

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Financial Statements
June 30, 2017 and 2016

LG Chem, Ltd. and Subsidiaries
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June 30, 2017 and 2016

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Report on Review of Interim Financial Statements

(English Translation of a Report Originally Issued in Korean)

To the Shareholders and Board of Directors of
LG Chem, Ltd.

Reviewed Financial Statements

We have reviewed the accompanying consolidated interim financial statements of LG Chem, Ltd. and its subsidiaries (collectively referred to as the "Group"). These financial statements consist of the consolidated interim statement of financial position of the Group as at June 30, 2017, and the related consolidated interim statements of profit or loss and comprehensive income for the three-month and six-month periods ended June 30, 2017 and 2016, and consolidated interim statements of changes in equity and cash flows for the six-month periods ended June 30, 2017 and 2016, and a summary of significant accounting policies and other explanatory notes, expressed in Korean won.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated interim financial statements in accordance with International Financial Reporting Standards as adopted by the Republic of Korea ("Korean IFRS") 1034 *Interim Financial Reporting*, and for such internal control as management determines is necessary to enable the preparation of consolidated interim financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to issue a report on these consolidated interim financial statements based on our review.

We conducted our review in accordance with quarterly or semi-annual review standards established by the Securities and Futures Commission of the Republic of Korea. A review of interim financial information consists of making inquiries, primarily of persons responsible for financial and accounting matters, and applying analytical and other review procedures. A review is substantially less in scope than an audit conducted in accordance with Korean Standards on Auditing and consequently does not enable us to obtain assurance that we would become aware of all significant matters that might be identified in an audit. Accordingly, we do not express an audit opinion.



Conclusion

Based on our review, nothing has come to our attention that causes us to believe the accompanying consolidated interim financial statements are not presented fairly, in all material respects, in accordance with Korean IFRS 1034 *Interim Financial Reporting*.

Other Matters

We have audited the consolidated statement of financial position of the Group as at December 31, 2016, and the related consolidated statements of profit or loss, comprehensive income, changes in equity and cash flows for the year then ended, in accordance with Korean Standards on Auditing. We expressed an unqualified opinion on those financial statements, not presented herein, in our audit report dated March 8, 2017. The consolidated statement of financial position as at December 31, 2016, presented herein for comparative purposes, is consistent, in all material respects, with the above audited statement of financial position as at December 31, 2016.

Review standards and their application in practice vary among countries. The procedures and practices used in the Republic of Korea to review such financial statements may differ from those generally accepted and applied in other countries.

August 11, 2017
Seoul, Korea

<p>This report is effective as at August 11, 2017, the review report date. Certain subsequent events or circumstances, which may occur between the review report date and the time of reading this report, could have a material impact on the accompanying consolidated interim financial statements and notes thereto. Accordingly, the readers of the review report should understand that there is a possibility that the above review report may have to be revised to reflect the impact of such subsequent events or circumstances, if any.</p>
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LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Financial Position
June 30, 2017 and December 31, 2016

<i>(in millions of Korean won)</i>	Notes	June 30, 2017 (Unaudited)	December 31, 2016
Assets			
Current assets			
Cash and cash equivalents	3, 5, 6	1,729,938	1,474,367
Trade receivables	3, 5, 7, 32	4,183,821	3,533,699
Other receivables	3, 5, 7, 32	614,612	979,027
Prepaid income taxes		3,668	5,753
Other current assets	14	323,840	260,793
Inventories	9	3,085,742	2,965,191
Assets held for sale	36	8,449	8,104
Total current assets		9,950,070	9,226,934
Non-current assets			
Other receivables	3, 5, 7	130,114	233,152
Other financial assets	3, 5, 8	26,129	23,448
Investments in associates and joint ventures	1, 10, 34	280,869	260,828
Deferred income tax assets		217,361	170,177
Property, plant and equipment	11	10,157,089	9,680,133
Intangible assets	12	1,797,276	832,144
Investment properties	13	2,272	2,287
Other non-current assets	14	109,939	57,957
Total non-current assets		12,721,049	11,260,126
Total assets		22,671,119	20,487,060
Liabilities			
Current liabilities			
Trade payables	3, 5, 32	1,608,995	1,723,252
Other payables	3, 5, 32	1,006,650	971,605
Borrowings	3, 5, 15	1,454,444	2,212,641
Provisions	16	56,754	51,694
Income tax payables		344,258	217,973
Other current liabilities	5, 18	335,717	269,644
Liabilities held for sale	36	31	42
Total current liabilities		4,806,849	5,446,851
Non-current liabilities			
Other payables	3, 5	8,620	14,307
Borrowings	3, 5, 15	1,868,886	678,000
Provisions	16	195,969	133,821
Net defined benefit liabilities	17	177,523	92,172
Deferred income tax liabilities		39,761	40,675
Other non-current liabilities	18	38,875	30,267
Total non-current liabilities		2,329,634	989,242
Total liabilities		7,136,483	6,436,093

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Financial Position
June 30, 2017 and December 31, 2016

<i>(in millions of Korean won)</i>	Notes	June 30, 2017 (Unaudited)	December 31, 2016
Equity			
Share capital	1, 20	391,406	369,500
Capital surplus		2,274,386	1,157,772
Other components of equity	22	(355,160)	(15,699)
Accumulated other comprehensive income		(92,410)	(36,993)
Retained earnings	21	13,194,871	12,462,772
Equity attributable to owners of the Parent Company		<u>15,413,093</u>	<u>13,937,352</u>
Non-controlling interest		<u>121,543</u>	<u>113,615</u>
Total equity		<u>15,534,636</u>	<u>14,050,967</u>
Total liabilities and equity		<u>22,671,119</u>	<u>20,487,060</u>

The above consolidated interim statements of financial position should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Profit or Loss
Three-Month and Six-Month Periods Ended June 30, 2017 and 2016

	Notes	Period Ended June 30			
		2017 (Unaudited)		2016 (Unaudited)	
		Three months	Six months	Three months	Six months
<i>(in millions of Korean won, except per share amounts)</i>					
Revenue	32, 34	6,382,062	12,868,730	5,219,229	10,093,321
Cost of sales	24, 32	(5,011,211)	(10,084,263)	(4,074,378)	(8,014,097)
Gross profit		1,370,851	2,784,467	1,144,851	2,079,224
Selling and administrative expenses	23, 24, 32	(643,981)	(1,260,689)	(532,398)	(1,009,025)
Operating profit	34	726,870	1,523,778	612,453	1,070,199
Finance income	5, 26	63,614	120,557	44,558	81,144
Finance costs	5, 26	(56,632)	(157,819)	(89,458)	(128,101)
Share of net profit of associates and joint ventures accounted for using the equity method	10	426	3,657	(2,873)	(5,211)
Other non-operating income	5, 27	177,983	271,059	163,064	220,274
Other non-operating expenses	5, 28, 36	(182,667)	(333,337)	(227,658)	(315,135)
Profit before income tax	33	729,594	1,427,895	500,086	923,170
Income tax expense	29	(139,272)	(289,476)	(124,602)	(209,561)
Profit for the period		590,322	1,138,419	375,484	713,609
Profit is attributable to:					
Owners of the Parent Company		577,077	1,108,567	376,911	716,674
Non-controlling interests		13,245	29,852	(1,427)	(3,065)
Earnings per share attributable to the equity holders of the Parent Company	30				
Basic and diluted earnings per ordinary share		7,531	14,467	5,124	9,743
Basic and diluted earnings per preferred share		7,544	14,492	5,137	9,768

The above consolidated interim statements of profit or loss should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Comprehensive Income
Three-Month and Six-Month Periods Ended June 30, 2017 and 2016

	Notes	Period Ended June 30			
		2017 (Unaudited)		2016 (Unaudited)	
		Three months	Six months	Three months	Six months
<i>(in millions of Korean won)</i>					
Profit for the period		590,322	1,138,419	375,484	713,609
Other comprehensive income					
<i>Items that will not be reclassified to profit or loss</i>					
Remeasurements of net defined benefit liabilities	17	(2,897)	(10,218)	(1,149)	(1,919)
Shares of remeasurements of net defined benefit liabilities of associates		2	62	4	5
Income tax relating to these items		700	2,472	276	465
<i>Items that may be subsequently reclassified to profit or loss</i>					
Exchange differences on translation of foreign operations		59,505	(52,792)	(17,545)	(26,095)
Changes in valuation on available-for-sale financial securities	8	(1,411)	(1,329)	1,568	3,858
Shares of other comprehensive income of joint ventures and associates		(362)	(3,521)	(1,591)	(3,464)
Reclassification from disposal of joint ventures		-	-	45,215	45,215
Income tax relating to these items		1,527	(1,830)	(12,244)	(13,064)
Other comprehensive income for the period, net of tax		<u>57,064</u>	<u>(67,156)</u>	<u>14,534</u>	<u>5,001</u>
Total comprehensive income for the period		<u>647,386</u>	<u>1,071,263</u>	<u>390,018</u>	<u>718,610</u>
Total comprehensive income for the period is attributable to:					
Owners of the Parent Company		629,755	1,045,463	393,012	723,700
Non-controlling interest		17,631	25,800	(2,994)	(5,090)

The above consolidated interim statements of comprehensive income should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Changes in Equity
Six-Month Periods Ended June 30, 2017 and 2016

(in millions of Korean won)

	Notes	Attributable to owners of the Parent Company						Non-controlling interests	Total equity
		Share capital	Capital surplus	Other components of equity	Accumulated other comprehensive income	Retained earnings	Total		
Balance at January 1, 2016		369,500	1,157,772	(15,699)	(52,608)	11,532,500	12,991,465	112,057	13,103,522
Comprehensive income									
Profit (loss) for the period		-	-	-	-	716,674	716,674	(3,065)	713,609
Remeasurements of net defined benefit liabilities	17	-	-	-	-	(1,454)	(1,454)	-	(1,454)
Exchange differences on translation of foreign operations		-	-	-	(25,400)	-	(25,400)	(2,025)	(27,425)
Changes in the fair value of available-for-sale financial instruments		-	-	-	2,924	-	2,924	-	2,924
Others		-	-	-	30,951	5	30,956	-	30,956
Total comprehensive income for the period		-	-	-	8,475	715,225	723,700	(5,090)	718,610
Transactions with owners									
Dividends	31	-	-	-	-	(331,287)	(331,287)	(15,259)	(346,546)
Issuance of shares by subsidiaries		-	-	-	-	-	-	5,521	5,521
Business combination	35	-	-	-	-	-	-	(16,349)	(16,349)
Others		-	-	(172)	-	(747)	(919)	(78)	(997)
Total transactions with owners		-	-	(172)	-	(332,034)	(332,206)	(26,165)	(358,371)
Balance at June 30, 2016 (Unaudited)		369,500	1,157,772	(15,871)	(44,133)	11,915,691	13,382,959	80,802	13,463,761
Balance at January 1, 2017		369,500	1,157,772	(15,699)	(36,993)	12,462,772	13,937,352	113,615	14,050,967
Comprehensive income									
Profit for the period		-	-	-	-	1,108,567	1,108,567	29,852	1,138,419
Remeasurements of net defined benefit liabilities	17	-	-	-	-	(7,749)	(7,749)	3	(7,746)
Exchange differences on translation of foreign operations		-	-	-	(50,888)	-	(50,888)	(4,055)	(54,943)
Changes in the fair value of available-for-sale financial instruments		-	-	-	(1,008)	-	(1,008)	-	(1,008)
Others		-	-	-	(3,521)	62	(3,459)	-	(3,459)
Total comprehensive income for the period		-	-	-	(55,417)	1,100,880	1,045,463	25,800	1,071,263
Transactions with owners									
Business combination	35	21,906	1,116,614	(337,211)	-	-	801,309	-	801,309
Purchase of treasury shares	35	-	-	(2,250)	-	-	(2,250)	-	(2,250)
Dividends	31	-	-	-	-	(368,055)	(368,055)	(17,627)	(385,682)
Others		-	-	-	-	(726)	(726)	(245)	(971)
Total transactions with owners		21,906	1,116,614	(339,461)	-	(368,781)	430,278	(17,872)	412,406
Balance at June 30, 2017 (Unaudited)		391,406	2,274,386	(355,160)	(92,410)	13,194,871	15,413,093	121,543	15,534,636

The above consolidated interim statements of changes in equity should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Cash Flows
Six-Month Periods Ended June 30, 2017 and 2016

