

# **Lotte Chemical Corporation and its subsidiaries**

Consolidated financial statements  
for the years ended December 31, 2016 and 2015  
with the independent auditors' report



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Independent auditors' report

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## Independent auditors' report

### The Shareholders and Board of Directors Lotte Chemical Corporation

We have audited the accompanying consolidated financial statements of Lotte Chemical Corporation (the "Company") and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as at December 31, 2016 and 2015, and the consolidated statements of comprehensive income, consolidated statements of changes in equity and consolidated statements of cash flows for the years 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 audits. We conducted our audits 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, 2016 and 2015, and its financial performance and cash flows for the years then ended in accordance with Korean International Financial Reporting Standard.



March 15, 2017

This audit report is effective as at March 15, 2017, the independent auditors' report date. Accordingly, certain material subsequent events or circumstances may have occurred during the period from the date of the independent auditors' report to the time this report is used. Such events and circumstances could significantly affect the accompanying consolidated financial statements and may result in modifications to this report.

# **Lotte Chemical Corporation and its subsidiaries**

Consolidated financial statements  
for the years ended December 31, 2016 and 2015

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

Huh, Soo-Young  
President and Chief Executive Officer  
Lotte Chemical Corporation

**Lotte Chemical Corporation and its subsidiaries**  
**Consolidated statements of financial position**  
**as at December 31, 2016 and 2015**  
(Korean won in thousands)

<b>Assets</b>	<b>Notes</b>	<b>2016</b>	<b>2015</b>
<b>Current assets:</b>			
Cash and cash equivalents	42	2,202,944,465	1,942,218,656
Short-term financial instruments	4	425,756,558	841,697,948
Financial assets at fair value through profit or loss (FVTPL)	6	6,685,073	-
Available-for-sale (AFS) financial assets	7	20,588,275	45,639,020
Trade accounts and other accounts receivable	5,41	1,551,920,459	1,016,335,868
Inventories	9	1,477,157,254	1,162,746,556
Finance lease receivables	10	138,600	138,598
Current income tax assets		16,403,225	18,567,576
Other financial assets	8,23	13,242,873	16,740,349
Other current assets	11	136,839,114	361,415,419
		<u>5,851,675,896</u>	<u>5,405,499,990</u>
<b>Non-current assets:</b>			
Long-term financial instruments	4	67,515,500	67,509,500
Non-current AFS financial assets	7	304,235,250	193,646,663
Non-current finance lease receivables	10	3,014,311	3,139,736
Investments in associates	12	1,288,114,097	846,144,172
Investments in joint ventures	13	848,082,771	800,374,672
Property, plant and equipment	15	5,546,663,157	3,964,852,432
Investment properties	16	99,471,563	81,298,743
Goodwill	17	723,796,857	3,196,152
Other intangible assets	18	1,068,600,007	34,442,560
Other non-current financial assets	4,8,23	20,898,713	8,277,637
Other non-current assets	11	5,552,910	4,655,761
Deferred tax assets	36	39,213,138	54,770,881
		<u>10,015,158,274</u>	<u>6,062,308,909</u>
<b>Total assets</b>		<u>\ 15,866,834,170</u>	<u>\ 11,467,808,899</u>

(Continued)

**Lotte Chemical Corporation and its subsidiaries**  
**Consolidated statements of financial position**  
**as at December 31, 2016 and 2015 (cont'd)**

(Korean won in thousands)

	<u>Notes</u>	<u>2016</u>	<u>2015</u>
<b>Liabilities</b>			
Current liabilities:			
Trade accounts and other accounts payable	19,41	\ 1,126,697,904	\ 934,257,282
Financial liabilities at FVTPL	20	-	179,284
Short-term borrowings and current portion of bonds payable	21	1,745,873,962	911,337,908
Income tax payables		365,609,756	157,692,460
Other financial liabilities	22,23	99,934,087	57,933,582
Other current liabilities	25	91,154,064	75,530,844
Current provisions	26	19,540,529	9,176,489
		<u>3,448,810,302</u>	<u>2,146,107,849</u>
Non-current liabilities:			
Long-term borrowings and bonds payable	21	2,439,574,476	1,500,781,746
Net defined benefit liability	24	23,195,913	30,263,276
Deferred tax liabilities	36	524,809,517	204,218,459
Other non-current financial liabilities	22,23	14,558,573	17,651,967
Other non-current liabilities	25	7,735,920	3,398,127
Non-current provisions	26	7,332,298	9,801,400
		<u>3,017,206,697</u>	<u>1,766,114,975</u>
<b>Total liabilities</b>		<b><u>6,466,016,999</u></b>	<b><u>3,912,222,824</u></b>
<b>Equity</b>			
Equity attributable to equity holders of the parent:			
Issued capital	27	171,377,095	171,377,095
Other paid-in capital	28	478,576,150	476,522,242
Retained earnings	29	8,486,992,509	6,739,344,146
Other components of equity	30	226,166,597	137,507,762
		<u>37,704,820</u>	<u>30,834,830</u>
Non-controlling interests		<u>9,400,817,171</u>	<u>7,555,586,075</u>
<b>Total equity</b>		<b><u>9,400,817,171</u></b>	<b><u>7,555,586,075</u></b>
<b>Total liabilities and equity</b>		<b><u>\ 15,866,834,170</u></b>	<b><u>\ 11,467,808,899</u></b>

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

**Lotte Chemical Corporation and its subsidiaries**  
**Consolidated statements of comprehensive income**  
**for the years ended December 31, 2016 and 2015**  
(Korean won in thousands except for share amounts)

	Notes	2016	2015
Sales	3,31,41	\ 13,223,540,874	\ 11,713,338,201
Cost of sales	37,41	(9,956,835,878)	(9,646,291,211)
<b>Gross profit</b>		<b>3,266,704,996</b>	<b>2,067,046,990</b>
Selling and administrative expenses	32,37,41	(722,451,059)	(455,927,525)
<b>Operating income</b>	<b>3</b>	<b>2,544,253,937</b>	<b>1,611,119,465</b>
Finance income	3,33	156,147,423	145,410,486
Finance costs	3,34	(241,023,186)	(204,624,158)
Share of profit (loss) in associates and joint ventures	12,13	71,447,129	(23,405,936)
Other non-operating income	3,35	232,893,826	179,938,655
Other non-operating expenses	3,35	(276,346,029)	(287,070,505)
<b>Income before income tax</b>	<b>3</b>	<b>2,487,373,100</b>	<b>1,421,368,007</b>
Income tax expense	36	(650,188,181)	(430,712,512)
<b>Net income</b>		<b>1,837,184,919</b>	<b>990,655,495</b>
<b>Other comprehensive income (loss)</b>			
<i>Other comprehensive income not to be reclassified to profit or loss in subsequent periods:</i>			
Remeasurement loss on defined benefit plans	24	(5,608,108)	(8,064,009)
Retained earning adjustments in equity method	12,13	1,658,336	(2,192,046)
<i>Other comprehensive income to be reclassified to profit or loss in subsequent periods:</i>			
Gain (loss) on valuation of AFS financial assets	7	(6,609,388)	20,375,204
Equity adjustments in equity method	12,13	(2,207,050)	10,651,905
Gain on valuation of derivative financial instruments	23	591,063	2,946,242
Foreign currency translation differences of foreign operations		98,084,340	105,906,546
		<b>85,909,193</b>	<b>129,623,842</b>
<b>Total comprehensive income</b>		<b>\ 1,923,094,112</b>	<b>\ 1,120,279,337</b>
Net income attributable to:			
Equity holders of the parent		\ 1,835,812,632	\ 992,512,355
Non-controlling interests		1,372,287	(1,856,860)
Comprehensive income attributable to:			
Equity holders of the parent		1,920,537,276	1,121,344,570
Non-controlling interests		2,556,835	(1,065,234)
<b>Earnings per share</b>			
Basic and diluted	38	\ 54,488	\ 29,458

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

**Lotte Chemical Corporation and its subsidiaries**  
**Consolidated statements of changes in equity**  
**for the years ended December 31, 2016 and 2015**

(Korean won in thousands)

	Attributable to the equity holders of the parent					Total equity
	Issued capital	Other paid-in capital	Retained earnings	Other components of equity	Non-controlling interests	
<b>As at January 1, 2015</b>	\ 171,377,095	\ 476,522,242	\ 5,790,777,028	\ (1,577,660)	\ 31,900,064	\ 6,468,998,769
Dividends (Note 29)	-	-	(33,692,031)	-	-	(33,692,031)
Total comprehensive income:						
Net income (loss)	-	-	992,512,355	-	(1,856,860)	990,655,495
Remeasurement loss on defined benefit plans	-	-	(8,061,160)	-	(2,849)	(8,064,009)
Retained earnings adjustments in equity method	-	-	(2,192,046)	-	-	(2,192,046)
Gain on valuation of AFS financial assets	-	-	-	20,375,204	-	20,375,204
Equity adjustments in equity method	-	-	-	10,651,905	-	10,651,905
Gain on valuation of derivative financial instruments	-	-	-	2,946,242	-	2,946,242
Foreign currency translation differences of foreign operations	-	-	-	105,112,071	794,475	105,906,546
	-	-	982,259,149	139,085,422	(1,065,234)	1,120,279,337
<b>As at December 31, 2015</b>	<u>\ 171,377,095</u>	<u>\ 476,522,242</u>	<u>\ 6,739,344,146</u>	<u>\ 137,507,762</u>	<u>\ 30,834,830</u>	<u>\ 7,555,586,075</u>

(Continued)



**Lotte Chemical Corporation and its subsidiaries**  
**Consolidated statements of changes in equity**  
**for the years ended December 31, 2016 and 2015 (cont'd)**

(Korean won in thousands)

	Attributable to the equity holders of the parent					Total equity
	Issued capital	Other paid-in capital	Retained earnings	Other components of equity	Non-controlling interests	
<b>As at January 1, 2016</b>	<u>171,377,095</u>	<u>476,522,242</u>	<u>6,739,344,146</u>	<u>137,507,762</u>	<u>30,834,830</u>	<u>7,555,586,075</u>
Dividends (Note 29)	-	-	(84,230,077)	-	(11,585)	(84,241,662)
Changes in ownership interests in subsidiaries	-	2,053,908	-	-	2,884,114	4,938,022
Business combination	-	-	-	-	1,440,625	1,440,625
Total comprehensive income:						
Net income	-	-	1,835,812,632	-	1,372,287	1,837,184,919
Remeasurement loss on defined benefit plans	-	-	(5,592,528)	-	(15,580)	(5,608,108)
Retained earning adjustments in equity method	-	-	1,658,336	-	-	1,658,336
Loss on valuation of AFS financial assets	-	-	-	(6,609,388)	-	(6,609,388)
Equity adjustments in equity method	-	-	-	(350,440)	-	(350,440)
Gain on valuation of derivative financial instruments	-	-	-	591,063	-	591,063
Foreign currency translation differences of foreign operations	-	-	-	95,027,600	1,200,129	96,227,729
<b>As at December 31, 2016</b>	<u>171,377,095</u>	<u>478,576,150</u>	<u>8,486,992,509</u>	<u>226,166,597</u>	<u>37,704,820</u>	<u>9,400,817,171</u>

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

**Lotte Chemical Corporation and its subsidiaries**  
**Consolidated statements of cash flows**  
**for the years ended December 31, 2016 and 2015**  
(Korean won in thousands)

	2016	2015
<b>Operating activities</b>		
Net income	\ 1,837,184,919	\ 990,655,495
Adjustments to reconcile net income to net cash flows:		
Income tax expense	650,188,181	430,712,512
Interest income	(28,814,876)	(38,468,071)
Interest expenses	76,514,065	69,947,514
Dividend income	(690,201)	(588,388)
Share of profit in associates and joint ventures	(89,488,666)	(31,166,499)
Share of loss in associates and joint ventures	18,041,537	54,572,436
Gain on valuation of financial assets at FVTPL	(649,594)	(9,039,742)
Loss on valuation of financial assets at FVTPL	2,032,866	173,087
Loss on disposal of financial assets at FVTPL	-	9,985,205
Gain on disposal of AFS financial assets	-	(360,693)
Impairment loss on AFS financial assets	6,329,000	9,853,203
Loss on foreign exchange translation	93,138,781	56,483,669
Gain on foreign exchange translation	(58,479,396)	(29,986,640)
Gain on valuation of derivative financial instruments	(12,258,968)	(13,736,004)
Loss on valuation of derivative financial instruments	565,190	245,000
Gain on settlement of derivative financial instruments	(6,580,540)	(12,771,440)
Loss on settlement of derivative financial instruments	7,598,904	-
Gain on disposal of property, plant and equipment	(401,119)	(3,167,755)
Loss on disposal of property, plant and equipment	20,281,471	15,811,559
Impairment loss on property, plant and equipment	19,142,620	86,558,845
Gain on disposal of intangible assets	-	(98,091)
Impairment loss on intangible assets	-	36,590
Gain on disposal of investment properties	-	(300,754)
(Reversal of) loss on valuation of inventories	(5,331,065)	(14,544,529)
Bad debt expenses	593,182	453,126
Other bad debt expenses (reversal)	(646,950)	674,000
Depreciation	561,225,936	484,827,472
Amortization	67,924,995	2,838,957
Additional provisions	15,721,570	-
Pension benefits costs	37,277,569	26,922,842
Long-term employee benefits	2,200,807	165,221
	<u>1,375,435,299</u>	<u>1,096,032,632</u>
Changes in working capital:		
Trade accounts receivable	(128,102,962)	271,264,767
Other accounts receivable	(2,570,903)	118,266,153
Inventories	(125,775,162)	411,081,115
Other financial assets	(14,027,744)	4,160,199
Other assets	(36,060,777)	3,076,801
Trade accounts payable	153,551,640	(23,834,005)
Other accounts payable	35,301,782	6,081,707
Other financial liabilities	32,549,112	6,905,957
Other liabilities	(1,178,516)	(37,436,955)
Provisions	(7,826,633)	12,952,666
Net defined benefit liability	(44,554,750)	(33,416,067)
	<u>(138,694,913)</u>	<u>739,102,338</u>
Income taxes paid	<u>(373,285,876)</u>	<u>(230,163,555)</u>
<b>Net cash flows from (used in) operating activities</b>	<b>\ 2,700,639,429</b>	<b>\ 2,595,626,910</b>

(Continued)

**Lotte Chemical Corporation and its subsidiaries**  
**Consolidated statements of cash flows**  
**for the years ended December 31, 2016 and 2015 (cont'd)**  
(Korean won in thousands)

	2016	2015
<b>Investing activities</b>		
Cash inflows from investing activities:		
Decrease in short-term financial instruments	454,282,387	25,595,245
Decrease in long-term financial instruments	247,855	2,500
Proceeds from disposal of AFS financial assets	639,020	921,714
Decrease in other financial assets	3,094,321	5,618,174
Proceeds from disposal of property, plant and equipment	10,927,988	53,170,182
Proceeds from disposal of intangible assets	-	130,373
Proceeds from disposal of investment properties	-	3,000,000
Interest received	32,124,085	38,693,620
Dividends received	30,190,201	37,588,388
Settlement of derivative transaction	3,988	-
	<u>531,509,845</u>	<u>164,720,196</u>
Increase in short-term financial instruments	10,675,647	578,598,889
Acquisition of financial assets at FVTPL	11,178,676	-
Increase in long-term financial instruments	-	17,000,000
Acquisition of AFS financial assets	125,128,200	10,034,804
Acquisition of investments in associates	418,692,212	138,265,420
Acquisition of investments in joint ventures	13,400,000	39,000,000
Increase in other financial instruments	732,074	2,280,940
Increase in other assets	-	279,150,000
Settlement of derivative financial instruments	-	9,985,205
Acquisition of property, plant and equipment	1,588,147,531	355,355,968
Acquisition of intangible assets	6,881,760	8,501,551
Acquisition of investment properties	19,136,013	-
Net cash outflows from business combination	1,902,173,556	-
	<u>4,096,145,669</u>	<u>1,438,172,777</u>
<b>Net cash flows from (used in) investing activities</b>	<b>(3,564,635,824)</b>	<b>(1,273,452,581)</b>
<b>Financing activities</b>		
Cash inflows from financing activities:		
Increase in short-term borrowings	2,265,614,490	2,558,969,903
Increase in long-term borrowings	102,146,880	4,788,423
Issuance of bonds	758,400,400	470,262,500
Disposal of investments in subsidiaries	4,933,346	-
	<u>3,131,095,116</u>	<u>3,034,020,826</u>
Repayment of short-term borrowings	1,623,466,323	2,704,289,337
Repayment of long-term borrowings	49,455,039	192,360,438
Repayment of bonds	190,000,000	367,421,175
Dividends paid	84,241,662	33,692,031
Interest paid	82,409,692	70,126,070
Settlement of derivative transaction	1,018,364	-
	<u>2,030,591,080</u>	<u>3,367,889,051</u>
<b>Net cash flows from (used in) financing activities</b>	<b>1,100,504,036</b>	<b>(333,868,225)</b>
<b>Net increase in cash and cash equivalents</b>	<b>236,507,641</b>	<b>988,306,104</b>
<b>Cash and cash equivalents at January 1</b>	<b>1,942,218,656</b>	<b>949,302,735</b>
<b>Net foreign exchange difference</b>	<b>24,218,168</b>	<b>4,609,817</b>
<b>Cash and cash equivalents at December 31</b>	<b><u>2,202,944,465</u></b>	<b><u>1,942,218,656</u></b>

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

**Lotte Chemical Corporation and its subsidiaries**  
**Notes to the consolidated financial statements**  
**December 31, 2016 and 2015**

**1. Corporate information**

**1.1 Company**

Lotte Chemical Corporation (the "Company") was incorporated on March 16, 1976 to manufacture and distribute various petrochemical products. The Company's plants are located in Yeosu, Daesan and Ulsan Petrochemical Complex. The Company is headquartered in Seoul and its branch offices are located in Busan, Daegu and Daejeon to market petrochemical products. The Company's shares have been listed on the Korea Exchange (formerly, the Korea Stock Exchange) since May 30, 1991.

The Company acquired Lotte Daesan Co., Ltd. on January 1, 2009 and KP Chemical Corp. on December 27, 2012, and changed its name to its current form from Honam Petrochemical Corp.

The major shareholders of the Company as at December 31, 2016 are as follows:

Shareholders	Number of shares	Equity ownership (%)
Lotte Corporation	10,718,818	31.27
Hotel Lotte Co., Ltd.	4,346,818	12.68
Lotte Holdings Co., Ltd.	3,186,000	9.30
Treasury shares	583,388	1.70
Others	15,440,395	45.05
	34,275,419	100.00

**1.2 Consolidated subsidiaries**

(1) Details of the Company's subsidiaries included in consolidation as at December 31, 2016 and 2015 are as follows:

Subsidiary	Year-end	2016			
		Principal business activities	Equity ownership (%)	Non-controlling interests (%)	Country of domicile
Lotte Chemical Trading (Shanghai) Corp.	December 31	Wholesale	100.00	-	China
Lotte Chemical Engineering Plastics (Jiaxing) Co., Ltd.	December 31	Chemical production	100.00	-	China
Lotte Chemical (Jiaxing) Corp.	December 31	Chemical production	100.00	-	China
Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries	December 31	Chemical production	100.00	-	Malaysia and others
Sambark LFT Co., Ltd.	December 31	Chemical production	99.51	0.49	Korea
Dacc Aerospace Co., Ltd.	December 31	Parts production	100.00	-	Korea
Lotte Chemical Alabama Corp.	December 31	Chemical production	100.00	-	United States
Lotte Chemical Engineering Plastics (Hefei) Co., Ltd.	December 31	Chemical production	100.00	-	China
KP Chemtech Corp.	December 31	Chemical production	100.00	-	Korea
Lotte Chemical Pakistan Limited	December 31	Chemical production	75.01	24.99	Pakistan
Lotte Chemical UK Limited	December 31	Chemical production	100.00	-	United Kingdom
Lotte Chemical Poland Sp. zo.o.	December 31	Wholesale	100.00	-	Poland
Lotte Chemical USA Corp. and its subsidiaries	December 31	Chemical production	100.00	-	United States
Lotte Chemical Engineering Plastic (Shenyang) Co., Ltd.	December 31	Chemical production	100.00	-	China
Lotte Advanced Material Co., Ltd. and its subsidiaries (*1)	December 31	Chemical production	100.00	-	Korea

**Lotte Chemical Corporation and its subsidiaries**  
**Notes to the consolidated financial statements**  
**December 31, 2016 and 2015**

**1. Corporate information (cont'd)**

**1.2 Consolidated subsidiaries (cont'd)**

Subsidiary	Year-end	Principal business activities	2015		Country of domicile
			Equity ownership (%)	Non-controlling interests (%)	
Lotte Chemical Trading (Shanghai) Corp.	December 31	Wholesale	100.00	-	China
Lotte Chemical Engineering Plastics (Jiaxing) Co., Ltd.	December 31	Chemical production	100.00	-	China
Lotte Chemical (Jiaxing) Corp.	December 31	Chemical production	100.00	-	China
Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries	December 31	Chemical production	100.00	-	Malaysia and others
Sambark LFT Co., Ltd.	December 31	Chemical production Parts	99.51	0.49	Korea
Dacc Aerospace Co., Ltd.	December 31	Chemical production	100.00	-	Korea
Lotte Chemical Alabama Corp.	December 31	Chemical production	100.00	-	United States
Lotte Chemical Engineering Plastics (Hefei) Co., Ltd.	December 31	Chemical production	100.00	-	China
KP Chemtech Corp.	December 31	Chemical production	100.00	-	Korea
Lotte Chemical Pakistan Limited	December 31	Chemical production	75.01	24.99	Pakistan
Lotte Chemical UK Limited	December 31	Chemical production	100.00	-	United Kingdom
Lotte Chemical Poland Sp. zo.o.	December 31	Wholesale	100.00	-	Poland
Lotte Chemical USA Corp. and its subsidiaries	December 31	Chemical production	100.00	-	United States
Lotte Chemical Engineering Plastics (Shenyang) Co., Ltd.	December 31	Chemical production	100.00	-	China

(\*1) The Company has entered into a shareholder agreement with Samsung SDI Co., non-controlling interests, which grants put and call options over the whole of the registered common stock owned by Samsung SDI Co. where the Company acquires 90% of equity interest in Lotte Advance Material Co., Ltd. Accordingly, the equity interest is added to the acquisition cost and option prices are accounted for as long-term borrowings as the Company is deemed to acquire the remaining 10% of equity interest from Samsung SDI Co. (see Note 21).

(2) Changes in consolidation for the years ended December 31, 2016 and 2015 are as follows:

	2016	
	Entity	Description
Newly included	Lotte Advanced Material Co., Ltd. and its subsidiaries	Newly acquired
	2015	
	Entity	Description
Newly included	Lotte Chemical Engineering Plastic (Shenyang) Co., Ltd. LACC, LLC	Newly incorporated Newly incorporated (*1)

(\*1) LACC, LLC is included as a joint operation of Lotte Chemical USA Corp. (see Note 14).

