,024	₩ 373,128,265

5. Restricted financial instruments

Details of restricted financial instruments as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016	Remarks
Cash and cash equivalent	₩ 5,288,410	₩ -	A pledge to KEB Hana Bank
Short-term financial instruments	217,000	268,000	A pledge to Korea Gas Corporation
	3,722,752	-	A pledge to Korea Hydro & Nuclear Power Co.,Ltd.,
	1,167,826	-	A pledge to NongHyup Bank
Long-term financial instruments	6,000	6,000	Guarantee deposits for checking account
	₩ 10,401,988	₩ 274,000	

6. Trade and other receivables

Trade and other receivables as at December 31, 2017 and 2016, consist of the following (Korean won in thousand):

	December 31, 2017			December 31, 2016		
	Gross	Allowance for doubtful accounts	Carrying value	Gross	Allowance for doubtful accounts	Carrying value
Current:						
Trade receivables	₩ 33,001,833	₩ (2,693,774)	₩ 30,308,059	₩ 62,415,772	₩ (2,682,012)	₩ 59,733,760
Other receivables	416,861	(249,930)	166,931	16,315,081	(6,236)	16,308,845
Accrued income	37,041	-	37,041	16,133	-	16,133
Guarantee deposits	62,065	-	62,065	62,065	-	62,065
	33,517,800	(2,943,704)	30,574,096	78,809,051	(2,688,248)	76,120,803
Non-current						
Guarantee deposits	3,869,832	-	3,869,832	3,883,005	-	3,883,005
	₩ 37,387,632	₩ (2,943,704)	₩ 34,443,928	₩ 82,692,056	₩ (2,688,248)	₩ 80,003,808

The amounts include trade receivables factored with recourse that have not been fully derecognized as they have not met all or some of the derecognition critera (See Note 30).

6. Trade and other receivables (cont'd)

The changes in allowance for doubtful accounts for the year ended December 31, 2017, are as follows (Korean won in thousands):

	Jan. 1	Charge for the year	Unused amounts reversed	Dec. 31
Trade receivables	₩ (2,682,012)	₩ (11,762)	₩ -	₩ (2,693,774)
Other receivables	(6,236)	(243,694)	-	(249,930)
	₩ (2,688,248)	₩ (255,456)	₩ -	₩ (2,943,704)

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

7. Inventories

Inventories as at December 31, 2017 and 2016, are summarized as follows (Korean won in thousands):

	December 31, 2017			December 31, 2016		
	Acquisition cost	Valuation allowance	Book value	Acquisition cost	Valuation allowance	Book value
Work in progress	₩ 137,499,265	₩ (22,094,288)	₩ 115,404,978	₩ 164,194,968	₩ (36,098,526)	₩ 128,096,442
Raw materials	72,681,043	(19,858,871)	52,822,172	89,160,448	(17,456,402)	71,704,046
Materials in transit	2,335,797	-	2,335,797	3,988,273	-	3,988,273
	₩ 212,516,105	₩ (41,953,159)	₩ 170,562,947	₩ 257,343,689	₩ (53,554,928)	₩ 203,788,761

Losses on inventory valuation amounted to ₩11,601,768 thousand and ₩21,977,195 thousand for the years ended December 31, 2017 and 2016, respectively.

8. Long-term investment securities

Long-term investment securities as at December 31, 2017 and 2016, are summarized as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016
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	378,694,906	379,223,810
Equity securities in non-listed company:		
Doosan Engineering & Construction	16,829,026	18,446,750
Casco	1	1
	₩ 395,595,980	₩ 397,742,608

8. Long-term investment securities (cont'd)

Changes in fair value of AFS financial assets for the year ended December 31, 2017 are as follows (Korean won in thousands):

	Jan. 1	Valuation	Dec. 31
Equity securities in listed company	₩ 61,881,710	₩ (528,904)	₩ 61,352,806
Equity securities in non-listed company	(6,808,511)	(1,617,724)	(8,426,235)
Corporate tax effect	(13,327,714)	519,484	(12,808,230)
	₩ 41,745,485	₩ (1,627,144)	₩ 40,118,341

9. Derivatives

Details of the derivatives are as follows:

Purpose	Derivative instrument	Contract description
Fair value hedges	Foreign currency forwards	The amount of foreign currency upon maturity is fixed to the amount of won for the risk of exchange rate fluctuation exposed upon receipt of foreign currency receivables or payment of foreign currency payables.

Details of gains or losses on valuation of derivatives as at December 31, 2017 and 2016, are as follows (in foreign currencies and Korean won in thousands):

	December 31, 2017						
	Buy		Sell				
Derivative instrument	Currency	Amount	Currency	Amount	Assets (liabilities)	Gains (losses)	Firm commitment
Foreign currency forwards	KRW	366,295,873	USD	324,759,500	₩ 19,201,944	₩ 24,111,861	₩ (22,355,922)
	EUR	26,828,000	KRW	35,228,507	(661,005)	(400,357)	1,723,538
	CHF	7,094,000	KRW	8,433,960	(570,403)	(670,477)	529,328
					₩ 17,970,536	₩ 23,041,027	₩ (20,103,056)

	December 31, 2016						
	Buy		Sell				
Derivative instrument	Currency	Amount	Currency	Amount	Assets (liabilities)	Gains (losses)	Firm commitment
Foreign currency forwards	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)
					₩ (33,087,800)	₩ (26,545,319)	₩ 30,280,215

10. Financial instruments

Categories of financial instruments as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017				
	Loans and receivables	AFS financial assets	Derivatives	Book value	Fair value
Cash and cash equivalents	₩ 72,235,836	₩ -	₩ -	₩ 72,235,836	₩ 72,235,836
Long and short-term financial instruments	11,463,578	-	-	11,463,578	11,463,578
Trade and other receivables	30,574,096	-	-	30,574,096	30,574,096
Derivative assets	-	-	19,245,620	19,245,620	19,245,620
Long and short-term loans	1,464,651	-	-	1,464,651	1,464,651
Long-term investment securities	-	395,595,980	-	395,595,980	395,595,980
Long-term other receivables	3,869,832	-	-	3,869,832	3,869,832
	₩ 119,607,993	₩ 395,595,980	₩ 19,245,620	₩ 534,449,593	₩ 534,449,593

	December 31, 2017			
	Financial liabilities at amortized cost	Derivatives	Book value	Fair value
Trade and other payables	₩ 82,052,221	₩ -	₩ 82,052,221	₩ 82,052,221
Borrowings and bonds	373,128,265	-	373,128,265	373,128,265
Derivative liabilities	-	1,275,085	1,275,085	1,275,085
Long-term other payables	2,095,738	-	2,095,738	2,095,738
	₩ 457,276,224	₩ 1,275,085	₩ 458,551,309	₩ 458,551,309

	December 31, 2016				
	Loans and receivables	AFS financial assets	Derivatives	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
	₩ 162,577,294	₩ 397,742,608	₩ 634,824	₩ 560,954,726	₩ 560,954,726

10. Financial instruments (cont'd)

	December 31, 2016			
	Financial liabilities at amortized cost	Derivatives	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 other payables	2,594,127	-	2,594,127	2,594,127
	₩ 475,455,266	₩ 33,722,624	₩ 509,177,890	₩ 509,177,890

Fair value measurements of financial instruments by fair value hierarchy levels as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017			
	Level 1	Level 2	Level 3	Total
Financial assets:				
AFS financial assets	₩ 378,694,906	₩ 16,829,026	₩ -	₩ 395,523,932
Derivatives designated as hedging instruments	-	19,245,620	-	19,245,620
	378,694,906	36,074,646	-	414,769,552
Financial liabilities:				
Derivatives designated as hedging instruments	-	(1,275,085)	-	(1,275,085)
	₩ 378,694,906	₩ 34,799,561	₩ -	₩ 413,494,467

	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
	379,223,810	19,081,574	-	398,305,384
Financial liabilities:				
Derivatives designated as hedging instruments	-	(33,722,624)	-	(33,722,624)
	₩ 379,223,810	₩ (14,641,050)	₩ -	₩ 364,582,760

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.