<i>(in millions of Korean won)</i>	Notes	Six-Month Period Ended June 30	
		2017 (Unaudited)	2016 (Unaudited)
Cash flows from operating activities			
Cash generated from operations	33	1,442,876	1,812,348
Interest received		13,625	22,241
Interest paid		(51,353)	(36,397)
Dividends received		10,204	-
Income taxes paid		(236,456)	(351,796)
Net cash inflow from operating activities		1,178,896	1,446,396
Cash flows from investing activities			
Decrease in other receivables		622,072	387,980
Decrease in other non-current receivables		40,300	32,703
Proceeds from disposal of investments in subsidiaries		343	-
Proceeds from disposal of investments in joint ventures		-	23,724
Proceeds from disposal of available-for-sale financial assets		-	41
Proceeds from disposal of property, plant and equipment		8,930	12,624
Proceeds from disposal of intangible assets		7,569	240
Government grants received		29,628	-
Business combination, net of cash acquired	35	43,759	(408,663)
Proceeds from disposal of business		2,022	-
Increase in other receivables		(261,100)	(297,626)
Increase in other non-current receivables		(47,219)	(73,688)
Acquisition of investments in associates and joint ventures		(28,720)	(3,636)
Acquisition of available-for-sale financial assets		(1,709)	(3,062)
Acquisition of property, plant and equipment		(762,869)	(681,545)
Acquisition of intangible assets		(34,109)	(37,702)
Net cash outflow from investing activities		(381,103)	(1,048,610)
Cash flows from financing activities			
Proceeds from borrowings		1,144,734	410,693
Capital contribution from non-controlling interests		-	5,574
Repayments of borrowings		(1,289,363)	(446,469)
Dividends paid		(385,682)	(346,559)
Purchase of treasury shares		(2,250)	-
Net cash outflow from financing activities		(532,561)	(376,761)
Net increase in cash and cash equivalents			
Cash and cash equivalents at the beginning of the period		1,474,367	1,704,918
Effects of exchange rate changes on cash and cash equivalents		(9,661)	(8,367)
Cash and cash equivalents at the end of the period		1,729,938	1,717,576

The above consolidated interim statements of cash flows should be read in conjunction with the accompanying notes.

LG Chem, Ltd. and Subsidiaries

Notes to the Consolidated Interim Financial Statements

June 30, 2017 and 2016 (Unaudited), and December 31, 2016

1. General Information

General information about LG Chem, Ltd. (the "Parent Company"), the controlling company in accordance with Korean IFRS 1110 *Consolidated Financial Statements*, and its subsidiaries (collectively referred to as the "Group") is as follows:

1.1 The Parent Company

The Parent Company was spun off on April 1, 2001, from LG Chem Investment Ltd. (now LG Corp., formerly LG Chemical Ltd.).

As at June 30, 2017, the Parent Company has its manufacturing facilities in Yeosu, Daesan, Ochang, Cheongju, Ulsan, Naju, Iksan, Paju, Osong, Onsan and Gimcheon.

The Parent Company is authorized to issue 292 million shares of ordinary shares with par value of ₩5,000 per share. As at June 30, 2017, the Parent Company has issued 70,592,343 ordinary shares (₩352,962 million) and 7,688,800 preferred shares (₩38,444 million). The largest shareholder of the Parent Company is LG Corp., which owns 33.34% of the Parent Company's ordinary shares. Preferred shareholders have no voting rights but are entitled to receive dividends at a rate 1% more than those paid to ordinary shareholders.

1.2 Business Overview

The Group is engaged in Basic materials & Chemicals business, Energy solutions, IT & Electronics materials and Advanced materials business, and also engaged in Life Sciences business acquired through a merger with LG Life Sciences, Ltd. in January 2017. In April 2016, the Parent Company acquired 100% shares of FarmHannong Co., Ltd., which is engaged to manufacture crop protection products, seeds, fertilizers and others.

The Basic materials & Chemicals business includes production of olefin petrochemicals, such as ethylene, propylene, butadiene from Naphtha, and aromatic petrochemicals such as benzene. It also includes production of synthetic resin and synthetic components from olefin, and aromatic petrochemicals. This business bears characteristics of a large-volume process industry. The Group's major products are PE, PP, BPA, ABS, EP, PVC, plasticizers, acrylic, SAP, synthetic rubber, a special resin, and others.

The Energy solutions business manufactures and supplies batteries ranging from IT & New application batteries for mobile phones and laptop computers, to automotive batteries for electric vehicles and ESS batteries. Demand of small sized batteries for new applications such as electric tools and electric driving devices as well as traditional IT devices is increasing recently and the automotive battery business is also expected to expand rapidly due to an increasing demand of the batteries in associated with enhanced environment regulation in developed countries. Demand for ESS is expanding with an increasing importance of efficient usage of electricity and generation of renewable energy.

The IT & Electronics material business manufactures and supplies various kinds of IT materials such as polarizer, Glass Substrate, OLED film, semiconductor materials and RO membranes, which will be the next growth engine for future. Advanced materials business manufactures and supplies display and battery materials for LCD Photoresist, OLED materials, battery materials and others.

The Life Sciences business manufactures and supplies pharmaceutical products, such as quinolone antibiotics 'Factive', human growth hormone 'Eutropin', diabetes drug 'Zemiglo', Bovine Somatotropin 'Boostin', hyaluronic acid filler 'YVOIRE' and others, as well as fine chemical products, such as herbicide for rice farming and others.

LG Chem, Ltd. and Subsidiaries

Notes to the Consolidated Interim Financial Statements

June 30, 2017 and 2016 (Unaudited), and December 31, 2016

FarmHannong Co., Ltd., subsidiary of the Parent Company, manufactures and sells crop protection products, seeds, fertilizers and others. The crop protection business provides high value products such as environmentally-friendly pesticide. The fertilizer business leads developing a next generation fertilizers such as eco-friendly organic and functional fertilizers, and potting soil. The seed business puts priority on retaining various genetic resources and developing rare breeds with high profit in order to remain competitive in a future food industry.

1.3 Consolidated Subsidiaries, Associates and Joint Ventures

	June 30, 2017			
	Percentage of ownership (%)	Business location	Closing month	Business activities
Consolidated subsidiaries				
Ningbo LG Yongxing Chemical Co., Ltd. ¹	75	China	December	ABS/SBL manufacturing and sales
Ningbo Zhenhai LG Yongxing Trade Co., Ltd. ¹	75	China	December	ABS sales
LG Chem HK Ltd.	100	Hong Kong	December	Sales and trading
LG Chem America, Inc.	100	USA	December	Sales and trading
LG Chemical India Pvt. Ltd. ²	100	India	December	Synthetic resin manufacturing and sales
LG Polymers India Pvt. Ltd. ²	100	India	December	PS manufacturing
LG Chemical (Guangzhou) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem (Nanjing) Information & Electronics Materials Co., Ltd. ³	100	China	December	Battery/ Polarizer Manufacturing and sales
LG Chem (Taiwan), Ltd.	100	Taiwan	December	Polarizer manufacturing and sales
LG Chem Display Materials (Beijing) Co., Ltd.	100	China	December	Polarizer manufacturing
Tianjin LG Bohai Chemical Co., Ltd. ⁴	75	China	December	PVC, VCM, EDC manufacturing and sales
Tianjin LG BOTIAN Chemical Co., Ltd. ⁴	56	China	December	SBS manufacturing and sales
LG Chem (China) Investment Co., Ltd. ⁵	100	China	December	China holding company
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	100	China	December	ABS/EP manufacturing and sales
LG Chem Europe GmbH	100	Germany	December	Sales and trading
LG Chem Poland Sp. z o.o.	100	Poland	December	Polarizer manufacturing
LG Chem Michigan Inc.	100	USA	December	Automotive battery research and manufacturing
LG Chem Power Inc.	100	USA	December	Automotive battery research
LGC Petrochemical India Private Ltd.	100	India	December	Synthetic resin manufacturing and sales
Haengboknuri Co., Ltd.	100	Korea	December	Facility management and general cleaning
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	100	Turkey	December	Sales and trading
LG Chem Japan Co., Ltd.	100	Japan	December	Sales and trading
LG NanoH2O, Inc. ⁶	100	USA	December	Water processing membrane research and manufacturing
NanoH2O Singapore Private Ltd. ⁶	100	Singapore	December	Water processing membrane research and manufacturing
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	100	China	December	Water processing membrane research and manufacturing
Nanjing LG Chem New Energy Battery Co., Ltd. ⁷	50	China	December	Automotive battery manufacturing and sales
LG Chem (Chongqing) Engineering Plastics Co., Ltd.	100	China	December	EP manufacturing and sales
LG Chem Wroclaw Energy sp. z o.o.	100	Poland	December	Automotive battery research and manufacturing

LG Chem, Ltd. and Subsidiaries

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LG Chem(HUIZHOU) Petrochemical Co., Ltd.	70	China	December	ABS manufacturing and sales
FarmHannong Co., Ltd. ⁸	100	Korea	December	Agricultural pesticide manufacturing
Cecel Co., Ltd. ⁸	71	Korea	December	Biologicals manufacturing
Agrotech Co., Ltd. ⁸	100	Korea	December	Agricultural pesticide manufacturing
FarmHwaong Co., Ltd. ^{8,9}	58	Korea	December	Vegetables and fruit farming
Dongbu Farm Hannong (Heilongjiang) Chemical Co., Ltd. ⁸	100	China	December	Agricultural pesticide manufacturing
LG Life Sciences India Pvt. Ltd. ¹⁰	100	India	December	Pharmaceutical products sales
LG Life Sciences (Beijing) Co., Ltd. ¹⁰	100	China	December	Pharmaceutical products sales
LG Life Sciences (Thailand) Ltd. ¹⁰	100	Thailand	December	Pharmaceutical products sales
LG Life Sciences America Inc. ¹⁰	100	USA	December	Agricultural pesticide sales
Sarangnuri Ltd. ¹⁰	100	Korea	December	Pharmaceutical products packaging
Associates				
LG Holdings (HK) Ltd.	26	Hong Kong	December	Sales and trading
TECWIN Co., Ltd.	21	Korea	December	Environment solution and Construction of chemical plant
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA. ¹¹	100	Brazil	December	Sales and trading
LG Chem Malaysia SDN.BHD. ¹¹	100	Malaysia	December	Sales and trading
LG Fuel Cell Systems Inc. ¹²	26	USA	December	Power fuel cell research
FJ Composite Material Co., Ltd. ¹³	33	Japan	May	Heat diffuser research and manufacturing
WUXI CL New Energy Technology Ltd. ¹⁴	30	China	December	ESS manufacturing
LG Life Sciences Poland Pvt, Ltd. ^{10,11}	100	Poland	December	Pharmaceutical products sales
Joint ventures				
LG VINA Chemical Co., Ltd.	40	Vietnam	December	DOP production and sales
HL Greenpower Co., Ltd.	49	Korea	December	Battery manufacturing for electric automobile
SEETEC Co., Ltd.	50	Korea	December	Plant utility and distribution, research assistance service

¹ As at June 30, 2017, Ningbo LG Yongxing Chemical Co., Ltd. owns 100% of Ningbo Zhenhai LG Yongxing Trade Co., Ltd.'s shares.

² As at June 30, 2017, LG Chemical India Pvt. Ltd. owns 100% of LG Polymer India Pvt. Ltd.'s shares.

³ During the period ended June 30, 2017, the Parent Company acquired additional shares of LG Chem (Nanjing) Information & Electronics Materials Co., Ltd. for ₩18,007 million.

⁴ As at June 30, 2017, Tianjin LG Bohai Chemical Co., Ltd. owns 20.30% of Tianjin LG BOTIAN Chemical Co., Ltd.'s shares.

⁵ During the period ended June 30, 2017, the Parent Company acquired additional shares of LG Chem (China) Investment Co., Ltd. for ₩6,244 million.

⁶ As at June 30, 2017, LG NanoH2O, Inc. owns 100% of NanoH2O Singapore Private Ltd.'s shares.

⁷ Although the Parent Company owns less than 50% of the voting rights of Nanjing LG Chem New Energy Battery Co., Ltd., the Parent Company is considered to have control over the investee as the Parent Company can exercise the majority voting rights in its decision-making process in accordance with the shareholders' agreement. During the period ended June 30, 2017, the Parent Company acquired additional shares of Nanjing LG Chem New Energy Battery Co., Ltd. for ₩13,960 million.