**Lotte Chemical Corporation and its subsidiaries**  
**Notes to the consolidated financial statements**  
**December 31, 2016 and 2015**

**1. Corporate information (cont'd)**

**1.2 Consolidated subsidiaries (cont'd)**

(3) Summarized financial position of subsidiaries as at December 31, 2016 and 2015 is as follows (Korean won in thousands):

	2016					
	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Controlling interests	Non-controlling interests
Lotte Chemical Trading (Shanghai) Corp.	₩ 92,534,208	₩ 23,821,723	₩ 82,414,155	₩ -	₩ 33,941,776	₩ -
Lotte Chemical Engineering Plastics (Jiaxing) Co., Ltd.	39,573,334	14,071,394	11,740,435	-	41,904,293	-
Lotte Chemical (Jiaxing) Corp.	47,220,275	59,106,924	14,739,113	54,054,348	37,533,738	-
Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries	896,717,890	1,548,882,538	170,497,841	107,033,588	2,161,980,408	6,088,591
Sambark LFT Co., Ltd.	28,367,974	25,541,285	19,197,153	3,306,410	31,405,696	-
Dacc Aerospace Co., Ltd.	6,367,297	11,610,233	4,754,529	15,833,484	(2,610,483)	-
Lotte Chemical Alabama Corp.	8,404,041	10,103,679	4,531,606	725,100	13,251,014	-
Lotte Chemical Engineering Plastics (Hefei) Co., Ltd.	9,219,397	14,400,733	3,459,085	5,544,320	14,616,725	-
KP Chemtech Corp.	35,141,615	13,526,037	22,018,284	1,002,710	25,646,658	-
Lotte Chemical Pakistan Limited	122,925,585	79,291,268	82,876,210	868,947	118,471,696	-
Lotte Chemical UK Limited	132,452,931	97,340,508	314,255,759	-	(84,462,320)	-
Lotte Chemical Poland Sp. zo.o.	14,695,957	19,961	14,861,645	-	(145,727)	-
Lotte Chemical USA Corp. and its subsidiaries	53,978,641	983,775,481	4,622,459	-	1,033,131,663	-
Lotte Chemical Engineering Plastics (Shenyang) Co., Ltd.	5,501,173	11,320,142	143,838	-	16,677,477	-
Lotte Advanced Material Co., Ltd. and its subsidiaries	899,555,308	886,653,357	444,296,628	247,462	1,339,939,342	1,725,233
	2015					
	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Controlling interests	Non-controlling interests
Lotte Chemical Trading (Shanghai) Corp.	₩ 40,702,009	₩ 24,849,028	₩ 37,977,156	₩ -	₩ 27,573,881	₩ -
Lotte Chemical Engineering Plastics (Jiaxing) Co., Ltd.	34,494,095	15,860,677	14,804,629	-	35,550,143	-
Lotte Chemical (Jiaxing) Corp.	66,325,653	65,089,229	62,576,460	35,008,212	33,830,210	-
Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries	954,861,081	977,042,171	166,274,456	48,970,805	1,713,860,783	2,797,208
Sambark LFT Co., Ltd.	26,949,560	27,762,338	26,774,071	3,195,882	24,741,945	-
Dacc Aerospace Co., Ltd.	6,250,995	11,418,873	13,594,199	8,070,913	(3,995,244)	-
Lotte Chemical Alabama Corp.	6,687,699	10,562,822	3,876,158	3,164,400	10,209,963	-
Lotte Chemical Engineering Plastics (Hefei) Co., Ltd.	9,911,884	16,095,178	4,259,111	7,513,009	14,234,942	-
KP Chemtech Corp.	33,975,597	14,876,729	19,814,265	1,077,605	27,960,456	-
Lotte Chemical Pakistan Limited	107,247,068	85,402,771	80,746,087	686,240	111,217,512	-
Lotte Chemical UK Limited	178,987,768	122,682,853	251,122,124	128,457,340	(77,908,843)	-
Lotte Chemical Poland Sp. zo.o.	10,190,033	16,802	10,020,085	-	186,750	-
Lotte Chemical USA Corp. and its subsidiaries	1,875,760	208,177,474	149,320,227	-	60,733,007	-
Lotte Chemical Engineering Plastics (Shenyang) Co., Ltd.	3,201,416	3,494,181	3,160	-	6,692,437	-

**Lotte Chemical Corporation and its subsidiaries**  
**Notes to the consolidated financial statements**  
**December 31, 2016 and 2015**

**1. Corporate information (cont'd)**

**1.2 Consolidated subsidiaries (cont'd)**

(4) Summarized financial performance of subsidiaries for the years ended December 31, 2016 and 2015 is as follows (Korean won in thousands):

	2016					
	Sales	Operating income (loss)	Net income (loss)	Total comprehensive income (loss)	Net income attributable to non- controlling interests	Total comprehensive income attributable to non- controlling interests
Lotte Chemical Trading (Shanghai) Corp.	₩ 298,488,417	₩ 10,685,338	₩ 7,530,459	₩ 6,367,894	₩ -	₩ -
Lotte Chemical Engineering Plastics (Jiaxing) Co., Ltd.	80,961,433	11,035,452	7,840,797	6,354,150	-	-
Lotte Chemical (Jiaxing) Corp.	134,655,727	(1,636,704)	(6,544,645)	(7,419,472)	-	-
Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries	2,285,117,299	505,865,264	377,774,853	446,472,985	195,616	407,268
Sambark LFT Co., Ltd.	77,287,625	9,195,279	6,704,767	6,663,751	-	-
Dacc Aerospace Co., Ltd.	19,668,012	2,983,905	1,346,294	1,384,761	-	-
Lotte Chemical Alabama Corp.	20,035,731	2,551,280	2,614,921	3,041,051	-	-
Lotte Chemical Engineering Plastics (Hefei) Co., Ltd.	15,332,325	1,243,909	962,836	381,783	-	-
KP Chemtech Corp.	141,496,595	(2,261,896)	(2,771,920)	(2,313,798)	-	-
Lotte Chemical Pakistan Limited	385,418,188	3,266,506	3,588,047	7,254,184	-	-
Lotte Chemical UK Limited	273,504,078	(10,518,666)	(19,152,122)	(6,553,478)	-	-
Lotte Chemical Poland Sp. zo.o.	42,196,112	(20,068)	(331,753)	(332,476)	-	-
Lotte Chemical USA Corp. and its subsidiaries	-	(242,176)	(6,771)	45,575,330	-	-
Lotte Chemical Engineering Plastics (Shenyang) Co., Ltd.	-	(647,896)	(577,266)	(1,068,713)	-	-
Lotte Advanced Material Co., Ltd. and its subsidiaries (*1)	1,950,761,669	239,750,037	180,976,443	172,613,346	239,262	296,192

(\*1) Includes only the financial results after the acquisition date of the equity interest of the Company.

	2015					
	Sales	Operating income (loss)	Net income (loss)	Total comprehensive income (loss)	Net income attributable to non- controlling interests	Total comprehensive income attributable to non- controlling interests
Lotte Chemical Trading (Shanghai) Corp.	₩ 207,590,611	₩ 4,920,472	₩ 1,433,915	₩ 1,918,414	₩ -	₩ -
Lotte Chemical Engineering Plastics (Jiaxing) Co., Ltd.	83,939,410	7,404,824	4,483,528	5,066,766	-	-
Lotte Chemical (Jiaxing) Corp.	118,429,601	(6,898,691)	(32,160,407)	(31,699,420)	-	-
Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries	2,395,312,702	327,630,665	186,314,535	287,399,805	163,667	212,239
Sambark LFT Co., Ltd.	78,225,868	8,294,469	6,166,170	6,157,019	-	-
Dacc Aerospace Co., Ltd.	17,136,480	2,486,173	1,977,259	1,998,221	-	-
Lotte Chemical Alabama Corp.	11,792,920	1,041,064	1,814,723	2,397,137	-	-
Lotte Chemical Engineering Plastics (Hefei) Co., Ltd.	18,033,986	997,598	477,893	732,138	-	-
KP Chemtech Corp.	134,026,871	(3,516,641)	(2,327,724)	(2,585,419)	-	-
Lotte Chemical Pakistan Limited	372,826,896	(7,502,610)	(8,231,593)	(5,258,491)	-	-
Lotte Chemical UK Limited	331,135,218	(49,396,981)	(92,374,551)	(93,455,226)	-	-
Lotte Chemical Poland Sp. zo.o.	24,139,274	208,827	143,606	142,340	-	-
Lotte Chemical USA Corp. and its subsidiaries	-	(2,385,198)	(2,380,042)	(603,067)	-	-
Lotte Chemical Engineering Plastics (Shenyang) Co., Ltd.	-	(106,255)	(77,976)	(237,563)	-	-

**Lotte Chemical Corporation and its subsidiaries**  
**Notes to the consolidated financial statements**  
**December 31, 2016 and 2015**

**1. Corporate information (cont'd)**

**1.2 Consolidated subsidiaries (cont'd)**

(5) Details of non-controlling interests in subsidiaries as at and for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016				
	Equity interest (%)	Non-controlling interests	Net income (loss) attributable to non-controlling interests	Total comprehensive income (loss) attributable to non-controlling interests	Dividends paid to non-controlling interests
Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries (*1)	-	₩ 6,088,591	₩ 195,616	₩ 407,268	₩ -
Sambark LFT Co., Ltd.	0.49	153,539	32,859	32,390	-
Lotte Chemical Pakistan Limited	24.99	29,737,457	904,550	1,820,984	-
Lotte Advanced Material Co., Ltd. and its subsidiaries (*2)	-	1,725,233	239,262	296,193	11,585
		<u>₩ 37,704,820</u>	<u>₩ 1,372,287</u>	<u>₩ 2,556,835</u>	<u>₩ 11,585</u>

(\*1) Represents financial information attributable to the non-controlling interests of Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries.

(\*2) Represents financial information attributable to the non-controlling interests of Lotte Advanced Material Co., Ltd and its subsidiaries

	2015				
	Equity interest (%)	Non-controlling interests	Net income (loss) attributable to non-controlling interests	Total comprehensive income (loss) attributable to non-controlling interests	Dividends paid to non-controlling interests
Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries (*1)	-	₩ 2,797,208	₩ 163,667	₩ 212,239	₩ -
Sambark LFT Co., Ltd.	0.49	121,150	28,652	28,727	-
Lotte Chemical Pakistan Limited	24.99	27,916,472	(2,049,179)	(1,306,200)	-
		<u>₩ 30,834,830</u>	<u>₩ (1,856,860)</u>	<u>₩ (1,065,234)</u>	<u>₩ -</u>

(\*1) Represents financial information attributable to the non-controlling interests of Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries.

(6) Changes in equity ownership in subsidiaries without loss of control for the year ended December 31, 2016 are as follows (Korean won in thousands):

	2016				
	Equity ownership before change (%)	Equity ownership after change (%)	Consideration paid	Changes in non-controlling interests	Changes in other paid-in capital
PT Lotte Chemical Titan Tbk (*1)	95.15	90.40	₩ 4,938,022	₩ 2,884,114	₩ 2,053,908

(\*1) It is a subsidiary company of Lotte Chemical Titan Holding Sdn. Bhd.



## **2. Basis of preparation and summary of significant accounting policies**

### **2.1 Basis of preparation**

The Company and its subsidiaries (collectively, the “Group”) have prepared statutory consolidated financial statements in accordance with Korean International Financial Reporting Standards (KIFRS) enacted by the *Act on External Audit of Stock Companies*. The accompanying consolidated financial statements have been translated into English from the Korean language financial statements. In the event of any differences in interpreting the financial statements or the independent auditors’ report thereon, the Korean version, which is used for regulatory reporting purposes, shall prevail.

Significant accounting policies used for the preparation of the consolidated financial statements are stated below. Except for the new and amended standards and interpretations effective as at January 1, 2016, these accounting policies have been applied consistently for the current and the comparative periods.

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

The Group's consolidated financial statements for submission to the annual shareholders’ meeting have been approved by the Board of Directors on February 28, 2017.

(1) The following new standards and amendments to KIFRS have been applied in the current year. The nature and the impact of each new standard or amendment is described below:

#### **KIFRS 1114 Regulatory Deferral Accounts**

KIFRS 1114 is an optional standard that allows an entity, whose activities are subject to rate-regulation, to continue applying most of its existing accounting policies for regulatory deferral account balances upon its first-time adoption of KIFRS. Entities that adopt KIFRS 1114 must present the regulatory deferral accounts as separate line items on the statement of financial position and present movements in these account balances as separate line items in the statement of profit or loss and other comprehensive income (OCI). The standard requires disclosure of the nature of, and risks associated with, the entity’s rate-regulation and the effects of that rate-regulation on its financial statements. Since the Group is an existing KIFRS preparer and is not involved in any rate-regulated activities, this standard does not apply.

#### **Amendments to KIFRS 1111 Joint Arrangements: Accounting for Acquisitions of Interests**

The amendments to KIFRS 1111 require that a joint operator accounting for the acquisition of an interest in a joint operation, in which the activity of the joint operation constitutes a business, must apply the relevant KIFRS 1103 *Business Combinations* principles for business combination accounting. The amendments also clarify that a previously held interest in a joint operation is not remeasured on the acquisition of an additional interest in the same joint operation if joint control is retained. In addition, a scope exclusion has been added to KIFRS 1111 to specify that the amendments do not apply when the parties sharing joint control, including the reporting entity, are under common control of the same ultimate controlling party. The amendments apply to both the acquisition of the initial interest in a joint operation and the acquisition of any additional interests in the same joint operation and are applied prospectively. These amendments do not have any impact on the Group.

#### **Amendments to KIFRS 1016 and KIFRS 1038 Clarification of Acceptable Methods of Depreciation and Amortisation**

The amendments clarify the principle in KIFRS 1016 *Property, Plant and Equipment* and KIFRS 1038 *Intangible Assets* that revenue reflects a pattern of economic benefits that are generated from operating a business (of which the asset is a part) rather than the economic benefits that are consumed through use of the asset. As a result, a revenue-based method cannot be used to depreciate property, plant and equipment and may only be used in very limited circumstances to amortise intangible assets. The amendments are applied prospectively and do not have any impact on the Group, given that it has not used a revenue-based method to depreciate its non-current assets.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.1 Basis of preparation (cont'd)**

#### **Annual Improvements 2012-2014 Cycle**

These amendments did not have any impact on the Group's consolidated financial statements. The improvements include:

##### **1) KIFRS 1105 *Non-current Assets Held for Sale and Discontinued Operations***

Assets (or disposal groups) are generally disposed of either through sale or distribution to the owners. The amendment clarifies that changing from one of these disposal methods to the other would not be considered a new plan of disposal, rather it is a continuation of the original plan. There is, therefore, no interruption of the application of the requirements in KIFRS 1105. This amendment is applied prospectively.

##### **2) KIFRS 1107 *Financial Instruments: Disclosures***

###### **(i) Servicing contracts**

The amendment clarifies that a servicing contract that includes a fee can constitute continuing involvement in a financial asset. An entity must assess the nature of the fee and the arrangement against the guidance for continuing involvement in KIFRS 1107 in order to assess whether the disclosures are required. The assessment of which servicing contracts constitute continuing involvement must be made retrospectively. However, the required disclosures need not be provided for any period beginning before the annual period in which the entity first applies the amendments.

###### **(ii) Applicability of the amendments to KIFRS 1107 to condensed interim financial statements**

The amendment clarifies that the offsetting disclosure requirements do not apply to condensed interim financial statements, unless such disclosures provide a significant update to the information reported in the most recent annual report. This amendment is applied retrospectively.

##### **3) KIFRS 1019 *Employee Benefits***

The amendment clarifies that market depth of high quality corporate bonds is assessed based on the currency in which the obligation is denominated, rather than the country where the obligation is located. When there is no deep market for high quality corporate bonds in that currency, government bond rates must be used. This amendment is applied prospectively.

##### **4) KIFRS 1034 *Interim Financial Reporting***

The amendment clarifies that the required interim disclosures must either be in the interim financial statements or incorporated by cross-reference between the interim financial statements and wherever they are included within the interim financial report (e.g., in the management commentary or risk report). The other information within the interim financial report must be available to users on the same terms as the interim financial statements and at the same time. This amendment is applied retrospectively.

#### **Amendments to KIFRS 1001 *Disclosure Initiative***

The amendments to KIFRS 1001 clarify, rather than significantly change, existing KIFRS 1001 requirements. The amendments clarify:

- The materiality requirements in KIFRS 1001
- That specific line items in the statement(s) of profit or loss and OCI and the statement of financial position may be disaggregated
- That entities have flexibility as to the order in which they present the notes to financial statements
- That the share of OCI of associates and joint ventures accounted for using the equity method must be presented in aggregate as a single line item, and classified between those items that will or will not be subsequently reclassified to profit or loss

Furthermore, the amendments clarify the requirements that apply when additional subtotals are presented in the statement of financial position and the statement(s) of profit or loss and OCI. These amendments did not have any impact on the Group's consolidated financial statements.

**2. Basis of preparation and summary of significant accounting policies (cont'd)**

**2.1 Basis of preparation (cont'd)**

**Amendments to KIFRS 1110, KIFRS 1112 and KIFRS 1028 *Investment Entities: Applying the Consolidation Exception***

The amendments address issues that have arisen in applying the investment entities exception under KIFRS 1110 *Consolidated Financial Statements*. The amendments to KIFRS 1110 clarify that the exemption from presenting consolidated financial statements applies to a parent entity that is a subsidiary of an investment entity, when the investment entity measures all of its subsidiaries at fair value. These amendments are applied retrospectively and do not have any impact on the Group's consolidated financial statements as the Group does not apply this exception.

Furthermore, the amendments to KIFRS 1110 clarify that only a subsidiary of an investment entity that is not an investment entity itself and that provides support services to the investment entity is consolidated. All other subsidiaries of an investment entity are measured at fair value. The amendments to KIFRS 1028 *Investments in Associates and Joint Ventures* allow the investor, when applying the equity method, to retain the fair value measurement applied by the investment entity associate or joint venture to its interests in subsidiaries. These amendments are applied retrospectively and do not have any impact on the Group's consolidated financial statements as the Group does not apply this exception.

(2) The standards and interpretations that are issued, but not yet effective, up to the date of issuance of the Company'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 of KIFRS 1109. 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. The impact on its consolidated financial statements is as follows:

**Classification and measurement of financial assets**

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.

Business model	Contractual cash flow characteristics	
	Composed solely of principal and interest	Other
Purpose of collecting contractual cash flows	Amortized cost measurement (*1)	
Purpose of collecting and selling contractual cash flows	FVOCI measurement (*1)	FVTPL measurement (*2)
Purpose of selling, etc.	FVTPL measurement	

(\*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 OCI changes in the fair value of an investment in an equity instrument that is not held for trading.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.1 Basis of preparation (cont'd)**

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.

As at December 31, 2016, the Group has financial assets at FVTPL of ₩9,748 million, loans and receivables of ₩4,269,625 million, AFS financial assets of ₩324,824 million and derivative assets designated as a hedge of ₩12,482 million.

#### **Classification and measurement of financial liabilities**

Based on the new 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 OCI, 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 OCI.

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 OCI; therefore, gains and losses on valuation of financial liabilities may decrease.

As at December 31, 2016, the Group has financial liabilities measured at amortized cost of ₩5,424,655 million and derivative assets designated as a hedge of ₩1,984 million.

#### **KIFRS 1115 Revenue from Contracts with Customers**

KIFRS 1115 establishes a five-step model to account for revenue arising from contracts with customers. Under KIFRS 1115, revenue is recognized at an amount that reflects the consideration to which an entity expects to be entitled in exchange for transferring goods or services to a customer. The new revenue standard will supersede all current revenue recognition requirements under KIFRS. Either a full retrospective application or a modified retrospective application is required for annual periods beginning on or after 1 January 2018. Early adoption is permitted. The Group plans to adopt the new standard on the required effective date.

The current KIFRS 1018 provides the criteria for the recognition of revenue relating to: sale of goods, rendering of services, interest, royalties, dividends and construction contracts; however, under the new KIFRS 1115, revenue is recognized by applying a five-stage revenue recognition model (① Identify a contract with a customer. → ② Identify the performance obligations in the contract. → ③ Determine the transaction price → ④ Allocate the transaction price to the separate performance obligations in the contract. → ⑤ Recognize revenue when the entity satisfies a performance obligation) to its all contracts with customers.

As at December 31, 2016, the Group plans to change its internal control procedures or the accounting system related to the adoption of KIFRS 1115, and analyze the effect of KIFRS 1115 on its consolidated financial statements. The Group will analyze the financial effect from the adoption of KIFRS 1115 in 2017 and disclose the results on its 2017 annual consolidated financial statements.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.1 Basis of preparation (cont'd)**

#### **Amendments to KIFRS 1110 and KIFRS 1028 *Sale or Contribution of Assets between an Investor and its Associate or Joint Venture***

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. These amendments are not expected to have any impact on the Group.

#### **Amendments to KIFRS 1007 *Statement of Cash Flows: Disclosure Initiative***

The amendments to KIFRS 1007 *Statement of Cash Flows* are part of the KASB's Disclosure Initiative and require an entity to provide disclosures that enable users of financial statements to evaluate changes in liabilities arising from financing activities, including both changes arising from cash flows and non-cash changes. On initial application of the amendment, entities are not required to provide comparative information for preceding periods. These amendments are effective for annual periods beginning on or after 1 January 2017, with early application permitted. Application of the amendments will result in additional disclosures provided by the Group.

#### **Amendments to KIFRS 1012 *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 that deductible temporary difference. 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. Entities are required to apply the amendments retrospectively. However, on initial application of the amendments, the change in the opening equity of the earliest comparative period may be recognized in the opening retained earnings (or in another component of equity, as appropriate), without allocating the change between opening retained earnings and other components of equity. Entities applying this relief must disclose that fact. These amendments are effective for annual periods beginning on or after 1 January 2017 with early application permitted. If an entity applies the amendments for an earlier period, it must disclose that fact. These amendments are not expected to have any impact on the Group.

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

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
- 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. These amendments are not expected to have any impact on the Group.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.2 Basis of consolidation**

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

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

- The Group's relative holding of voting rights and dispersion of holdings of the other voting rights;
- Potential voting rights held by the Group, other voting right holders or other parties;
- Rights arising from other contractual arrangements and
- Any additional facts and circumstances that indicate that the Group has, or does not have, the current ability to direct the relevant activities at the time that decisions need to be made, including voting patterns at previous shareholders' meetings.

Gains and losses on subsidiaries acquired or disposed of during the year are included in the consolidated statements of comprehensive income from the date the Group gains control until the date when the Group ceases to control the subsidiary. Profit or loss and each component of other comprehensive income are attributed to the owners of the Group and to the non-controlling interests. Total comprehensive income of subsidiaries is attributed to the owners 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 in line with the Group's accounting policies.

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

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

When the Group loses control of a subsidiary, a gain or loss on disposal is calculated as the difference between (i) the aggregate of the fair value of the consideration received and the fair value of any retained interest and (ii) the previous carrying amount of the assets including goodwill, and liabilities of the subsidiary and any non-controlling interests.

When assets of the subsidiary are carried at revalued amounts or fair value and the related cumulative gain or loss has been recognized in OCI and accumulated in equity, the amounts previously recognized in OCI and accumulated in equity are accounted for as if the Group had directly disposed of the relevant assets (i.e., reclassified to profit or loss or transferred directly to retained earnings). The fair value of any investment retained in the former subsidiary at the date when control is lost is recognized as the fair value on initial recognition for subsequent accounting under KIFRS 1039 or, when applicable, the cost on initial recognition of an investment in an associate or a joint venture.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.3 Business combination**

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

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

- Deferred tax assets or liabilities and liabilities or assets related to employee benefit arrangements are recognized and measured in accordance with KIFRS 1012 and KIFRS 1019;
- Liabilities or equity instruments related to share-based payment arrangements of the venture or share-based payment arrangements of the Group entered into to replace share-based payment arrangements of the venture are measured in accordance with KIFRS 1102 *Share-Based Payment*, at the acquisition date and
- Assets (or disposal groups) that are classified as held for sale in accordance with KIFRS 1105 *Non-Current Assets Held for Sale and Discontinued Operations*, are measured in accordance with that standard.

Goodwill is measured at cost, being the excess of the aggregate of the consideration transferred and the amount recognized for non-controlling interests, and any previous interest held, over the net identifiable assets acquired and liabilities assumed. If the fair value of the net assets acquired is in excess of the aggregate consideration transferred, the Group re-assesses whether it has correctly identified all of the assets acquired and all of the liabilities assumed and reviews the procedures used to measure the amounts to be recognized at the acquisition date. If the re-assessment still results in an excess of the fair value of net assets acquired over the aggregate consideration transferred, then the gain is recognized in profit or loss.

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

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

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

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

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.3 Business combination (cont'd)**

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

### **2.4 Investments in associates and joint ventures**

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

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

Profit or loss, assets and liabilities of associates or joint ventures are incorporated in the consolidated financial statements of the Group using the equity method, except when the investment is classified as held for sale, in which case it is accounted for in accordance with KIFRS 1105. Under the equity method, an investment in an associate or a joint venture is initially recognized in the consolidated statement of financial position at cost and adjusted thereafter to recognize the Group's share of the profit or loss and other comprehensive income in the associate or joint venture. When the Group's share of losses of an associate or a joint venture exceeds the Group's interest in that associate or joint venture which includes any long-term interests that, in substance, form part of the Group's net investment in the associate or joint venture, the Group discontinues recognizing its share of further losses. Additional losses are recognized only to the extent that the Group has incurred legal or constructive obligations or made payments on behalf of the associate or joint venture.

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

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



## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.4 Investments in associates and joint ventures (cont'd)**

When the Group reduces its ownership interest in an associate or a joint venture, but the Group continues to use the equity method, the Group reclassifies to profit or loss the proportion of the gain or loss that had previously been recognized in OCI relating to that reduction in ownership interest if that gain or loss would be reclassified to profit or loss on the disposal of the related assets or liabilities. In addition, the Group applies KIFRS 1105 to a portion of investment in an associate or a joint venture that meets the criteria to be classified as held for sale.

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

The Group continues to use the equity method when an investment in an associate becomes an investment in a joint venture or an investment in a joint venture becomes an investment in an associate.

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

### **2.5 Investments in joint operations**

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

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

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

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

When a group entity transacts with a joint operation in which a group entity is a joint operator (such as a sale or contribution of assets), the Group is considered to be conducting the transaction with the other parties to the joint operation, and gains and losses resulting from the transactions are recognized in the Group's consolidated financial statements only to the extent of other parties' interests in the joint operation.

When a group entity transacts with a joint operation in which a group entity is a joint operator (such as a purchase of assets), the Group does not recognize its share of the gains and losses until it resells those assets to a third party.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.6 Goodwill**

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

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

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

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

The Group's policy for goodwill arising on the acquisition of an associate is described in Note 2.4

### **2.7 Non-current assets held for sale**

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

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

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

After the disposal takes place, the Group accounts for any retained interest in the associate or joint venture in accordance with KIFRS 1039 *Financial Instruments: Recognition and Measurement*, unless the retained interest continues to be an associate or a joint venture, in which case the Group uses the equity method.