10. Financial instruments (cont'd)

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.

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.

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

Comprehensive income (loss) by categories of financial instruments for the years ended December 31, 2017 and 2016, is as follows (Korean won in thousands):

	2017							
	Profit or loss							Other comprehensive income
	Interest	Dividend	Valuation	Impairment /Reversal	Disposal	Foreign exchange	Others	
Financial instruments:								
Loans and receivables	₩ 1,132,414	₩ -	₩ -	₩ (255,456)	₩ (12,417)	₩ (10,753,639)	₩ -	₩ -
AFS financial assets	-	7,404,649	-	-	-	-	-	(2,146,628)
	₩ 1,132,414	₩ 7,404,649	₩ -	₩ (255,456)	₩ (12,417)	₩ (10,753,639)	₩ -	₩ (2,146,628)
Financial liabilities:								
Financial liabilities at amortized cost	₩ (16,635,383)	₩ -	₩ -	₩ -	₩ -	₩ 655,981	₩ -	₩ -
	₩ (16,635,383)	₩ -	₩ -	₩ -	₩ -	₩ 655,981	₩ -	₩ -

10. Financial instruments (cont'd)

	2016							
	Profit or loss							Other comprehensive income
	Interest	Dividend	Valuation	Impairment /Reversal	Disposal	Foreign exchange	Others	
Financial instruments:								
Loans and receivables	₩ 984,911	₩ -	₩ -	₩ 24,650	₩ (20,086)	₩ 5,732,405	₩ -	₩ -
AFS financial assets	-	-	-	(261,450,872)	(578,098)	-	-	55,073,199
	₩ 984,911	₩ -	₩ -	₩ (261,426,222)	₩ (598,184)	₩ 5,732,405	₩ -	₩ 55,073,199
Financial liabilities:								
Financial liabilities at amortized cost	₩ (14,408,241)	₩ -	₩ -	₩ -	₩ -	₩ (329,130)	₩ -	₩ -
Financial guarantee contracts	-	-	-	-	-	-	265,132	-
	₩ (14,408,241)	₩ -	₩ -	₩ -	₩ -	₩ (329,130)	₩ 265,132	₩ -

Comprehensive income (loss) from other financial instruments than the above for the years ended December 31, 2017 and 2016, is as follows (Korean won in thousands):

	December 31, 2017			December 31, 2016		
	Profit or loss		Other comprehensive income	Profit or loss		Other comprehensive income
	Valuation	Disposal		Valuation	Disposal	
Derivatives	₩ 23,041,027	₩ 36,809,257	₩ -	₩ (26,545,319)	₩ 7,532,916	₩ -

11. Investments in associates

Investments in associates as at December 31, 2017 and 2016, consist of the following (Korean won in thousands):

Company	Country	Percentage of ownership (%)	Acquisition cost		Book value		Proportionate share of net assets	
			December 31, 2017	December 31, 2016	December 31, 2017	December 31, 2016	December 31, 2017	December 31, 2016
Dalian Samyoung Doosan Metal Product Co., Ltd. ("DSDMP") (*1)	China	10.80	₩ 2,675,402	₩ 2,675,402	₩ 2,735,196	₩ 3,043,907	₩ 2,735,196	₩ 3,043,907
Doosan Cuvex Co., Ltd. (*2)	Korea	3.71	4,155,085	4,155,085	3,648,343	4,170,995	3,648,343	4,170,995
DBC (*3)	Korea	2.20	5,786,000	-	5,781,716	-	5,781,716	-
			₩ 12,616,487	₩ 6,830,487	₩ 12,165,255	₩ 7,214,902	₩ 12,165,255	₩ 7,214,902

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

(*2) The investment in Doosan Cuvex Co., Ltd. had been classified as investments in associates despite the Company's equity interest in the investee is less than 20%, as the Company has entered into an agreement for the appointment of the chief executive officer of the investee.

(*3) Although the Group's direct ownership in the investee is less than 20%, it is classified as investments in associates since the Group exercises rights for agreement on its major transactions. DBC has undergone equal capital reduction in January 2018, and the book value is ₩2,332,000 thousand, thereafter. Moreover, DBC has borrowed ₩375 billion under the PF loan agreement with Koramco REIT 69 (the "PF lender") in January 2018. As the PF lender requested for the repayment of the loan and valuation of building, the shareholders excluding Doosan Co. have pledged their stocks to KSFC and the lease agreement for Doosan Bundang Center has been signed.

Meanwhile, the above investments in associates have no quoted market prices in active markets.

Changes in investments in associates for the years ended December 31, 2017 and 2016, consist of the following (Korean won in thousands):

	2017					
	January 1,	Acquisition	Share of profit (loss)	Increase (decrease) in equity of associates	Disposal	December 31,
DSDMP	₩ 3,043,907	₩ -	₩ (143,135)	₩ (165,576)	₩ -	₩ 2,735,196
Doosan Cuvex Co., Ltd	4,170,995	-	(36,510)	(98,309)	(387,833)	3,648,343
DBC	-	5,786,000	(4,284)	-	-	5,781,716
	₩ 7,214,902	₩ 5,786,000	₩ (183,929)	₩ (263,885)	₩ (387,833)	₩ 12,165,255

11. Investments in associates (cont'd)

Company	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
	₩ 391,382,540	₩ 4,155,085	₩ 10,673,346	₩ 18,093,356	₩ (2,241,451)	₩ (414,847,974)	₩ 7,214,902

The condensed financial information of the investees as of and for the years ended December 31, 2017 and 2016, is as follows (Korean won in thousands):

Group	As of and for the year ended December 31, 2017							
	Assets		Liabilities					
	Current	Non-current	Current	Non-current	Sales	Net income (loss)	Comprehensive income (loss)	Dividends
DSDMP	₩ 17,744,829	₩ 17,702,836	₩ 10,121,774	₩ -	₩ 10,667,922	₩ (1,325,324)	₩ (2,858,436)	₩ -
Doosan Cuvex Co., Ltd.	9,144,186	206,312,181	55,635,706	46,936,327	37,671,798	(1,002,384)	589,311	-
DBC	77,013,842	185,791,100	(331)	-	-	(194,727)	(194,727)	

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).