⁸ As at June 30, 2017, FarmHannong Co., Ltd. owns 100% of Agrotech Co., Ltd., Dongbu Farm Hannong (Heilongjiang) Chemical Co., Ltd., and also holds 71.05% of Cecel Co., Ltd., and 57.87% of FarmHwaong Co., Ltd. During the period ended June 30, 2017, FarmHannong Co., Ltd. disposed of a subsidiary, FarmBiotec Co., Ltd.

LG Chem, Ltd. and Subsidiaries

Notes to the Consolidated Interim Financial Statements

June 30, 2017 and 2016 (Unaudited), and December 31, 2016

⁹ As at June 30, 2017, FarmHwaong Co., Ltd.'s assets and liabilities are classified as assets and liabilities held for sale (Note 36).

¹⁰ During the period ended June 30, 2017, the Group acquired subsidiaries of LG Life Sciences, Ltd. due to the merger with LG Life Sciences, Ltd.

¹¹ Classified as an investment in associate due to its small size.

¹² During the period ended June 30, 2017, the Parent Company newly acquired shares of LG Fuel Cell Systems Inc. for ₩24,527 million.

¹³ During the period ended June 30, 2017, the Parent Company newly acquired 33.25% shares of FJ Composite Material Co., Ltd. for ₩3,015 million.

¹⁴ During the period ended June 30, 2017, the Parent Company newly acquired 30% shares of WUXI CL New Energy Technology Ltd. for ₩1,178 million.

1.4 Summarized Financial Information of Subsidiaries, Associates and Joint Ventures

Summarized financial information (before elimination of intercompany transactions and adjustments for differences in accounting policies) of subsidiaries, associates and joint ventures is as follows:

(in millions of Korean won)

	June 30, 2017			Six month period ended June 30, 2017	
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the period
Subsidiaries					
Ningbo LG Yongxing Chemical Co., Ltd.	730,374	298,295	432,079	1,032,967	91,198
Ningbo Zhenhai LG Yongxing Trade Co., Ltd.	5,832	2,684	3,148	21,684	454
LG Chem HK Ltd.	98,643	80,551	18,092	256,931	342
LG Chem America, Inc.	233,741	211,320	22,421	389,815	3,688
LG Chemical India Pvt. Ltd.	32,781	19	32,762	-	19
LG Polymers India Pvt. Ltd.	107,567	29,477	78,090	123,943	7,514
LG Chemical (Guangzhou) Engineering Plastics Co., Ltd.	104,951	38,022	66,929	93,409	1,918
LG Chem (Nanjing) Information & Electronics Materials Co., Ltd.	2,221,806	1,402,789	819,017	1,344,654	56,278
LG Chem (Taiwan), Ltd.	123,150	57,166	65,984	93,998	4,278
LG Chem Display Materials (Beijing) Co., Ltd.	40,585	13,662	26,923	33,293	1,681
Tianjin LG Bohai Chemical Co., Ltd.	319,892	258,213	61,679	261,005	13,465
Tianjin LG BOTIAN Chemical Co., Ltd.	46,838	55,836	(8,998)	82,102	(6,725)
LG Chem (China) Investment Co., Ltd.	184,688	61,653	123,035	29,968	3,046
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	55,043	8,512	46,531	43,117	(166)
LG Chem Europe GmbH	233,944	201,009	32,935	254,604	8,810
LG Chem Poland Sp. z o.o.	53,085	19,481	33,604	44,812	1,527
LG Chem Michigan Inc.	224,476	133,863	90,613	105,505	11,426
LG Chem Power Inc.	18,127	4,097	14,030	21,952	1,985
LGC Petrochemical India Private Ltd.	2,385	457	1,928	2,149	187
Haengboknuri Co., Ltd.	2,027	864	1,163	3,354	3
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	5,005	3,492	1,513	11,463	207
LG Chem Japan Co., Ltd.	3,476	445	3,031	3,070	334
LG NanoH2O, Inc. ¹	11,821	3,101	8,720	8,366	1,428
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	4,398	1,203	3,195	-	(1,831)
Nanjing LG Chem New Energy Battery Co., Ltd.	369,251	304,499	64,752	87,623	8,335
LG Chem (Chongqing) Engineering Plastics Co., Ltd.	39,537	36,507	3,030	8,974	(2,219)
LG Chem Wroclaw Energy sp. z o.o.	86,773	75,825	10,948	10,256	1,879
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	321,582	251,052	70,530	170,803	1,500

LG Chem, Ltd. and Subsidiaries

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FarmHannong Co., Ltd. ¹	1,228,737	666,189	562,548	439,625	35,072
LG Life Sciences India Pvt. Ltd.	4,917	3,532	1,385	4,851	(910)
LG Life Sciences (Beijing) Co., Ltd.	1,195	8	1,187	399	(7)
LG Life Sciences (Thailand) Ltd.	8,833	5,930	2,903	10,305	1,321
LG Life Sciences America Inc.	13,942	13,129	813	9,301	349
Sarangnuri Ltd.	190	36	154	137	35
Associates					
LG Holdings (HK) Ltd.	320,390	41,883	278,507	23,624	7,150
TECWIN Co., Ltd.	64,015	25,735	38,280	-	-
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	128	177	(49)	997	(29)
LG Chem Malaysia SDN.BHD.	251	37	214	288	10
LG Fuel Cell Systems Inc.	35,896	5,194	30,702	987	(20,422)
FJ Composite Material Co., Ltd.	7,761	3,017	4,744	378	(255)
WUXI CL New Energy Technology Ltd.	4,009	-	4,009	-	-
LG Life sciences Poland Pvt, Ltd.	122	67	55	-	-
Joint ventures					
LG VINA Chemical Co., Ltd.	21,803	14,035	7,768	24,429	1,012
HL Greenpower Co., Ltd.	157,537	120,608	36,929	200,452	2,403
SEETEC Co., Ltd.	343,606	48,183	295,423	242,790	9,349

¹ Included its subsidiaries' financial information from an intermediate parent perspective and not applied adjustments of a fair value evaluation due to the business combination in the consolidated financial statements.

(in millions of Korean won)

	December 31, 2016			Six month period ended June 30, 2016	
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the period
Subsidiaries					
Ningbo LG Yongxing Chemical Co., Ltd.	676,217	249,084	427,133	728,829	29,344
Ningbo Zhenhai LG Yongxing Trade Co., Ltd.	8,464	5,687	2,777	16,600	371
LG Chem HK Ltd.	108,970	90,142	18,828	261,656	157
LG Chem America, Inc.	176,522	156,627	19,895	308,331	119
LG Chemical India Pvt. Ltd.	32,761	6	32,755	-	10
LG Polymers India Pvt. Ltd.	89,187	18,073	71,114	105,876	6,842
LG Chemical (Guangzhou) Engineering Plastics Co., Ltd.	112,309	45,195	67,114	67,998	3,762
LG Chem (Nanjing) Information & Electronics Materials Co., Ltd.	2,357,476	1,593,091	764,385	1,031,378	(37,974)
LG Chem (Taiwan), Ltd.	133,777	66,712	67,065	98,753	2,288
LG Chem Display Materials (Beijing) Co., Ltd.	37,473	9,910	27,563	29,210	1,260
Tianjin LG Bohai Chemical Co., Ltd.	311,868	262,247	49,621	210,247	(35,430)
Tianjin LG BOTIAN Chemical Co., Ltd.	54,947	57,176	(2,229)	65,285	5,860
LG Chem (China) Investment Co., Ltd.	243,675	129,390	114,285	26,479	3,609
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	65,316	17,080	48,236	44,255	2,596
LG Chem Europe GmbH	177,371	154,464	22,907	203,410	5,374
LG Chem Poland Sp. z o.o.	50,133	20,220	29,913	41,662	2,053
LG Chem Michigan Inc.	245,278	161,224	84,054	105,232	23,002
LG Chem Power Inc.	20,042	7,253	12,789	19,915	3,720
LGC Petrochemical India Private Ltd.	2,153	398	1,755	2,073	236
Haengboknuri Co., Ltd.	1,950	790	1,160	2,828	(31)
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	4,139	2,757	1,382	12,570	72
LG Chem Japan Co., Ltd.	3,115	368	2,747	2,766	296

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LG NanoH2O, Inc. ¹	11,318	3,565	7,753	8,519	384
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	6,463	1,242	5,221	-	-
Nanjing LG Chem New Energy Battery Co., Ltd.	298,201	254,678	43,523	34,443	(6,587)
LG Chem (Chongqing) Engineering Plastics Co., Ltd.	41,390	35,957	5,433	-	(729)
LG Chem Wroclaw Energy sp. z o.o.	18,009	9,725	8,284	-	-
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	334,007	262,755	71,252	114,117	(15,047)
FarmHannong Co., Ltd. ¹	1,129,257	601,749	527,508	188,555	(72,657)
Associates					
LG Holdings (HK) Ltd.	379,243	98,434	280,809	26,846	8,946
TECWIN Co., Ltd.	64,015	25,735	38,280	-	-
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	89	112	(23)	-	-
LG Chem Malaysia SDN.BHD.	226	17	209	-	-
LG Fuel Cell Systems Inc.	59,468	74,366	(14,898)	1,350	(23,414)
Joint ventures					
LG VINA Chemical Co., Ltd.	19,786	10,121	9,665	27,343	1,145
HL Greenpower Co., Ltd.	151,411	116,896	34,515	70,564	(1,497)
SEETEC Co., Ltd.	351,603	45,529	306,074	229,323	8,691

¹ Included its subsidiaries' financial information from an intermediate parent perspective and not applied adjustments of a fair value evaluation due to the business combination in the consolidated financial statements.

1.5 Changes in Scope for Consolidation

Subsidiaries newly included in the consolidation for the six-month period ended June 30, 2017, are as follows:

Subsidiary	Reason
LG Life Sciences India Pvt. Ltd.	Business combination
LG Life Sciences (Beijing) Co., Ltd.	Business combination
LG Life Sciences (Thailand) Ltd.	Business combination
LG Life Sciences America Inc.	Business combination
Sarangnuri Ltd.	Business combination

Subsidiaries excluded from the consolidation for the six-month period ended June 30, 2017, are as follows:

Subsidiary	Reason
FarmBiotec Co., Ltd.	Disposed interests of subsidiary

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2. Summary of Significant Accounting Policies

The principal accounting policies applied in the preparation of these consolidated interim financial statements are set out below. These policies have been consistently applied to all the periods presented, unless otherwise stated.

2.1 Basis of Preparation

The Group maintains its accounting records in Korean won and prepares statutory financial statements in the Korean language (Hangul) in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS). The accompanying consolidated interim financial statements have been condensed, restructured and translated into English from the Korean language financial statements.

The Group's consolidated interim financial statements for the six-month period ended June 30, 2017, have been prepared in accordance with Korean IFRS 1034 *Interim Financial Reporting*. These consolidated interim financial statements have been prepared in accordance with Korean IFRS which is effective or early adopted as at June 30, 2017.

(a) New and amended standards adopted by the Group

The Group has applied the following standards and amendments for the first time for their annual reporting period commencing January 1, 2017. The adoption of these amendments did not have any impact on the current period or any prior period and is not likely to affect future periods.

- Amendments to Korean IFRS 1007 *Statement of Cash Flows*
- Amendments to Korean IFRS 1012 *Income Tax*
- Amendments to Korean IFRS 1112 *Disclosure of Interests in Other Entities*

(b) New standards and interpretations not yet adopted by the Group

Certain new accounting standards and interpretations that have been published that are not mandatory for annual reporting period commencing January 1, 2017 and have not been early adopted by the Group are set out below.

- Korean IFRS 1109 *Financial Instruments*

The new standard for financial instruments issued on September 25, 2015 are effective for annual periods beginning on or after January 1, 2018 with early application permitted. This standard will replace Korean IFRS 1039 *Financial Instruments: Recognition and Measurement*. The Group will apply the standards for annual periods beginning on or after January 1, 2018.

The standard requires retrospective application with some exceptions. For example, an entity is not required to restate prior period in relation to classification and measurement (including impairment) of financial instruments. The standard requires prospective application of its hedge accounting requirements for all hedging relationships except the accounting for time value of options and other exceptions.

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Korean IFRS 1109 *Financial Instruments* requires all financial assets to be classified and measured on the basis of the entity's business model for managing financial assets and the contractual cash flow characteristics of the financial assets. A new impairment model, an expected credit loss model, is introduced and any subsequent changes in expected credit losses will be recognized in profit or loss. Also, hedge accounting rules amended to extend the hedging relationship, which consists only of eligible hedging instruments and hedged items, qualifies for hedge accounting.