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

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.8 Revenue recognition**

Revenue is measured at the fair value of the consideration received or receivable less estimated customer returns, rebates and other similar allowances. The Group recognizes revenue when the amount of revenue can be measured reliably, when it is probable that the economic benefits associated with the transaction will flow to the Group and when the following criteria specific to each of the Group's activities are met:

#### **(1) Sale of goods**

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

#### **(2) Dividend and interest income**

Dividend income from investments is recognized when the shareholder's right to receive payment has been established.

Interest income is accrued on a timely basis, by reference to the principal outstanding and at the effective interest rate applicable, which is the rate that exactly discounts estimated future cash receipts through the expected life of the financial asset to that asset's net carrying amount on initial recognition.

#### **(3) Rental income**

The Group's policy for recognition of revenue from operating leases is described in Note 2.9 below.

#### **(4) Rendering of services**

Revenue from the rendering of services is recognized in accordance with the criteria of progress. To measure revenue of rendering of services reliably, the Group uses methods to determine progress, such as survey results on work progress, the ratio of used capabilities to total capabilities and the ratio of costs incurred to total estimated cost.

#### **(5) License fees and royalties**

License fee and royalty revenue are recognized on an accrual basis in accordance with the substance of the relevant agreement.

### **2.9 Lease**

A lease is classified at the inception date as a finance lease or an operating lease. Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

#### **(1) Group as a lessee**

Assets held under finance leases are initially recognized as assets of the Group at their fair value at the inception of the lease or, if lower, at the present value of the minimum lease payments. The corresponding liability to the lessor is included in the consolidated statements of financial position as a finance lease payable. Lease payments are apportioned between finance expenses and reduction of the finance lease payable to achieve a constant rate of interest on the remaining balance of the liability. Finance expenses are recognized immediately in profit or loss, unless they are directly attributable to qualifying assets, in which case they are capitalized in accordance with the Group's general policy on borrowing costs (see Note 2.11). Contingent rentals are recognized as expenses in the periods in which they are incurred.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.9 Lease (cont'd)**

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

In the event that lease incentives are received to enter into operating leases, such incentives are recognized as a liability. The aggregate benefit of incentives is recognized as a reduction of rental expense on a straight-line basis, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed.

#### **(2) Group as a lessor**

In case of financial leases, financial lease receivables are recognized at the same amount as lease net investment. Interest incomes are recognized for the uncollected financial lease net investment using effective interest method.

Operating lease income is recognized on a straight-line basis over the lease term, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed.

### **2.10 Foreign currency translation**

The Group's consolidated financial statements are presented in the currency of the primary economic environment in which the Group operates, and the functional and reporting currency of the Company is Korean won (KRW).

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

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

- Exchange differences on foreign currency borrowings relating to assets under construction for future productive use, which are included in the cost of those assets when they are regarded as an adjustment to interest costs on those foreign currency borrowings;
- Exchange differences on transactions entered into in order to hedge certain foreign currency risks (see Note 2.23 for hedging accounting policies); and
- Exchange differences on monetary items receivable from or payable to a foreign operation for which settlement is neither planned nor likely to occur, forming part of the net investment in the foreign operation, which are recognized initially in OCI and reclassified from equity to profit or loss on disposal or partial disposal of the net investment.

For the purpose of presenting consolidated financial statements, the assets and liabilities of the Group's foreign operations are expressed in KRW using exchange rates prevailing at the end of the reporting period. Income and expense items are translated at the average exchange rates for the period, unless exchange rates fluctuate significantly during that period, in which case the exchange rates at the dates of the transactions are used. Exchange differences arising, if any, are recognized in OCI and accumulated in equity attributed to non-controlling interests as appropriate.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.10 Foreign currency translation (cont'd)**

On the disposal of a foreign operation (i.e., a disposal of the Group's entire interest in a foreign operation, or a disposal involving loss of control over a subsidiary that includes a foreign operation, or partial disposal of an interest in a joint arrangement or an associate that includes a foreign operation of which the retained interest becomes a financial asset), all of the accumulated exchange differences in respect of that operation attributable to the owners of the Group are reclassified to profit or loss. Any exchange differences that have previously been attributed to non-controlling interests are derecognized, but they are not reclassified to profit or loss.

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

Goodwill and fair value adjustments arising on the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated at the closing rate. Such exchange differences are recognized in equity.

### **2.11 Borrowing costs**

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

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

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

### **2.12 Government subsidies**

Government subsidies are not recognized until there is reasonable assurance that the Group will comply with the conditions attaching to them and that the subsidy will be received.

The benefit of a government loan at a below-market rate of interest is treated as a government subsidy, measured as the difference between proceeds received and the fair value of the loan based on prevailing market interest rates.

Government subsidies related to assets are presented in the statement of financial position by deducting the grant from the carrying amount of the asset. The related grant is recognized in profit or loss over the life of a depreciable asset as a reduced depreciation expense.

Government subsidies related to income are recognized in profit or loss on a systematic basis over the periods in which the Group recognizes as expenses the related costs for which the grants are intended to compensate. Government subsidies that are receivable as compensation for expenses or losses already incurred or for the purpose of giving immediate financial support to the Group with no future related costs are recognized in profit or loss in the period in which they become receivable.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.13 Pension benefits costs and termination benefits**

Contributions to defined contribution retirement benefit plans are recognized as an expense when employees have rendered service entitling them to the contributions.

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

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

The net defined benefit liability on the consolidated statement of financial position represents the actual deficit or surplus in the Group's defined benefit plans. Any surplus resulting from this calculation is limited to the present value of any economic benefits available in the form of refunds from the plans or reductions in future contributions to the plans.

A liability for a termination benefit is recognized at the earlier of when the entity can no longer withdraw the offer of the termination benefit and when the entity recognizes any related restructuring costs.

### **2.14 Taxes**

Income tax consists of current and deferred taxes.

#### **(1) Current income tax**

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

#### **(2) Deferred tax**

Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities in the consolidated financial statements and the corresponding tax bases used in the computation of taxable income. Deferred tax liabilities are generally recognized for all taxable temporary differences. Deferred tax assets are generally recognized for all deductible temporary differences to the extent that it is probable that taxable income will be available against which those deductible temporary differences can be utilized.

Such deferred tax assets and liabilities are not recognized if the temporary difference arises from goodwill or from the initial recognition other than in a business combination of other assets and liabilities in a transaction that affects neither the taxable income nor the accounting income.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.14 Taxes (cont'd)**

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

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

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

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

#### **(3) Recognition of current income tax and deferred tax**

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

### **2.15 Inventories**

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

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

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.16 Financial instruments**

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

All regular-way purchases or sales of financial assets are recognized and derecognized on a trade-date basis. Regular way purchases or sales are purchases or sales of financial assets that require delivery of assets within the time frame established by regulation or convention in the marketplace.

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

#### **(1) Effective interest rate method**

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

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

#### **(2) Financial assets at FVTPL**

Financial assets are classified as financial assets at FVTPL when the financial asset is either held for trading or it is designated as a financial asset at FVTPL upon initial recognition. Every financial instrument, containing one or more embedded derivatives, treated separately from the host contract, is classified as held for trading if it is a derivative that is not designated and effective as a hedge. Financial assets at FVTPL are stated at fair value, with any gains or losses arising from remeasurement recognized in profit or loss.

A financial asset is classified as held for trading if:

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

A financial asset other than a financial asset held for trading may be designated as a financial asset at FVTPL upon initial recognition if:

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



## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.16 Financial instruments (cont'd)**

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

#### **(3) Held-to-maturity investments**

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

#### **(4) AFS financial assets**

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

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

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

The fair value of AFS monetary financial assets denominated in a foreign currency is determined in that foreign currency and translated at the spot rate prevailing at the end of the reporting period. The foreign exchange gains and losses that are recognized in profit or loss are determined based on the amortized cost of the monetary asset. Other foreign exchange gains and losses are recognized in OCI.

Unquoted AFS financial assets, whose fair value cannot be measured reliably and derivative financial instruments, which are linked to unquoted equity financial assets and are settled by the delivery of such equity financial assets, are carried at acquisition cost less any impairment.

#### **(5) Loans and receivables**

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

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.16 Financial instruments (cont'd)**

#### **(6) Impairment of financial assets**

Financial assets, other than those at FVTPL, are assessed for indicators of impairment at the end of each reporting period. Financial assets are considered to be impaired when there is objective evidence that events after the initial recognition of the financial asset affected changes in the estimated future cash flows of the financial asset.

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

For all other financial assets, objective evidence of impairment could include:

- Significant financial difficulty of the issuer or counterparty;
- Default or delinquency in interest or principal payments;
- It becoming probable that the borrower will enter bankruptcy or financial reorganization or
- The disappearance of an active market for that financial asset because of financial difficulties

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

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

The carrying amount of the financial asset is reduced by the impairment loss directly for all financial assets with the exception of trade receivables, where the carrying amount is reduced through the use of an allowance account. When a trade receivable is considered uncollectible, it is written off against the allowance account. Subsequent recoveries of amounts previously written off are credited against the allowance account. Changes in the carrying amount of the allowance account are recognized in profit or loss.

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

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

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

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.16 Financial instruments (cont'd)**

#### **(7) Derecognition of financial assets**

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

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

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

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.17 Property, plant and equipment**

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

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

The Group does not depreciate land. Depreciation is calculated on a straight-line basis over the estimated useful lives of the asset as follows:

	Useful lives (years)
Buildings	10–50
Structures	15–50
Machinery	6–30
Vehicles	4–5
Fixtures and furniture	4–5
Tools and equipment	4–5
Others	1–5

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

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

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

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.18 Investment properties**

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

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

While land is not depreciated, all other investment property is depreciated based on the respective assets' estimated useful lives ranging from 40 to 50 years using the straight-line method.

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

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

### **2.19 Intangible assets**

#### **(1) Intangible assets acquired separately**

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

#### **(2) Internally generated intangible assets - research and development expenditure**

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

An internally generated intangible asset arising from development or from the development phase of an internal project is recognized if, and only if, it has been demonstrated the technical feasibility and development of new product and the ability to measure reliably the expenditure attributable to the intangible asset during its development.

The amount initially recognized for internally generated intangible assets is the sum of the expenditure incurred from the date when the intangible asset first meets the recognition criteria listed above. Where no internally generated intangible asset can be recognized, development expenditure is recognized in profit or loss in the period in which it is incurred.

Subsequent to initial recognition, internally generated intangible assets are reported at cost, less accumulated amortization and accumulated impairment losses.

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.19 Intangible assets (cont'd)**

#### (3) Intangible assets acquired in a business combination

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

#### (4) Derecognition of intangible assets

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

#### (5) Estimated useful lives of intangible assets

The Group does not amortize membership and goodwill acquired in business combination. Amortization is calculated on a straight-line basis over the estimated useful lives of the asset as follows:

	<u>Years</u>
Industrial property rights	5-10
Others	4-5
Customer relationship and others	10-15

### **2.20 Impairment of tangible and intangible assets other than goodwill**

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

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

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

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

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.21 Provisions**

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

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

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

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

### **2.22 Financial liabilities and equity instruments**

#### **(1) Classification as debt or equity**

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

#### **(2) Equity instruments**

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

When the Group reacquires the Company's stock, it is less on the equity directly. The profit or loss on disposal of the treasury stock is not recognized as profit or loss.

#### **(3) Financial liabilities**

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

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

## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.22 Financial liabilities and equity instruments (cont'd)**

#### **(4) Financial liabilities at FVTPL**

Financial liabilities are classified as financial liabilities at FVTPL when the financial liability is either held for trading or it is designated as a financial liability at FVTPL.

A financial liability is classified as held for trading if:

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

A financial liability other than a financial liability held for trading may be designated as a financial liability at FVTPL upon initial recognition if:

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

Financial liabilities at FVTPL are stated at fair value, with any gains or losses arising from remeasurement recognized in profit or loss. The net gain or loss recognized in profit or loss incorporates any interest paid on the financial liability and is included in its profit or loss.

#### **(5) Other financial liabilities**

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

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

#### **(6) Financial guarantee contract liabilities**

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

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

- (a) The amount of the obligation under the contract, as determined in accordance with KIFRS 1037; and
- (b) The amount initially recognized, less cumulative amortization recognized in accordance with the KIFRS 1018 *Revenue*



## **2. Basis of preparation and summary of significant accounting policies (cont'd)**

### **2.22 Financial liabilities and equity instruments (cont'd)**

#### **(7) Derecognition of financial liabilities**

The Group derecognizes financial liabilities when the Group's obligations are discharged, canceled or they expire. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable is recognized in profit or loss.

### **2.23 Derivative financial instruments**

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

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

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

#### **(1) Embedded derivatives**

Derivatives embedded in other financial instruments or other host contracts are treated as separate derivatives when their risks and characteristics are not closely related to those of the host contracts and the host contracts are not measured as financial liabilities at FVTPL.

An embedded derivative is presented as a non-current asset or a non-current liability if the remaining maturity of the hybrid instrument to which the embedded derivative relates is more than 12 months and it is not expected to be realized or settled within 12 months. Other embedded derivatives are presented as current assets or current liabilities.

#### **(2) Hedge accounting**

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

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

## **2. Summary of significant accounting policies (cont'd)**

### **2.23 Derivative financial instruments (cont'd)**

#### (3) Fair value hedges

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

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

#### (4) Cash flow hedges

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

Amounts previously recognized in other comprehensive income and accumulated in equity are reclassified to profit or loss in the periods when the hedged item is recognized in profit or loss, in the same line of the consolidated statements of comprehensive income as the recognized hedged item. However, when the forecast transaction that is hedged results in the recognition of a non-financial asset or a non-financial liability, the gains and losses previously accumulated in equity are transferred from equity and included in the initial measurement of the cost of the non-financial asset or liability.

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

### **2.24 Fair value**

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

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

Level 1: Quoted (unadjusted) prices in active markets for identical assets or liabilities

Level 2: Inputs other than quoted prices included within level 1, that are observable for the asset or liability, either directly or indirectly and

Level 3: Unobservable inputs for the asset or liability

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**2. Summary of significant accounting policies (cont'd)**

**2.25 Significant accounting judgments, estimates and assumptions**

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

The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from those estimates.

**3. Segment information**

Goods or services provided by each reportable business segment

Segment	Goods or services
Monomer	Ethylene glycol (EG), Styrene Monomer (SM), Butadiene (BD), Ethylene oxide adduct (EOA), Methyl Methacrylate (MMA), Purified Terephthalic Acid (PTA) and Purified Isophthalic Acid (PIA)
Polymer	High-density Polyethylene (HDPE), Low-density Polyethylene (LDPE), Linear low-density Polyethylene (LLDPE), Polypropylene (PP), Polyethylene Terephthalate (PET), Polycarbonate (PC), Acrylonitrile Butadiene Styrene (ABS), Foamed Polystyrene (EPS) and Engineering Plastics (EP)
Primary oil content	Ethylene, Propylene, Benzene, Toluene, Xylene, Para-Xylene and Ortho-Xylene
Others	Property lease and labor dispatch services, etc.

Operating results by business segment

Operating results by business segment for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016					
	Monomer	Polymer	Primary oil content	Others	Consolidation adjustments	Total
Sales	₩ 3,536,868,903	₩ 8,752,802,969	₩ 1,520,403,818	₩ 171,847,078	₩ (758,381,894)	₩ 13,223,540,874
Operating income	814,279,557	1,615,414,394	145,293,841	53,330,391	(84,064,247)	2,544,253,936
Finance income	57,703,433	90,525,295	8,523,576	2,004,255	(2,609,136)	156,147,423
Finance costs	87,864,441	138,375,203	12,602,163	4,435,508	(2,254,129)	241,023,186
Other non-operating income	82,952,510	193,509,460	13,245,564	1,845,620	(58,659,328)	232,893,826
Other non-operating expenses	85,454,917	200,881,549	14,531,820	7,226,246	(31,748,503)	276,346,029
Income before income tax	781,616,141	1,560,192,398	139,928,998	45,518,512	(39,882,949)	2,487,373,100

  

	2015					
	Monomer	Polymer	Primary oil content	Others	Consolidation adjustments	Total
Sales	₩ 3,455,584,668	₩ 6,775,175,442	₩ 1,868,811,094	₩ 164,964,924	₩ (551,197,927)	₩ 11,713,338,201
Operating income	504,030,115	976,497,802	86,555,647	51,866,140	(7,830,239)	1,611,119,465
Finance income	43,808,941	90,662,588	10,197,834	1,360,814	(619,691)	145,410,486
Finance costs	66,732,813	123,660,236	13,241,941	1,608,859	(619,691)	204,624,158
Other non-operating income	67,135,354	165,642,779	12,540,706	2,803,788	(68,183,972)	179,938,655
Other non-operating expenses	129,795,563	279,161,321	20,294,427	6,770,112	(148,950,918)	287,070,505
Income before income tax	418,446,034	829,981,612	75,757,819	47,651,773	49,530,769	1,421,368,007

The accounting policies of the business segments are the same with those explained in Note 2. The income of each segment represents the income to which income tax expense is not allocated. The income of segments requires to be reported on the same basis as is used internally to evaluate operating segments' performances and to decide how to allocate resources to operating segments.

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**3. Segment information (cont'd)**

Assets and liabilities by business segments

Assets and liabilities by business segments as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016					
	Monomer	Polymer	Primary oil content	Others	Consolidation adjustments	Total
Total assets	₩ 2,772,037,216	₩ 6,428,993,695	₩ 2,366,164,952	₩ 10,226,374,736	₩ (5,926,736,429)	₩ 15,866,834,170
Total liabilities	1,159,950,714	1,817,305,208	1,252,238,701	2,253,212,956	(16,690,580)	6,466,016,999

  

	2015					
	Monomer	Polymer	Primary oil content	Others	Consolidation adjustments	Total
Total assets	₩ 2,176,488,407	₩ 3,078,808,103	₩ 2,368,950,804	₩ 5,965,993,805	₩ (2,122,432,220)	₩ 11,467,808,899
Total liabilities	953,073,248	1,093,316,313	848,958,253	1,235,893,710	(219,018,700)	3,912,222,824

Information about geography

The Group conducts operations in the Republic of Korea, Malaysia, United Kingdom, Pakistan, China and other region. Details of operating income and non-current assets by regions are as follows (Korean won in thousands):

	Income from external customers		Non-current assets (*1)	
	2016	2015	December 31, 2016	December 31, 2015
Korea	₩ 10,046,156,782	₩ 8,701,335,510	₩ 5,195,182,623	₩ 2,624,195,697
China	645,371,999	427,993,608	103,590,644	94,761,665
Malaysia	1,837,012,155	1,936,848,335	1,021,920,889	824,814,385
United States	174,961,234	11,792,920	997,419,259	217,915,921
Mexico	3,626,168	-	352,290	-
Indonesia	448,105,144	458,464,367	104,714,102	114,130,434
Thailand	6,518,869	-	388,756	-
Pakistan	385,418,188	372,826,896	59,405,742	68,485,861
United Kingdom	273,504,078	331,135,218	97,340,508	122,682,853
Germany	26,438,417	-	374,036	-
Poland	42,196,112	24,139,274	2,467	4,523
Hungary	92,613,622	-	12,994,571	-
	13,981,922,768	12,264,536,128	7,593,685,887	4,066,991,339
Consolidation adjustment	(758,381,894)	(551,197,927)	(149,601,392)	21,454,309
	₩ 13,223,540,874	₩ 11,713,338,201	₩ 7,444,084,495	₩ 4,088,445,648

(\*1) Exclude financial instruments, investments in associates and joint ventures, deferred tax assets and pension plan assets.

Information about key customers

Due to the nature of the Group's operations, there is no major customer that accounts for 10% or more of the Group's total sales.

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**4. Restricted financial instruments**

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

Account	Bank	2016		2015		Details
Short-term financial instruments	Shinhan Bank and others	₩	68,278	₩	117,948	Development expense
Other financial assets	Deutsche Bank		11,505		6,016	Deposit for corporate purchase card
Long-term financial instruments	Woori Bank and others		9,500		9,500	Guarantee deposits for checking accounts
Long-term financial instruments	Industrial Bank of Korea		67,500,000		67,500,000	Mutual benefit fund
		₩	67,589,283	₩	67,633,464	

**5. Trade accounts and other accounts receivable**

Details of trade accounts receivable and other receivable as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Current	Non-current	Current	Non-current
Trade accounts receivable	₩ 1,488,980,065	₩ -	₩ 1,010,654,381	₩ -
Less allowance for doubtful accounts	(5,294,521)	-	(4,440,343)	-
Trade receivables, net	1,483,685,544	-	1,006,214,038	-
Other accounts receivable	68,329,131	-	10,795,830	-
Less allowance for doubtful accounts	(94,216)	-	(674,000)	-
Other accounts receivable, net	68,234,915	-	10,121,830	-
	₩ 1,551,920,459	₩ -	₩ 1,016,335,868	₩ -

**Policies for trade receivables and other receivables**

Relating to trade and other receivables, the Group holds payment guarantees and titles to real estate as collateral, and collateral levels are readjusted periodically by reviewing the credit limit and reassessing the customer's credit.

The Group recognizes allowances for doubtful accounts based on its past experience of collecting receivables. The Group estimates a recoverable amount of a receivable of which a loss event has been identified on an individual basis through individual assessment, and recognizes the difference between the estimated recoverable amount and the carrying amount as an impairment loss. To determine the possibility for the recovery of receivables, the Group considers the trade receivables' credit rating changes from the credit granting date until the end of the reporting period. Exposure to credit risk is considered limited as the Group conducts transactions with a large number of customers that are unrelated to each other.