11. Investments in associates (cont'd)

Reconciliation of book value of investments in associates as at December 31, 2017 and 2016, is as follows (Korean won in thousands):

	2017				
	Net assets (a)	Ratio (%) (b)	Net asset value (a*b)	Goodwill	Book value
DSDMP	₩ 25,325,891	10.80	₩ 2,735,196	₩ -	₩ 2,735,196
Doosan Cuvex Co., Ltd.	98,259,836	3.71	3,648,343	-	
DBC	262,805,273	2.20	5,781,716	-	5,781,716
	₩ 386,391,000		₩ 12,165,255	₩ -	₩ 12,165,255

	2016				
	Net assets (a)	Ratio (%) (b)	Net asset value (a*b)	Goodwill	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
	₩ 167,614,871		₩ 7,214,902	₩ -	₩ 7,214,902

12. Property, plant and equipment

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

	2017					
	Land	Buildings and structures	Machinery	Others	Construction in progress	Total
Jan. 1	₩ 271,724,973	₩ 150,695,892	₩ 61,625,930	₩ 1,752,720	₩ 12,395,179	₩ 498,194,694
Acquisition	96,591	677,865	1,383,257	685,392	109,125	2,952,230
Transfer (*1)	-	1,500,000	1,560,208	126,410	(3,562,072)	(375,454)
Net changes from Revaluation	24,449,693	-	-	-	-	24,449,693
Disposal	(6,367,943)	(3,691,291)	(69,845)	(60,356)	(8,595,576)	(18,785,011)
Depreciation	-	(5,998,342)	(9,183,688)	(776,383)	-	(15,958,413)
Foreign difference	-	(730,759)	(187,241)	(30,990)	-	(948,990)
Dec. 31	₩ 289,903,314	₩ 142,453,365	₩ 55,128,621	₩ 1,696,793	₩ 346,656	₩ 489,528,749
-Acquisition cost	192,116,133	204,598,384	194,694,343	53,872,674	346,656	645,628,190
-Accumulated depreciation	-	(62,145,019)	(139,565,722)	(52,175,881)	-	(253,886,622)
-Revaluation surplus	97,787,181	-	-	-	-	97,787,181

(*1) Some of construction in progress are transferred into intangible assets

12. Property, plant and equipment (cont'd)

	2016					
	Land	Buildings and structures	Machinery	Others	Construction in progress	Total
Jan. 1	₩ 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)	(2,538,230)	(28,959)	-	(2,591,550)
Depreciation	-	(6,009,453)	(9,027,794)	(1,068,737)	-	(16,714,278)
Foreign difference	-	(418,923)	(115,683)	(17,619)	-	(552,225)
Dec. 31	₩ 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

(*1) The ₩4,526,814 thousand was transferred into assets held for sale.

The Group recognized the land subsequently measured at revaluation amount. If the land is stated at cost, the land would amount to ₩192,116,133 thousand and ₩197,800,282 thousand as at December 31, 2017 and 2016, respectively.

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

(2) The details of revaluation model are as follows:

The Group measured all land using fair value at the date of the revaluation. As at December 31, 2017, the fair value of land was determined from the appraisal that was undertaken by independently qualified valuator, Pacific Appraisal Group Limited ("Pacific"), on October 31, 2017. 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 by fair value hierarchy level as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017			December 31, 2016		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Land	₩ -	₩ -	₩ 289,903,314	₩ -	₩ -	₩ 271,724,973

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 fluctuation 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).

12. Property, plant and equipment (cont'd)

(4) Changes in land for the year ended December 31, 2017, are as follows (Korean won in thousands):

January 1, 2017	Acquisition	Disposal	Transfer	Revaluation increase: Other comprehensive income	Revaluation increase: Profit (loss)	December 31, 2017
₩ 271,724,973	₩ 96,591	₩ (6,367,943)	₩ -	₩ 24,534,231	₩ (84,538)	₩ 289,903,314

(5) Changes in revaluation surplus and classification by the asset for the year ended December 31, 2017, are as follows (Korean won in thousands):

January 1, 2017	Increase	Disposal: Property, plant and equipment	Disposal: Assets held for sale	December 31, 2017	Classification: Property, plant and equipment	Classification: Assets held for sale
₩ 73,924,691	₩ 24,534,231	₩ (671,741)	₩ -	₩ 97,787,181	₩ 97,787,181	₩ -

The revaluation surplus do not reflect tax effect.

(6) Classification of depreciation expenses for the years ended December 31, 2017 and 2016, is as follows (Korean won in thousands):

	2017	2016
Cost of sales	₩ 15,649,019	₩ 16,314,100
Selling and administrative expenses	100,400	191,184
Selling and administrative expenses-expenditure on research and development	208,994	-
Development costs	-	208,994
	₩ 15,958,413	₩ 16,714,278

13. Intangible assets

Changes in intangible assets for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017							
	Development costs		Software		Others		Total	
January 1	₩	2,746,093	₩	1,660,686	₩	3,349,166	₩	7,755,945
Acquisition		-		256,208		-		256,208
Transfer		-		375,454		-		375,454
Disposal		-		-		(278,000)		(278,000)
Amortization		(559,698)		(959,595)		(191,195)		(1,710,488)
Reversal of impairment loss		-		-		65,970		65,970
December 31	₩	2,186,395	₩	1,332,753	₩	2,945,941	₩	6,465,089
-Acquisition cost	₩	24,554,215	₩	14,757,289	₩	4,224,015	₩	43,535,519
-Accumulated amortization		(22,367,820)		(13,424,536)		(1,278,074)		(37,070,430)

	2016							
	Development costs		Software		Others		Total	
January 1	₩	21,050,373	₩	3,508,547	₩	3,984,361	₩	28,543,281
Acquisition		2,600,812		275,300		-		2,876,112
Transfer		1,304,614		656,850		-		1,961,464
Disposal		-		-		(335,500)		(335,500)
Amortization		(401,584)		(2,780,011)		(191,195)		(3,372,790)
Impairment		(21,808,122)		-		(108,500)		(21,916,622)
Foreign exchange difference		-		(8)				(8)
December 31	₩	2,746,093	₩	1,660,686	₩	3,349,166	₩	7,755,945
-Acquisition cost	₩	47,192,098	₩	14,125,627	₩	4,502,015	₩	65,819,740
-Accumulated amortization		(44,446,005)		(12,464,941)		(1,152,849)		(58,063,795)

The carrying amount of membership with indefinite useful lives in other intangible assets item is ₩1,830,083 thousand and ₩2,042,113 thousand as at December 31, 2017 and 2016, respectively. Expenditure on research and development, which was recognized as expenses, amounted to ₩10,963,284 thousand and ₩6,547,995 thousand for the years ended December 31, 2017 and 2016, respectively.

Borrowing costs added to the cost of intangible assets for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017		2016	
Borrowing costs added to the cost of intangible assets	₩	-	₩	889,458
Interest rate (%)		-		4.30%

Classification of amortization expense for the years ended December 31, 2017 and 2016, is as follows (Korean won in thousands):

	2017		2016	
Cost of sales	₩	741,898	₩	2,564,155
Selling and administrative expenses		848,590		688,635
Selling and administrative expenses -expenditure on research and development		120,000		-
Development costs		-		120,000
	₩	1,710,488	₩	3,373,109

13. Intangible assets (cont'd)

The impairment loss of intangible assets is as follows.