An effective implementation of Korean IFRS 1109 requires preparation processes including financial impact assessment, accounting policy establishment, accounting system development and the system stabilization. The impact on the Group's financial statements due to the application of the standard is dependent on judgements made in applying the standard, financial instruments held by the Group and macroeconomic variables.

With the implementation of Korean IFRS 1109 the Group is preparing for internal management process and is beginning to adjust accounting system for financial instruments reporting. Also, the Group is analyzing the financial effects of applying the standard.

- Korean IFRS 1115 *Revenue from Contracts with Customers*

The Group will apply Korean IFRS 1115 *Revenue from Contracts with Customers* issued on November 6, 2015 for annual reporting periods beginning on or after January 1, 2018. Earlier adoption is permitted under Korean IFRS. This standard replaces Korean IFRS 1018 *Revenue*, Korean IFRS 1011 *Construction Contracts*, Interpretation 2031 *Revenue-Barter Transactions Involving Advertising Services*, Interpretation 2113 *Customer Loyalty Programs*, Interpretation 2115 *Agreements for the Construction of Real Estate* and Interpretation 2118 *Transfers of assets from customers*. The Group will apply Korean IFRS 1115 *Revenue from Contracts with Customers* within annual reporting periods beginning on or after January 1, 2018.

The new standard is based on the principle that revenue is recognized when control of a good or service transfers to a customer so the notion of control replaces the existing notion of risks and rewards. A new five-step process must be applied before revenue from contract with customer can be recognized:

- Identify contracts with customers
- Identify the separate performance obligation
- Determine the transaction price of the contract
- Allocate the transaction price to each of the separate performance obligations, and
- Recognize the revenue as each performance obligation is satisfied.

As at June 30, 2017, the Group is preparing for internal management process and is beginning to adjust accounting system in relation to implementation of Korean IFRS 1115. Also, the Group is analyzing the financial effects of applying the standard.

- Amendments to Korean IFRS 1028 *Investments in Associates and Joint Ventures*
- Amendments to Korean IFRS 1102 *Share-based Payment*
- Enactments to Interpretation 2122 *Foreign Currency Transactions and Advance Consideration*

2.2 Accounting Policies

Significant accounting policies and method of computation used in the preparation of the consolidated interim financial statements are consistent with those of the consolidated financial statements for the year ended December 31, 2016, except for the changes due to the application of amendment and enactments of standards described in Note 2.1 (a) and the one described below.

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2.2.1 Income tax expense

Income tax expense for the interim period is recognized based on management's best estimate of the weighted average annual income tax rate expected for the full financial year. The estimated average annual tax rate is applied to the pre-tax income.

3. Financial risk Management

3.1 Financial Risk Factors

The Group's activities expose it to a variety of financial risks: market risk, credit risk and liquidity risk. The Group's overall risk management program focuses on the unpredictability of financial markets and seeks to minimize potential adverse effects on the financial performance of the Group. The Group uses derivative financial instruments to hedge certain risk exposures.

Risk management is carried out by the Group's finance team under policies approved by the Corporate Management Committee. The finance team identifies, evaluates and hedges financial risks in close co-operation with the Group's operating units. The Corporate Management Committee reviews and approves written principles for overall risk management, as well as written policies covering specific areas, such as foreign exchange risk, interest rate risk, and credit risk, use of derivative financial instruments and non-derivative financial instruments, investment of excess liquidity.

(1) Market risk

1) Foreign exchange risk

The Group operates internationally and is exposed to foreign exchange risk arising from foreign currency exposures, primarily with respect to the US dollar. Foreign exchange risk arises from future commercial transactions, recognized assets and liabilities.

Management has set up a policy to require group companies to manage their foreign exchange risk against their functional currency. The Group manages maximum loss for currency risk exposures within acceptable range by using currency risk management model and hires employees who are exclusively responsible for currency risk management.

The Group has certain investments in foreign operations, whose net assets are exposed to foreign currency translation risk. Currency exposure arising from the net assets of the Group's foreign operations is managed primarily through borrowings denominated in the relevant foreign currencies.

As at June 30, 2017 and December 31, 2016, the Group's monetary assets and liabilities denominated in currencies other than its functional currency, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017		December 31, 2016	
	Assets	Liabilities	Assets	Liabilities
USD	2,154,532	1,772,014	1,667,146	2,263,717
EUR	203,790	35,848	78,532	90,506
JPY	28,423	106,824	29,169	113,351
GBP and others	63,590	4,348	33,534	2,187

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As at June 30, 2017 and December 31, 2016, if the Group's functional currency had weakened / strengthened by 10% against the US dollar with all other variables held constant, profit before income tax would have been affected as follows:

<i>(in millions of Korean won)</i>	June 30, 2017		December 31, 2016	
	10% Increase	10% Decrease	10% Increase	10% Decrease
USD	38,252	(38,252)	(59,657)	59,657

The above sensitivity analysis has been performed for monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency at the end of the reporting period.

2) Price risk

The Group is exposed to equity securities price risk arises from investments held by the Group and classified in the separate statement of financial position either as available-for-sale or at fair value through profit or loss. The Group's equity investments are publicly traded and are related to the KOSPI index.

The table below summarizes the impact of increases/decreases of the listed stock price index on the Group's equity before tax effects as at June 30, 2017 and December 31, 2016. The analysis is based on the assumption that the equity index has increased/decreased by 10% with all other variables held constant, and that all the Group's equity instruments moved in line with the index.

<i>(in millions of Korean won)</i>	June 30, 2017		December 31, 2016	
	10% Increase	10% Decrease	10% Increase	10% Decrease
KOSPI	971	(971)	1,134	(1,134)

3) Interest rate risk

Interest rate risk is defined as the risk that the interest income or expenses arising from deposits and borrowings will fluctuate because of changes in future market interest rate. The interest rate risk mainly arises through floating rate deposits and borrowings. The objective of interest rate risk management lies in maximizing corporate value by minimizing uncertainty in interest rates fluctuations and net interest expense.

The Group adequately minimizes risks from interest rate fluctuations through various policies, such as sharing excess cash within the Group (internal cash sharing) to minimize external borrowings, avoiding high rate borrowings, reforming capital structure, managing an appropriate ratio of fixed rate borrowings and floating rate borrowings, monitoring a fluctuation of domestic and foreign interest rates daily, weekly and monthly, establishing alternatives, and balancing floating rate short-term borrowings with floating rate deposits.

The table below summarizes the impact of increases/decreases of interest rate on the Group's post-tax profit for the six-month periods ended June 30, 2017 and 2016, and on equity as at June 30, 2017 and 2016. The analysis is based on the assumption that the interest rate has increased/decreased by 1% (100 basis points) with all other variables held constant.

<i>(in millions of Korean won)</i>	Impact on post-tax profit		Impact on equity	
	2017	2016	2017	2016
Increase	(14,521)	(18,815)	(14,521)	(18,815)
Decrease	14,521	18,815	14,521	18,815

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(2) Credit risk

Credit risk is managed on the Group basis. Credit risk arises from cash and cash equivalents, derivative financial instruments and deposits with banks and financial institutions, as well as credit exposures to customers, including outstanding receivables and committed transactions.

The maximum exposure to credit risk as at June 30, 2017 and December 31, 2016, is as follows:

(in millions of Korean won)

	June 30, 2017		
	Amount before provision	Provision for impairment	Book amount (maximum exposure)
Loans and receivables (excluding cash on hand)	6,670,711	(12,273)	6,658,438
Total	6,670,711	(12,273)	6,658,438

(in millions of Korean won)

	December 31, 2016		
	Amount before provision	Provision for impairment	Book amount (maximum exposure)
Loans and receivables (excluding cash on hand)	6,233,784	(13,594)	6,220,190
Total	6,233,784	(13,594)	6,220,190

The Group has established the following policies and procedures to manage credit risks.

To manage credit risks relating to trade receivables, the Group evaluates the credit rating of customers and determines credit limit for each customer based on the information provided by credit rating agencies and other available financial information before commencing business with customers. The credit risks relating to trade receivables are also mitigated by insurance contracts, collaterals as well as payment guarantees.

The Group has entered into export insurance contracts with Korea Trade Insurance Corporation to mitigate credit risks relating to export trade receivables to overseas customers. The Group is also provided with collaterals by customers depending on their credit rating or payment guarantees from the customers' financial institutions as necessary.

The Group has deposited its cash and cash equivalents, and other long-term deposits in several financial institutions, such as Woori Bank and others. The Group has also entered into derivative contracts with several financial institutions. The Group maintains business relationship with those financial institutions with high credit ratings evaluated by independent credit rating agencies and accordingly, credit risks associated with these financial institutions are limited.

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(3) Liquidity risk

Finance team of the Group monitors rolling forecasts of the Group's liquidity requirements to ensure it has sufficient cash to meet operational needs while maintaining sufficient headroom on its undrawn committed borrowing facilities at all times so that the Group does not breach borrowing limits or covenants (where applicable) on any of its borrowing facilities. The Group's liquidity management policy involves projecting cash flows in major currencies and considering the level of liquid assets necessary to meet these, monitoring balance sheet liquidity ratios against internal and external regulatory requirements and maintaining debt financing plans.

The table below analyzes the Group's non-derivative financial liabilities into relevant maturity groupings based on the remaining period at the reporting period to the contractual maturity date. Cash flows presented below are gross cash flows before discount, and includes cash flows for interests.

(in millions of Korean won)

	June 30, 2017			
	Less than 1 year	Between 1-2 years	Between 2-5 years	Over 5 years
Borrowings (excluding finance lease liabilities)	1,514,172	586,725	1,041,071	335,827
Finance lease liabilities	5,311	5,192	15,532	13,121
Trade and other payables	2,615,645	6,601	1,848	171
Total	4,135,128	598,518	1,058,451	349,119

(in millions of Korean won)

	December 31, 2016			
	Less than 1 year	Between 1-2 years	Between 2-5 years	Over 5 years
Borrowings (excluding finance lease liabilities)	2,239,782	373,198	258,839	84,402
Finance lease liabilities	5,000	5,000	15,000	15,000
Trade and other payables	2,694,857	12,307	1,784	216
Total	4,939,639	390,505	275,623	99,618

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3.2 Capital Risk Management

The Group's objectives when managing capital are to safeguard the Group's ability to continue as a going concern, so the Group can continue to provide returns for shareholders and benefits for other stakeholders, and to maintain an optimal capital structure to reduce the cost of capital.

Consistent with others in the industry, the Group monitors capital on the basis of the gearing ratio. This ratio is calculated as net debt divided by total capital. Net debt is calculated as total borrowings less cash and cash equivalents. Total capital is calculated as 'equity' as shown in the consolidated statement of financial position plus net debt.

The gearing ratio and debt-to-equity ratio as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won, except for ratios)</i>	June 30, 2017	December 31, 2016
Total borrowings (Note 15) (A)	3,323,330	2,890,641
Less: cash and cash equivalents (B)	<u>(1,729,938)</u>	<u>(1,474,367)</u>
Net debt (C=A+B)	1,593,392	1,416,274
Total liabilities (D)	7,136,483	6,436,093
Total equity (E)	<u>15,534,636</u>	<u>14,050,967</u>
Total capital (F=C+E)	17,128,028	15,467,241
Gearing ratio (C/F)	9.3%	9.2%
Debt-to-equity ratio (D/E)	45.9%	45.8%

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3.3 Fair Value

(1) Carrying amount and fair value of financial instruments by category as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017		December 31, 2016	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial assets (current)				
Cash and cash equivalents	1,729,938	1	1,474,367	1
Deposits held by financial institutions	376,888	1	732,871	1
Trade receivables	4,183,821	1	3,533,699	1
Other receivables (excluding deposits held by financial institutions)	237,724	1	246,156	1
Financial assets (non-current)				
Deposits held by financial institutions	64,318	1	64,485	1
Other receivables (excluding deposits held by financial institutions)	65,796	1	168,667	1
Other non-current financial assets (carried at cost)	15,839	2	11,829	2
Other non-current financial assets (carried at fair value)	10,290	10,290	11,619	11,619
Financial liabilities (current)				
Trade and other payables	2,615,645	1	2,694,857	1
Current borrowings (excluding finance lease liabilities)	1,449,254	1	2,207,755	1
Current finance lease liabilities	5,190	1	4,886	1
Other current liabilities (dividends payable)	-	1	12	1
Financial liabilities (non-current)				
Non-current borrowings (excluding finance lease liabilities)	1,839,459	1,848,033	647,728	1
Non-current finance lease liabilities	29,427	30,666	30,272	31,411
Other non-current payables	8,620	1	14,307	1

¹ These financial assets and liabilities are not included in the disclosure above as their carrying amount is a reasonable approximation of the fair value.