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**5. Trade accounts and other accounts receivable (cont'd)**

An aging analysis of the trade accounts and other accounts receivable that are overdue, but are not impaired as at December 31, 2016 and 2015 is as follows (Korean won in thousands):

	2016			
	60-90 days	90-180 days	Over 180 days	Total
Trade accounts receivable	₩ 96,871,068	₩ 3,471,884	₩ 17,459,828	₩ 117,802,780
Other accounts receivable	242,111	24,944	119,518	386,573
	₩ 97,113,179	₩ 3,496,828	₩ 17,579,346	₩ 118,189,353

  

	2015			
	60-90 days	90-180 days	Over 180 days	Total
Trade accounts receivable	₩ 15,322,249	₩ 3,432,777	₩ 29,870,907	₩ 48,625,933
Other accounts receivable	1,370,549	21,288	64,321	1,456,158
	₩ 16,692,798	₩ 3,454,065	₩ 29,935,228	₩ 50,082,091

Changes in allowance for doubtful accounts for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Trade accounts receivable	Other accounts receivable	Trade accounts receivable	Other accounts receivable
January 1	₩ 4,440,343	₩ 674,000	₩ 4,683,255	₩ -
Provision	593,182	27,050	453,126	674,000
Reversal of provision	-	(674,000)	-	-
Write-off	(1,469,356)	-	(732,380)	-
Collection	(62,141)	(13,000)	-	-
Others	1,792,493	80,166	36,342	-
December 31	₩ 5,294,521	₩ 94,216	₩ 4,440,343	₩ 674,000

**6. Financial assets at FVTPL**

Details of financial assets at FVTPL as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Current	Non-current	Current	Non-current
Subscription right - Lotte Global Logistics Co., Ltd.	₩ 6,359,869	₩ -	₩ -	₩ -
Derivative assets held for trading	325,204	-	-	-
	₩ 6,685,073	₩ -	₩ -	₩ -

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**7. AFS financial assets**

Details of AFS financial assets as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Current	Non-current	Current	Non-current
Equity securities:				
Marketable equity securities	₩ -	₩ 11,448,352	₩ -	₩ 16,925,815
Non-marketable equity securities	-	288,161,363	-	171,507,038
Bonds:				
Public bonds	588,275	4,625,535	639,020	5,213,810
Commercial paper	-	-	15,000,000	-
Bank bonds	20,000,000	-	30,000,000	-
	<u>₩ 20,588,275</u>	<u>₩ 304,235,250</u>	<u>₩ 45,639,020</u>	<u>₩ 193,646,663</u>

Details of equity securities as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016						
	Number of shares	Equity ownership	Acquisition costs	Book value	Accumulated unrealized gain (loss)	Accumulated impairment loss	Foreign exchange difference
Marketable equity securities (*1):							
Lotte Food Co., Ltd.	13,354	0.98%	₩ 7,625,134	₩ 8,666,746	₩ 1,041,612	₩ -	₩ -
Kumho Industrial Co., Ltd.	287,356	0.82%	4,999,994	2,781,606	(2,218,388)	-	-
			<u>12,625,128</u>	<u>11,448,352</u>	<u>(1,176,776)</u>	<u>-</u>	<u>-</u>
Non-marketable equity securities:							
Sparx Asset Management Korea Co., Ltd.	65,680	7.76%	19,465,366	13,136,366	-	(6,329,000)	-
Weifang Yaxing Group Co., Ltd.	-	10.00%	9,628,681	-	-	(9,628,681)	-
ChemCross Inc.	200,000	1.27%	224,522	-	-	(224,522)	-
Korea Surfactant & Adhesive Industry Cooperative	50	4.30%	5,000	5,000	-	-	-
Lotte Logistics Corp. Lotte (China)	66,308	4.64%	3,999,998	17,729,234	13,729,236	-	-
Management Co., Ltd.	-	15.00%	1,336,831	1,336,831	-	-	-
Lotte Aluminum Co., Ltd.	136,908	13.19%	83,312,560	88,632,459	5,319,899	-	-
Hanju Corp.	97,920	8.66%	6,712,294	10,198,956	3,486,662	-	-
Igis I Corp.	588,696	8.64%	29,434,800	25,939,535	(3,495,265)	-	-
SIN-E P&C Co., Ltd.	127	0.03%	9,560	9,560	-	-	-
Kumho & Company Incorporation (*2)	50,000	1.51%	5,000,000	5,000,000	-	-	-
Lotte Accelerator Corporation	500,000	16.67%	2,500,000	2,500,000	-	-	-
Lotte Global Logistics Co., Ltd. (*3)	3,202,360	17.54%	122,619,150	122,567,127	(52,023)	-	-
Hyunjin Co., Ltd.	175,040	1.80%	4,376	4,376	-	-	-
Unic Technology Korea Speciality Contractor Financial Cooperative	56	-	50,606	50,679	73	-	-
Samsung Engineering (Thailand) Co., Ltd.	11,787	18.96%	211,055	216,859	-	-	5,804
			<u>285,349,180</u>	<u>288,161,363</u>	<u>18,988,582</u>	<u>(16,182,203)</u>	<u>5,804</u>
			<u>₩ 297,974,308</u>	<u>₩ 299,609,715</u>	<u>₩ 17,811,806</u>	<u>₩ (16,182,203)</u>	<u>₩ 5,804</u>

**Lotte Chemical Corporation and its subsidiaries**  
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**7. AFS financial assets (cont'd)**

	2015					
	Number of shares	Equity ownership	Acquisition costs	Book value	Accumulated unrealized gain (loss)	Accumulated impairment loss
Marketable equity securities (*1):						
Lotte Food Co., Ltd.	13,354	0.98%	₩ 7,625,134	₩ 12,672,946	₩ 5,047,812	₩ -
Kumho Industrial Co.,Ltd.	287,356	0.82%	4,999,994	4,252,869	(747,125)	-
			12,625,128	16,925,815	4,300,687	-
Non-marketable equity securities:						
Sparx Asset Management Korea Co., Ltd.	65,680	7.76%	19,465,366	15,107,122	(4,358,244)	-
Weifang Yaxing Group Co., Ltd.	-	10.00%	9,628,681	-	-	(9,628,681)
ChemCross Inc.	200,000	1.27%	224,522	-	-	(224,522)
Korea Surfactant & Adhesive Industry Cooperative	50	4.30%	5,000	5,000	-	-
Lotte Logistics Corp. Lotte (China) Management Co., Ltd.	66,308	4.64%	3,999,998	13,864,539	9,864,541	-
Lotte Aluminum Co., Ltd.	-	15.00%	1,336,831	1,336,831	-	-
Hanju Corp.	136,908	13.19%	83,312,560	99,828,522	16,515,962	-
Igis I Corp.	97,920	8.66%	6,712,294	9,815,011	3,102,717	-
SIN-E P&C Co., Ltd.	588,696	8.64%	29,434,800	26,540,453	(2,894,347)	-
Kumho & Company Incorporation (*2)	127	0.05%	9,560	9,560	-	-
	50,000	1.79%	5,000,000	5,000,000	-	-
			159,129,612	171,507,038	22,230,629	(9,853,203)
			₩ 171,754,740	₩ 188,432,853	₩ 26,531,316	₩ (9,853,203)

(\*1) The fair values of marketable equity securities are measured at quoted market prices at the end of the reporting period (if unavailable, then on the last day before the end of reporting period).

(\*2) Kumho Terminal Inc. merged with Kumho & Company Incorporation in 2016.

(\*3) As at December 31, 2016, the Company has subscription right of Lotte Global Logistics Co., Ltd. and this right is recognized as financial assets at FVTPL.

The Group measured certain non-marketable equity securities at their acquisition cost. These entities have no historical financial information, for the purpose of estimating their future cash flows, to the extent that their fair values can be reliably measured. Impairment losses are recognized when the decline in the net asset values is significant and it is determined that the recovery of such decline is remote.



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**7. AFS financial assets (cont'd)**

Changes in equity securities for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016						
	January 1	Acquisition	Business combination (Note 46)	Valuation	Impairment loss	Foreign exchange difference	December 31
Marketable equity securities (*1):							
Lotte Food Co., Ltd.	₩ 12,672,946	₩ -	₩ -	₩ (4,006,200)	₩ -	₩ -	₩ 8,666,746
Kumho Industrial Co., Ltd.	4,252,869	-	-	(1,471,263)	-	-	2,781,606
	16,925,815	-	-	(5,477,463)	-	-	11,448,352
Non-marketable equity securities:							
Sparx Asset Management Korea Co., Ltd.	15,107,122	-	-	4,358,244	(6,329,000)	-	13,136,366
Weifang Yaxing Group Co., Ltd.	-	-	-	-	-	-	-
ChemCross Inc.	-	-	-	-	-	-	-
Korea Surfactant & Adhesive Industry Cooperative	5,000	-	-	-	-	-	5,000
Lotte Logistics Corp.	13,864,539	-	-	3,864,695	-	-	17,729,234
Lotte (China) Management Co., Ltd.	1,336,831	-	-	-	-	-	1,336,831
Lotte Aluminum Co., Ltd.	99,828,522	-	-	(11,196,063)	-	-	88,632,459
Hanju Corp.	9,815,011	-	-	383,945	-	-	10,198,956
Igis I Corp.	26,540,453	-	-	(600,918)	-	-	25,939,535
SIN-E P&C Co., Ltd.	9,560	-	-	-	-	-	9,560
Kumho & Company Incorporation	5,000,000	-	-	-	-	-	5,000,000
Lotte Accelerator Corporation	-	2,500,000	-	-	-	-	2,500,000
Lotte Global Logistics Co., Ltd.	-	122,619,150	-	(52,023)	-	-	122,567,127
Hyunjin Co., Ltd.	-	-	4,376	-	-	-	4,376
Unic Technology	-	-	834,381	-	-	-	834,381
Korea Speciality Contractor Financial Cooperative	-	9,050	41,556	73	-	-	50,679
Samsung Engineering (Thailand) Co., Ltd.	-	-	211,055	-	-	5,804	216,859
	171,507,038	125,128,200	1,091,368	(3,242,047)	(6,329,000)	5,804	288,161,363
	₩ 188,432,853	₩ 125,128,200	₩ 1,091,368	₩ (8,719,510)	₩ (6,329,000)	₩ 5,804	₩ 299,609,715

	2015					
	January 1	Acquisition	Disposal	Valuation	Impairment loss	December 31
Marketable equity securities:						
Lotte Food Co., Ltd.	₩ 7,745,320	₩ -	₩ -	₩ 4,927,626	₩ -	₩ 12,672,946
Dongyang Co., Ltd.	152,479	-	(132,376)	(20,103)	-	-
Kumho Industrial Co., Ltd.	-	4,999,994	-	(747,125)	-	4,252,869
	7,897,799	4,999,994	(132,376)	4,160,398	-	16,925,815
Non-marketable equity securities:						
Sparx Asset Management Korea Co., Ltd.	15,423,372	-	-	(316,250)	-	15,107,122
Weifang Yaxing Honam Chemical Co., Ltd.	9,628,681	-	-	-	(9,628,681)	-
ChemCross Inc.	224,522	-	-	-	(224,522)	-
Korea Surfactant & Adhesive Industry Cooperative	5,000	-	-	-	-	5,000
Lotte Logistics Corp.	10,278,071	-	-	3,586,468	-	13,864,539
Lotte (China) Management Co., Ltd.	1,336,831	-	-	-	-	1,336,831
Lotte Aluminum Co., Ltd.	78,163,790	-	-	21,664,732	-	99,828,522
Hanju Corp.	9,530,652	-	-	284,359	-	9,815,011
Igis I Corp.	29,039,944	-	-	(2,499,491)	-	26,540,453
Shin-E P&C Co., Ltd.	9,560	-	-	-	-	9,560
Kumho & Company Incorporation	-	5,000,000	-	-	-	5,000,000
	153,640,423	5,000,000	-	22,719,818	(9,853,203)	171,507,038
	₩ 161,538,222	₩ 9,999,994	₩ (132,376)	₩ 26,880,216	₩ (9,853,203)	₩ 188,432,853

A maturity schedule of debt securities among the AFS financial assets as at December 31, 2016 and 2015 is as follows (Korean won in thousands):

	2016		2015	
Within a year	₩	20,588,275	₩	45,639,020
1 to 5 years		4,625,535		5,213,810
	₩	25,213,810	₩	50,852,830

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**8. Other financial assets**

Details of other financial assets as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Current	Non-current	Current	Non-current
Accrued income	₩ 4,521,056	₩ -	₩ 8,115,895	₩ -
Long-term other receivables	-	667,873	-	1,379,467
Loans receivable	562,892	2,982,501	538,283	2,792,103
Guarantee deposits	3,360,443	6,501,686	1,752,495	3,844,776
Derivative assets designated as a hedge	4,798,482	7,683,920	6,333,676	261,291
Derivative assets held for trading	-	3,062,733	-	-
	₩ 13,242,873	₩ 20,898,713	₩ 16,740,349	₩ 8,277,637

**9. Inventories**

Details of inventories as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		
	Acquisition cost	Valuation allowance	Carrying amount
Merchandise	₩ 28,454,531	₩ (179,551)	₩ 28,274,980
Finished goods	465,383,962	(3,243,083)	462,140,879
Work-in-process	204,430,909	(350,033)	204,080,876
Raw materials	358,558,083	(262,476)	358,295,607
Submaterials	45,998,247	-	45,998,247
Supplies	230,891,651	(8,582,539)	222,309,112
Goods-in-transit	156,057,553	-	156,057,553
	₩ 1,489,774,936	₩ (12,617,682)	₩ 1,477,157,254

  

	2015		
	Acquisition cost	Valuation allowance	Carrying amount
Merchandise	₩ 17,523,368	₩ (38,046)	₩ 17,485,322
Finished goods	354,249,131	(3,037,452)	351,211,679
Work-in-process	150,664,880	(2,461,450)	148,203,430
Raw materials	292,835,791	(1,536,257)	291,299,534
Submaterials	44,390,004	-	44,390,004
Supplies	216,798,767	(8,323,323)	208,475,444
Goods-in-transit	101,681,142	-	101,681,142
	₩ 1,178,143,083	₩ (15,396,527)	₩ 1,162,746,556

The reversal of valuation loss on inventory amounting to ₩5,331 million and ₩14,545 million, which focused on the valuation of inventory at net realizable value, were deducted from cost of sales in 2016 and 2015, respectively.

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**10. Financial lease receivables**

Lease agreements

The Group has entered into finance lease agreements with Doobon Inc. and all lease payments are presented in Korean won. The lease agreements are in connection with manufacturing facilities and their auxiliary facilities, and the lease term is 30 years.

Details of finance lease receivables as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Minimum lease payments	Present value	Minimum lease payments	Present value
Within a year	₩ 139,196	₩ 138,598	₩ 139,196	₩ 138,598
1 to 5 years	556,784	548,477	556,784	548,477
Over 5 years	2,622,463	2,465,834	2,761,660	2,591,259
	3,318,443	3,152,909	3,457,640	3,278,334
Less: unrealized interest income	(165,534)	-	(179,306)	-
	₩ 3,152,909	₩ 3,152,909	₩ 3,278,334	₩ 3,278,334

Implicit interest rates are determined at the date of the agreement. The average annual implicit interest rate is 0.4248% as at December 31, 2016 and 2015.

Finance lease receivables classified by current and non-current portion as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
Current	₩ 138,598	₩ 138,598
Non-current	3,014,311	3,139,736
	₩ 3,152,909	₩ 3,278,334

**11. Other assets**

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

	2016		2015	
	Current	Non-current	Current	Non-current
Other current assets	₩ 6,747,077	₩ -	₩ 3,531,475	₩ -
Advance payments	59,084,879	-	294,429,638	-
Prepaid expenses	27,835,414	5,552,910	14,491,313	4,655,761
Value-added tax receivables	43,171,744	-	48,962,993	-
	₩ 136,839,114	₩ 5,552,910	₩ 361,415,419	₩ 4,655,761

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**12. Investments in associates**

Details of investments in associates as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	Principal business activities	Country of domicile	Equity ownership (%)	
			2016	2015
Lotte Engineering & Construction Co., Ltd.	Constructions	Korea	35.21	35.21
Lotte Asset Development Co., Ltd.	Real estate development	Korea	20.53	20.53
Hyundai Chemical Co., Ltd.	Chemical production	Korea	40.00	40.00
Yeosu Petro Corp.	Facility management	Korea	27.20	27.20
Lotte Fine Chemical Co., Ltd. (*1)	Chemical production	Korea	31.53	-

(\*1) The substantial ownership considering treasury shares of the entity.

The Company's investments in associates as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Acquisition costs	Book value	Acquisition costs	Book value
Lotte Engineering & Construction Co., Ltd.	₩ 243,586,059	₩ 621,715,321	₩ 243,586,059	₩ 630,353,073
Lotte Asset Development Co., Ltd.	41,419,551	17,356,094	41,419,551	25,327,337
Hyundai Chemical Co., Ltd.	192,000,000	205,242,172	192,000,000	190,192,363
Yeosu Petro Corp.	227,800	290,433	227,800	271,399
Lotte Fine Chemical Co., Ltd.	432,700,547	443,510,077	-	-
	₩ 909,933,957	₩ 1,288,114,097	₩ 477,233,410	₩ 846,144,172

Changes in investments in associates for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016					
	January 1	Acquisition	Share of profit (loss)	Equity adjustments in equity method	Others (*1)	December 31
Lotte Engineering & Construction Co., Ltd.	₩ 630,353,073	₩ -	₩ (1,054,026)	₩ (8,523,199)	₩ 939,473	₩ 621,715,321
Lotte Asset Development Co., Ltd.	25,327,337	-	(3,133,110)	(4,552,214)	(285,919)	17,356,094
Hyundai Chemical Co., Ltd.	190,192,363	-	15,973,923	(430,970)	(493,144)	205,242,172
Yeosu Petro Corp.	271,399	-	19,034	-	-	290,433
Lotte Fine Chemical Co., Ltd.	-	432,700,547	9,423,597	10,592	1,375,341	443,510,077
	₩ 846,144,172	₩ 432,700,547	₩ 21,229,418	₩ (13,495,791)	₩ 1,535,751	₩ 1,288,114,097

  

	2015					
	January 1	Acquisition	Share of profit (loss)	Equity adjustments in equity method	Others (*1)	December 31
Lotte Engineering & Construction Co., Ltd.	₩ 652,697,676	₩ -	₩ (10,239,286)	₩ (10,908,523)	₩ (1,196,794)	₩ 630,353,073
Lotte Asset Development Co., Ltd.	21,907,904	10,265,420	(2,663,692)	(3,989,192)	(193,103)	25,327,337
Hyundai Chemical Co., Ltd.	63,801,087	128,000,000	(613,046)	(556,205)	(439,473)	190,192,363
Yeosu Petro Corp.	258,781	-	12,618	-	-	271,399
	₩ 738,665,448	₩ 138,265,420	₩ (13,503,406)	₩ (15,453,920)	₩ (1,829,370)	₩ 846,144,172

(\*1) Others represent changes in retained earnings in equity method arising from a remeasurement gain or loss on the defined benefit pension plans of associates.

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**12. Investments in associates (cont'd)**

A summarized financial information of associates as at and for the years ended December 31, 2016 and 2015 is as follows (Korean won in thousands):

	2016				
	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Net assets
Lotte Engineering & Construction Co., Ltd.	₩ 3,547,538,571	₩ 1,569,574,708	₩ 2,432,417,158	₩ 838,011,365	₩ 1,846,684,756
Lotte Asset Development Co., Ltd.	586,129,257	262,205,146	678,252,664	85,064,858	85,016,881
Hyundai Chemical Co., Ltd.	608,804,511	1,020,651,393	461,954,737	652,416,621	515,084,546
Yeosu Petro Corp.	509,192	1,157,805	38,437	560,794	1,067,766
Lotte Fine Chemical Co., Ltd.	569,184,595	1,257,568,781	202,786,442	216,487,906	1,407,479,028

	2015				
	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Net assets
Lotte Engineering & Construction Co., Ltd.	₩ 3,648,310,559	₩ 1,542,368,668	₩ 2,260,066,511	₩ 1,070,620,255	₩ 1,859,992,461
Lotte Asset Development Co., Ltd.	375,566,009	239,220,442	138,391,408	351,235,670	125,159,373
Hyundai Chemical Co., Ltd.	42,426,542	526,779,561	6,861,770	86,863,425	475,480,908
Yeosu Petro Corp.	991,935	738,794	61,775	671,163	997,791

	2016			
	Sales	Operating income (loss)	Net income (loss)	Total comprehensive income (loss)
Lotte Engineering & Construction Co., Ltd.	₩ 4,662,554,603	₩ 255,419,489	₩ 8,350,737	₩ (13,186,608)
Lotte Asset Development Co., Ltd.	224,788,444	9,749,522	(16,577,297)	(40,142,492)
Hyundai Chemical Co., Ltd.	570,905,898	56,666,240	41,913,923	39,603,638
Yeosu Petro Corp.	1,211,899	74,891	69,976	69,976
Lotte Fine Chemical Co., Ltd. (*1)	825,142,839	50,989,401	33,320,249	37,715,577

(\*1) Includes only financial results for the second, third and fourth quarter of 2016 after the acquisition of equity interest in Lotte Fine Chemical Co., Ltd.

	2015			
	Sales	Operating income (loss)	Net income (loss)	Total comprehensive income (loss)
Lotte Engineering & Construction Co., Ltd.	₩ 4,178,389,019	₩ 169,896,164	₩ (18,855,871)	₩ (53,234,277)
Lotte Asset Development Co., Ltd.	155,020,410	1,526,403	(14,299,409)	(31,296,271)
Hyundai Chemical Co., Ltd.	-	(2,247,358)	(1,532,615)	(2,485,811)
Yeosu Petro Corp.	1,126,333	60,130	46,392	46,392

The above financial information includes fair value adjustments at the date of acquisition. The transactions between the Group and its associates were not eliminated.

**Lotte Chemical Corporation and its subsidiaries**  
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**12. Investments in associates (cont'd)**

Details of the reconciliation between net assets of associates and the book value of the investments in associates as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016				
	Net assets (*1)	Share of net assets	Goodwill	Less: unrealized profit on transactions with the Group	Book value
Lotte Engineering & Construction Co., Ltd.	₩ 1,791,777,691	₩ 630,920,392	₩ 7,776,444	₩ (16,981,515)	₩ 621,715,321
Lotte Asset Development Co., Ltd.	84,536,687	17,356,094	-	-	17,356,094
Hyundai Chemical Co., Ltd.	515,084,546	206,033,818	-	(791,646)	205,242,172
Yeosu Petro Corp.	1,067,766	290,433	-	-	290,433
Lotte Fine Chemical Co., Ltd.	1,108,205,224	442,715,045	814,892	(19,860)	443,510,077
	2015				
	Net assets (*1)	Share of net assets	Goodwill	Less: unrealized profit on transactions with the Group	Book value
Lotte Engineering & Construction Co., Ltd.	₩ 1,807,564,298	₩ 636,479,169	₩ 7,776,444	₩ (13,902,540)	₩ 630,353,073
Lotte Asset Development Co., Ltd.	123,362,388	25,327,337	-	-	25,327,337
Hyundai Chemical Co., Ltd.	475,480,908	190,192,363	-	-	190,192,363
Yeosu Petro Corp.	997,791	271,399	-	-	271,399

(\*1) Represents net assets attributable to controlling interests.

**13. Investments in joint ventures**

Details of investments in joint ventures as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	Principal business activities	Country of domicile	Equity ownership (%)	
			2016	2015
Seetec Co., Ltd.	Utility	Korea	50.00	50.00
Lotte MRC Co., Ltd.	Chemical production	Korea	50.00	50.00
Lotte Sanjiang Chemical Co., Ltd.	Chemical production	China	50.00	50.00
Lotte Mitsui Chemical Co., Ltd.	Chemical production	Korea	50.00	50.00
Lotte Ube Synthetic Rubber Sdn. Bhd.	Chemical production	Malaysia	50.00	50.00
Lotte Versalis Elastomers Co., Ltd. (*1)	Chemical production	Korea	50.00 +1 share	50.00 +1 share
Weifang Yaxing Honam Chemical Co., Ltd.	Chemical production	China	25.00	25.00
Kor-UZ Gas Chemical Investment Ltd. (*2, *3)	Natural resource Development	Malaysia	49.00	49.00

(\*1) Although equity ownership in the entity exceeds 50%, the Group's investment in the entity was classified as a joint venture arising from a joint arrangement.

(\*2) The financial statements for the year ended December 31, 2016 of Uz-Kor Gas Chemical LLC, a joint venture of Kor-Uz Gas Chemical Investment Ltd., were unavailable, and accordingly, the financial statements for the twelve-month period ended September 30, 2016 were used for equity method, and significant transactions occurred during the remaining three months were reviewed and considered in the consolidated financial statements.

(\*3) The shares are pledged as security for the borrowings of Uz-Kor Gas Chemical LLC, the Company's related party, in relation to the Surgil joint arrangement in Uzbekistan.

**Lotte Chemical Corporation and its subsidiaries**  
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**13. Investments in joint ventures (cont'd)**

	2016		2015	
	Acquisition costs	Book value	Acquisition costs	Book value
Seetec Co., Ltd.	₩ 105,234,004	₩ 149,564,348	₩ 105,234,004	₩ 156,703,266
Lotte MRC Co., Ltd.	95,125,421	171,002,778	95,125,421	158,910,896
Lotte Sanjiang Chemical Co., Ltd.	24,700,840	9,734,991	24,700,840	15,338,091
Lotte Mitsui Chemical Co., Ltd.	10,000,000	10,302,431	10,000,000	9,945,125
Lotte Ube Synthetic Rubber Sdn. Bhd.	33,137,835	17,038,821	33,137,835	24,771,054
Lotte Versalis Elastomers Co., Ltd.	96,000,010	93,847,816	82,600,010	81,324,591
Weifang Yaxing Honam Chemical Co., Ltd.	12,668,543	-	12,668,543	-
Kor-UZ Gas Chemical Investment Ltd.	379,975,384	396,591,586	379,975,384	353,381,649
	<u>₩ 756,842,037</u>	<u>₩ 848,082,771</u>	<u>₩ 743,442,037</u>	<u>₩ 800,374,672</u>

Changes in investments in joint ventures for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016						
	January 1	Acquisition	Dividends received	Share of profit (loss)	Equity adjustments in equity method	Others (*1)	December 31
Seetec Co., Ltd.	₩ 156,703,266	₩ -	₩ (17,500,000)	₩ 10,329,923	₩ -	₩ 31,159	₩ 149,564,348
Lotte MRC Co., Ltd.	158,910,896	-	(12,000,000)	23,478,828	24,523	588,531	171,002,778
Lotte Sanjiang Chemical Co., Ltd.	15,338,091	-	-	(4,985,143)	(617,957)	-	9,734,991
Lotte Mitsui Chemical Co., Ltd.	9,945,125	-	-	150,630	206,676	-	10,302,431
Lotte Ube Synthetic Rubber Sdn. Bhd.	24,771,054	-	-	(8,059,060)	501,480	(174,653)	17,038,821
Lotte Versalis Elastomers Co., Ltd.	81,324,591	13,400,000	-	(810,198)	(66,577)	-	93,847,816
Weifang Yaxing Honam Chemical Co., Ltd.	-	-	-	-	-	-	-
Kor-UZ Gas Chemical Investment Ltd.	353,381,649	-	-	30,112,731	13,097,206	-	396,591,586
	<u>₩ 800,374,672</u>	<u>₩ 13,400,000</u>	<u>₩ (29,500,000)</u>	<u>₩ 50,217,711</u>	<u>₩ 13,145,351</u>	<u>₩ 445,037</u>	<u>₩ 848,082,771</u>

  

	2015						
	January 1	Acquisition	Dividends received	Share of profit (loss)	Equity adjustments in equity method	Others (*1)	December 31
Seetec Co., Ltd.	₩ 178,843,651	₩ -	₩ (33,500,000)	₩ 11,363,646	₩ -	₩ (4,031)	₩ 156,703,266
Lotte MRC Co., Ltd.	143,553,805	-	(3,500,000)	19,382,674	151,115	(676,698)	158,910,896
Lotte Sanjiang Chemical Co., Ltd.	24,525,956	-	-	(9,623,626)	435,761	-	15,338,091
Lotte Mitsui Chemical Co., Ltd.	9,259,008	-	-	407,562	278,555	-	9,945,125
Lotte Ube Synthetic Rubber Sdn. Bhd.	29,828,360	-	-	(6,156,691)	1,808,344	(708,959)	24,771,054
Lotte Versalis Elastomers Co., Ltd.	43,000,628	39,000,000	-	(485,074)	(190,963)	-	81,324,591
Weifang Yaxing Honam Chemical Co., Ltd.	7,013,999	-	-	(7,123,501)	109,502	-	-
Kor-UZ Gas Chemical Investment Ltd.	347,535,658	-	-	(17,667,520)	23,513,511	-	353,381,649
	<u>₩ 783,561,065</u>	<u>₩ 39,000,000</u>	<u>₩ (37,000,000)</u>	<u>₩ (9,902,530)</u>	<u>₩ 26,105,825</u>	<u>₩ (1,389,688)</u>	<u>₩ 800,374,672</u>

(\*1) Others represent retained earnings adjustments in equity method arising from the remeasurement gain or loss on the defined benefit pension plans of the joint ventures, as well as foreign exchange difference.