	Individual asset	Book value	The amount of impairment loss: Amount recognized in current period	The amount of impairment loss: Accumulated amount	Method of valuation of recoverable amount
Development costs	SCR Development	₩ 2,186,395	₩ -	₩ (21,808,122)	Value in use

As the Group can not reliably estimate the fair value of an asset in relation to its development cost, the Group measured the recoverable amount as value in use. The future cash flow to measure the used value has been estimated for the next four years based on the Group's past sales performance and future business plans. The discount rate for measuring used values is estimated to be 8.85 %, the weighted average capital cost adjusted, reflecting the inherent risk of the asset

14. Borrowing and bonds

(1) Bonds as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	Interest rate (%)	December 31, 2017	December 31, 2016
The 6th	-	₩ -	₩ 100,000,000
The 7th	5.00	90,000,000	90,000,000
The 8th	4.60	130,000,000	-
		220,000,000	190,000,000
Less current portion		(89,933,789)	(99,907,752)
Less discount on bonds		(1,279,700)	(282,515)
		₩ 128,786,511	₩ 89,809,733

14. Borrowing and bonds (cont'd)

(2) Short-term borrowings

	Finance institutions	Interest rate (%)	December 31, 2017	December 31, 2016
Short-term borrowings in foreign currency	Woori Bank	-	₩ -	₩ 2,432,106
	The Export-Import Bank of Korea	3.99+LIBOR	3,207,965	4,807,617
			3,207,965	7,239,723
Short-term borrowings in Korean won:	NH Bank	3M MOR+2.81	12,000,000	-
		3.74	19,200,000	19,200,000
	Korea Development Bank	6.15	15,000,000	25,000,000
	The Export-Import Bank of Korea	5.20	25,000,000	-
	KB Securities Co., Ltd	3.40	40,000,000	-
	Korea Investment & Securities Co., Ltd.,	3.40	10,000,000	-
			121,200,000	44,200,000
			₩ 124,407,965	₩ 51,439,724

(3) Long-term borrowings

	Finance institutions	Interest rate (%)	December 31, 2017	December 31, 2016
Short-term borrowings in Korean won	NH Bank	-	₩ -	₩ 20,000,000
	Korea Development Bank	-	-	25,000,000
		3M CD+2.06	30,000,000	30,000,000
			30,000,000	75,000,000
Less current portion			(30,000,000)	(45,000,000)
			₩ -	₩ 30,000,000

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.

Details of retirement benefit obligation as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016
Present value of defined benefit obligation	₩ 33,232,700	₩ 33,728,883
Fair value of plan assets	(30,282,077)	(27,209,422)
	₩ 2,950,623	₩ 6,519,461

Expenses recognized in profit and loss for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Current service cost	₩ 4,130,309	₩ 4,047,021
Net interest cost (interest cost – expected return on plan assets)	231,823	266,597
	₩ 4,362,132	₩ 4,313,618

Classification of the expenses related to the retirement benefit obligation recognized in the separate statements of income for the years ended December 31, 2017 and 2016, is as follows (Korean won in thousands):

	2017	2016
Cost of sales	₩ 3,254,503	₩ 3,138,463
Selling and administrative expenses	1,017,449	1,088,994
Selling and administrative expenses -expenditure on research and development	90,180	-
Development costs	-	86,161
	₩ 4,362,132	₩ 4,313,618

15. Retirement benefit obligation (cont'd)

Changes in defined benefit obligations for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Beginning balance	₩ 33,728,883	₩ 29,549,919
Current service cost	4,130,309	4,047,021
Transfer in	267,218	67,783
Transfer out	(506,710)	(261,440)
Interest cost	782,989	713,660
Remeasurements of defined benefit liabilities:	(3,025,846)	482,789
- Changes in demographic assumptions	(1,432,755)	(735,843)
- Changes in financial assumptions	(3,023,774)	179,806
- Others	1,430,683	1,038,826
Benefit paid	(2,144,143)	(870,849)
Ending balance	₩ 33,232,700	₩ 33,728,883

Changes in plan assets for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Beginning balance	₩ 27,209,422	₩ 21,617,042
Expected return on plan assets	551,166	447,063
Remeasurements of plan assets	(241,930)	(149,666)
Contributions by employer directly to plan assets	4,000,000	6,311,338
Benefit paid	(1,337,980)	(870,849)
Transfer in	133,121	-
Transfer out	(31,722)	(145,506)
Ending balance	₩ 30,282,077	₩ 27,209,422

Assumptions used for actuarial valuation as at December 31, 2017 and 2016, are as follows:

	December 31, 2017	December 31, 2016
Discount rate for defined benefit obligations	3.40%	2.50%
Expected rate of salary increase:		
Employee	2.00%	2.00%
Officer	2.40%	3.20%

Details of plan assets as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Debt securities	₩ 4,940,509	₩ 2,894,079
Equity securities	1,559,883	1,997,085
Loans	196,699	95,157
Deposits	23,371,412	21,468,413
Others	213,574	754,688
	₩ 30,282,077	₩ 27,209,422

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

15. Retirement benefit obligation (cont'd)

The sensitivity analysis for the significant actuarial assumptions as at December 31, 2017 and 2016, is as follows (Korean won in thousands):

	2017		2016	
	Amount	Rate	Amount	Rate
Discount rate:				
1% increase	₩ (2,797,905)	(-)8.42%	₩ (1,521,422)	(-)4.62%
1% decrease	3,270,363	9.84%	1,692,394	4.90%
Salary increase rate:				
1% increase	2,962,321	8.91%	1,490,794	(1,374,102)
1% decrease	(2,597,072)	(-)7.81%	4.30%	(-)4.17%

Information about the maturity profile of the defined benefit obligation as at December 31, 2017 and 2016, is as follows (Korean won in thousands):

	December 31, 2017			
	Less 1year	1 ~ 2 years	2 ~ 5 years	More than 5 years
Expected payment	₩ 1,923,194	₩ 3,991,953	₩ 9,326,047	₩ 15,278,682

	December 31, 2016			
	Less 1year	1 ~ 2 years	2 ~ 5 years	More than 5 years
Expected payment	₩ 4,818,679	₩ 6,453,650	₩ 14,633,269	₩ 17,130,976

16. Provisions

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

	2017			
	Warranty	Litigation	Compensation of deferment	Total
Beginning balance	₩ 6,352,679	₩ 608,904	₩ 1,573,449	₩ 8,535,032
Accrual	3,217,251	-	(1,468,051)	1,749,200
Use	(1,762,153)	-	-	(1,762,153)
Others (*1)	2,314,168	146,136	-	2,460,304
Foreign exchange difference	-	-	(105,398)	(105,398)
Ending balance	₩ 10,121,945	₩ 755,040	₩ -	₩ 10,876,985
Current	5,980,700	755,040	-	6,735,740
Non-current	4,141,245	-	-	4,141,245

(*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.

16. Provisions (cont'd)

	2016			
	Warranty	Litigation	Compensation of deferment	Total
Beginning balance	₩ 7,467,932	₩ -	₩ -	₩ 7,467,932
Accrual	(618,508)	-	1,537,077	918,569
Use	(2,113,264)	-	-	(2,113,264)
Others (*1)	1,616,519	608,904	-	2,225,423
Foreign exchange difference	-	-	36,372	36,372
Ending balance	₩ 6,352,679	₩ 608,904	₩ 1,573,449	₩ 8,535,032
Current	2,512,167	608,904	1,573,449	4,694,520
Non-current	3,840,512	-	-	3,840,512

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

17. Share capital and capital surplus

There were no changes in share capital and capital surplus for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands, except for number of shares):

December 31, 2017 and 2016			
Number of shares	Par value	Capital stock	Capital surplus
69,500,000	₩ 1,000	₩ 69,500,000	₩ 367,214,701

The Group'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 components

(1) Other capital components as at December 31, 2017 and 2016, are summarized as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016
Share options	₩ 621,478	₩ 621,478

(2) Share-based payment

The Group 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 2-year service after the resolution at the stockholders' meeting.

The number of granted options as at December 31, 2017, 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	6,500shares	2014.3.25 - 2021.3.24	₩ 21,600	₩ 10,343
2nd	2012.3.30	18,200shares	2015.3.30 - 2022.3.29	13,300	4,653
3rd	2013.3.29	49,200shares	2016.3.29 - 2023.3.28	9,050	3,383
4th	2014.3.28	24,000shares	2017.3.28 - 2024.3.27	9,490	3,583

The Group 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 3-year treasury bond yield rate.