² All other non-current financial assets of the Group consist of available-for-sale equity securities. Certain equity securities are measured at cost (June 30, 2017: ₩15,839 million, December 31, 2016: ₩11,829 million) as the range of reasonable fair value estimates is significant and the probabilities of the various estimates cannot be reasonably assessed. These are not included in the disclosure above (Note 8). The Group does not have any plans to dispose of these available-for-sale equity securities in the near future.

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(2) Fair value for measurement and disclosure are determined based on the following method:

Fair values of financial liabilities(non-current) are based on cash outflows discounted using Korean won currency note yield in the same credit grade with the Parent Company (AA+), and the applied discount rates as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in percentage)</i>	June 30, 2017	December 31, 2016
Discount rate	1.48%~2.66%	1.63%~2.57%

(3) Fair value hierarchy

Items that are measured at fair value or for which the fair value is disclosed are categorized by the fair value hierarchy levels, and the defined levels are as follows:

- Quoted prices (unadjusted) in active markets for identical assets or liabilities (Level 1).
- Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (that is, prices) or indirectly (that is, derived from prices) (Level 2).
- Inputs for the asset or liability that are not based on observable market data (that is, unobservable inputs) (Level 3).

Fair value hierarchy classifications of the financial instruments that are measured at fair value or its fair value is disclosed as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017			
	Level 1	Level 2	Level 3	Total
Financial assets/liabilities measured at fair value				
Other non-current financial assets (carried at fair value)	10,290	-	-	10,290
Financial assets/liabilities not measured at fair value				
Non-current borrowings (excluding finance lease liabilities)	-	1,848,033	-	1,848,033
Non-current finance lease liabilities	-	30,666	-	30,666
<i>(in millions of Korean won)</i>	December 31, 2016			
	Level 1	Level 2	Level 3	Total
Financial assets/liabilities measured at fair value				
Other non-current financial assets (carried at fair value)	11,619	-	-	11,619
Financial assets/liabilities not measured at fair value				
Non-current finance lease liabilities	-	31,411	-	31,411

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4. Critical Accounting Estimates and Assumptions

The Group makes estimates and assumptions concerning the future. Estimates and assumptions are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. The resulting accounting estimates will, by definition, seldom equal the related actual results.

Significant accounting estimates and assumptions applied in the preparation of these consolidated interim financial statements are consistent with those of the previous financial period, except for the estimates used to determine income tax expense.

5. Financial Instruments by Category

Categorizations of financial instruments as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)

Financial assets	June 30, 2017			
	Loans and receivables	Financial assets at fair value through profit or loss	Available-for-sale financial assets	Total
Cash and cash equivalents	1,729,938	-	-	1,729,938
Trade receivables	4,183,821	-	-	4,183,821
Other receivables	614,612	-	-	614,612
Other non-current receivables	130,114	-	-	130,114
Other non-current financial assets	-	-	26,129	26,129
Total	6,658,485	-	26,129	6,684,614

(in millions of Korean won)

Financial liabilities	June 30, 2017			
	Financial liabilities at fair value through profit or loss	Financial liabilities at amortized cost	Other financial liabilities ¹	Total
Trade payables	-	1,608,995	-	1,608,995
Other payables	-	1,006,650	-	1,006,650
Borrowings (current)	-	1,360,450	93,994	1,454,444
Other non-current payables	-	8,620	-	8,620
Borrowings (non-current)	-	1,839,459	29,427	1,868,886
Total	-	5,824,174	123,421	5,947,595

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	December 31, 2016			
	Loans and receivables	Financial assets at fair value through profit or loss	Available-for- sale financial assets	Total
Financial assets				
Cash and cash equivalents	1,474,367	-	-	1,474,367
Trade receivables	3,533,699	-	-	3,533,699
Other receivables	979,027	-	-	979,027
Other non-current receivables	233,152	-	-	233,152
Other non-current financial assets	-	-	23,448	23,448
Total	6,220,245	-	23,448	6,243,693

(in millions of Korean won)

	December 31, 2016			
	Financial liabilities at fair value through profit or loss	Financial liabilities at amortized cost	Other financial liabilities ¹	Total
Financial liabilities				
Trade payables	-	1,723,252	-	1,723,252
Other payables	-	971,605	-	971,605
Borrowings (current)	-	1,759,033	453,608	2,212,641
Other current liabilities (dividends payable)	-	12	-	12
Other non-current payables	-	14,307	-	14,307
Borrowings (non-current)	-	647,728	30,272	678,000
Total	-	5,115,937	483,880	5,599,817

¹ Other financial liabilities are financial liabilities that are not subject to the categorizations such as finance lease liabilities, financial liabilities related to transfer transactions not qualified for derecognition.

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Net gains or losses on each category of financial instruments for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

<i>(in millions of Korean won)</i>	2017		2016	
	Three months	Six months	Three months	Six months
Financial instruments at fair value through profit or loss				
Loss on valuation/disposal (profit or loss)	-	-	-	(1,501)
Hedging derivatives				
Gain on disposal	-	170	-	-
Available-for-sale financial assets				
Interest income	-	5	-	-
Gain on disposal	-	-	18	18
Dividend income	8	204	-	-
Loans and receivables				
Interest income	6,340	13,801	9,911	21,284
Gain (loss) on foreign currency translation	97,154	25,173	65,361	(12,353)
Loss on foreign currency exchange	(24,229)	(148,037)	(37,116)	(132)
Financial liabilities measured at amortized cost				
Interest expense	(26,140)	(50,863)	(20,176)	(33,528)
Gain (loss) on foreign currency translation	(7,850)	24,915	(62,575)	(28,118)
Gain (loss) on foreign currency exchange	10,037	52,042	(4,239)	(21,126)
Loss on redemption of debentures	-	-	(3,031)	(3,031)
Other financial liabilities				
Interest expense	(1,870)	(5,347)	(2,958)	(5,661)
Gain (loss) on foreign currency translation	(26,710)	(2,173)	(33,712)	4,007
Gain (loss) on foreign currency exchange	15,152	67,836	24,215	(268)

6. Cash and Cash Equivalents

Details of cash and cash equivalents as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Bank deposits and cash on hand	546,519	478,058
Deposits held by financial institutions and others	1,183,419	996,309
Total	1,729,938	1,474,367

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7. Trade and Other Receivables

Trade and other receivables, and its provisions for impairment as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017		
	Gross amount	Provision for impairment	Carrying amount
Trade receivables ¹	4,194,053	(10,232)	4,183,821
Other current receivables	615,663	(1,051)	614,612
Other non-current receivables ²	131,104	(990)	130,114
Total	4,940,820	(12,273)	4,928,547

(in millions of Korean won)

	December 31, 2016		
	Gross amount	Provision for impairment	Carrying amount
Trade receivables ¹	3,545,918	(12,219)	3,533,699
Other current receivables	979,412	(385)	979,027
Other non-current receivables ²	234,142	(990)	233,152
Total	4,759,472	(13,594)	4,745,878

¹ As at June 30, 2017, trade receivables transferred to financial institutions have been accounted for as a collateralized borrowing and financial assets not fully derecognized are as follows (Note 15):

	Loans and receivables	
	(trade receivables collateralized borrowings)	
	June 30, 2017	December 31, 2016
Carrying amount of transferred assets	88,804	448,722
Carrying amount of related liabilities	(88,804)	(448,722)

² As at June 30, 2017, ₩561 million(December 31, 2016: ₩482 million) of other non-current receivables represents deposits which are restricted from withdrawal in connection with maintaining checking accounts.

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Details of other receivables as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Current		
Non-trade receivables	153,851	195,087
Deposits held by financial institutions ¹	376,888	732,871
Accrued income	4,750	4,230
Loans	5,910	21,127
Guarantee deposits provided	73,213	25,712
	<u>614,612</u>	<u>979,027</u>
Non-current		
Non-trade receivables	3,063	16
Deposits held by financial institutions ²	64,318	64,485
Loans	319	291
Guarantee deposits provided	62,414	168,360
	<u>130,114</u>	<u>233,152</u>
Total	<u>744,726</u>	<u>1,212,179</u>

¹ As at June 30, 2017, ₩1,338 million(December 31, 2016: ₩1,338 million) is pledged as a collateral for borrowings and others.

² As at June 30, 2017, ₩63,400 million(December 31, 2016: ₩63,400 million) is restricted from being withdrawn in relation to large, small and medium-sized companies cooperation agreement and others.

The aging analysis of trade and other receivables as at June 30, 2017 and December 31, 2016, is as follows:

<i>(in millions of Korean won)</i>	June 30, 2017		December 31, 2016	
	Trade receivables	Other receivables	Trade receivables	Other receivables
Receivables not past due	4,111,741	736,494	3,451,627	1,200,755
Past due but not impaired				
Up to 3 months	54,174	5,336	79,103	7,297
Between 3-6 months	13,923	1,510	1,984	1,178
Over 6 months	2,812	1,277	3,504	2,949
	<u>70,909</u>	<u>8,123</u>	<u>84,591</u>	<u>11,424</u>
Impaired receivables	11,403	2,150	9,700	1,375
Total	<u>4,194,053</u>	<u>746,767</u>	<u>3,545,918</u>	<u>1,213,554</u>

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Movements on the provision for impairment of trade and other receivables for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	12,219	-	385	990
Business combination (Note 35)	2,018	-	-	-
Impairment loss	-	-	666	-
Write-off	(357)	-	-	-
Reversals	(3,317)	-	-	-
Exchange differences	(331)	-	-	-
Ending balance	10,232	-	1,051	990

(in millions of Korean won)

	December 31, 2016			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	12,939	-	331	-
Business combination (Note 35)	1,237	-	21,644	990
Impairment loss	1,388	-	116	-
Write-off	(2,052)	-	(21,131)	-
Reversals	-	-	(486)	-
Exchange differences	(1,293)	-	(89)	-
Ending balance	12,219	-	385	990

As at June 30, 2017 and December 31, 2016, the carrying amounts of trade and other receivables are approximation of their fair values.

8. Other Financial Assets

Details of other financial assets as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017	December 31, 2016
Other financial assets		
Available-for-sale financial assets	26,129	23,448
	<u>26,129</u>	<u>23,448</u>

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Changes in available-for-sale financial assets for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Beginning balance	23,448	15,301
Business combination (Note 35)	2,652	2,270
Acquisitions / Transfer	1,709	3,463
Disposals	-	(44)
Impairment	(209)	-
Gain (loss) on valuation (before income tax effects)	(1,329)	2,392
Exchange differences	(142)	66
Ending balance	<u>26,129</u>	<u>23,448</u>

Available-for-sale financial assets consist of equity securities. The certain unlisted equity securities are measured at cost as the range of reasonable fair value estimates is wide and the probabilities of the various estimates cannot be reasonably assessed.

9. Inventories

Details of inventories as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017		
	Gross amount	Valuation allowance	Carrying amount
Merchandise	149,856	(7,323)	142,533
Finished / Semi-finished products	1,737,930	(81,553)	1,656,377
Work-in-process	14,902	-	14,902
Raw materials	863,318	(12,531)	850,787
Supplies	131,669	-	131,669
Materials-in-transit	289,474	-	289,474
Total	<u>3,187,149</u>	<u>(101,407)</u>	<u>3,085,742</u>

<i>(in millions of Korean won)</i>	December 31, 2016		
	Gross amount	Valuation allowance	Carrying amount
Merchandise	111,742	(2,438)	109,304
Finished / Semi-finished products	1,699,252	(84,326)	1,614,926
Work-in-process	785	-	785
Raw materials	822,044	(11,088)	810,956
Supplies	114,525	-	114,525
Materials-in-transit	314,695	-	314,695
Total	<u>3,063,043</u>	<u>(97,852)</u>	<u>2,965,191</u>

During the six-month period ended June 30, 2017, the cost of inventories recognized as expense is included in 'cost of sales' amounted to ₩7,870,664 million (2016: ₩5,903,939 million).