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**13. Investments in joint ventures (cont'd)**

A summarized financial information of joint ventures as at and for the years ended December 31, 2016 and 2015 is as follows (Korean won in thousands):

	2016				
	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Net assets
Seetec Co., Ltd.	₩ 67,145,793	₩ 289,058,452	₩ 39,110,223	₩ 6,418,570	₩ 310,675,452
Lotte MRC Co., Ltd.	213,147,932	291,969,214	135,650,126	20,102,639	349,364,381
Lotte Sanjiang Chemical Co., Ltd.	61,384,224	72,858,792	114,773,034	-	19,469,982
Lotte Mitsui Chemical Co., Ltd.	6,300,290	35,952,374	9,565,875	12,081,928	20,604,861
Lotte Ube Synthetic Rubber Sdn. Bhd.	25,081,080	147,211,593	51,721,720	82,330,032	38,240,921
Lotte Versalis Elastomers Co., Ltd.	18,997,603	526,636,854	46,338,825	311,600,000	187,695,632
Weifang Yaxing Honam Chemical Co., Ltd.	23,447,164	40,780,959	80,789,379	1,455,557	(18,016,813)
Kor-UZ Gas Chemical Investment Ltd.	286,685	859,480,970	-	-	859,767,655

	2015				
	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Net assets
Seetec Co., Ltd.	₩ 76,935,210	₩ 285,128,926	₩ 41,246,756	₩ 7,410,848	₩ 313,406,532
Lotte MRC Co., Ltd.	182,386,335	336,921,831	129,621,538	62,654,872	327,031,756
Lotte Sanjiang Chemical Co., Ltd.	58,339,394	85,831,706	111,648,397	-	32,522,703
Lotte Mitsui Chemical Co., Ltd.	9,881,245	40,063,080	9,731,945	20,322,131	19,890,249
Lotte Ube Synthetic Rubber Sdn. Bhd.	14,577,499	150,165,399	32,327,260	79,836,895	52,578,743
Lotte Versalis Elastomers Co., Ltd.	7,893,980	227,986,171	17,730,970	55,500,000	162,649,181
Weifang Yaxing Honam Chemical Co., Ltd.	73,820,536	46,388,059	123,869,641	892,414	(4,553,460)
Kor-UZ Gas Chemical Investment Ltd.	510,825	755,666,338	-	-	756,177,163

	2016			
	Sales	Operating income (loss)	Net income (loss)	Total comprehensive income (loss)
Seetec Co., Ltd.	₩ 467,224,888	₩ 18,843,810	₩ 17,053,211	₩ 17,115,530
Lotte MRC Co., Ltd.	455,476,579	62,025,194	45,106,518	46,332,626
Lotte Sanjiang Chemical Co., Ltd.	174,480,110	(5,031,643)	(11,816,807)	(13,052,721)
Lotte Mitsui Chemical Co., Ltd.	12,005,496	301,657	301,261	714,612
Lotte Ube Synthetic Rubber Sdn. Bhd.	23,622,551	(14,036,997)	(15,340,783)	(14,337,823)
Lotte Versalis Elastomers Co., Ltd.	-	(1,809,279)	(1,620,395)	(1,620,395)
Weifang Yaxing Honam Chemical Co., Ltd.	119,370,387	(12,450,010)	(13,737,001)	(13,463,353)
Kor-UZ Gas Chemical Investment Ltd.	-	(216,224)	76,861,500	103,590,492

	2015			
	Sales	Operating income (loss)	Net income (loss)	Total comprehensive income (loss)
Seetec Co., Ltd.	₩ 507,701,183	₩ 23,750,973	₩ 19,120,657	₩ 19,112,597
Lotte MRC Co., Ltd.	452,301,215	58,982,907	46,456,074	45,404,908
Lotte Sanjiang Chemical Co., Ltd.	145,047,689	(8,836,953)	(17,400,731)	(16,529,208)
Lotte Mitsui Chemical Co., Ltd.	11,012,460	338,863	815,124	1,372,233
Lotte Ube Synthetic Rubber Sdn. Bhd.	5,382,088	(12,505,379)	(12,289,218)	(8,672,530)
Lotte Versalis Elastomers Co., Ltd.	-	(1,305,484)	(970,133)	(970,133)
Weifang Yaxing Honam Chemical Co., Ltd.	102,879,510	(31,065,904)	(33,195,757)	(32,757,750)
Kor-UZ Gas Chemical Investment Ltd.	-	(213,927)	(35,603,052)	12,383,705



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**13. Investments in joint ventures (cont'd)**

Details of the reconciliations between net assets of joint ventures and the book value of the investments in joint ventures as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016					
	Net assets	Share of net assets	Goodwill	Less: unrealized profit on transactions with the Group	Unrecognized accumulated loss on valuation of investment under the equity method	Book value
Seetec Co., Ltd.	₩ 310,675,452	₩ 149,564,348	₩ -	₩ -	₩ -	₩ 149,564,348
Lotte MRC Co., Ltd.	349,364,381	174,682,191	-	(3,679,413)	-	171,002,778
Lotte Sanjiang Chemical Co., Ltd.	19,469,982	9,734,991	-	-	-	9,734,991
Lotte Mitsui Chemical Co., Ltd.	20,604,861	10,302,431	-	-	-	10,302,431
Lotte Ube Synthetic Rubber Sdn. Bhd.	38,240,921	19,120,460	-	(2,081,639)	-	17,038,821
Lotte Versalis Elastomers Co., Ltd.	187,695,632	93,847,816	-	-	-	93,847,816
Weifang Yaxing Honam Chemical Co., Ltd.	(18,016,813)	(4,504,203)	-	(387,838)	4,892,041	-
Kor-UZ Gas Chemical Investment Ltd.	859,767,655	421,286,151	237,685	(24,932,250)	-	396,591,586

  

	2015					
	Net assets	Share of net assets	Goodwill	Less: unrealized profit on transactions with the Group	Unrecognized accumulated loss on valuation of investment under the equity method	Book value
Seetec Co., Ltd.	₩ 313,406,532	₩ 156,703,266	₩ -	₩ -	₩ -	₩ 156,703,266
Lotte MRC Co., Ltd.	327,031,756	163,515,878	-	(4,604,982)	-	158,910,896
Lotte Sanjiang Chemical Co., Ltd.	32,522,703	16,261,352	-	(923,261)	-	15,338,091
Lotte Mitsui Chemical Co., Ltd.	19,890,249	9,945,125	-	-	-	9,945,125
Lotte Ube Synthetic Rubber Sdn. Bhd.	52,578,743	26,289,372	-	(1,518,318)	-	24,771,054
Lotte Versalis Elastomers Co., Ltd.	162,649,181	81,324,591	-	-	-	81,324,591
Weifang Yaxing Honam Chemical Co., Ltd.	(4,553,460)	(1,138,365)	-	(172,299)	1,310,664	-
Kor-UZ Gas Chemical Investment Ltd.	756,177,163	370,526,810	237,685	(17,382,846)	-	353,381,649

**14. Joint operation**

As at December 31, 2016, the Group has 90% equity interest in LACC, LLC domiciled in the United States. Axiall Corp., which has the remaining 10% ownership interests in LACC, LLC, also has a call option to acquire 40% ownership interests in LACC, LLC from the Group. LACC, LLC is a joint operation of which primary objective is to provide its jointly controlling parties with output, and accordingly, the Group recognizes its share of assets, liabilities, revenue and expenses.

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**15. Property, plant and equipment**

Details of property, plant and equipment as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016				
	Acquisition costs	Accumulated depreciation	Accumulated impairment loss	Government subsidies	Carrying value
Land	₩ 852,716,905	₩ -	₩ -	₩ -	₩ 852,716,905
Buildings	680,437,826	(205,511,350)	-	-	474,926,476
Structures	1,219,485,663	(753,457,430)	-	-	466,028,233
Machinery	9,034,572,891	(7,046,318,789)	(131,188,181)	(183,685)	1,856,882,236
Vehicles	12,932,403	(11,366,267)	-	-	1,566,136
Tools and equipment	206,937,304	(156,468,081)	-	-	50,469,223
Fixtures and furniture	81,349,701	(73,186,604)	-	-	8,163,097
Others	384,950,914	(154,925,301)	-	(62,881)	229,962,732
Construction-in-progress	1,605,948,119	-	-	-	1,605,948,119
	₩ 14,079,331,726	₩ (8,401,233,822)	₩ (131,188,181)	₩ (246,566)	₩ 5,546,663,157

  

	2015				
	Acquisition costs	Accumulated depreciation	Accumulated impairment loss	Government subsidies	Carrying value
Land	₩ 520,637,602	₩ -	₩ -	₩ -	₩ 520,637,602
Buildings	503,820,440	(176,323,406)	(49,815)	-	327,447,219
Structures	1,100,866,315	(685,797,741)	-	-	415,068,574
Machinery	8,676,494,116	(6,566,030,774)	(131,450,620)	(253,736)	1,978,758,986
Vehicles	12,603,200	(11,061,319)	-	-	1,541,881
Tools and equipment	159,881,234	(117,664,630)	-	-	42,216,604
Fixtures and furniture	72,986,843	(66,704,431)	-	-	6,282,412
Others	400,268,723	(169,584,515)	-	-	230,684,208
Construction-in-progress	442,214,946	-	-	-	442,214,946
	₩ 11,889,773,419	₩ (7,793,166,816)	₩ (131,500,435)	₩ (253,736)	₩ 3,964,852,432

Changes in property, plant and equipment for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016								
	January 1	Acquisition	Disposal	Depreciation	Business combination (Note 46)	Impairment loss	Transfer (*1)	Others (*2)	December 31
Land	₩ 520,637,602	₩ 17,755,352	₩ -	₩ -	₩ 312,100,769	₩ -	₩ 2,891,826	₩ (668,644)	₩ 852,716,905
Buildings	327,447,219	10,356,800	(226,811)	(18,821,841)	155,183,444	-	1,105,864	(118,199)	474,926,476
Structures	415,068,574	887,452	(165,949)	(46,795,845)	85,975,020	-	10,826,256	232,725	466,028,233
Machinery	1,978,758,986	3,714,602	(18,883,805)	(399,807,322)	157,796,692	(19,142,620)	156,568,429	(2,122,726)	1,856,882,236
Vehicles	1,541,881	20,205	(10,565)	(414,590)	296,093	-	104,614	28,498	1,566,136
Tools and equipment	42,216,604	1,135,459	(72,968)	(16,622,976)	18,069,508	-	4,969,574	774,022	50,469,223
Fixtures and furniture	6,282,412	891,837	(69,659)	(3,574,214)	2,165,427	-	2,303,645	163,649	8,163,097
Others	230,684,208	2,733,865	(11,378,583)	(73,877,780)	1,356,039	-	76,252,623	2,192,360	229,962,732
Construction-in-progress	442,214,946	1,373,415,186	-	-	1,752,670	-	(259,663,539)	48,228,856	1,605,948,119
	₩ 3,964,852,432	₩ 1,410,910,758	₩ (30,808,340)	₩ (559,914,568)	₩ 734,695,662	₩ (19,142,620)	₩ (2,640,708)	₩ 48,710,541	₩ 5,546,663,157

  

	2015							
	January 1	Acquisition	Disposal	Depreciation	Impairment loss	Transfer (*1)	Others (*2)	December 31
Land	₩ 549,195,121	₩ -	₩ (28,655,620)	₩ -	₩ -	₩ 2,038	₩ 96,063	₩ 520,637,602
Buildings	334,730,931	57,120	(15,770)	(14,687,888)	-	5,526,704	1,836,122	327,447,219
Structures	426,235,126	272,393	(40,836)	(41,423,989)	-	21,855,828	8,170,052	415,068,574
Machinery	2,103,259,659	5,905,933	(3,545,093)	(367,878,803)	(86,558,845)	284,678,362	42,897,773	1,978,758,986
Vehicles	1,776,664	33,323	(6,456)	(402,790)	-	71,768	69,372	1,541,881
Tools and equipment	43,064,416	1,918,339	(62)	(9,492,450)	-	4,740,256	1,986,105	42,216,604
Fixtures and furniture	9,222,796	375,446	(2,447)	(5,494,189)	-	1,986,561	194,245	6,282,412
Others	176,467,887	4,213,373	(33,547,701)	(43,951,769)	-	123,842,194	3,660,224	230,684,208
Construction-in-progress	331,857,787	544,532,182	-	-	-	(446,534,837)	12,359,814	442,214,946
	₩ 3,975,810,387	₩ 557,308,109	₩ (65,813,985)	₩ (483,331,878)	₩ (86,558,845)	₩ (3,831,126)	₩ 71,269,770	₩ 3,964,852,432

(\*1) Transfers to investment property and intangible assets.

(\*2) Effects of foreign exchange difference.

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**15. Property, plant and equipment (cont'd)**

Details of impairment loss of property, plant and equipment for the years ended December 31, 2016 and 2015 are as follows:

The Company

The Company recognized an impairment loss amounting to ₩19,143 million in 2016 (₩30,000 million in 2015) resulted from an impairment indicator of certain plant's shutdown. The plants' shutdown attributes to the polymer business segment and their recoverable amount was estimated based on the fair value.

Lotte Chemical (Jiaxing) Corp.

As a result of an impairment test on Lotte Chemical (Jiaxing) Corp.'s property, plant and equipment, an impairment loss amounting to ₩17,767 million in 2015 was recognized. The property, plant and equipment attributes to the monomer business segment and their recoverable amount was calculated based on value in use under which discount rate of 10.81% was used.

Lotte Chemical UK Limited

As a result of an impairment test on Lotte Chemical UK Limited's PET plant, an impairment loss amounting to ₩38,792 million in 2015 was recognized. The PET plant attributes to the polymer business segment and its recoverable amount was calculated based on value in use under which discount rate of 9.50% was used.

**16. Investment properties**

Details of investment properties as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		
	Acquisition cost	Accumulated depreciation	Carrying value
Land	₩ 60,796,795	₩ -	₩ 60,796,795
Buildings	55,864,212	(17,189,443)	38,674,769
	<u>₩ 116,661,007</u>	<u>₩ (17,189,443)</u>	<u>₩ 99,471,564</u>

  

	2015		
	Acquisition cost	Accumulated depreciation	Carrying value
Land	₩ 46,885,491	₩ -	₩ 46,885,491
Buildings	50,291,327	(15,878,075)	34,413,252
	<u>₩ 97,176,818</u>	<u>₩ (15,878,075)</u>	<u>₩ 81,298,743</u>

Changes in investment properties for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016					
	January 1	Acquisition	Disposal	Depreciation	Transfer	December 31
Land	₩ 46,885,491	₩ 13,911,304	₩ -	₩ -	₩ -	₩ 60,796,795
Buildings	34,413,252	5,224,709	-	(1,311,368)	348,176	38,674,769
	<u>₩ 81,298,743</u>	<u>₩ 19,136,013</u>	<u>₩ -</u>	<u>₩ (1,311,368)</u>	<u>₩ 348,176</u>	<u>₩ 99,471,564</u>

  

	2015					
	January 1	Acquisition	Disposal	Depreciation	Transfer	December 31
Land	₩ 49,084,629	₩ -	₩ -	₩ -	₩ (2,199,138)	₩ 46,885,491
Buildings	35,162,387	-	(2,699,246)	(1,172,202)	3,122,313	34,413,252
	<u>₩ 84,247,016</u>	<u>₩ -</u>	<u>₩ (2,699,246)</u>	<u>₩ (1,172,202)</u>	<u>₩ 923,175</u>	<u>₩ 81,298,743</u>

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**16. Investment properties (cont'd)**

There is no significant difference between the fair value and book value of investment properties as at December 31, 2016 and 2015.

Details of income and expenses associated with investment properties for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015
Rental income	₩ 7,961,745	₩	6,476,451
Operating expenses	(5,291,431)		(4,255,890)
	<u>₩ 2,670,314</u>	₩	<u>2,220,561</u>

**17. Goodwill**

Details of goodwill as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015
Acquisition cost	₩ 761,274,960	₩	40,674,255
Accumulated impairment loss	(37,478,103)		(37,478,103)
Book value	<u>₩ 723,796,857</u>	₩	<u>3,196,152</u>

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

	2016		2015
January 1	₩ 3,196,152	₩	3,196,152
Business combination (Note 46)	720,600,705		-
Impairment loss	-		-
December 31	<u>₩ 723,796,857</u>	₩	<u>3,196,152</u>

Changes in accumulated impairment loss for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015
January 1	₩ (37,478,103)	₩	(37,478,103)
Impairment loss	-		-
December 31	<u>₩ (37,478,103)</u>	₩	<u>(37,478,103)</u>

The Group annually reviews whether there is an indication that an asset may be impaired and the recoverable amount of the cash-generating unit is determined based on the value-in-use calculation. The calculation of value-in-use uses pre-tax cash flow estimates based on the financial budgets approved by management for the next five years. The calculation of the permanent cash flow for the period exceeding five years is based on the assumption of a certain growth rate (but not exceeding the average growth rate in the industry).

As a result of the impairment test during 2016, the Group did not recognize an impairment loss for goodwill. Key assumptions used in value-in-use calculations are as follows:

Sales growth rate (*1)	7.5 %
Perpetual growth rate	1.00 %
Pre-tax discount rate (*1)	10.74 %

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**17. Goodwill (cont'd)**

(\*1) The Group has determined its sales growth rate based on past experience and expectations for future market fluctuations. The discount rate used is the discount rate that reflects the specific risk of the business involved.

**18. Other intangible assets**

Details of other intangible assets as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016			
	Acquisition costs	Accumulated amortization	Accumulated impairment loss	Book value
Industrial property rights	₩ 4,825,550	₩ (1,450,617)	₩ -	₩ 3,374,933
Membership	24,686,726	-	(138,445)	24,548,281
Customer relationship, etc.	1,067,325,000	(56,090,732)	-	1,011,234,268
Others	64,176,749	(34,734,224)	-	29,442,525
	<u>₩ 1,161,014,025</u>	<u>₩ (92,275,573)</u>	<u>₩ (138,445)</u>	<u>₩ 1,068,600,007</u>

  

	2015			
	Acquisition costs	Accumulated amortization	Accumulated impairment loss	Book value
Industrial property rights	₩ 2,569,845	₩ (1,336,279)	₩ -	₩ 1,233,566
Membership	13,569,583	-	(138,445)	13,431,138
Others	52,521,435	(32,743,579)	-	19,777,856
	<u>₩ 68,660,863</u>	<u>₩ (34,079,858)</u>	<u>₩ (138,445)</u>	<u>₩ 34,442,560</u>

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

	2016						
	January 1	Acquisition	Transfer (*1)	Amortization (*2)	Business combination (*3)	Others (*4)	December 31
Industrial property rights	₩ 1,233,566	₩ 994,138	₩ -	₩ (466,943)	₩ 1,614,247	₩ (75)	₩ 3,374,933
Membership	13,431,138	4,627,158	-	-	6,489,985	-	24,548,281
Customer relationship, etc.	-	-	-	(56,090,732)	1,067,325,000	-	1,011,234,268
Others	19,777,856	1,260,465	2,292,532	(11,367,320)	17,948,968	(469,976)	29,442,525
	<u>₩ 34,442,560</u>	<u>₩ 6,881,761</u>	<u>₩ 2,292,532</u>	<u>₩ (67,924,995)</u>	<u>₩ 1,093,378,200</u>	<u>₩ (470,051)</u>	<u>₩ 1,068,600,007</u>

  

	2015							
	January 1	Acquisition	Transfer (*1)	Disposal	Amortization (*2)	Impairment loss	Others (*4)	December 31
Industrial property rights	₩ 738,150	₩ 349,279	₩ 300,000	₩ -	₩ (153,953)	₩ -	₩ 90	₩ 1,233,566
Membership	12,022,238	1,477,772	-	(32,282)	-	(36,590)	-	13,431,138
Others	7,602,496	6,674,500	7,848,578	-	(2,685,004)	-	337,286	19,777,856
	<u>₩ 20,362,884</u>	<u>₩ 8,501,551</u>	<u>₩ 8,148,578</u>	<u>₩ (32,282)</u>	<u>₩ (2,838,957)</u>	<u>₩ (36,590)</u>	<u>₩ 337,376</u>	<u>₩ 34,442,560</u>

(\*1) Transfers in 2016 comes from property, plant and equipment amounting to ₩2,292,532 thousand and transfers in 2015 are comprised of transfers from property, plant and equipment amounting to ₩2,907,952 thousand and transfers from prepaid expenses amounting to ₩5,240,626 thousand.

(\*2) The amortization amounting to ₩7,883,417 thousand in 2016 (₩1,663,021 thousand in 2015) was included in selling and administrative expenses and the remainder was included in cost of sales and other accounts.

(\*3) It was caused by the acquisition of Lotte Advanced Material Co., Ltd. (see Note 46).

(\*4) Effects of foreign exchange difference.

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**19. Trade accounts payable and other accounts payable**

Details of trade and other accounts payable as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Current	Non-current	Current	Non-current
Trade accounts payable	₩ 911,627,019	₩ -	₩ 631,579,961	₩ -
Other accounts payable	215,070,885	-	302,677,321	-
	₩ 1,126,697,904	₩ -	₩ 934,257,282	₩ -

**20. Financial liabilities at FVTPL**

Details of financial liabilities at FVTPL as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Current	Non-current	Current	Non-current
Derivative instruments held for trading	₩ -	₩ -	₩ 179,284	₩ -

**21. Borrowings and bonds payable**

Details of borrowings and bonds payable as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Current	Non-current	Current	Non-current
Short-term borrowings	₩ 1,414,679,503	₩ -	₩ 444,775,582	₩ -
Long-term borrowings	131,277,021	545,848,148	276,740,725	171,805,461
Bonds payable	199,917,438	1,893,726,329	189,821,601	1,328,976,285
	₩ 1,745,873,962	₩ 2,439,574,477	₩ 911,337,908	₩ 1,500,781,746

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**21. Borrowings and bonds payable (cont'd)**

Details of short-term borrowings as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	Lender	Annual interest rate as at December 31, 2016	2016	2015
Usance	Woori Bank and others	6M LIBOR + 0.18%	₩ 370,569,588	₩ 143,747,933
Commercial paper	IBK Securities and others	1.71%	300,000,000	-
Common borrowings	Nonghyup Bank	-	-	2,500,000
	Shinhan Bank	3M EURIBOR + 1.5%	34,043,910	39,925,930
	Standard Chartered Bank	-	-	5,049,524
	HSBC	-	-	8,124,750
Borrowings in foreign currency	Mizuho Corporate Bank, Ltd.	3M LIBOR + 0.6%	76,685,368	-
Trade borrowings	KEB Hana Bank	2.73%	2,550,000	1,550,000
Facility loans	KEB Hana Bank	-	-	4,000,000
Borrowings	Woori Bank	-	-	1,812,000
for working capital	Citibank	1.97%	2,779,585	3,983,003
	Industrial & Commercial Bank of China	1.93%	370,925	1,488,218
Import Loan	Korea Development Bank and others	3M LIBOR + 0.39% ~ 6M LIBOR +0.45%	374,199,191	101,975,327
Factored receivables (*1)	DBS Bank	8M GBP LIBOR + 0.5%	49,222,943	31,145,650
	Mizuho Corporate Bank, Ltd.	-	-	65,319,698
	KEB Hana Bank	1M LIBOR + 2.37%, 1.57%	77,911,853	885,452
	Woori Bank	3M LIBOR + 1.00%, 1.57%	75,784,047	33,268,097
	Shinhan Bank	1.57%	1,222,191	-
	Kookmin Bank	1.57%	49,339,902	-
			<u>₩ 1,414,679,503</u>	<u>₩ 444,775,582</u>

(\*1) Are recognized as financial liabilities in connection with the transfer of trade receivables that do not meet the elimination requirements and are secured by the Group's trade receivables.