18. Other capital components (cont'd)

Changes in share options for the year ended December 31, 2017, are as follows:

a) Number of common shares to be issued:

	January 1	Granted	Exercised	Canceled	December 31
1st	6,500	-	-	-	6,500
2nd	19,700	-	-	(1,500)	18,200
3rd	83,700	-	-	(34,500)	49,200
4th	24,000	-	-	-	24,000
	133,900	-	-	(36,000)	97,900

b) Valuation amount (Korean won in thousands):

	January 1	Granted	Exercised	Canceled	December 31
1st	₩ 112,739	₩ -	₩ -	₩ -	₩ 112,739
2nd	139,590	-	-	-	139,590
3rd	283,157	-	-	-	283,157
4th	85,992	-	-	-	85,992
	₩ 621,478	₩ -	₩ -	₩ -	₩ 621,478

The related expense amounted to ₩ (1,565) thousand for the year ended December 31, 2016.

19. Accumulated other comprehensive income

Accumulated other comprehensive income as at December 31, 2017 and 2016, is as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016
Loss on valuation of AFS financial assets	₩ 40,118,340	₩ 41,745,485
Overseas operation translation	566,395	134,214
Negative capital variation of equity method	947,557	1,211,442
Revaluation surplus of land	74,122,683	56,034,916
	₩ 115,754,975	₩ 99,126,057

20. Retained earnings

Retained earnings as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016
Legal reserve	₩ 1,200,000	₩ 1,200,000
Voluntary reserve	2,700,000	2,700,000
Undisposed deficits	(13,821,225)	(6,097,374)
	₩ (9,921,225)	₩ (2,197,374)

20. Retained earnings (cont'd)

Changes in retained earnings for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Beginning balance	₩ (2,197,374)	₩ 174,721,228
Net loss for the period	(10,343,240)	(181,226,463)
Remeasurements of defined benefit liabilities	2,110,209	(479,401)
Change of retained earnings in associates	-	(2,241,450)
Revaluation surplus of land	509,180	7,028,712
Ending balance	₩ (9,921,225)	₩ (2,197,374)

21. Sales

Details of sales for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Sales of goods	₩ 734,089,037	₩ 762,695,737
Construction sales	31,483,025	34,446,339
Others	3,298,235	5,774,507
	₩ 768,870,297	₩ 802,916,583

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.

The following table provides sale information by geographical segment for the years ended December 31, 2017 and 2016 (Korean won in thousands):

	2017	2016
Domestic	₩ 532,978,583	₩ 626,488,252
Overseas	245,835,865	191,733,473
	778,814,448	818,221,725
Adjustments	(9,944,151)	(15,305,142)
	₩ 768,870,297	₩ 802,916,583

22. Segment information (cont'd)

There is a single external customer who accounted for 10% or more of the Group's sales for the years ended December 31, 2017 and 2016 (Korean won in thousands):

	2017	2016
Samsung Heavy Industries Co., Ltd.	₩ 166,282,563	₩ 263,185,354
Daewoo Shipbuilding & Marine Engineering Co., Ltd.	219,032,112	206,700,312
	₩ 385,314,675	₩ 469,885,666

23. Construction contracts

Details of construction cantracts in progress for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017					
	Accumulated revenue	Accumulated cost	Accumulated profit	Receivables	Due from customers for construction contracts	Due to customers for construction contracts
Diesel engine	₩ 263,995,939	₩ 227,479,122	₩ 36,516,817	₩ 144,208	₩ 1,451,141	₩ 11,492,219

	2016					
	Accumulated revenue	Accumulated cost	Accumulated profit	Receivables	Due from customers for construction contracts	Due to customers for construction contracts
Diesel engine	₩ 233,372,150	₩ 187,819,298	₩ 45,552,852	₩ 451,602	₩ 15,762,004	₩ 16,562,497

Major construction contract for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017					
Order	Description	Construction period	January 1	Increase (Decrease)	Sales	December 31
KHNP and six other companies	Singori No. 3 and No. 4 emergency generators, alternative AC power diesel engine and 10 others	2009-06-23 ~ 2018-03-31	₩ 49,930,584	₩ 2,237,766	₩ (31,483,025)	₩ 20,685,325

	2016					
Order	Description	Construction period	January 1	Increase (Decrease)	Sales	December 31
KHNP and six other companies	Singori No. 3 and No. 4 emergency generators, alternative AC power diesel engine and 10 others	2009-06-23 ~ 2018-02-28	₩ 85,207,761	₩ (830,838)	₩ (34,446,339)	₩ 49,930,584

23. Construction contracts (cont'd)

Under the stage-of-completion method, changes in total contract revenues, estimated total contract costs, and due from customers for construction contracts from changes in accounting estimates for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	Changes in estimated total contract cost	Effect on profit or loss in current period	Impact on the current profit (loss)	Impact on the future profit (loss)	Changes in unbilled construction receivables
Diesel engine	₩ 2,501,960	₩ (4,737,334)	₩ (3,686,551)	₩ (4,737,334)	₩ 124,067

The effect on profit or loss is determined based on the current estimates of total contract revenue and total contract costs which reflect circumstances until the current period. The estimates of total contract revenue and total contract cost may change in the subsequent periods.

The contracts which contract price is at least 5% of previous sales which is recognized on the percentage of completion method applying the cost incurred method are as follows (Korean won in millions):

				Due from customers for construction contracts		Receivables from construction contracts	
	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	2018-03-31	99.9%	₩ 1,451,141	₩ -	₩ -	₩ -

24. Expenses classified by nature

Expenses classified by nature for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Changes in inventories	₩ 33,225,814	₩ (4,807,356)
Purchase of raw materials	466,737,097	522,034,581
Salaries	71,173,118	71,888,691
Other employee benefits	13,134,405	11,180,859
Depreciation and amortization	17,668,901	19,758,392
Commission expenses	48,808,971	54,572,185
Others	104,644,567	124,051,957
	₩ 755,392,873	₩ 798,679,309

25. Selling and administrative expenses

Selling and administrative expenses for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Salaries	₩ 14,974,277	₩ 16,821,194
Other employee benefits	2,943,028	2,508,710
Pension benefits	1,017,449	1,088,994
Commission expenses	5,383,812	4,936,005
Depreciation	100,400	191,184
Amortization	848,590	688,635
Advertising and marketing expenses	971,203	517,523
Rental expenses	1,097,583	1,233,200
Allowance for bad debt	11,762	(24,650)
Research and ordinary development costs	10,963,284	6,547,995
Others	3,186,486	2,885,418
	₩ 41,497,874	₩ 37,394,208

26. Financial income and expenses

Finance income and expenses for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Finance income:		
Interest income	₩ 1,132,414	₩ 984,911
Dividend income	7,404,649	-
Income from financial guarantee	-	265,132
Gain on foreign currency transaction	16,860,249	31,438,725
Gain on foreign currency translation	1,058,133	1,785,822
Gain on derivative transaction	43,493,817	25,632,422
Gain on valuation of derivatives	24,200,893	687,349
Gain on valuation of firm commitments	4,706,796	35,784,039
	98,856,952	96,578,400
Finance expenses:		
Interest expenses	16,635,383	14,408,241
Expense for financial guarantee	615,397	501,642
Loss on foreign currency transaction	25,737,592	26,856,671
Loss on foreign currency translation	2,278,448	964,600
Loss on derivative transaction	6,684,559	18,099,506
Loss on valuation of derivatives	1,159,866	27,232,668
Loss on valuation of firm commitments	64,051,626	26,948,754
	117,162,871	115,012,082
	₩ (18,305,919)	₩ (18,433,682)