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10. Investments in Associates and Joint Ventures

Changes in investments in associates and joint ventures for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017								
	Beginning balance	Business combination	Acquisitions / Transfer	Dividends	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income of associates and joint ventures	Changes in ownership of associates	Others	Ending balance
LG VINA Chemical Co., Ltd.	3,874	-	-	(846)	404	(1,163)	-	-	2,269
HL Greenpower Co., Ltd.	16,927	-	-	-	1,061	-	-	5	17,993
LG Holdings (HK) Ltd.	74,843	-	-	-	1,859	(2,457)	-	-	74,245
TECWIN Co., Ltd.	7,214	-	-	-	794	-	-	-	8,008
SEETEC Co., Ltd.	148,333	-	-	(10,000)	5,069	-	-	-	143,402
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	-	-	150
LG Fuel Cell Systems Inc.	8,908	-	24,527	-	(5,400)	50	1,952	57	30,094
FJ Composite Materials Co., Ltd.	-	-	3,015	-	(130)	26	-	-	2,911
WUXI CL New Energy Technology Ltd.	-	-	1,178	-	-	23	-	-	1,201
LF Life Sciences Poland Ltd.	-	17	-	-	-	-	-	-	17
	<u>260,828</u>	<u>17</u>	<u>28,720</u>	<u>(10,846)</u>	<u>3,657</u>	<u>(3,521)</u>	<u>1,952</u>	<u>62</u>	<u>280,869</u>

(in millions of Korean won)

	December 31, 2016								
	Beginning balance	Acquisitions / Transfer	Dividends	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income of associates and joint ventures	Disposal	Others	Ending balance	
LG VINA Chemical Co., Ltd.	3,742	-	(926)	907	151	-	-	3,874	
HL Greenpower Co., Ltd.	16,559	-	-	369	-	-	(1)	16,927	
LG Holdings (HK) Ltd.	73,012	-	-	3,555	(1,724)	-	-	74,843	
TECWIN Co., Ltd.	6,535	-	-	679	-	-	-	7,214	
SEETEC Co., Ltd.	155,539	-	(17,500)	10,263	-	-	31	148,333	
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	-	579	
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	-	150	
CNOOC & LG Petrochemicals Co., Ltd.	14,287	-	-	(7,780)	(367)	(6,140)	-	-	
KLPE Limited Liability Partnership ¹	20,079	-	-	264	(582)	(19,761)	-	-	
LG Fuel Cell Systems Inc.	3,265	17,555	-	(12,048)	192	-	(56)	8,908	
	<u>293,747</u>	<u>17,555</u>	<u>(18,426)</u>	<u>(3,791)</u>	<u>(2,330)</u>	<u>(25,901)</u>	<u>(26)</u>	<u>260,828</u>	

¹ During 2016, the Group decided to discontinue the business of KLPE Limited Liability Partnership and completed the disposal by collecting ₩23,724 million of the investments.

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11. Property, Plant and Equipment

Changes in property, plant and equipment for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017										
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Construction -in-progress	Machinery -in-transit	Total
Beginning balance	1,470,226	2,181,396	651,061	4,288,509	8,594	384,777	95,905	100,360	473,111	26,194	9,680,133
Cost	1,507,154	2,796,650	1,145,962	12,656,297	41,183	1,005,567	323,646	238,906	484,950	26,194	20,226,509
Accumulated depreciation	-	(575,932)	(479,210)	(8,305,213)	(32,439)	(611,202)	(225,767)	(138,098)	-	-	(10,367,861)
Accumulated impairment	(36,928)	(39,322)	(15,691)	(62,575)	(150)	(9,588)	(1,974)	(448)	(11,839)	-	(178,515)
Business combination (Note 35)	62,738	81,497	6,590	109,011	197	8,256	2,918	-	164,722	57,392	493,321
Acquisitions/ Transfer	23,476	69,908	22,844	342,187	7,766	57,734	20,200	15,401	693,808	34,894	1,288,218
Disposals/ Transfer	(1,567)	(1,428)	(248)	(15,202)	(44)	(19,684)	(469)	-	(529,146)	(38,006)	(605,794)
Exchange differences	(25)	(9,312)	(2,732)	(9,184)	359	(2,123)	282	-	593	-	(22,142)
Depreciation	-	(35,517)	(24,229)	(485,290)	(2,038)	(62,288)	(17,289)	(34,081)	-	-	(660,732)
Impairment	-	-	-	(9,356)	-	(2,126)	(44)	-	(1,343)	-	(12,869)
Transfer to assets held for sale (Note 36)	-	-	-	(1,991)	-	(1,044)	(11)	-	-	-	(3,046)
Ending balance	1,554,848	2,286,544	653,286	4,218,684	14,834	363,502	101,492	81,680	801,745	80,474	10,157,089
Cost	1,591,776	2,948,325	1,177,925	13,043,683	47,391	1,037,972	355,633	250,174	814,637	80,474	21,347,990
Accumulated depreciation	-	(622,823)	(509,239)	(8,762,867)	(32,408)	(664,896)	(252,185)	(168,046)	-	-	(11,012,464)
Accumulated impairment	(36,928)	(38,958)	(15,400)	(62,132)	(149)	(9,574)	(1,956)	(448)	(12,892)	-	(178,437)

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	December 31, 2016										
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Construction -in-progress	Machinery -in-transit	Total
Beginning balance	910,241	2,010,009	606,497	4,228,274	9,524	349,835	82,541	135,437	524,314	10,537	8,867,209
Cost	912,108	2,539,113	1,053,036	11,705,377	38,599	863,085	282,407	281,556	565,061	10,537	18,250,879
Accumulated depreciation	-	(505,157)	(434,206)	(7,437,847)	(28,933)	(504,276)	(198,119)	(146,119)	-	-	(9,254,657)
Accumulated impairment	(1,867)	(23,947)	(12,333)	(39,256)	(142)	(8,974)	(1,747)	-	(40,747)	-	(129,013)
Business combination (Note 35)	414,123	77,141	43,795	266,818	1,019	4,737	3,631	-	3,109	-	814,373
Acquisitions/ Transfer	147,464	187,602	49,349	840,388	1,821	167,536	42,775	30,982	1,319,406	55,261	2,842,584
Disposals/ Transfer	(1,441)	(5,607)	(150)	(17,518)	(34)	(8,475)	(650)	-	(1,391,481)	(39,604)	(1,464,960)
Exchange differences	(161)	(5,427)	(346)	(57,826)	1	(1,834)	(474)	-	23,871	-	(42,196)
Depreciation	-	(66,347)	(46,139)	(943,927)	(3,729)	(126,050)	(30,985)	(65,611)	-	-	(1,282,788)
Impairment	-	(15,975)	(1,945)	(26,015)	(8)	(810)	(474)	(448)	(6,108)	-	(51,783)
Transfer to assets held for sale (Note 36)	-	-	-	(1,685)	-	(162)	(459)	-	-	-	(2,306)
Ending balance	1,470,226	2,181,396	651,061	4,288,509	8,594	384,777	95,905	100,360	473,111	26,194	9,680,133
Cost	1,507,154	2,796,650	1,145,962	12,656,297	41,183	1,005,567	323,646	238,906	484,950	26,194	20,226,509
Accumulated depreciation	-	(575,932)	(479,210)	(8,305,213)	(32,439)	(611,202)	(225,767)	(138,098)	-	-	(10,367,861)
Accumulated impairment	(36,928)	(39,322)	(15,691)	(62,575)	(150)	(9,588)	(1,974)	(448)	(11,839)	-	(178,515)

During the six-month period ended June 30, 2017, the Group capitalized ₩2,270 million of borrowing costs (2016: ₩2,955 million), which recognized from borrowings in relation to acquisition of property, plant and equipment, on property, plant and equipment. The capitalization rate of borrowings used to determine the amount of borrowing costs eligible for capitalization is 2.12% (2016: 1.83%).

As at June 30, 2017, certain property, plant and equipment have been pledged as collaterals for borrowings and credit line agreements (Note 19).

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Line items including depreciation in the consolidated statements of profit or loss for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

<i>(in millions of Korean won)</i>	2017		2016	
	Three months	Six months	Three months	Six months
Cost of sales	306,000	611,575	299,258	589,542
Selling and administrative expenses	23,607	47,413	21,035	41,136
Others	828	1,744	456	582
Total	330,435	660,732	320,749	631,260

Details of machinery and construction-in-progress classified as a finance lease as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017		December 31, 2016	
	Machinery	Construction -in-progress	Machinery	Construction -in-progress
Cost- capitalized finance leases	44,370	2,533	42,669	-
Accumulated depreciation	(11,497)	-	(8,534)	-
Net book amount	<u>32,873</u>	<u>2,533</u>	<u>34,135</u>	<u>-</u>

The Group leases machinery and construction-in-progress under non-cancellable finance lease agreements. The lease terms are 3~10 years and the contracts include an agreement that the ownership of the assets is transferred by the end of the lease term.

The Group reviews annually whether there is any indication that an asset may be impaired. During 2016, Glass Substrate business, a CGU in IT & Electronic materials and Advanced materials segment, was tested for impairment as its economic performance was lower than expected.

The recoverable amount of the CGU is calculated on a basis of the value in use and impairment is mainly related to machinery and equipment used in manufacturing.

The amount of impairment loss recognized as other non-operating expenses and key assumptions used for calculation of value in use for the year ended December 31, 2016, is as follows:

<i>(in millions of Korean won)</i>	2016
	Glass Substrate
Impaired amount	
Property, plant and equipment	47,699
Intangible assets	535
Key assumptions	
Pre-tax discount rate	9.5%
Growth rate for subsequent years exceeding five years	0%

The Group decided to dispose of certain non-current assets for the six-month period ended June 30, 2017 and for the year ended December 31, 2016. The differences between net fair value and carrying amount were recognized as impairment losses (Note 36).

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12. Intangible Assets

Changes in intangible assets for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017					
	Development costs	Industrial property rights	Goodwill	Memberships	Others	Total
Beginning balance	102,853	344,882	252,253	52,793	79,363	832,144
Business combination (Note 35)	53,913	12,770	686,229	3,723	203,144	959,779
Acquisitions/ Transfer	44,517	17,654	-	1,538	9,595	73,304
Disposals/ Transfer	(3,534)	(30)	-	(3,943)	(117)	(7,624)
Exchange differences	(1,680)	(3,083)	(6,477)	(1,687)	1,217	(11,710)
Amortization	(14,786)	(12,551)	-	-	(16,649)	(43,986)
Impairment	(4,246)	(22)	-	-	(4)	(4,272)
Transfer to assets held for sale (Note 36)	-	(359)	-	-	-	(359)
Ending balance	177,037	359,261	932,005	52,424	276,549	1,797,276

(in millions of Korean won)

	December 31, 2016					
	Development costs	Industrial property rights	Goodwill	Memberships	Others	Total
Beginning balance	61,670	200,779	143,599	49,642	46,196	501,886
Business combination (Note 35)	17,500	123,364	105,223	1,674	32,855	280,616
Acquisitions/ Transfer	58,486	38,956	-	2,309	14,591	114,342
Disposals/ Transfer	(10,087)	(804)	-	(826)	(57)	(11,774)
Exchange differences	(212)	1,104	3,431	(6)	(384)	3,933
Amortization	(22,151)	(18,362)	-	-	(13,801)	(54,314)
Impairment	(2,353)	(155)	-	-	(37)	(2,545)
Ending balance	102,853	344,882	252,253	52,793	79,363	832,144

Line items including amortization of intangible assets for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Cost of sales	5,155	9,557	2,932	5,571
Selling and administrative expenses	17,620	34,429	10,450	19,245
Total	22,775	43,986	13,382	24,816

During the six-month period ended June 30, 2017, the Group recognized total research and development costs of ₩427,580 million (2016: ₩326,052 million) as expenses.