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**21. Borrowings and bonds payable (cont'd)**

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

Lender	Interest rate (%)	Maturity	2016		2015	
			Current	Non-current	Current	Non-current
Shinhan Bank	3M EURLIBOR +1.5%	March 24, 2017	₩ 14,801,700	₩ -	₩ -	₩ 17,359,100
	3M EURLIBOR +1.5%	April 15, 2017	22,202,550	-	-	26,038,650
Woori Bank	-	June 27, 2016	-	-	150,000	-
	-	September 26, 2016	-	-	120,000	-
KEB Hana Bank	3M EURLIBOR +1.5%	January 27, 2017	57,726,630	-	-	67,700,490
	3M EURLIBOR +1.5%	February 25, 2017	14,801,700	-	-	17,359,100
HSBC Bank Malaysia Berhad	LIBOR +1.25%	September 22, 2017	20,302,800	-	19,455,200	19,689,600
Lotte Capital Lease&Finance (China) Co., Ltd.	-	June 14, 2016	-	-	-	1,735,409
Korean National Oil Corp. (*1)	1.25%	December 31, 2017	1,441,641	-	1,441,641	-
Korea Eximbank	2.37%	April 29, 2021	-	100,000,000	-	-
WELLS FARGO	1M LIBOR + 1.25%	March 24, 2018	-	725,100	-	3,164,400
Standard Chartered Bank	3.90%	Mach 25, 2019	-	19,230,474	37,517,424	-
Samsung SDI Co., Ltd. (*2)	2.00%	April 28, 2019	-	258,500,000	-	-
Mizuh Corporate Bank, Ltd.	-	December 20, 2016	-	-	113,684,000	-
	3M LIBOR+0.8%	May 23, 2019	-	30,937,600	30,003,200	-
	3M LIBOR+1.22%	December 20, 2019	-	117,224,500	-	-
	-	July 26, 2016	-	-	57,428,000	-
	-	October 18, 2016	-	-	16,941,260	-
DBS Singapore	2.98%	March 25, 2018	-	19,230,474	-	18,758,712
			₩ 131,277,021	₩ 545,848,148	₩ 276,740,725	₩ 171,805,461

(\*1) The borrowings were provided in connection with the development of overseas natural resources and shall not be used for any other purposes, and should the Group not succeed in the development project, the Group may be fully or partially exempted from repayments of the principal and interest. The Group provided three blank checks to Korea National Oil Corporation as collateral for the borrowings.

(\*2) See Note 1.2



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**21. Borrowings and bonds payable (cont'd)**

Details of bonds payable as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016			
	Annual interest rate as at December 31, 2016	Maturity	Current	Non-current
49-2th unsecured	3.57%	September 12, 2018	₩ -	₩ 210,000,000
50-1th unsecured	2.67%	July 28, 2017	200,000,000	-
50-2th unsecured	3.03%	July 28, 2019	-	250,000,000
50-3th unsecured	3.25%	July 28, 2021	-	200,000,000
51-1th unsecured	2.06%	October 8, 2018	-	200,000,000
51-2th unsecured	2.48%	October 8, 2022	-	100,000,000
52-1th unsecured	1.82%	April 28, 2018	-	210,000,000
52-2th unsecured	1.93%	April 28, 2019	-	340,000,000
52-3th unsecured	2.14%	April 28, 2021	-	150,000,000
52-4th unsecured	2.60%	April 28, 2026	-	60,000,000
Floating rate USD bond A	3M LIBOR+0.60%	September 28, 2018	-	118,433,000
Floating rate USD bond B	3M LIBOR+0.52%	December 28, 2018	-	57,766,300
Discount on bonds payable			(82,562)	(2,472,971)
			₩ 199,917,438	₩ 1,893,726,329

	2015			
	Annual interest rate as at December 31, 2015	Maturity	Current	Non-current
49-1th unsecured	3.09%	September 12, 2016	₩ 190,000,000	₩ -
49-2th unsecured	3.57%	September 12, 2018	-	210,000,000
50-1th unsecured	2.67%	July 28, 2017	-	200,000,000
50-2th unsecured	3.03%	July 28, 2019	-	250,000,000
50-3th unsecured	3.25%	July 28, 2021	-	200,000,000
51-1th unsecured	2.06%	October 8, 2018	-	200,000,000
51-2th unsecured	2.48%	October 8, 2022	-	100,000,000
Floating rate USD bond A	3M LIBOR+0.60%	September 28, 2018	-	114,856,000
Floating rate USD bond B	3M LIBOR+0.52%	December 28, 2018	-	56,021,600
Discount on bonds payable			(178,399)	(1,901,315)
			₩ 189,821,601	₩ 1,328,976,285

In relation to the 49th, 50th, 51th, 52th and floating rate USD bonds payable A and B, the Group is to maintain debt-to-equity ratio below 200%~300% and is given restrictions on pledging collateral and disposing of assets until the principal and interests are repaid.

Floating rate USD bond A and Floating rate USD bond B consist of USD 145,800,000.

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**22. Other financial liabilities**

	2016		2015	
	Current	Non-current	Current	Non-current
Accrued expenses	₩ 72,739,665	₩ -	₩ 32,147,473	₩ -
Other payables	920,616	9,330,746	135,850	12,570,206
Guarantee deposits received	24,964,616	14,122	23,196,692	-
Derivative liabilities designated as a hedge	565,190	1,418,705	1,693,567	542,761
Finance guarantee liabilities	744,000	3,795,000	760,000	4,539,000
	₩ 99,934,087	₩ 14,558,573	₩ 57,933,582	₩ 17,651,967

**23. Derivative financial instruments**

The Group entered into currency swap contracts for foreign bonds payable and long-term borrowings (see Note 21) as at December 31, 2016 and 2015 to hedge against the risks of changes in foreign exchange rates and interest rate fluctuations. The fair values of currency swaps were estimated by valuations provided by the respective financial institutions.

Details of open derivative contracts as at December 31, 2016 are as follows (KRW, USD, CNY and EUR in thousands):

<Current>

Counterparty	Contract date	Maturity date	Swaps sold	Contract exchange rate (Korean won)	Swaps purchased	Fair value
Mizuho Corporate Bank, Ltd.	October 18, 2016	January 18, 2017	KRW 16,412,207	₩ 1,135.40	USD 14,455	₩ 1,055,958
	October 26, 2016	January 26, 2017	KRW 55,477,800	1,132.20	USD 49,000	3,735,107
Standard Chartered Bank, Ltd.	October 07, 2016	January 06, 2017	CNY 10,000	164.76	KRW 1,647,600	(84,209)
	October 14, 2016	January 13, 2017	CNY 10,000	166.42	KRW 1,664,200	(66,600)
	October 24, 2016	January 20, 2017	CNY 10,000	166.35	KRW 1,663,500	(66,486)
	October 28, 2016	January 26, 2017	CNY 10,000	167.25	KRW 1,672,500	(56,633)
	November 04, 2016	February 03, 2017	CNY 10,000	167.80	KRW 1,678,000	(50,677)
	November 11, 2016	February 10, 2017	CNY 10,000	169.15	KRW 1,691,500	(35,333)
	December 29, 2016	February 28, 2017	EUR 5,500	1,262.99	KRW 6,946,445	7,417
Citibank Korea Inc.	November 18, 2016	February 17, 2017	CNY 10,000	169.72	KRW 1,697,200	(28,279)
	November 25, 2016	February 24, 2017	CNY 10,000	167.90	KRW 1,679,000	(45,743)
	December 02, 2016	March 03, 2017	CNY 10,000	168.50	KRW 1,685,000	(36,699)
	December 09, 2016	March 10, 2017	CNY 10,000	166.40	KRW 1,664,000	(53,435)
	December 16, 2016	March 17, 2017	CNY 10,000	167.30	KRW 1,673,000	(33,710)
	December 23, 2016	March 24, 2017	CNY 10,000	169.60	KRW 1,696,000	(4,677)
	December 29, 2016	March 31, 2017	CNY 10,000	169.80	KRW 1,698,000	(2,709)
						₩ 4,233,292

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**23. Derivative financial instruments (cont'd)**

<Non-current>

Counterparty	Contract date	Maturity date	Swaps sold		Contract exchange rate (Korean won)	Swaps purchased		Fair value	
Mizuho Corporate Bank, Ltd.	September 21, 2015	September 28, 2018	KRW	115,101,000	₩ 1,174.50	USD	98,000	₩	2,984,627
	December 24, 2015	December 28, 2018	KRW	55,830,400	1,168.00	USD	47,800		1,508,406
	May 19, 2016	May 23, 2019	KRW	30,510,080	1,191.80	USD	25,600		357,333
	December 19, 2016	December 20, 2019	KRW	115,236,000	1,188.00	USD	97,000		1,414,849
								₩	<u>6,265,215</u>

The estimated maximum period that the Group is exposed to risks in cash flow fluctuations relating to the above swaps is 36 months from December 31, 2016.

Details of unsettled derivative contracts as at December 31, 2015 are as follows (KRW and USD in thousands):

<Current>

Counterparty	Contract date	Maturity date	Swaps sold		Contract exchange rate (Korean won)	Swaps purchased		Fair value	
Mizuho Corporate Bank, Ltd.	June 15, 2012	June 20, 2016	KRW	113,005,000	₩ 1,165.00	USD	97,000	₩	(238,628)
	May 21, 2013	May 23, 2016	KRW	28,518,400	1,114.00	USD	25,600		1,345,237
	July 25, 2013	July 26, 2016	KRW	54,791,800	1,118.20	USD	49,000		2,163,442
	October 16, 2013	October 18, 2016	KRW	15,407,585	1,065.90	USD	14,455		1,370,058
								₩	<u>4,640,109</u>

<Non-current>

Counterparty	Contract date	Maturity date	Swaps sold		Contract exchange rate (Korean won)	Swaps purchased		Fair value	
Mizuho Corporate Bank, Ltd.	September 21, 2015	September 28, 2018	KRW	115,101,000	₩ 1,174.50	USD	98,000	₩	(174,909)
	December 24, 2015	December 28, 2018	KRW	55,830,400	1,168.00	USD	47,800		(106,561)
								₩	<u>(281,470)</u>

The components of gains or losses arising from the valuation of derivative financial instruments for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

Accumulated valuation gains or losses

	2016		2015	
Fair value	₩	10,498,507	₩	4,358,639
Accumulated gain recognized		11,639,977		6,279,876
Accumulated other comprehensive loss		(1,141,470)		(1,921,237)

Gains and losses during the year

	2016		2015	
Changes in fair value	₩	6,139,868	₩	30,149,307
Gain recognized		5,360,101		26,262,444
Other comprehensive income		779,767		3,886,863

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**24. Pension benefits**

Defined contribution pension plan

The Group operates defined contribution pension plans. The Group recognized expenses relating to defined contribution pension plans amounting to ₩5,069,526 thousand and ₩4,102,424 thousand in 2016 and 2015, respectively.

Defined benefit pension plan

The Group also operates defined benefit pension plans. An actuarial valuation for the plan assets and the defined benefit obligation has been performed by Lotte Non-Life Insurance Co., Ltd. The present value of the defined benefit pension plans and current and past service cost are determined using the projected unit credit method.

Details of the net defined benefit liability as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
Present value of defined benefit obligation	₩ 229,364,749	₩ 152,046,419
Fair value of plan assets	(206,168,836)	(121,783,143)
Net defined benefit plans	₩ 23,195,913	₩ 30,263,276

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

	2016		
	Present value of defined benefit obligation	Fair value of plan assets	Total
January 1	₩ 152,046,419	₩ (121,783,143)	₩ 30,263,276
Current service cost	30,263,579	-	30,263,579
Interest cost (expected return)	6,875,861	(4,931,397)	1,944,464
Remeasurement loss on net defined benefit plans due to changes in demographical assumptions	264,681	-	-
Remeasurement loss on net defined benefit plans due to changes in financial assumptions	(1,404,322)	-	(1,404,322)
Other remeasurement loss (gain) on net defined benefit plans	7,389,136	826,184	8,215,320
Transfers from affiliates	1,040,009	(259,327)	780,682
Employer's contribution	-	(50,477,848)	(50,477,848)
Business combination (see Note 46)	45,157,930	(42,254,908)	2,903,022
Settled liabilities	(5,453,112)	5,453,112	-
Benefit paid	(7,224,402)	7,018,107	(206,295)
Others	5,034	(2,103)	2,931
Effect of foreign exchange rate	403,936	242,487	646,423
December 31	₩ 229,364,749	₩ (206,168,836)	₩ 23,195,913

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**24. Pension benefits (cont'd)**

	2015		
	Present value of defined benefit obligation	Fair value of plan assets	Total
January 1	₩ 122,232,079	₩ (96,024,534)	₩ 26,207,545
Current service cost	20,745,229	-	20,745,229
Interest cost (expected return)	5,241,458	(3,166,269)	2,075,189
Remeasurement loss on net defined benefit plans due to changes in demographical assumptions	711,097	-	711,097
Remeasurement loss on net defined benefit plans due to changes in financial assumptions	3,756,186	-	3,756,186
Other remeasurement loss (gain) on net defined benefit plans	6,122,836	263,377	6,386,213
Employer's contribution	-	(28,971,366)	(28,971,366)
Settled liabilities	(1,876,916)	1,876,916	-
Benefit paid	(5,351,977)	3,912,499	(1,439,478)
Others	(1,627)	8,409	6,782
Effect of exchange rate fluctuation	468,054	317,825	785,879
December 31	₩ 152,046,419	₩ (121,783,143)	₩ 30,263,276

Plan assets comprise mainly of term deposits.

The principal assumptions used for actuarial valuation as at December 31, 2016 and 2015 are as follows:

	2016 (%)	2015 (%)
Discount rate	1.58 ~ 3.99	1.58 ~ 3.94
Expected rate of salary increase	0.97 ~ 4.77	0.97 ~ 3.50

The sensitivity of present value of the defined benefit obligation due to actuarial as at December 31, 2016 is as follow (Korean won in thousands):

	1%p increase	1%p decrease
Discount rate	₩ (12,125,054)	₩ 14,254,222
Expected salary increase rate	14,321,930	(12,395,222)

The changes in assumptions provided in the sensitivity analysis above are not necessarily reflective of those in the current market. The present value of the defined benefit obligation above is determined using the projected unit credit method.

**25. Other liabilities**

Details of other liabilities as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Current	Non-current	Current	Non-current
Advances received	₩ 45,824,536	₩ -	₩ 27,847,789	₩ -
Unearned income	6,793,995	3,301,982	9,778,453	-
Withholdings	26,250,696	-	18,728,462	-
Value-added tax withholdings	5,323,751	-	2,180,496	-
Long-term employee benefits	-	4,419,649	-	3,398,127
Other current liabilities	6,961,086	14,289	16,995,644	-
	₩ 91,154,064	₩ 7,735,920	₩ 75,530,844	₩ 3,398,127

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**26. Provisions**

Details of provisions as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015	
	Current	Non-current	Current	Non-current
Asset retirement obligation	₩ -	₩ 5,155,359	₩ -	₩ 7,621,449
Greenhouse gas emission liabilities	18,819,314	-	4,108,572	-
Others	721,215	2,176,939	5,067,917	2,179,951
	₩ 19,540,529	₩ 7,332,298	₩ 9,176,489	₩ 9,801,400

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

	2016				
	January 1	Additional provisions	Utilization	Others	December 31
Asset retirement obligation	₩ 7,621,449	₩ 979,729	₩ (3,592,111)	₩ 146,292	₩ 5,155,359
Greenhouse gas emission liabilities	4,108,572	18,819,314	(4,108,572)	-	18,819,314
Others	7,247,868	31,099	(3,856,670)	(524,143)	2,898,154
	₩ 18,977,889	₩ 19,830,142	₩ (11,557,353)	₩ (377,851)	₩ 26,872,827

  

	2015				
	January 1	Additional provisions	Utilization	Others	December 31
Asset retirement obligation	₩ 7,939,496	₩ 959,781	₩ (1,770,112)	₩ 492,284	₩ 7,621,449
Greenhouse gas emission liabilities	-	4,108,572	-	-	4,108,572
Others	3,384,727	7,464,018	(3,671,181)	70,304	7,247,868
	₩ 11,324,223	₩ 12,532,371	₩ (5,441,293)	₩ 562,588	₩ 18,977,889

**Greenhouse gas emissions**

The Group records a provision for estimated costs for actual emissions in excess of emission rights granted.

As at December 31, 2016, free emission rights and emissions estimated for the years ended December 31, 2015, 2016 and 2017 are as follows (tons):

	2015	2016	2017
Free emission rights	5,688,340	5,556,073	6,502,368
Emissions estimated	6,018,151	6,177,977	6,354,076

There are no emission rights that have been provided as collateral and changes in the emission rights of the Group for the years ended December 31, 2015, 2016 and 2017 are as follows (tons):

	2015	2016	2017
January 1	5,691,653	5,431,457	5,315,619
Allocation adjustment and cancellation	(3,462)	-	9,027
Succession to rights (Lotte Chilsung Beverage Co., Ltd.)	149	148	146
Early reduction performance	-	68,601	1,177,576
Free supply	-	55,867	-
December 31	5,688,340	5,556,073	6,502,368

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**27. Equity**

Details of issued capital as at December 31, 2016 and 2015 are as follows (Korean won in thousands except par value amount):

Category	Authorized	Issued	Par value	Issued capital
Common stock	100,000,000 shares	34,275,419 shares	₩ 5,000	₩ 171,377,095

**28. Other paid-in capital**

Details of other paid-in capital as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
Share premium	₩ 22,913,228	₩ 22,913,228
Others	445,517,172	443,463,264
Gain on disposal of treasury shares	10,145,750	10,145,750
	<u>₩ 478,576,150</u>	<u>₩ 476,522,242</u>

Changes in other paid-in capital for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
January 1	₩ 476,522,242	₩ 476,522,242
Changes in ownership interests in subsidiaries	2,053,908	-
December 31	<u>₩ 478,576,150</u>	<u>₩ 476,522,242</u>

**29. Retained earnings and dividends**

Details of retained earnings as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
Legal reserve:		
Earned surplus reserve (*1)	₩ 58,351,617	₩ 49,928,609
Voluntary reserve:		
Business rationalization reserve	-	31,100,000
Reserve for research and human resources development	57,333,333	68,666,667
Reserve for business expansion	6,308,000,000	5,496,000,000
Unappropriated retained earnings	2,063,307,559	1,093,648,870
	<u>₩ 8,486,992,509</u>	<u>₩ 6,739,344,146</u>

(\*1) In accordance with the Korean Commercial Code, earned surplus reserve may be used to reduce a deficit or may be transferred to capital.

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

	2016	2015
January 1	₩ 6,739,344,146	₩ 5,790,777,028
Net income	1,835,812,632	992,512,355
Dividend paid	(84,230,078)	(33,692,031)
Remeasurement loss on defined benefit plans	(5,592,528)	(8,061,160)
Changes in retained earnings in equity method	1,658,337	(2,192,046)
December 31	<u>₩ 8,486,992,509</u>	<u>₩ 6,739,344,146</u>

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**29. Retained earnings and dividends (cont'd)**

Details of dividends paid for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands except for dividends per share):

	2016			
	Issued	Shares for dividends	Dividends per share	Total
Common stock	34,275,419 shares	33,692,031 shares	₩ 2,500	₩ 84,230,078

  

	2015			
	Issued	Shares for dividends	Dividends per share	Total
Common stock	34,275,419 shares	33,692,031 shares	₩ 1,000	₩ 33,692,031

**30. Other components of equity**

Details of other components of equity as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		
	Before tax	Income tax effect	After tax
Loss on valuation of derivative financial instruments	₩ (1,141,470)	₩ 276,236	₩ (865,234)
Gain on valuation of AFS financial assets	20,828,908	(5,040,596)	15,788,312
Equity adjustment in equity method	70,234,609	(17,855,612)	52,378,997
Foreign currency translation differences of foreign operations	158,864,522	-	158,864,522
	₩ 248,786,569	₩ (22,619,972)	₩ 226,166,597

  

	2015		
	Before tax	Income tax effect	After tax
Loss on valuation of derivative financial instruments	₩ (1,921,236)	₩ 464,939	₩ (1,456,297)
Gain on valuation of AFS financial assets	29,548,417	(7,150,717)	22,397,700
Equity adjustment in equity method	72,441,659	(17,855,612)	54,586,047
Foreign currency translation differences of foreign operations	61,980,311	-	61,980,311
	₩ 162,049,151	₩ (24,541,390)	₩ 137,507,761

Changes in other components of equity for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
January 1	₩ 137,507,761	₩ (1,577,659)
Gain on valuation of derivative financial instruments	779,765	3,886,863
Tax effect	(188,702)	(940,621)
Gain (loss) on valuation of AFS financial assets	(8,719,509)	26,880,216
Tax effect	2,110,121	(6,505,012)
Equity adjustment in equity method	(2,207,050)	10,651,905
Tax effect	-	-
Difference on foreign currency translation of overseas operation	96,884,211	105,112,069
December 31	₩ 226,166,597	₩ 137,507,761



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**31. Sales**

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

	2016		2015
Sale of goods	₩ 13,178,201,959	₩	11,661,915,795
Rendering of service	15,685,090		26,877,856
Commissions	279,199		116,115
Others	29,374,626		24,428,435
	<u>₩ 13,223,540,874</u>	₩	<u>11,713,338,201</u>

**32. Selling and administrative expenses**

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

	2016		2015
Salaries	₩ 138,095,752	₩	73,717,988
Pension benefits costs	11,611,527		6,543,134
Employee welfare benefits	32,565,296		13,234,261
Travel	10,687,856		3,370,796
Communications	14,454,750		2,040,870
Utilities	102,872		259,848
Taxes and dues	19,779,256		3,968,275
Supplies	2,625,399		612,910
Printing	619,183		373,977
Rents	16,180,156		7,653,147
Depreciation	9,065,399		5,279,967
Amortization	7,833,417		1,663,021
Repairs and maintenance	16,685,663		3,575,671
Vehicle maintenance	1,393,210		1,439,769
Insurance premium	3,962,278		1,777,591
Commissions and fees	53,935,962		30,064,122
Sales commission	6,697,709		7,764,035
Transportation and warehousing	279,596,290		227,014,583
Entertainment	2,470,070		1,180,019
Sales promotion	3,562,456		362,268
Advertising	5,514,450		3,379,936
Training	3,242,913		2,259,233
Compensation for damages	709,787		868,681
Sample	11,205,741		1,205,894
Bad debt expenses	593,182		453,126
Others	5,658,335		3,154,790
Research and development	63,602,150		52,709,613
	<u>₩ 722,451,059</u>	₩	<u>455,927,525</u>

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**33. Finance income**

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

	2016		2015
Interest income:			
Loans and receivables	₩ 28,683,669	₩	38,326,405
AFS financial assets	131,207		141,666
	<u>28,814,876</u>		<u>38,468,071</u>
Gain on foreign currency transactions	77,733,739		58,202,124
Gain on foreign currency translation	29,435,706		13,193,105
Gain on valuation of financial assets at FVTPL	649,594		9,039,742
Gain on valuation of derivative financial instruments	12,258,968		13,736,004
Gain on settlement of derivative financial instruments	6,580,540		12,771,440
Reversal of other bad debt expenses	674,000		-
	<u>₩ 156,147,423</u>	₩	<u>145,410,486</u>

Finance income classified by financial instruments for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015
Loans and receivables	₩ 101,131,003	₩	66,128,376
Financial instruments at FVTPL	649,594		9,039,742
AFS financial assets	131,207		141,666
Derivative assets designated as a hedge	18,839,508		26,507,444
Financial liabilities measured at amortized cost	35,396,111		43,593,258
	<u>₩ 156,147,423</u>	₩	<u>145,410,486</u>

**34. Finance costs**

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

	2016		2015
Interest expenses:			
Bonds payable	₩ 52,207,298	₩	69,712,596
Other interest expenses	29,153,345		2,523,802
	<u>81,360,643</u>		<u>72,236,398</u>
Less: cost included in qualifying assets	<u>(4,846,578)</u>		<u>(2,288,884)</u>
	76,514,065		69,947,514
Loss on foreign currency transactions	79,554,719		83,229,219
Loss on foreign currency translation	74,757,442		41,044,133
Loss on valuation of financial assets at FVTPL	2,032,866		173,087
Loss on disposal of financial assets at FVTPL	-		9,985,205
Loss on valuation of derivative financial instruments	565,190		245,000
Loss on settlement of derivative financial instruments	7,598,904		-
	<u>₩ 241,023,186</u>	₩	<u>204,624,158</u>

Weighted-average interest rates of the borrowing costs capitalized for the years ended December 31, 2016 and 2015 are 2.55% and 3.24%, respectively.