27. Other non-operating income and expenses

Other non-operating income and expenses for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Other non-operating income:		
Rental income	₩ 297,600	₩ 329,864
Gain on disposal of property, plant and equipment	1,979,569	267,497
Gain on disposal of intangible assets	17,091	-
Recovery of impairment losses on intangible assets	65,970	17,500
Recovery of impairment losses on assets held for sale	-	311,227
Gain on revaluation of land	29,568	-
Other income	1,645,860	522,903
	4,035,658	1,448,991
Other non-operating expenses:		
Loss on disposal of trade receivables	12,417	20,086
Loss on disposal of property, plant and equipment	434,109	1,941,964
Loss on disposal of intangible assets	12,364	10,500
Impairment loss on intangible assets	-	21,934,122
Loss on disposal of assets held for sale	813,000	508,306
Impairment loss on assets held for sale	-	12,650,120
Other allowance for doubtful accounts	243,693	-
Loss on disposal of AFS financial assets	-	578,098
Impairment loss on AFS financial assets	-	261,450,872
Donations	624,191	679,429
Loss on revaluation of land	114,105	-
Other loss	1,273,942	4,208,742
	3,527,821	303,982,239
	₩ 507,837	₩ (302,533,248)

28. Income tax expense

Details of income tax expense for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Current income tax expense	₩ 30,681	₩ 117,426
Changes in deferred tax assets (liabilities) related to temporary differences	11,511,644	6,489,624
Deferred tax assets (liabilities) directly reflected in equity	(6,091,508)	(13,174,660)
Income tax expense (benefit)	₩ 5,450,817	₩ (6,567,610)

28. Income tax expense (cont'd)

Changes in deferred tax assets and liabilities for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017			
		Change		
	January 1	Profit or loss	Equity	December 31
Foreign currency translation, net	₩ (251,062)	₩ 561,911	₩ -	₩ 310,849
Depreciation	2,476,419	1,148,590	-	3,625,009
Allowance for doubtful accounts	758,720	(170,822)	-	587,898
Accrued income	47,159	(56,123)	-	(8,964)
Loss on inventory valuation	11,736,159	(1,356,658)	-	10,379,501
Currency forwards	8,007,248	(12,356,118)	-	(4,348,870)
Firm commitment assets	(7,327,812)	12,192,752	-	4,864,940
Loss on investment assets	(12,357,256)	-	519,484	(11,837,772)
Other intangible assets	152,213	(45,659)	-	106,554
Accrued expenses	5,838,398	(415,721)	-	5,422,677
Unearned revenue	(857,925)	968,293	-	110,368
Provision for construction warranties	1,537,348	912,163	-	2,449,511
Provision for defined pension liabilities	1,177,454	172,256	(673,708)	676,002
Gain on revaluation of land and buildings	(51,835,100)	(82,794)	(5,937,284)	(57,855,178)
Advance payment	17,287	(2,347)	-	14,940
Provision for litigation	147,355	35,365	-	182,720
Development costs	10,642,553	(1,052,977)	-	9,589,576
Assets held for sale	3,043,408	(3,043,408)	-	-
Dividend income	-	(1,791,925)	-	(1,791,925)
Investments in associates	(3,850)	3,850	-	-
Others	(4,169)	576,487	-	572,318
	(27,055,453)	(3,802,885)	(6,091,508)	(36,949,846)
Tax deficit carryforwards	18,204,281	(1,617,250)	-	16,587,031
	₩ (8,851,172)	₩ (5,420,135)	₩ (6,091,508)	₩ (20,362,815)

28. Income tax expense (cont'd)

	2016			
		Change		
	January 1	Profit or loss	Equity	December 31
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 valuation	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 investment assets	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 defined pension liabilities	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 payment	272,815	(255,528)	-	17,287
Provision for litigation	-	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 associates	-	(3,850)		(3,850)
Others	47,117	(51,286)	-	(4,169)
	(25,870,119)	11,989,326	(13,174,660)	(27,055,453)
Tax credit carryforwards	1,228,695	(1,228,695)	-	-
Donations in excess of tax limit	90,890	(90,890)	-	-
Tax deficit carryforwards	22,188,986	(3,984,705)	-	18,204,281
	₩ (2,361,548)	₩ 6,685,036	₩ (13,174,660)	₩ (8,851,172)

Deductible temporary differences, tax deficit and unused tax credit, which have not been recognized as deferred income tax assets expired and unused, as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016
Deductible temporary differences:		
Long-term investment securities	₩ 233,437,065	₩ 233,437,065
Donations in excess of tax limit	1,798,230	1,174,039
Unused tax deficit	210,076,300	187,473,027
Unused tax credit	2,128,440	2,028,476

28. Income tax expense (cont'd)

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

	0–1 year	1 year–2 years	2 years–3 years	More than 3 years	Total
Deductible temporary differences:					
Long-term investment securities	₩ -	₩ -	₩ -	₩ 233,437,065	₩ 233,437,065
Donations in excess of tax limit	124,088	154,862	220,715	1,298,565	1,798,230
Unused tax deficit	3,270,370	2,065,475	489,114	204,251,341	210,076,300
Unused tax credit	881,754	793,248	148,926	304,512	2,128,440

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.

Temporary differences associated with investments in subsidiaries and associates, which are not recognized as deferred tax assets, as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017	December 31, 2016	Remarks
Subsidiaries	₩ 9,477,799	₩ 10,939,878	Reversibility is not high
Associates	451,232	(384,415)	Reversibility is not high
	₩ 9,929,031	₩ 10,555,463	

Deferred tax assets (liabilities) and income tax benefits (expenses) added to (deducted from) the equity as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	December 31, 2017			December 31, 2016		
	Before tax	Deferred tax assets (liabilities)	After tax	Before tax	Deferred tax assets (liabilities)	After tax
Remeasurements of defined benefit liabilities	₩ (2,229,548)	₩ 539,551	₩ (1,689,997)	₩ (5,013,465)	₩ 1,213,258	₩ (3,800,207)
Revaluation surplus of land	97,787,181	(23,664,498)	74,122,683	73,924,691	(17,889,775)	56,034,916
Gain on valuation of AFS financial assets	61,352,806	(14,847,379)	46,505,427	61,881,710	(14,975,374)	46,906,336
Loss on valuation of AFS financial assets	(8,426,235)	2,039,149	(6,387,086)	(6,808,511)	1,647,660	(5,160,851)
	₩ 148,484,204	₩ (35,933,177)	₩ 112,551,027	₩ 123,984,425	₩ (30,004,231)	₩ 93,980,194

28. Income tax expense (cont'd)

A reconciliation of income tax expense and accounting income before income tax expense for the years ended December 31, 2017 and 2016, is as follows (Korean won in thousands):

	2017	2016
Loss before income tax expense	₩ (4,892,422)	₩ (187,794,074)
Income tax expense at statutory income tax rate	(1,183,966)	(45,446,166)
Adjustments:		
Additional payment of income tax	30,681	117,423
Non-temporary difference	(59,441)	93,927
Tax credits	-	82,773
Temporary difference not recognized as deferred income tax	7,016,309	39,476,917
Others	(352,766)	(892,484)
Income tax expense (benefit)	5,450,817	(6,567,610)
Effective tax rate	(*1)	(*1)

(*1) 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 parent shareholders by the weighted-average number of common shares outstanding during the period (Korean won in thousands, except for share data).