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Changes in greenhouse gas emission permits for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

(in thousands of tons and millions of Korean won)

	June 30, 2017					
	2016		2017		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance	6,191	-	6,475	-	12,666	-
Allocation with nil consideration	330	-	799	-	1,129	-
Purchase	250	5,133	-	-	250	5,133
Business combination	62	-	58	-	120	-
Borrowings/ Carry forwards between years	(15)	-	15	-	-	-
Surrendered to the government	(69)	-	-	-	(69)	-
Ending balance	6,749	5,133	7,347	-	14,096	5,133

(in thousands of tons and millions of Korean won)

	December 31, 2016							
	2015		2016		2017		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance	6,842	-	6,650	-	6,508	-	20,000	-
Allocation with nil consideration	(7)	-	10	-	-	-	3	-
Purchase	-	-	-	-	-	-	-	-
Business combination/ Disposal	(35)	-	(34)	-	(33)	-	(102)	-
Borrowings/ Carry forwards between years	435	-	(435)	-	-	-	-	-
Surrendered to the government	(7,235)	-	-	-	-	-	(7,235)	-
Ending balance	-	-	6,191	-	6,475	-	12,666	-

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13. Investment Properties

Changes in investment properties for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017			December 31, 2016		
	Land	Building	Total	Land	Building	Total
Beginning balance	1,015	1,272	2,287	-	-	-
Acquisition cost	1,015	1,400	2,415	-	-	-
Accumulated depreciation	-	(128)	(128)	-	-	-
Business combination (Note 35)	-	-	-	10,754	4,522	15,276
Acquisitions/ Transfer	-	-	-	-	-	-
Disposals/ Transfer	-	-	-	(9,739)	(3,141)	(12,880)
Depreciation	-	(15)	(15)	-	(109)	(109)
Ending balance	<u>1,015</u>	<u>1,257</u>	<u>2,272</u>	<u>1,015</u>	<u>1,272</u>	<u>2,287</u>
Acquisition cost	1,015	1,400	2,415	1,015	1,400	2,415
Accumulated depreciation	-	(143)	(143)	-	(128)	(128)

As at June 30, 2017, the carrying amounts of property, plant and equipment classified as investment properties are approximation of their fair values.

Details of gain or loss on investment properties for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Rental income	4	8	190	190
Depreciation	(7)	(15)	(36)	(36)
Total	<u>(3)</u>	<u>(7)</u>	<u>154</u>	<u>154</u>

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14. Other Current and Non-current Assets

Details of other current and non-current assets as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Current		
Advance payments to suppliers and prepaid expenses	121,062	139,005
Prepaid value added tax	185,145	111,787
Others	17,633	10,001
Total	<u>323,840</u>	<u>260,793</u>
Non-current		
Long-term advance payments to suppliers and long-term prepaid expenses	99,023	47,037
Others	10,916	10,920
Total	<u>109,939</u>	<u>57,957</u>

15. Borrowings

Borrowings as at June 30, 2017 and December 31, 2016, consist of:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Current		
Short-term borrowings	1,127,176	1,633,898
Current-portion of long-term borrowings of bank loans	222,258	343,935
Current-portion of debentures	99,820	229,922
Finance lease liabilities	5,190	4,886
	<u>1,454,444</u>	<u>2,212,641</u>
Non-current		
Long-term borrowings	692,610	607,996
Debentures	1,146,849	39,732
Finance lease liabilities	29,427	30,272
	<u>1,868,886</u>	<u>678,000</u>
Total	<u>3,323,330</u>	<u>2,890,641</u>

Details of short-term borrowings as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	Bank	Latest maturity date	Interest rate(%) as at June 30, 2017	June 30, 2017	December 31, 2016
Notes discounted ¹ (Negotiable notes)	Woori Bank and others	2017.12.03	Libor + 0.50 and others	88,804	448,722
Bank loans	Nonghyup Bank and others	2018.06.26	2.35 and others	1,038,372	1,185,176
Total				<u>1,127,176</u>	<u>1,633,898</u>

¹ As at June 30, 2017, trade receivables transferred to financial institutions but not derecognized are accounted for as collateralized borrowing transaction (Note 7).

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Details of long-term borrowings as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)	June 30, 2017					
	Bank	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non- current
Borrowings in Korean won	KEB Hana Bank ¹	1.75	2019.12.15	882	353	529
Borrowings in foreign currencies	Sumitomo Mitsui Banking Corporation	3Libor + 1.05	2019.10.28	56,830	-	56,830
	Standard Chartered Bank Construction Bank of China	3Libor + 1.00	2017.11.20	40,613	40,613	-
	Communications Bank of China	PBOC × 0.90	2023.11.13	30,105	3,544	26,561
	Agricultural Bank of China	PBOC	2021.09.20	25,169	3,356	21,813
	Agricultural Bank of China	3Libor + 0.80	2020.06.29	27,753	6,962	20,791
	Agricultural Bank of China	PBOC × 0.90	2022.09.03	29,700	1,678	28,022
	Bank of America	6Libor + 1.60	2017.10.24	34,100	34,100	-
	Bank of America	3Libor + 1.50	2018.08.13	34,100	-	34,100
	Bank of America	3Libor + 0.90	2019.05.27	45,584	-	45,584
	Bank of China	3Libor + 0.95	2022.05.05	39,472	6,138	33,334
	BNP PARIBAS	EURIBOR + 0.99	2019.12.13	19,390	-	19,390
	BNP PARIBAS	WIBOR + 0.55	2019.12.13	97	-	97
	CNOOC Finance	PBOC × 0.90	2021.12.23	78,358	5,034	73,324
	HSBC	3Libor + 1.00	2018.12.20	113,668	-	113,668
	HSBC	3Libor + 1.05	2018.09.19	45,467	-	45,467
	HSBC	3Libor + 1.05	2018.11.12	45,467	-	45,467
	HSBC	3Libor + 1.05	2019.04.19	50,013	6,820	43,193
	JP Morgan	3Libor + 0.85	2018.01.15	22,727	22,727	-
	JP Morgan	3Libor + 1.05	2018.01.15	22,732	22,732	-
	Mizuho Banking Corporation	3Libor + 1.02	2019.04.17	45,467	-	45,467
	Citi	EURIBOR + 0.90	2020.04.04	38,973	-	38,973
	United Overseas Bank	3Libor + 0.85	2017.12.21	68,201	68,201	-
Total				<u>914,868</u>	<u>222,258</u>	<u>692,610</u>

¹ Other receivables are pledged as collaterals for the above long-term borrowings (Note 19).

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(in millions of Korean won)		December 31, 2016				
		Bank	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current
Borrowings in Korean won	KEB Hana Bank ¹	1.75	2019.12.15	1,058	353	705
Borrowings in foreign currencies	Sumitomo Mitsui Banking Corporation	3Libor + 0.60	2017.04.03	24,170	24,170	-
	Sumitomo Mitsui Banking Corporation	3Libor + 1.05	2019.10.28	36,904	-	36,904
	Standard Chartered Bank	3Libor + 1.00	2017.11.20	48,313	48,313	-
	Construction Bank of China	PBOC x 0.90	2023.11.13	32,476	2,915	29,561
	Communications Bank of China	PBOC	2021.09.20	27,721	3,465	24,256
	Agricultural Bank of China	3Libor + 0.80	2020.06.29	32,291	5,889	26,402
	Agricultural Bank of China	PBOC x 0.90	2022.09.03	31,533	-	31,533
	Bank of America	6Libor + 1.60	2017.10.24	36,057	36,057	-
	Bank of America	3Libor + 1.50	2018.08.13	36,057	-	36,057
	Bank of China	3Libor + 0.95	2021.12.21	32,195	3,606	28,589
	BNP PARIBAS	EURIBOR + 0.99	2019.12.13	6,560	-	6,560
	BNP PARIBAS	WIBOR + 0.55	2019.12.13	90	-	90
	CITI	6Libor + 2.00	2017.03.10	18,029	18,029	-
	CNOOC Finance	PBOC x 0.90	2021.12.23	80,914	7,263	73,651
	HSBC	3Libor + 1.00	2018.12.20	120,190	-	120,190
	HSBC	3Libor + 1.05	2018.09.19	48,076	-	48,076
	HSBC	3Libor + 1.05	2018.11.12	48,076	-	48,076
	HSBC	3Libor + 1.05	2019.04.19	56,495	7,217	49,278
	JP Morgan	3Libor + 0.85	2018.01.15	24,037	-	24,037
	JP Morgan	3Libor + 1.05	2018.01.15	24,031	-	24,031
	Mizuho Banking Corporation	3Libor + 1.02	2017.04.16	48,076	48,076	-
	Mizuho Banking Corporation	3Libor + 0.75	2017.05.27	66,468	66,468	-
	United Overseas Bank	3Libor + 0.85	2017.12.21	72,114	72,114	-
Total				<u>951,931</u>	<u>343,935</u>	<u>607,996</u>

¹ Other receivables are pledged as collaterals for the above long-term borrowings (Note 19).

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Details of debentures as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)	June 30, 2017					
	Financial institution	Annual interest rate (%)	Latest maturity date	Total amount	Current	Non-current
47th Debentures (non-guaranteed/private)	Government Employees Pension Service and others	3.20	2018.04.30	30,000	30,000	-
48th Debentures (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.77	2019.02.21	50,000	-	50,000
49th Debentures (non-guaranteed/private)	KB Asset Management Co., Ltd and others	2.82	2018.12.12	100,000	-	100,000
50-1st Debentures (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.95	2020.05.19	120,000	-	120,000
50-2nd Debentures (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.28	2022.05.19	400,000	-	400,000
50-3rd Debentures (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.53	2024.05.19	280,000	-	280,000
Debentures in Korean won (collateralized)¹	IBK Securities Co., Ltd. and others	4.70	2018.03.05	40,000	40,000	-
Debentures in Korean won (non-guaranteed)	Ebest Investment & securities Co., Ltd. and others	4.75	2017.10.24	30,000	30,000	-
	NH Investment & Securities Co., Ltd. and others	1.93	2020.02.16	100,000	-	100,000
	NH Investment & Securities Co., Ltd. and others	2.26	2022.02.16	100,000	-	100,000
Less: discount on debentures				(3,331)	(180)	(3,151)
Total				<u>1,246,669</u>	<u>99,820</u>	<u>1,146,849</u>

¹ Certain property, plant and equipment are pledged as collaterals for the above debentures (Note 19).

(in millions of Korean won)	December 31, 2016					
	Financial institution	Annual interest rate (%)	Latest maturity date	Total amount	Current	Non-current
Debentures in Korean won (non-guaranteed)	Woori Security and others	4.11	2017.03.29	200,000	200,000	-
	Ebest Investment & securities Co., Ltd. and others	4.75	2017.10.24	30,000	30,000	-
Debentures in Korean won (collateralized)¹	IBK Securities Co., Ltd. and others	4.70	2018.03.05	40,000	-	40,000
Less: discount on debentures				(346)	(78)	(268)
Total				<u>269,654</u>	<u>229,922</u>	<u>39,732</u>

¹ Certain property, plant and equipment are pledged as collaterals for the above debentures (Note 19).

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Details of finance lease liabilities as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)

Leaser	June 30, 2017				
	Annual interest rate (%)	Latest maturity date	Total amount	Current	Non-current
Hyundai Oil Bank	3.12	2024.12.31	33,206	4,885	28,321
Doarm Engineering Co., Ltd.(Iksan)	3.70	2018.09.30	79	65	14
DoArm Engineering Co., Ltd.(Osong)	3.70	2018.09.30	66	66	-
Chungbuk Technopark	4.13	2023.12.31	1,266	174	1,092
Total			34,617	5,190	29,427

(in millions of Korean won)

Leaser	December 31, 2016				
	Annual interest rate (%)	Latest maturity date	Total amount	Current	Non-current
Hyundai Oil Bank	3.12	2024.12.31	35,158	4,886	30,272
Total			35,158	4,886	30,272

The present value of finance lease liabilities as at June 30, 2017 and December 31, 2016, is as follows:

(in millions of Korean won)

	June 30, 2017			December 31, 2016		
	Minimum lease payments	Future finance costs	Present value	Minimum lease payments	Future finance costs	Present value
Within 1 year	5,311	121	5,190	5,000	114	4,886
Between 1-5 years	20,724	2,003	18,721	20,000	1,902	18,098
Over 5 years	13,121	2,415	10,706	15,000	2,826	12,174

16. Provisions

Changes in provisions for other liabilities and charges for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017					
	Sales returns ¹	Warranty ²	Greenhouse gas emission ³	Legal claims ⁴	Restoration ⁵	Total
Beginning balance	10,362	41,476	27,801	10,102	95,774	185,515
Business combination (Note 35)	5,994	-	59	-	-	6,053
Additions	21,408	14,535	(3,492)	58,642	2,162	93,255
Used	(22,231)	(3,288)	-	(2,588)	(3,993)	(32,100)
Ending balance	15,533	52,723	24,368	66,156	93,943	252,723
Less : current portion	(11,060)	(4,936)	(24,368)	-	(16,390)	(56,754)
Total	4,473	47,787	-	66,156	77,553	195,969

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(in millions of Korean won)

	December 31, 2016					Total
	Sales returns ¹	Warranty ²	Greenhouse gas emission ³	Legal Claims ⁴	Restoration ⁵	
Beginning balance	5,214	27,578	3,720	-	-	36,512
Business combination (Note 35)	5,026	-	-	2,685	91,665	99,376
Additions	32,320	19,778	31,498	29,891	4,109	117,596
Used	(32,198)	(5,880)	(7,417)	(22,474)	-	(67,969)
Ending balance	10,362	41,476	27,801	10,102	95,774	185,515
Less : current portion	(6,279)	(1,224)	(27,801)	-	(16,390)	(51,694)
Total	4,083	40,252	-	10,102	79,384	133,821

¹ Sales return provisions have been accrued for the estimated sales return determined based on historical experience.