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**34. Finance costs (cont'd)**

Finance costs classified by financial instruments for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
Loans and receivables	₩ 39,127,062	₩ 19,436,955
Financial instruments at FVTPL	2,032,866	10,158,292
Derivative financial liabilities designated as a hedge	8,164,094	245,000
Financial liabilities measured at amortized cost	191,699,164	174,783,911
	<u>₩ 241,023,186</u>	<u>₩ 204,624,158</u>

**35. Other non-operating income and expenses**

Details of other non-operating income and expenses for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

Other non-operating income

	2016	2015
Gain on foreign currency transactions	₩ 179,547,875	₩ 138,971,051
Gain on foreign currency translation	29,043,691	16,793,535
Gain on disposal of property, plant and equipment	401,119	3,167,755
Gain on disposal of intangible assets	-	98,091
Gain on disposal of investment properties	-	300,754
Dividend income	690,201	588,388
Gain on disposal of AFS financial assets	-	360,693
Others	23,210,940	19,658,388
	<u>₩ 232,893,826</u>	<u>₩ 179,938,655</u>

Other non-operating expenses

	2016	2015
Loss on foreign currency transaction	₩ 180,175,038	₩ 132,190,723
Loss on foreign currency translation	18,381,339	15,439,537
Loss on disposal of property, plant and equipment	20,281,471	15,811,559
Impairment of property, plant and equipment	19,142,620	86,558,845
Impairment of intangible assets	-	36,590
Impairment loss of AFS financial assets	6,329,000	9,853,203
Other bad debt expenses	27,050	674,000
Donations and contributions	10,848,383	10,701,697
Others	21,161,128	15,804,351
	<u>₩ 276,346,029</u>	<u>₩ 287,070,505</u>

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**36. Income tax expense**

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

	2016	2015
Current income tax payable	₩ 565,030,951	₩ 340,988,544
Income tax expenses directly charged to equity	3,729,935	(4,338,094)
Changes in deferred tax	84,682,561	86,428,714
Effect on deferred tax due to changes in foreign exchange rates	(3,255,266)	7,633,348
	<u>₩ 650,188,181</u>	<u>₩ 430,712,512</u>

A reconciliation between income before income tax and income tax expense of the Group for the years ended December 31, 2016 and 2015 is as follows (Korean won in thousands):

	2016	2015
Income before income tax expense	₩ 2,487,373,100	₩ 1,421,368,007
Income tax expense at the effective tax rate	603,219,140	357,951,074
Adjustments:		
Tax credit (special taxes for rural and fishing villages included)	(6,440,394)	(3,107,246)
Changes in unrecognized deferred tax	10,122,112	30,316,780
Additional income taxes for prior years	5,791,880	2,688,568
Surtax on undistributed earnings	46,439,034	-
Others	(8,943,591)	42,863,336
Income tax expense	<u>₩ 650,188,181</u>	<u>₩ 430,712,512</u>
Effective tax rate (income tax expense/income before income tax)	26.14%	30.30%

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**36. Income tax expense (cont'd)**

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

	2016			
	January 1	Increase (decrease)	Business combination (Note 46)	December 31
Pension benefit obligation	₩ 132,389,674	₩ 31,367,956	₩ 44,777,653	₩ 208,535,283
Investments in subsidiaries, associates and joint ventures	(378,780,590)	22,587,859	-	(356,192,731)
Advanced depreciation provision	(155,756,436)	-	-	(155,756,436)
Revaluation of property, plant and equipment	(769,896,689)	42,114,313	(82,639,714)	(810,422,090)
Valuation on derivative financial instruments (OCI)	1,921,236	(779,766)	-	1,141,470
Valuation on derivative financial instruments	-	(159,133)	-	(159,133)
Valuation on AFS financial asset (OCI)	(26,531,315)	8,719,509	(298)	(17,812,104)
Reserve for research and human resources development	(61,333,333)	21,333,333	-	(40,000,000)
Plan assets	(121,714,361)	(39,307,839)	(41,502,895)	(202,525,095)
Investment tax allowance	722,497,940	(497,409,441)	-	225,088,499
Capital allowance	(4,342,451)	4,342,451	-	-
Fair value differences due to business combination	-	63,911,088	(1,115,301,088)	(1,051,390,000)
Others	244,362,622	(88,642,038)	33,426,714	189,147,298
	(417,183,703)	₩ (431,921,708)	₩ (1,161,239,628)	(2,010,345,039)
Unrealizable temporary differences	158,506,553			(14,752,048)
Realizable temporary differences	(575,690,256)			(1,995,592,991)
Tax rate (*1)	25.96%			24.33%
Deferred tax liabilities	₩ (149,447,578)			₩ (485,596,380)

(\*1) Deferred tax assets and liabilities are measured at the tax rates that are expected to be applied 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.

	2015		
	January 1	Increase (decrease)	December 31
Pension benefit obligation	₩ 100,635,222	₩ 31,754,452	₩ 132,389,674
Investments in subsidiaries, associates and joint ventures	(482,010,287)	103,229,697	(378,780,590)
Advanced depreciation provision	(155,756,436)	-	(155,756,436)
Revaluation of property, plant and equipment	(785,093,974)	15,197,285	(769,896,689)
Valuation on derivative financial instruments (OCI)	5,808,099	(3,886,863)	1,921,236
Valuation on AFS financial asset (OCI)	348,901	(26,880,216)	(26,531,315)
Reserve for research and human resources development	(72,666,667)	11,333,334	(61,333,333)
Plan assets	(91,531,246)	(30,183,115)	(121,714,361)
Investment tax allowance	1,064,079,181	(341,581,241)	722,497,940
Capital allowance	138,002,765	(142,345,216)	(4,342,451)
Others	135,989,839	108,372,783	244,362,622
	(142,194,603)	₩ (274,989,100)	(417,183,703)
Unrealizable temporary differences	192,755,113		158,506,553
Realizable temporary differences	(334,949,716)		(575,690,256)
Tax rate (*1)	18.81%		25.96%
Deferred tax liabilities	₩ (63,018,864)		₩ (149,447,578)

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**36. Income tax expense (cont'd)**

(\*1) Deferred tax assets and liabilities are measured at the tax rates that are expected to be applied 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.

Details of temporary differences, not recognized due to uncertainty of its realization, are as follows (Korean won in thousands):

	2016		2015
Investments in subsidiaries, associates and joint ventures	₩ (88,038,883)	₩	13,078,384
Impairment of property, plant and equipment	-		75,659,976
Other temporary differences and carryover of tax credits	73,286,835		69,768,193
	<u>₩ (14,752,048)</u>	₩	<u>158,506,553</u>

Tax effects relating to the components of other comprehensive income and other equity changes recognized directly in equity for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016		2015
Loss (gain) on valuation of AFS financial assets	₩ 2,110,121	₩	(940,621)
Loss on valuation of derivative financial instruments	(188,703)		(6,505,012)
Retained earnings adjustment in equity method	(159,147)		318,052
Remeasurement loss on defined benefit plans	1,967,664		2,789,487
	<u>₩ 3,729,935</u>	₩	<u>(4,338,094)</u>

**37. Expenses classified by nature**

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

	2016		
	Selling and administrative expenses	Cost of sales	Total
Changes in inventories	₩ -	₩ 943,086,704	₩ 943,086,704
Raw materials used	-	7,166,502,941	7,166,502,941
Payroll expense	138,095,752	327,792,112	465,887,864
Pension benefits costs	11,611,527	25,666,042	37,277,569
Employee welfare benefits	32,565,296	36,492,706	69,058,002
Depreciation	9,065,399	552,160,537	561,225,936
Amortization	7,833,417	60,091,578	67,924,995
Commission	53,935,962	98,777,312	152,713,274
Transportation and warehousing	279,596,290	10,262,129	289,858,419
Others	189,747,416	736,003,817	925,751,233
	<u>₩ 722,451,059</u>	<u>₩ 9,956,835,878</u>	<u>₩ 10,679,286,937</u>

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**37. Expenses classified by nature (cont'd)**

	2015		
	Selling and administrative expenses	Cost of sales	Total
Changes in inventories	₩ -	₩ 1,027,488,073	₩ 1,027,488,073
Raw materials used	-	7,251,950,542	7,251,950,542
Payroll expense	73,717,988	201,746,825	275,464,813
Pension benefits costs	6,543,134	20,379,708	26,922,842
Employee welfare benefits	13,234,261	32,529,970	45,764,231
Depreciation	5,279,967	479,547,505	484,827,472
Amortization	1,663,021	1,175,936	2,838,957
Commission	30,064,122	54,092,221	84,156,343
Transportation and warehousing	227,014,583	1,605,487	228,620,071
Others	98,410,449	575,774,944	674,185,392
	₩ 455,927,525	₩ 9,646,291,211	₩ 10,102,218,736

**38. Earnings per share**

Basic earnings per share, which are computed by dividing net income by the weighted-average number of shares outstanding for the years ended December 31, 2016 and 2015 are as follows (Korean won):

	2016	2015
Net income attributable to owners of the parent (A)	₩ 1,835,812,632,200	₩ 992,512,355,206
Weighted-average number of shares outstanding during the year (B)	33,692,031 shares	33,692,031 shares
Basic earnings per share (C=A/B)	₩ 54,488	₩ 29,458

Details of weighted-average number of shares outstanding for the years ended December 31, 2016 and 2015 are as follows:

	2016		
	Period	Days	Average number of shares outstanding
At January 1	January 1 ~ December 31	366	12,331,283,346
Weighted-average number of shares outstanding			33,692,031
	2015		
	Period	Days	Average number of shares outstanding
At January 1	January 1 ~ December 31	365	12,297,591,315
Weighted-average number of shares outstanding			33,692,031

Basic and diluted earnings per share for the years ended December 31, 2016 and 2015 are the same as there are no dilutive potential common shares.

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**39. Financial assets and risk management**

Capital risk management

The primary objective of the Group's capital management is to maintain its ability to continuously provide return to its shareholders and stakeholders and to optimize its capital structure to reduce capital expenses.

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

	2016	2015
Total liabilities	₩ 6,466,016,999	₩ 3,912,222,824
Total equity	9,400,817,170	7,555,586,075
Debt-to-equity ratio	68.78%	51.78%

Significant accounting policies and methods adopted for each category of financial assets and liabilities and equity (including recognition criteria and measurement standards, and recognition criteria for revenue and expenses) are detailed in Note 2.

Details of the Group's financial instruments by category as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

Financial assets

	2016				Total
	Financial assets at FVTPL	Loans and receivables	AFS financial assets	Derivative financial instruments designated as a hedge	
Cash and cash equivalents	₩ -	₩ 2,202,683,183	₩ -	₩ -	₩ 2,202,683,183
Short-term financial instruments	-	425,756,558	-	-	425,756,558
Long-term financial instruments	-	67,515,500	-	-	67,515,500
Trade and other accounts receivable	-	1,551,920,459	-	-	1,551,920,459
Financial assets at FVTPL	6,685,073	-	-	-	6,685,073
AFS financial assets	-	-	324,823,525	-	324,823,525
Other financial assets	3,062,733	18,596,451	-	12,482,402	34,141,586
Finance lease receivables	-	3,152,909	-	-	3,152,909
	<u>₩ 9,747,806</u>	<u>₩ 4,269,625,060</u>	<u>₩ 324,823,525</u>	<u>₩ 12,482,402</u>	<u>₩ 4,616,678,793</u>

	2015				Total
	Loans and receivables	AFS financial assets	Derivative financial instruments designated as a hedge	Total	
Cash and cash equivalents	₩ 1,941,883,178	₩ -	₩ -	₩ -	₩ 1,941,883,178
Short-term financial instruments	841,697,948	-	-	-	841,697,948
Long-term financial instruments	67,509,500	-	-	-	67,509,500
Trade accounts and other receivables	1,016,335,868	-	-	-	1,016,335,868
AFS financial assets	-	239,285,683	-	-	239,285,683
Other financial assets	18,423,019	-	6,594,967	-	25,017,986
Finance lease receivables	3,278,334	-	-	-	3,278,334
	<u>₩ 3,889,127,847</u>	<u>₩ 239,285,683</u>	<u>₩ 6,594,967</u>	<u>₩ -</u>	<u>₩ 4,135,008,497</u>



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**39. Financial assets and risk management (cont'd)**

Financial liabilities

	2016		
	Financial liabilities measured at amortized cost	Derivative financial instruments designated as a hedge	Total
Trade accounts and other payables	₩ 1,126,697,904	₩ -	₩ 1,126,697,904
Borrowings and bond payable	4,185,448,439	-	4,185,448,439
Other financial liabilities	112,508,766	1,983,895	114,492,661
	<u>₩ 5,424,655,109</u>	<u>₩ 1,983,895</u>	<u>₩ 5,426,639,004</u>

	2015			
	Financial liabilities at FVTPL	Financial liabilities measured at amortized cost	Derivative financial instruments designated as a hedge	Total
Trade accounts and other payables	₩ -	₩ 934,257,282	₩ -	₩ 934,257,282
Financial liabilities at FVTPL	179,284	-	-	179,284
Borrowings and bond payable	-	2,412,119,655	-	2,412,119,655
Other financial liabilities	-	73,349,221	2,236,328	75,585,549
	<u>₩ 179,284</u>	<u>₩ 3,419,726,158</u>	<u>₩ 2,236,328</u>	<u>₩ 3,422,141,770</u>

Financial risk

The Group is exposed to various risks related to its financial instruments, such as market risk, credit risk, currency risk and interest rate risk.

Market risk

The Group is mainly exposed to foreign exchange rate fluctuation risk and interest rate risk. To manage such risks, the Group uses a risk management system and derivative financial instruments.

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**39. Financial assets and risk management (cont'd)**

Foreign currency risk

The Group is exposed to foreign exchange rate fluctuation relating to monetary assets and liabilities denominated in foreign currencies. The Group periodically evaluates and manages its exchange exposure risk using its financial management system.

The carrying amounts of the Group's foreign currency-denominated monetary assets and monetary liabilities by functional currency as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016					
	USD		EUR		MYR	
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
Functional currency:						
KRW	₩ 1,436,328,263	₩ 1,344,234,021	₩ 53,531,669	₩ 30,597,713	₩ -	₩ -
PKR	-	31,247,511	-	91,617	-	-
GBP	7,241	4,638,533	30,616,692	74,038,596	-	-
USD	-	-	60,983	429,962	111,308,181	12,618,621
CNY	7,806,712	241,600,305	-	-	-	-
	<u>₩ 1,444,142,216</u>	<u>₩ 1,621,720,370</u>	<u>₩ 84,209,344</u>	<u>₩ 105,157,888</u>	<u>₩ 111,308,181</u>	<u>₩ 12,618,621</u>

  

	2015					
	USD		EUR		MYR	
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
Functional currency:						
KRW	₩ 555,050,890	₩ 767,841,637	₩ 11,992,320	₩ 920,814	₩ -	₩ -
PKR	-	37,171,861	-	85,316	-	-
GBP	936,896	102,509	29,018,380	56,476,940	-	-
USD	-	-	59,461	37,697	83,571,426	16,292,657
CNY	3,912,419	247,423,351	-	-	-	-
	<u>₩ 559,900,205</u>	<u>₩ 1,052,539,358</u>	<u>₩ 41,070,161</u>	<u>₩ 57,520,767</u>	<u>₩ 83,571,426</u>	<u>₩ 16,292,657</u>

A sensitivity analysis on the Group's net income before income tax for the period, assuming a 10% increase or decrease in currency exchange rates, as at December 31, 2016 and 2015 is presented in the table below (Korean won in thousands):

	2016		
	USD	EUR	MYR
Functional currency:			
KRW	₩ 9,209,424	₩ 2,293,396	₩ -
PKR	(3,124,751)	(9,162)	-
GBP	(463,129)	(4,342,190)	-
USD	-	(36,898)	9,868,956
CNY	(23,379,359)	-	-
	<u>₩ (17,757,815)</u>	<u>₩ (2,094,854)</u>	<u>₩ 9,868,956</u>

  

	2015		
	USD	EUR	MYR
Functional currency:			
KRW	₩ (21,279,075)	₩ 1,107,151	₩ -
PKR	(3,717,186)	(8,532)	-
GBP	83,439	(2,745,856)	-
USD	-	2,176	6,727,877
CNY	(24,351,093)	-	-
	<u>₩ (49,263,915)</u>	<u>₩ (1,645,061)</u>	<u>₩ 6,727,877</u>

The above amounts include hedge effects relating to the currency swap contracts (see Note 23).

Interest rate risk

The Group is exposed to interest rate risk relating to its borrowings with floating interest rates. To manage its interest rate risks, the Group maintains a balance between borrowings with variable interest rate and fixed-interest rate or enters into interest swap contract. Risk management is evaluated periodically to adjust risks to appropriate levels corresponding to floating interest rates, and to apply the optimized risk management strategies.

**39. Financial assets and risk management (cont'd)**

Credit risk

The Group makes transactions with reputable financial institutions to manage credit risk and operating with policy and procedures for credit enhancement of financial assets. The Group determines credit transaction limits based on evaluation of client's credit. The Group continually reviews the credit and the limits of credit of clients to adjust necessary collateral. For delayed collection of financial assets, appropriate actions are taken in accordance with the reason for such delays. Accounts receivable are from a large number of customers, and it is also distributed to a variety of industries and across geographies. Credit rating for trade accounts receivable is continuously evaluated, and if necessary, the Group enters into guarantee insurance contracts. As financial institutions the Group makes transactions with are reputable financial institutions, the credit risk from liquidities and derivatives are considered limited.

As at December 31, 2016 and 2015, the maximum exposed amounts of credit risk for financial assets maintained by the Group are as follows (CNY, USD, Korean won in thousands):

Description	Currency	2016	2015
Payment guarantee contract (*1)	USD	37,197	486,233
	CNY	339,950	339,950
	KRW	379,975,384	410,641,384

(\*1) The maximum exposed amounts of payment guarantee contract represent a limit of payment guarantee, which is the maximum amount payable by the Group in case the debtor claims for the full guaranteed amount.

The carrying amount of financial assets exposed to credit risk, except for payment guarantee, performance guarantee contracts and loan commitments, best represents a limit of payment, so the carrying amount is excluded from the disclosure above.

Liquidity risk

The Group has established an appropriate liquidity risk management framework for the management of the Group's short-, medium- and long-term funding and liquidity management requirements. The Group manages liquidity risk by maintaining adequate reserves, banking facilities and reserve borrowing facilities, by continuously monitoring forecast and actual cash flows, and by matching the maturity profiles of financial assets and liabilities.

The table below analyses the Group's non-derivative financial liabilities into relevant maturity groups based on the remaining period at the end of the reporting period. The table below is based on the earliest maturity date the Group is to pay for the undiscounted cash flows of financial liabilities. The contractual maturity is based on the earliest possible date the Group will be asked to pay back (Korean won in thousands):

	2016		
	Within a year	More than a year	Total
Interest-free liabilities	₩ 1,709,894,497	₩ 13,139,868	₩ 1,723,034,365
Fixed interest rate liabilities	674,139,524	2,116,960,948	2,791,100,472
Floating interest rate liabilities	1,071,817,000	325,086,500	1,396,903,500
	<u>₩ 3,455,851,021</u>	<u>₩ 2,455,187,316</u>	<u>₩ 5,911,038,337</u>
	2015		
	Within a year	More than a year	Total
Interest-free liabilities	₩ 2,031,621,730	₩ 12,570,206	₩ 2,044,191,936
Fixed interest rate liabilities	257,736,560	1,180,494,121	1,438,230,681
Floating interest rate liabilities	653,779,747	322,188,940	975,968,687
	<u>₩ 2,943,138,037</u>	<u>₩ 1,515,253,267</u>	<u>₩ 4,458,391,304</u>

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**39. Financial assets and risk management (cont'd)**

Amounts included above are the maximum amounts that the Group is obliged to pay for payment guarantee contracts. Based on expectations at the end of the reporting period, the Group assumes that it is more likely than not to pay such guarantees. However, such expectations are subject to change as the possibility of guaranteed party's claiming the guarantee may change depending on the credit loss on financial receivables.

The following table shows expected maturity of non-derivative financial assets. The following table was prepared based on undiscounted contractual maturity of financial assets, including accrued interest. As the Group manages its liquidity based on net assets and net liabilities, non-derivative financial assets should be considered to understand the Group's liquidity risk management (Korean won in thousands):

	2016			
	Within a year	1-5 years	Over 5 years	Total
Interest-free assets	₩ 1,559,801,958	₩ 68,183,373	₩ 6,501,686	₩ 1,634,487,017
Floating interest rate assets	562,892	2,982,501	-	3,545,393
Fixed interest rate assets	2,628,840,219	556,784	2,622,463	2,632,019,466
	₩ 4,189,205,069	₩ 71,722,658	₩ 9,124,149	₩ 4,270,051,876

  

	2015			
	Within a year	1-5 years	Over 5 years	Total
Interest-free assets	₩ 1,026,204,259	₩ 68,888,967	₩ 3,844,775	₩ 1,098,938,001
Floating interest rate assets	538,283	2,792,103	-	3,330,386
Fixed interest rate assets	2,784,055,800	556,784	2,761,659	2,787,374,243
	₩ 3,810,798,342	₩ 72,237,854	₩ 6,606,434	₩ 3,889,642,630

The following table shows the liquidity of derivative analysis in detail. Derivatives in the following table were prepared based on undiscounted cash inflows and outflows (Korean won in thousands):

	2016		
	Within a year	More than a year	Total
Cash inflows, net	₩ 111,547,772	₩ 332,588,380	₩ 444,136,152
Cash outflows, net	(108,306,936)	(326,042,647)	(434,349,583)
	₩ 3,240,836	₩ 6,545,733	₩ 9,786,569

  

	2015		
	Within a year	More than a year	Total
Cash inflows, net	₩ 221,609,126	₩ 174,585,979	₩ 396,195,105
Cash outflows, net	(218,359,026)	(176,794,638)	(395,153,664)
	₩ 3,250,100	₩ (2,208,659)	₩ 1,041,441

**Pledged receivables**

Trade receivables sold or factored with recourse that have not been fully derecognized as they have not met the derecognition criteria applicable for financial assets amounted to ₩253,481 million as at December 31, 2016. In relation to these transactions, financial liability was recorded as short-term borrowings amounting to ₩253,481 million. Where account receivables are not collected by the due date, the Group is obligated by recourse to pay for the uncollected amounts. As the Group retains the risks and compensation on recourse conditions for debtors' default, the receivables are carried at their book values, and cash received from the factored receivables are recognized as short-term borrowings.

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**40. Fair value of financial instruments**

Details of carrying and fair value of the financial assets and liabilities, as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016			
	Level 1	Level 2	Level 3	Total
Financial assets:				
AFS financial assets (marketable equity securities)	₩ 11,448,352	₩ -	₩ -	₩ 11,448,352
AFS financial assets (non-marketable equity securities)	-	-	278,254,356	278,254,356
Financial assets at FVTPL	-	9,747,806	-	9,747,806
Derivative financial assets designated as a hedge	-	12,482,402	-	12,482,402
	<u>₩ 11,448,352</u>	<u>₩ 22,230,208</u>	<u>₩ 278,254,356</u>	<u>₩ 311,932,916</u>
Financial liabilities:				
Derivative financial liabilities designated as a hedge	-	1,983,895	-	1,983,895
	<u>₩ -</u>	<u>₩ 1,983,895</u>	<u>₩ -</u>	<u>₩ 1,983,895</u>
	2015			
	Level 1	Level 2	Level 3	Total
Financial assets:				
AFS financial assets (marketable equity securities)	₩ 16,925,815	₩ -	₩ -	₩ 16,925,815
AFS financial assets (non-marketable equity securities)	-	-	165,155,647	165,155,647
Derivative financial assets designated as a hedge	-	6,594,967	-	6,594,967
	<u>₩ 16,925,815</u>	<u>₩ 6,594,967</u>	<u>₩ 165,155,647</u>	<u>₩ 188,676,429</u>
Financial liabilities:				
Derivative liabilities at FVTPL	₩ -	₩ 179,284	₩ -	₩ 179,284
Derivative financial liabilities designated as a hedge	-	2,236,328	-	2,236,328
	<u>₩ -</u>	<u>₩ 2,415,612</u>	<u>₩ -</u>	<u>₩ 2,415,612</u>

The Group management considers that the carrying amount of loans and receivables (financial assets) and financial liabilities measured at amortized cost as at December 31, 2016 and 2015 approximates their respective fair value.

Details of financial assets and liabilities, which are subsequently measured at fair value in principal, but are not measured at fair value as fair value cannot be measured reliably as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	Description	2016	2015
AFS financial assets (*1)	Non-marketable equity securities	₩ 9,907,007	₩ 6,351,391
	Bank bonds	20,000,000	30,000,000
	Commercial paper	-	15,000,000
	Government and public bonds	5,213,810	5,852,830

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**40. Fair value of financial instruments (cont'd)**

(\*1) They are measured at cost method as it is difficult to obtain financial information for the purpose of fair value measurement or the fair value by other appropriate methods cannot be measured reliably.

Changes in level 3 financial assets for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016					
	January 1	Acquisition	Business combination	Valuation	Impairment	December 31
AFS financial assets:						
Non-marketable equity securities	₩ 165,155,647	₩ 122,628,200	₩ 41,556	₩ (3,242,047)	₩ (6,329,000)	₩ 278,254,356
	2015					
	January 1	Acquisition		Valuation		December 31
AFS financial assets:						
Non-marketable equity securities		₩ 142,435,828	₩ -	₩ 22,719,819		₩ 165,155,647

Details of valuation techniques and inputs applied on measurement of financial instruments categorized as level 2 and 3 are as follows:

- Currency forwards and interest swaps

Fair value of the Group's currency forward is based on quoted currency forward rates and the terms of foreign currency forward contract match the terms of the expected maturities as at the end of the reporting period. The Group estimates quoted currency forward rates, using interpolation on market currency forward rates, when there are no quoted currency forward rates for identical terms as at the end of the reporting period. The Group uses an appropriate discount rate in order to estimate fair value of currency forwards using yield curves calculated by market rates as at the end of reporting period.