	2017	2016
Net loss attributable to parent shareholders	₩ 10,343,240	₩ 181,226,463
Weighted-average number of common shares outstanding (*)	69,500,000	69,500,000
Basic net loss per share	149	2,608

The weighted-average number of common shares outstanding for the years ended December 31, 2017 and 2016, 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, 2017 and 2016, because there is no dilutive effect of potential ordinary share (share-based payment). Diluted earnings per share are equal to earnings per share for the years ended December 31, 2017 and 2016.

Due to the antidilutive effect for the years ended December 31, 2017 and 2016, the Group is not considering share option, which could dilute the basic earnings per share in the future.

	2017	2016
Number of common shares to be issued	97,900	133,900

30. Commitments and contingencies

(1) Notes and checks provided as collateral

As at December 31, 2017, the Group has provided 6 (as at December 31, 2016: 6) blank promissory notes and 20 (as at December 31, 2016: 20) promissory notes amounting to USD 10,829,062 (as at December 31, 2016: 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) Trade receivables discount

There are no outstanding trade receivables disposed with recourse by the Group as at December 31, 2017 (2016: ₩2,432,106 thousand)

(3) Lawsuits in which the Company is named as defendant in

As at December 31, 2017, lawsuits in which the Company is named as defendant are for the compensation of damages totaling ₩33,898 million and the outcome of the lawsuit cannot be predicted.

(4) Commitments with financial institution (Korean won in thousands, CHF, JPY, EUR, USD)

	Financial institution	Credit limit		Used amount	
General loan facilities	Korea Development Bank	KRW	25,000,000	KRW	-
	NH Bank	KRW	19,200,000	KRW	19,200,000
	The Export-Import Bank of Korea	KRW	25,000,000	KRW	25,000,000
Electronic loan facilities	Kookmin Bank	KRW	1,250,000	KRW	239,642
Issuance of letter of credit	Woori Bank	USD	11,700,000	USD	3,549,011
	Industrial Bank of Korea	USD	5,000,000	USD	2,601,173
	Korea Development Bank	USD	15,000,000	CHF	937,150
				EUR	5,462,213
				JPY	32,467,190
				USD	162,343
Other guarantees in foreign currency	KEB Hana Bank	USD	4,935,981	USD	4,935,981
	Woori Bank	USD	11,233,149	USD	11,233,149
	NH Bank	USD	10,090,000	USD	8,285,500
	Kookmin Bank	USD	1,338,400	USD	1,338,400
	Seoul Guarantee Insurance Company	USD	2,111,798	USD	2,111,798
		EUR	3,714,938	EUR	3,714,938
Other guarantees in Korean currency	Woori Bank	KRW	4,400,000	KRW	450,184
	Seoul Guarantee Insurance Company	KRW	13,857,356	KRW	13,857,356

(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, 2017 and 2016, respectively.

30. Commitments and contingencies (cont'd)

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

If bonuses included in the salaries paid by the Group in the past are currently considered as part of the wages, the Group will be entitled to pay the additional corresponding amounts. However, based on the Supreme Court ruling dated December 18, 2013, the Group will be under an excessive financial burden resulting in material difficulty in management and thus, the Group does not expect to make the payments. The impact of the above on the Group's consolidated financial statements in accordance with the paragraph 92 of KIFRS 1037 'Provisions, Contingent Liabilities and Contingent Assets' was omitted from the notes. The Group is currently undergoing a litigation with regards to the wages. In the current year, it has partially won the litigation and it has recognized provisions for the lost trials of the litigation.

31. Guarantees and pledged assets

(1) Guarantees

Guarantees provided to the Group from third parties as at December 31, 2017, 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	4,935,981	Guarantee for advance receipts, bidding, defect and fulfillment of a contract
Woori Bank	USD	11,233,149	Guarantee for advance receipts, defect and fulfillment of a contract
	KRW	450,184	
NH Bank	USD	8,285,500	Guarantee for advance receipts
Kookmin Bank	USD	1,338,400	Guarantee for advance receipts, defect and fulfillment of a contract
Seoul Guarantee Insurance Company	USD	2,111,798	Guarantee for advance receipts, bidding, defect and fulfillment of a contract
	EUR	3,714,938	
	KRW	13,857,356	
	USD	27,904,828	
	EUR	3,714,938	
	KRW	14,307,540	

31. Guarantees and pledged assets (cont'd)

(2) Pledged assets

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

		Pledged assets		Book value		Established amount		Amount of provision
Import L/C	Korea Development Bank	Land	₩	34,080,323	EUR	5,983,200	EUR	4,986,000
Bond	Korea Real Estate Investment & Trust Co., Ltd	Land, Buildings, Machinery		400,004,463	₩	169,000,000	₩	130,000,000
Mortgage loan on stocks	KB Securities Co., Ltd.	Stocks of Doosan Bobcat Inc		68,780,034		66,666,667		40,000,000
Mortgage loan on stocks	Korea Investment & Securities Co., Ltd.,	Stocks of Doosan Bobcat Inc		17,532,585		16,700,000		10,000,000
Trade finance limit loan	Export-Import Bank of Korea	Inventories		177,412,024		32,500,000		25,000,000

32. Related parties

(1) Related parties

Relationship with the Group	Company name
Ultimate parent company	Doosan Corporation ("DS")
Parent company	Doosan Heavy Industries Construction Co., Ltd. ("DHIC")
Associates	Dalian Samyoung Doosan Metal Product Co., Ltd. ("DSDMP")
	Doosan Cuvex Co., Ltd.
	DBC
Other related parties	Doosan Infracore Co., Ltd.
	Doosan Bobcat Co., Ltd. ("DB")
	Doosan Engineering & Construction Co., Ltd. ("Doosan E&C")
	Oricom Inc. ("Oricom")
	Doosan Bears Inc.
	Doosan Tower Co., Ltd. ("Doosan Tower")

32. Related parties (cont'd)

(2) Significant transactions with related parties for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

		2017					
		Sales			Purchases		
	The name of the related parties	Sales	Disposal of property, plant and equipment and intangible assets	Other incomes	Purchases	Acquisition of property, plant and equipment and intangible assets	Other expenses
Ultimate parent company	DS	₩ 1,713,420	₩ -	₩ 901,485	₩ 6,026,155	₩ 385,208	₩ 3,596,036
Parent company	DHIC	-	-	-	84,397,126	-	3,887
Associates	DSDMP	139,382	-	-	-	-	-
	Doosan Cuvex Co., Ltd.	-	-	1,163	302,423	-	-
	DBC	-	5,564,081	-	-	-	-
Other related parties	Doosan E&C	-	-	-	186,614	17,898	-
	DLI	284,420	11,759,695	-	-	-	672,010
	Others	75,232	-	228,091	72,644	198,798	935,170
		₩ 2,212,454	₩ 17,323,776	₩ 1,130,739	₩ 90,984,962	₩ 601,904	₩ 5,207,103

		2016					
		Sales			Purchases		
	The name of the related parties	Sales	Disposal of property, plant and equipment and intangible assets	Other incomes	Purchases	Acquisition of property, plant and equipment and intangible assets	Other expenses
Ultimate parent company	DS	₩ 1,797,433	₩ -	₩ 910,566	₩ 5,106,768	₩ 588,391	₩ 4,898,278
Parent company	DHIC	-	-	-	96,665,660	-	441,686
Associates	DSDMP	261,556	-	-	-	-	-
	Doosan Cuvex Co., Ltd.	-	-	-	-	-	1,345
Other related parties	Doosan E&C	1,452,628	50,510,530	290,986	177,796	5,619,880	-
	DLI	312,083	-	-	-	-	517,298
	Others	1,487,494	-	274,717	169,145	-	736,905
		₩ 5,311,194	₩ 50,510,530	₩ 1,476,269	₩ 102,119,369	₩ 6,208,271	₩ 6,595,512

The disposal of property, plant and equipment and intangible assets includes the amount of investment in kind of ₩25,255,265 thousand.