Discount rates and forward rates used to measure fair value of interest rate swaps are determined based on yield curves derived from quoted interest rates as at the end of the reporting period. Fair values are determined by using the discounted cash flows method using an appropriate discount rate.

The Group categorizes currency forwards and interest swaps within level 2 as inputs to measure fair value of the Group's currency forward are market observable.

- Non-marketable equity securities

The Group measures non-marketable equity securities at fair value, using discounted cash flow models. The measurement utilizes assumptions, such as sales growth rate, pretax operating margin, average cost of capital and others, which are not observable. The weighted-average cost of capital used to discount future cash flow is calculated by using the capital asset pricing model. The Group categorizes non-marketable equity securities within level 3 as the assumptions are significant to the entire measurement.

The Group recognizes transfers between different levels of fair value hierarchy at the time the transfer event occurred or when circumstances have changed. There have been no changes in level 2 and 3 fair value hierarchy as at the end of the reporting period.

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**40. Fair value of financial instruments (cont'd)**

Significant unobservable inputs used in the fair value measurement categorized within level 2 and 3 of the fair value hierarchy with a quantitative sensitivity analysis as at December 31, 2016 and 2015 are as follows (Korean won in millions):

	Fair value	Valuation method	Non-observable input variable	Range (weighted average)	Sensitivity of the input to fair value
Non-marketable equity securities	₩ 278,254	Discounted cash flow	Perpetual growth rate Weighted-average cost of capital Sales growth rate (upcoming 5 years) Pre-tax operating income rate (upcoming 5 years)	0.00%~1.00% 7.91%~11.06% (9.75%) 2.1%~24.27% (8.58%) 2.09%~33.41% (12.29%)	If perpetual growth rate, sales growth rate and pre-tax operating income rate increase and weighted-average cost of capital decreases, fair value of non-marketable equity securities shall increase.
Subscription right	₩ 6,360	Binominal model	Expected volatility  Risk-free interest rate	18.62%  2.09%	If the expected volatility increases or the risk-free interest rate decreases, the fair value of the subscription right will increase.
Currency forward and interest swap	₩ 13,886	Discounted cash flow	N/A	N/A	N/A

Effects of significant unobservable inputs used in the fair value measurement categorized within level 3 of the fair value on net income and other comprehensive income for the year ended December 31, 2016 are as follows (Korean won in thousands):

	Non-observable input variable	Change of input variable	Favorable change	Unfavorable change
AFS financial assets (Non-marketable equity securities)	Perpetual growth rate	+1.00%p	₩ 38,086,245	₩ (23,345,204)
	Weighted-average cost of capital	±1.00%p	51,718,987	(35,602,521)

The Group's accounting and finance department performs fair value measurement of level 2 and level 3 for the purpose of financial reporting and uses the valuation results from independent valuers. The result of such fair value measurement is reported directly to the chief financial officer.

- The sales growth rate and pretax operating margin applied to the fair value measurement of non-marketable equity securities are estimated based on mid- and long term financial business plans performance, forecast on future market, business environment.
- The weighted-average cost of capital used in the fair value measurement is estimated from the weighted average of the cost of equity derived from capital asset pricing model with beta ( $\beta$ ) based on similar entities reflecting a sound capital structure and the cost of debt after tax.

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**41. Related-party transactions**

Details of related parties as at December 31, 2016 are as follows:

	<u>Related party</u>
Subsidiaries	Lotte Chemical Titan Holding Sdn. Bhd. and other 19 companies, Lotte Chemical Trading (Shanghai) Corp., Lotte Chemical Engineering Plastics (Jiaxing) Co., Ltd., Lotte Chemical (Jiaxing) Corp., Sambark LFT Co., Ltd., Dacc Aerospace Co., Ltd., Lotte Chemical Alabama Corp., Lotte Chemical Engineering Plastics (Hefei) Co., Ltd., KP Chemtech Corp., Lotte Chemical Pakistan Limited, Lotte Chemical UK Limited, Lotte Chemical Poland Sp. zo.o. Lotte Chemical USA Corp. and other 2 companies, Lotte Chemical Engineering Plastics (Shenyang) Co., Ltd. Lotte Advanced Material Co., Ltd. and its subsidiaries
Associates	Lotte Engineering & Construction Co., Ltd., Lotte Asset Development Co., Ltd., Hyundai Chemical Co., Ltd., Yeosu Petro Corp., Lotte Fine Chemical Co., Ltd.
Joint ventures	Seetec Co., Ltd., Lotte MRC Co., Ltd., Lotte Sanjiang Chemical Co., Ltd., Lotte Mitsui Chemical Co., Ltd., Lotte Ube Synthetic Rubber Sdn. Bhd., Lotte Versalis Elastomers Co., Ltd., Kor-Uz Gas Chemical Investment Ltd., Weifang Yaxing Honam Chemical Co., Ltd.
Others	Hotel Lotte Co., Ltd. and others (*1)

(\*1) Includes subsidiaries and associates of Hotel Lotte Co., Ltd.

Transactions and outstanding balances between the Group are eliminated in consolidation and are not presented in the accompanying notes.



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**41. Related-party transactions (cont'd)**

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

	Related party	Sales and others	
		2016	2015
Associates	Lotte Engineering & Construction Co., Ltd.	₩ 662,438	₩ 741,605
	Yeosu Petro Corp.	15	-
	Hyundai Chemical Co., Ltd.	628,662	960,354
	Lotte Fine Chemical Co., Ltd. (*1)	17,999	-
Joint ventures	Kor-Uz Gas Chemical Investment Ltd.	86,885	54,006
	Weifang Yaxing Honam Chemical Co., Ltd.	73,714,656	78,275,406
	Seetec Co., Ltd.	37,806,381	54,084,777
	Lotte MRC Co., Ltd.	219,042,713	272,776,016
	Lotte Mitsui Chemical Co., Ltd.	6,879,640	4,911,796
	Lotte Sanjiang Chemical Co., Ltd.	106,298	29,725
	Lotte Versalis Elastomers Co., Ltd.	3,651,966	31,244,278
	Lotte Ube Synthetic Rubber Sdn. Bhd.	29,576,348	25,700,698
Others	Lotte Aluminium Co., Ltd.	24,131,437	24,751,200
	Uz-Kor Gas Chemical LLC	20,107,693	21,663,633
	Hotel Lotte Co., Ltd., and others	11,720,495	15,309,356
		₩ 428,133,626	₩ 530,502,850

(\*1) The amount is only incurred by transactions after the acquisition date.

	Related party	Purchases and others	
		2016	2015
Associates	Lotte Engineering & Construction Co., Ltd.	₩ 260,105,225	₩ 84,648,809
	Yeosu Petro Corp.	160,308	125,494
	Hyundai Chemical Co., Ltd.	191,822,770	-
	Lotte Asset Development Co., Ltd.	416,716	64,090
	Lotte Fine Chemical Co., Ltd.	4,872,649	-
Joint ventures	Seetec Co., Ltd.	221,921,447	234,039,617
	Lotte MRC Co., Ltd.	56,938,700	66,051,535
	Lotte Mitsui Chemical Co., Ltd.	5,344,680	5,313,339
	Lotte Sanjiang Chemical Co., Ltd.	81,269,786	69,978,797
Others	Lotte Logistics Corp.	18,840,619	24,419,279
	Lotte Aluminium Co., Ltd.	1,029,312	1,056,379
	Uz-Kor Gas Chemical LLC	248,183,337	10,090,499
	Hotel Lotte Co., Ltd., and others	160,743,561	165,360,664
		₩ 1,251,649,110	₩ 661,148,502

**Lotte Chemical Corporation and its subsidiaries**  
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**41. Related-party transactions (cont'd)**

	Related party	Receivables and others	
		2016	2015
Associates	Lotte Engineering & Construction Co., Ltd.	₩ 49,865	₩ 29,942
	Yeosu Petro Corp.	9,277	9,261
	Hyundai Chemical Co., Ltd.	12,346	110,385
	Lotte Fine Chemical Co., Ltd.	142	-
Joint ventures	Kor-Uz Gas Chemical Investment Ltd.	3,675	3,675
	Weifang Yaxing Honam Chemical Co., Ltd.	6,698,595	5,174,849
	Seetec Co., Ltd.	4,547,978	3,687,502
	Lotte MRC Co., Ltd.	15,424,096	17,705,441
	Lotte Mitsui Chemical Co., Ltd.	648,910	537,307
	Lotte Sanjiang Chemical Co., Ltd.	106,298	16,869
	Lotte Versalis Elastomers Co., Ltd.	2,259,438	467,748
	Lotte Ube Synthetic Rubber Sdn. Bhd.	7,326,763	1,550,345
Others	Lotte Aluminium Co., Ltd.	1,671,557	5,380,781
	Uz-Kor Gas Chemical LLC	2,806,054	9,656,965
	Hotel Lotte Co., Ltd., and others	17,775,667	11,742,067
		₩ 59,340,661	₩ 56,073,137

	Related party	Payables and others	
		2016	2015
Associates	Lotte Engineering & Construction Co., Ltd.	₩ 8,796,784	₩ 6,218,526
	Yeosu Petro Corp.	15,292	9,542
	Hyundai Chemical Co., Ltd.	80,827,453	-
	Lotte Asset Development Co., Ltd.	114,597	-
	Lotte Fine Chemical Co., Ltd.	2,529,332	-
Joint ventures	Seetec Co., Ltd.	24,270,407	32,422,692
	Lotte MRC Co., Ltd.	3,635,098	3,152,844
	Lotte Mitsui Chemical Co., Ltd.	102,115	19,500
	Lotte Sanjiang Chemical Co., Ltd.	8,665,841	7,763,094
	Lotte Versalis Elastomers Co., Ltd.	430,000	342,500
Others	Lotte Logistics Corp.	1,384,441	1,957,490
	Lotte Aluminium Co., Ltd.	260,031	312,142
	Uz-Kor Gas Chemical LLC	42,463,644	10,084,825
	Hotel Lotte Co., Ltd., and others	82,673,803	80,370,363
	₩ 256,168,838	₩ 142,653,518	

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**41. Related-party transactions (cont'd)**

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

	Related party	Transactions	2016	2015
Additional investment	Hyundai Chemical Co., Ltd. (associate)	Cash	₩ -	₩ 128,000,000
	Lotte Asset Development Co., Ltd. (associate)	Cash	-	10,265,420
	Lotte Versalis Elastomers Co., Ltd. (joint venture)	Cash	13,400,000	39,000,000
			<u>13,400,000</u>	<u>177,265,420</u>
Newly acquired	Lotte Fine Chemical Co., Ltd. (associate)	Cash, advance payments, other accounts receivable	432,700,547	-
			<u>432,700,547</u>	<u>-</u>
Dividend income	Lotte MRC Co., Ltd. (joint venture)	Cash	12,000,000	3,500,000
	Seetec Co., Ltd. (joint venture)	Cash	17,500,000	33,500,000
	Lotte Food Co., Ltd. (others)	Cash	63,832	33,385
	Lotte Logistics Corp. (others)	Cash	93,494	33,154
	Sparx Asset Management Korea Co., Ltd. (others)	Cash	34,942	32,249
				<u>29,692,268</u>
			<u>₩ 475,792,815</u>	<u>₩ 214,364,208</u>

Compensation for key management of the Group for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
Short-term salaries	₩ 19,174,366	₩ 17,803,493
Pension benefits costs	3,431,298	3,029,581
	<u>₩ 22,605,664</u>	<u>₩ 20,833,074</u>

See Note 44 for details of payment guarantees provided as at December 31, 2016.

**42. Cash and cash equivalents**

Details of cash and cash equivalents as at December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
Cash on hand	₩ 261,283	₩ 335,478
Bank deposits	2,202,683,182	1,941,883,178
	<u>₩ 2,202,944,465</u>	<u>₩ 1,942,218,656</u>

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**43. Non-cash transactions**

Significant non-cash transactions of investing and financing activities that are not included in the consolidated statements of cash flows for the years ended December 31, 2016 and 2015 are as follows (Korean won in thousands):

	2016	2015
Transfer of current portion of long-term loans receivable	₩ 3,279,167	₩ 4,283,333
Transfer of short-term loans receivable to long-term loans receivable	11,429,167	-
Transfer to current portion of non-current AFS financial assets	588,275	290,145
Transfer of advance payments to investments in associates	46,500,000	-
Transfer of investments in associates to other accounts receivable	32,491,665	-
Transfer of construction-in-progress to related property, plant and equipment	259,663,539	446,534,837
Transfer to current portion of long-term prepaid expenses	757,200	-
Transfer to current portion of long-term accounts payable	5,205,293	5,171,502
Changes in accounts payable related to acquisition of property, plant and equipment	(177,236,773)	201,952,142
Write-offs of accounts receivable	1,469,356	732,380
Transfer to current portion of bonds payable and long-term borrowings	153,020,861	10,075,481
Transfer to current portion of long-term other accounts receivable	361,594	670,564
Changes in borrowings due to business combination	258,500,000	-
Changes in advance payments of business combination	232,650,000	-
Transfer to current portion of non-current derivative financial assets	-	2,148,013
Transfer to current portion of non-current derivative financial liabilities	-	9,790,106

**44. Payment guarantee**

Payment guarantees provided by the Company to its associates and joint ventures as at December 31, 2016 are as follows (USD, CNY and Korean won in thousands):

Guarantee	Foreign currency		Korean won	Description
Lotte Engineering & Construction Co., Ltd.	USD	9,997	₩ 12,081,375	Joint surety with Lotte Engineering & Construction Co., Ltd., for performing construction contract
Lotte Sanjiang Chemical Co., Ltd.	CNY	39,950	6,921,737	Guarantee for export credit limit
	CNY	155,000	26,855,300	Guarantee for comprehensive limit
	CNY	145,000	25,122,700	Guarantee for comprehensive limit
Lotte Ube Synthetic Rubber Sdn. Bhd.	USD	27,200	32,871,200	Payment guarantee of borrowings
			₩ 103,852,312	

**44. Payment guarantee (cont'd)**

Dacc Aerospace Co., Ltd., which is a subsidiary of the Group, provided payment guarantee for the borrowings of Human Composite Co., Ltd. from Woori Bank amounting to ₩1,231 million.

As at December 31, 2016, Lotte Chemical Titan Holding Sdn. Bhd., a subsidiary of the Company, provides a payment guarantee amounting to ₩8,218 million for Lotte Ube Synthetic Rubber Sdn. Bhd.'s loan from Bank of Tokyo-Mitsubishi UFJ (Malaysia) Berhad.

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**45. Commitments and contingencies**

The Group has entered into various agreements with financial institutions and others as at December 31, 2016 and, details are as follows (Korean won, USD and MYR in thousands):

	Financial institution	Description	Contract amount	
The Company	KEB Hana Bank (Comprehensive limit, ₩185.5 billion)	Local letter of credit	KRW	10,000,000
		Usance and at sight	USD	120,000
		Stand by letter of credit	USD	20,000
		OA	USD	10,000
	KEB Hana Bank	Bank overdrafts	KRW	10,000,000
	KEB Hana Bank	Usance	USD	70,000
	Woori Bank (Comprehensive limit, ₩135 billion)	Bank overdrafts	KRW	2,000,000
		Usance and at sight	USD	110,000
	Nonghyup Bank	Trade financing	USD	90,000
	Shinhan Bank	Usance	USD	100,000
	Standard Chartered Bank	Bank overdrafts	KRW	10,000,000
		Trade financing	USD	150,000
	The Korea Development Bank	Usance and Import Loan	USD	150,000
	Kookmin Bank	Usance	USD	50,000
	Suhyup Bank	Trade financing	USD	30,000
	Mizuho Bank	Trade financing	USD	100,000
	Citibank	Usance	USD	50,000
	SMBC	Usance and stand by letter of credit	USD	50,000
	JP Morgan	Trade financing	USD	50,000
	Credit Agricole	Usance and stand by letter of credit	USD	80,000
	Deutsche Bank	Trade financing	USD	50,000
	BNP Paribas	Trade financing	USD	100,000
	ANZ	Trade financing	USD	100,000
	HSBC	Trade financing	USD	50,000
	Bank of China	Trade financing	USD	100,000
	Industrial Bank of Korea	Usance	USD	50,000
	DBS	Trade financing	USD	80,000
Lotte Chemical Titan Holding Sdn. Bhd. and its subsidiaries	Malayan Banking Berhad	Comprehensive limit	MYR	570,000
		Bank overdrafts	MYR	26,000
	HSBC Bank	General fund loan	USD	26,800
		Comprehensive limit	MYR	290,000
	Standard Chartered Bank	Comprehensive limit	MYR	515,000
	Deutsche Bank	Comprehensive limit	MYR	195,000
	Bank Islam Malaysia	Comprehensive limit	MYR	150,000
	RBS Bank	Comprehensive limit	MYR	165,000
	JP Morgan	Comprehensive limit	MYR	165,000
	Lotte Advanced Material Co., Ltd.	Kookmin Bank	Trade financing	USD
Trade financing			KRW	10,000,000
KEB Hana Bank		General fund loan	KRW	30,000,000
		Bank overdrafts	KRW	10,000,000
		General fund loan	KRW	50,000,000
Woori Bank		Trade financing	USD	55,000
		Payment guarantee	USD	3,000
		Trade financing	USD	56,000
Shinhan Bank		Win-win partner loan	KRW	1,000,000
		Trade financing	USD	40,000
BBCN Bank		Credit account receivable system	KRW	20,000,000
Lotte Card Co., Ltd.		General fund loan	USD	6,000
		Domestic letter of credit	KRW	30,000,000

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**45. Commitments and contingencies (cont'd)**

	Financial institution	Description	Contract amount	
Other subsidiaries	Standard Chartered Bank (China) Limited	Comprehensive limit	CNY	200,000
		General fund loan	USD	16,000
	DBS Bank	General fund loan	USD	16,000
	Citibank (China) Co., Ltd.	Comprehensive limit	CNY	100,000
		General fund loan	USD	5,000
	National Bank of Pakistan	Payment guarantee	PKR	391,250
		Local letter of credit	PKR	1,307,250
	Standard Chartered Bank	Payment guarantee	PKR	1,299,883
	MCB Bank Limited	Payment guarantee	PKR	398,500
	Askari Bank Limited	Payment guarantee	PKR	40,000
	KEB Hana Bank	Account receivable loan	KRW	640,000
		Trade financing	KRW	3,900,000

Technical license agreements

The Company entered into technical license agreements with Asahi Kasei Corporation and other overseas entities to receive technical know-how used in the production of dimethyl carbonates and ethylene vinyl acetate copolymers. Licensing fees (including manufacturing costs) incurred for the years ended December 31, 2016 and 2015 amounted to ₩112,026 thousand and ₩832,218 thousand, respectively.

Furthermore, the Company holds the technical license agreement entered into on December 13, 2006 between KP Chemical Corp., a subsidiary acquired by the Group in 2012, and UOP Co., Ltd, a US entity, for the supply of technical know-how to the MX Sorbex Plant. The Company is obligated to notify UOP Co., Ltd. of its total output for the year on every January 30 of the following year for the purpose of calculating fees on amounts in excess of the Fully Paid License limit.

Supply agreement

For the stable purchasing of Naphtha and M-X (Mixed Xylene), the Company entered into a contract with Hyundai Chemical Co., Ltd. for long-term supply agreement guaranteed over 20 years from 2016 to 2036.

Pending lawsuits

Three lawsuits with claims amounted to ₩833 million relating to damage compensation and others are pending as at December 31, 2016. The Group is involved in various lawsuits and the ultimate outcome cannot be reasonably estimated as at the end of the reporting period.

Assets provided as collateral

Assets provided as collateral for the Group as at December 31, 2016 are as follows (USD and Korean won in thousands):

Entity	Asset	Book value	Details	Related amount (limit)	Financial institution
The Company	Kor-Uz Gas Chemical Investment Ltd. (Investments in associates)	₩ 396,591,586	Borrowings of Uz-Kor Gas Chemical LLC	USD 2,188,845 (USD 2,508,900)	ING Bank N.V., etc.

Blank checks and promissory note

The Group provided their three blank check as collateral to the Korea National Oil Corporation in connection to borrowings for the development of overseas natural resources (see Note 21), and one blank promissory note in connection with petroleum import tariffs.

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**45. Commitments and contingencies (cont'd)**

Commitments and contingencies

As at December 31, 2016, the Company has entered into a fund contribution agreement in the amount of ₩185,000 million, in relation to Lotte Versalis Elastomers Co., Ltd.'s borrowings of ₩370,000 million, which is the Company's ownership interests share of 50% plus 1 in the principal of the borrowings. As at December 31, 2016, the Company has also committed to a fund contribution amounting to ₩286,000 million, in relation to Hyundai Chemical Co., Ltd.'s borrowings of ₩715,000 million, which is the Company's ownership interests share of 40% in the borrowings.

Others

In accordance with a resolution of Board of Directors of the Company, the Company and Lotte Chemical Titan Holding Sdn. Bhd. participated in the paid-up capital increases of USD 1,277 million of Lotte Chemical USA Corp. In relation to those capital increases, the total injected amount of paid-in-capital of the Company and Lotte Titan Holding Sdn. Bhd. is USD 857 million as at December 31, 2016.

Igis I Corp. has a put option to sell 24.7% equity interest in Lotte Global Logistics Co., Ltd. to the Company as at December 31, 2016.

Non-cancellable operating leases

Non-cancellable operating leases of Lotte Chemical Pakistan Limited and Lotte Chemical Titan Holdings Corp. Bhd. and its subsidiaries as at December 31, 2016 and 2015 are as follows (Korean won in millions):

	Amounts
2017	₩ 9,193
2018	2,676
2019	2,606
2020	2,253
2021 and afterwards	11,713
	<u>₩ 28,441</u>

**46. Business combination**

The Company acquires 100% of equity interest in Lotte Advanced Material Co., Ltd. at 2,585,000 million Korean Won on April 29, 2016 and is deemed to acquire on April 1, 2016. Purchase considerations consist of the following (Korean won in millions):

Cash and cash equivalents	₩ 2,326,500
Long-term borrowings and bonds payable (*1)	258,500
	<u>2,585,000</u>

(\*1) The Company acquires 90% of equity interest in Lotte Advanced Material Co., Ltd. and holds a call option over the remaining 10% owned by Samsung SDI Co. where Samsung SDI Co. holds a put option over the stock. Accordingly, the Company is deemed to acquire the remaining equity interest and accounts the equity interest as long-term borrowings.



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**46. Business combination (cont'd)**

The fair value of the identifiable assets and liabilities acquired or assumed by the Group at the acquisition date, the non-controlling interest and the goodwill at the acquisition date are as follows (Korean won in millions):

	Amounts	
1. Fair value of identifiable net assets		
Assets		
Current assets		₩ 668,198
Cash and cash equivalents	₩ 191,677	
Short-term financial instruments	2,665	
Trade accounts and other accounts receivable	274,800	
Inventories	175,008	
Other financial assets	949	
Other current assets	22,456	
Deferred tax assets	643	
Non-current assets		1,846,289
Non-current AFS financial assets	1,091	
Long-term financial instruments	217	
Property, plant and equipment	734,696	
Intangible assets	1,093,378	
Other non-current financial assets	4,090	
Other non-current assets	2,122	
Deferred tax assets	10,695	
Assets acquired		2,514,487
Liabilities		
Current liabilities		(377,825)
Trade payables and other accounts payable	(178,876)	
Borrowings	(138,414)	
Other financial liabilities	(20,835)	
Other current liabilities	(19,954)	
Income tax payables	(19,746)	
Non-current liabilities		(270,822)
Borrowings	(6,066)	
Net defined benefit liability	(2,903)	
Non-current provisions	(19)	
Other non-current financial liabilities	(11)	
Deferred tax liabilities	(261,823)	
Liabilities assumed		(648,647)
Fair value of identifiable net assets		1,865,840
2. Non-controlling interests		(1,441)
3. Goodwill		720,601
		₩ 2,585,000

**46. Business combination (cont'd)**

The total sales and net income of Lotte Advanced Material Co., Ltd. included in the consolidated statement of comprehensive income of the Group for the year ended December 31, 2016, are ₩1,950.8 billion and ₩181 billion, respectively. If there was an acquisition transaction on February 1, 2016, the Group's total sales and net income for the year would be estimated at ₩13,651.8 billion and ₩1,882 billion.

During the year ended December 31, 2016, the Group paid ₩11,149 million in acquisition tax and legal fees related to the business combination, which was recognized as selling, general and administrative expenses in the consolidated statement of comprehensive income.

**47. Subsequent events**

On February 21, 2017, in accordance with a resolution of Board of Directors of the Company, the Company disposed of 588,388 treasury shares acquired on December 27, 2012, upon the merger of KP Chemical Co., Ltd.