32. Related parties (cont'd)

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

		December 31, 2017					
		Sales			Purchases		
	The name of the related parties	Trade receivables	Other receivables	Loans	Trade payables	Other payables	Borrowings
Ultimate parent company	DS	₩ -	₩ 16,511	₩ -	₩ 1,676,759	₩ 1,720,275	₩ -
Parent company	DHIC	-	-	-	3,152,239	385	-
Associates	DSDMP	-	-	-	-	-	-
	Doosan Cuvex Co., Ltd.	-	387,000	-	-	45,509	-
Other related parties	Doosan E&C	-	2,543,348	-	-	18,117	-
	DLI	-	38,551	-	-	15,868	-
	Others	-	33,960	-	374,556	8,110	-
		₩ -	₩ 3,019,370	₩ -	₩ 5,203,554	₩ 1,808,264	₩ -

		December 31, 2016					
		Sales			Purchases		
	The name of the related parties	Trade receivables	Other receivables	Loans	Trade payables	Other payables	Borrowings
Ultimate parent company	DS	₩ -	₩ -	₩ -	₩ 1,666,731	₩ 1,976,677	₩ -
Parent company	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	-
	DLI	-	140,970	-	-	-	-
	Others	-	5,844,244	-	248,133	47,611	-
		₩ 2,719	₩ 19,254,827	₩ -	₩ 5,441,093	₩ 2,043,239	₩ -

32. Related parties (cont'd)

(4) Loan and borrowings and capital transactions for the year ended December 31, 2017, with related parties are as follows (Korean won in thousands):

	The name of the related parties	Loan	Withdraw	Capital expansion and investment	Acquisition of equity
Associates	DBC	₩ 5,786,000	₩ -	₩ -	₩ -
Other related parties	Doosan Bobcat Inc.	-	-	7,404,649	-
		₩ 5,786,000	₩ -	₩ 7,404,649	₩ -

(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, 2017 and 2016, is as follows (Korean won in thousands):

	2017	2016
Salaries	₩ 3,757,198	₩ 4,166,961
Pension benefits	267,817	325,268
Share-based payment	-	(1,565)
	₩ 4,025,015	₩ 4,490,664

33. Statements of cash flows

The adjustments and changes in operating assets and liabilities in the statements of cash flows for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Expenses not involving cash outflows:		
Interest expenses	₩ 16,635,383	₩ 14,408,241
Income tax expenses	5,450,817	-
Pension benefits	4,362,132	4,227,457
Bad debt expenses	11,762	(24,650)
Other allowance for doubtful accounts	243,693	-
Loss on valuation of inventories	-	21,977,195
Depreciation	15,958,413	16,505,283
Amortization	1,710,488	3,253,109
Loss on foreign currency translation	2,278,448	964,600
Loss on valuation of derivatives	1,159,866	27,232,668
Loss on valuation of firm commitments	64,051,626	26,948,754
Loss on disposal of AFS financial assets	-	578,098
Impairment loss on AFS financial assets	-	261,450,872
Loss on disposal of property, plant and equipment	434,109	1,941,964
Loss from revaluation of land	114,105	-
Loss on disposal of intangible assets	12,364	10,500
Impairment loss on intangible assets	-	21,934,122
Provisions	3,217,251	1,537,077
Loss on disposal of assets held for sale	813,000	508,306
Impairment loss of assets held for sale	-	12,650,120
Loss on equity method	183,929	310,077
Loss on disposal of investments in associates	387,833	-
Others	3,728	-
Income not involving cash inflows:		
Interest income	(1,132,414)	(984,911)
Dividend income	(7,404,649)	-
Income tax profit	-	(6,567,610)
Reversal of loss on valuation of inventories	(11,123,407)	-
Gain from revaluation of land	(29,568)	-
Reversal of allowance for doubtful accounts	-	(618,508)
Income on financial guarantee	-	(265,132)
Gain on foreign currency translation	(1,058,133)	(1,785,822)
Gain on valuation of derivatives	(24,200,893)	(687,349)
Gain on valuation of firm commitments	(4,706,797)	(35,784,039)
Gain on disposal of property, plant and equipment	(1,979,569)	(267,497)
Gain on disposal of intangible assets	(17,091)	-
Reversal of impairment loss on intangible assets	(65,970)	(17,500)
Reversal of impairment loss on assets held for sale	-	(311,227)
Gain on disposal of investment in associates	-	(118,262,237)
Gain on equity method	-	(10,983,424)
Reversal of share-based payment	-	(1,565)
Reversal of other provisions	(1,468,051)	-
	₩ 63,842,405	₩ 239,876,972

33. Consolidated statements of cash flows (cont'd)

	2017	2016
Changes in operating assets and liabilities:		
Trade receivables	₩ 26,376,437	₩ (5,564,452)
Other receivables	15,728,875	156,916
Due from customers for construction contracts	14,310,863	(13,430,548)
Inventories	44,192,499	(26,790,051)
Other current assets	8,435,361	(675,571)
Long-term accounts receivable – other	9,313	1,224,226
Other non-current assets	(105,168)	(19,767)
Derivative instruments	(28,017,308)	(29,390,014)
Firm commitments	(8,961,557)	23,960,586
Trade payables	(61,400,054)	39,043,355
Other payables	(10,577,860)	(6,476,760)
Due to customers for construction contracts	(4,938,235)	6,860,131
Advance receipts	(103,863,714)	(23,902,392)
Other current liabilities	(2,538,783)	4,461,019
Long-term other payable	(485,062)	(5,529,136)
Other non-current liabilities	-	1,484,421
Plan assets	(4,000,000)	(5,440,488)
Payment of severance benefits	(806,162)	(870,849)
Transfer in	134,097	67,783
Transfer out	(474,988)	(115,934)
Provision for construction warranties	1,032,966	112,159
	₩ (115,948,480)	₩ (40,835,366)

Significant non-cash transactions for the years ended December 31, 2017 and 2016, are as follows (Korean won in thousands)

	2017	2016
Reclassification of other receivable to other long-term receivables	₩ -	₩ 5,788,558
Reclassification of construction in progress to property, plant and equipment	3,562,072	3,384,002
Reclassification of depreciation to development costs	-	208,994
Reclassification of property, plant and equipment to assets held for sale	-	4,526,814
Acquisition of property, plant and equipment	67,659	412,841
Revaluation of assets (after deduction of corporate tax)	18,596,947	-
Acquisition of intangible assets	-	83,654
Investment in kind	-	616,875,872
Replacement of long-term loans to current portion	629,300	-
Reclassification of long-term bonds payable to short-term bonds payable	90,000,000	100,000,000
Reclassification of long-term borrowings to short-term borrowings	30,000,000	45,000,000
Replacement of provisions to current portion	3,468,532	-

34. Assets held for sale

The assets held for sale as at December 31, 2017 and 2016, are as follows (Korean won in thousands):

	2017	2016
Machineray	₩ -	₩ 4,913,000