² Warranty provisions have been accrued for the estimated warranty service costs to be incurred based on the terms of warranty and historical experience.

³ Greenhouse gas emission provisions have been accrued for estimated expenditures to be obligated for any excess emission. The estimated emission for the six-month period ended June 30, 2017, amounts to 3,857 thousand tons (2016: 3,754 thousand tons).

⁴ Lawsuit provisions have been accrued for certain pending cases.

⁵ As at June 30, 2017, restoration provisions have been accrued based on the estimated expenses to restore land pollutions and others.

17. Net Defined Benefit Liabilities

Details of net defined benefit liabilities recognized in the statements of financial position as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)	June 30, 2017	December 31, 2016
Present value of defined benefit obligations ¹	1,004,577	885,259
Fair value of plan assets	(827,054)	(793,087)
Liabilities in the consolidated statement of financial position	177,523	92,172

¹ The present value of retirement benefit obligations is net of existing contributions to the National Pension Plan of ₩868 million as at June 30, 2017 (December 31, 2016: ₩821 million).

The amounts recognized in the statements of profit or loss for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)	2017		2016	
	Three months	Six months	Three months	Six months
Current service cost ¹	33,160	68,069	30,064	58,764
Interest expense	726	1,452	810	1,356
Total, included in employee benefit expenses	33,886	69,521	30,874	60,120

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¹ The above amounts excluded ₩403 million (2016: ₩19 million) of expenses capitalized to construction in progress and development costs.

Post-employment benefits recognized for defined contribution plan for the six-month period ended June 30, 2017, amounted to ₩310 million (2016: ₩337 million).

Post-employment benefits recognized in the statements of profit or loss for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Cost of sales	23,620	47,612	20,532	41,160
Selling and administrative expenses	10,434	22,219	10,570	19,297
Total	34,054	69,831	31,102	60,457

Movements in the present value of defined benefit obligations for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017	December 31, 2016
Beginning balance	885,259	717,770
Business combination (Note 35)	69,693	52,191
Transfer in	1,678	11,390
Transfer out	(1,577)	(5,764)
Current service cost	68,472	119,179
Interest expense	13,265	20,419
Remeasurements:		
Actuarial loss from change in demographic assumptions	2,731	3,731
Actuarial loss (gain) from change in financial assumptions	2,625	(11,225)
Actuarial loss from experience adjustments	-	24,400
Others	-	3,453
Exchange differences	(292)	234
Payments from plans	(37,277)	(50,519)
Ending balance	1,004,577	885,259

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Movements in the fair value of plan assets for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Beginning balance	793,087	636,578
Business combination (Note 35)	57,771	13,080
Transfer in	-	1,384
Transfer out	(134)	-
Interest income	11,813	17,475
Remeasurements:		
Return on plan assets (excluding amounts included in interest income)	(4,862)	(4,407)
Contributions:		
Employers	72	160,421
Payments from plans	(30,610)	(30,509)
Administrative costs	(83)	(935)
Ending balance	<u>827,054</u>	<u>793,087</u>

The actual return on plan assets for the six-month period ended June 30, 2017, was ₩6,951 million (for the year ended December 31, 2016: ₩13,068 million).

The significant actuarial assumptions as at June 30, 2017 and December 31, 2016, are as follows:

	June 30, 2017	December 31, 2016
Discount rate	2.2% ~ 2.8%	2.2% ~ 2.9%
Salary growth rate	2.5% ~ 5.1%	2.5% ~ 5.1%

The sensitivity analysis for changes in key actuarial assumptions as at June 30, 2017, is as follows:

<i>(in millions of Korean won)</i>	Increase by 1%	Decrease by 1%
Discount rate:		
Increase (decrease) in defined benefit obligations	(104,644)	125,998
Salary growth rate:		
Increase (decrease) in defined benefit obligations	122,027	(103,677)

A decrease in corporate bond yields may lead most significantly to an increase in defined benefit liabilities.

The above sensitivity analyses are based on a change in an assumption while holding all other assumptions constant. In practice, this is unlikely to occur, and changes in some of the assumptions may be correlated. The sensitivity of the defined benefit obligation to changes in principal actuarial assumptions is calculated using the projected unit credit method, the same method applied when calculating the defined benefit obligations recognized on the statement of financial position.

The methods and types of assumptions used in preparing the sensitivity analysis did not change compared to the prior period.

Plan assets as at June 30, 2017 and December 31, 2016, consist of:

<i>(in millions of Korean won)</i>	June 30, 2017				December 31, 2016			
	Quoted price	Unquoted price	Total	Compo-sition	Quoted price	Unquoted price	Total	Compo-sition
Insurance contracts with guaranteed yield	827,054	-	827,054	100%	793,087	-	793,087	100%

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18. Other Current and Non-Current Liabilities

Details of other current and non-current liabilities as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Current		
Advances from customers	71,921	70,590
Dividends payable	-	12
Withholdings	86,015	68,946
Unearned revenues	9,416	6,201
Accrued expenses	168,365	123,895
Total	<u>335,717</u>	<u>269,644</u>
Non-current		
Long-term accrued expenses	38,875	30,267

19. Commitments and Contingencies

(1) As at June 30, 2017, the Group has been guaranteed from the Seoul Guarantee Insurance Company for the execution of contracts.

(2) As at June 30, 2017, the Parent Company has provided one blank promissory note to the Korea National Oil Corporation as a collateral in relation to petroleum import surcharges.

(3) As at June 30, 2017, the Parent Company and certain subsidiaries have various specific line of credit agreements with several financial institutions, as follows:

(unit: in millions of Korean won and in millions of foreign currencies)

Classification	The Parent Company		Certain Overseas Subsidiaries					
	KRW	USD	KRW	USD	CNY	EUR	INR	PLN
Limit of bank overdraft	69,100	50	-	100	503	20	-	-
Limit of the letter of credit	32,000	378	-	205	682	3	-	-
Limit of discount of notes from export	-	1,481	-	-	-	-	-	-
Limit of guaranteed payments in other foreign currency	-	84	-	-	-	-	-	-
Limit of loan arrangements	-	-	76,582	2,001	7,168	75	3,200	32

The Group also entered into credit line agreements with other financial institutions relating to trade finance and import/export amounting to ₩20,000 million and US\$ 140 million.

(4) As at June 30, 2017, the Parent Company and certain subsidiaries have B2B purchase arrangements with several financial institutions with limit of ₩349,000 million and ₩15,000 million, respectively.

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- (5) As at June 30, 2017, in relation to price fixing of mobile batteries, the consumers in U.S., Canada and Israel have filed three class actions claims and the customers have filed five separate actions against the Parent Company and certain overseas subsidiaries. However, the ultimate outcome of these cases cannot be determined at the reporting date.
- (6) In addition, as at June 30, 2017, the Parent Company and certain overseas subsidiaries have been named as a plaintiff in 8 and 24 legal actions, respectively, involving ₩19,872 million and ₩3,667 million in claims, respectively. They have been named as a defendant in 8 and 15 legal actions, respectively, with ₩3,891 million and ₩14,418 million in claims, respectively. The ultimate outcome of these cases cannot be determined at the reporting date.
- (7) As at June 30, 2017, the Parent Company has technology license agreements with STYRON EUROPE GmbH and other companies for the production of Polycarbonate products. Further, the Parent Company has entered into manufacture and production technical contracts with Exxon Mobile and others.
- (8) The Parent Company has entered into a license agreement with LG Corp. to use trademarks on the products that the Group manufactures and sells, and on the services the Group provides in relation to its business.
- (9) As at June 30, 2017, the Parent Company has entered into payment guarantee contract of US\$ 1 million and EUR 5 million with financial institutions to guarantee the warrant of certain installed products. The Parent Company has entered into a payment guarantee contract of US\$ 25 million with a financial institution in relation to advance received from customers for certain sales. Also, certain subsidiaries have entered into payment guarantee contract of CNY 666 million with financial institutions in relation to custom of imported raw materials.
- (10) As at June 30, 2017 and December 31, 2016, assets pledged as collaterals for the borrowings are as follows:

(in millions of Korean won)

		June 30, 2017		
	Secured amount	Borrowings / Loan	Limit	Secured party
Other receivables	300	Non-current borrowings (Won currency borrowings)	882	KEB Hana Bank
Gumi facility, Anseong facility, Genetics institute	52,000	Won currency public debentures (Collateralized)	40,000	Creditors
	<u>52,300</u>		<u>40,882</u>	

(in millions of Korean won)

		December 31, 2016		
	Secured amount	Borrowings / Loan	Limit	Secured party
Other receivables	300	Non-current borrowings (Won currency borrowings)	1,058	KEB Hana Bank
Gumi facility, Anseong facility, Genetics institute	52,000	Won currency debentures (Collateralized)	40,000	Creditors
	<u>52,300</u>		<u>41,058</u>	

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(11) Capital expenditure arrangement that has not incur at the end of the reporting period is as follows:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Property, plant and equipment	735,758	399,562

20. Share Capital

Changes in share capital and share premium for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

*(in millions of Korean won
and in shares)*

	Ordinary shares		Preferred shares		Share premium
	Number of shares	Share capital	Number of shares	Share capital	
January 1, 2016	66,271,100	331,356	7,628,921	38,144	897,424
December 31, 2016	66,271,100	331,356	7,628,921	38,144	897,424
Share issuance due to business combination	4,321,243	21,606	59,879	300	1,116,614
June 30, 2017	<u>70,592,343</u>	<u>352,962</u>	<u>7,688,800</u>	<u>38,444</u>	<u>2,014,038</u>

Changes in treasury shares for the six-month period ended June 30, 2017 and for the year ended December 31, 2016, are as follows:

<i>(in millions of Korean won and in shares)</i>	Number of shares			Gain on disposal of treasury shares (Reserves)
	Ordinary shares	Preferred shares	Carrying amount	
January 1, 2016	359,795	5,519	15,484	13,855
December 31, 2016	359,795	5,519	15,484	13,855
Purchase of treasury shares due to business combination	1,284,891	10,328	337,211	-
Acquisition of fractional shares due to business combination	7,730	520	2,250	-
June 30, 2017	<u>1,652,416</u>	<u>16,367</u>	<u>354,945</u>	<u>13,855</u>

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21. Retained Earnings

Retained earnings as at June 30, 2017 and December 31, 2016, consist of:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Legal reserve ¹	302,594	300,294
Discretionary reserve ²	11,410,610	10,408,789
Retained earnings before appropriation	<u>1,481,667</u>	<u>1,753,689</u>
Total	<u>13,194,871</u>	<u>12,462,772</u>

¹ The Commercial Code of the Republic of Korea requires the Parent Company to appropriate for each financial period, as a legal reserve, an amount equal to a minimum of 10% of cash dividends paid until such reserve equals 50% of its issued share capital. The reserve is not available for cash dividends payment, but may be transferred to share capital or used to reduce accumulated deficit. When the accumulated legal reserves (the sum of capital reserves and earned profit reserves) are greater than 1.5 times the paid-in capital amount, the excess legal reserves may be distributed in accordance with a resolution of the shareholders' meeting.

² The Parent Company separately accumulates a discretionary reserve for research and human resource development through appropriation of retained earnings, which has been included as deductible expense for the corporate income tax return according to the Special Tax Treatment Law. The reserve could be reversed in accordance with the terms of related tax laws.

22. Other Components of Equity

Details of other components of equity of the Parent Company as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Treasury shares (Note 20)	(354,945)	(15,484)
Capital transactions within the Group ¹	<u>(215)</u>	<u>(215)</u>
Total	<u>(355,160)</u>	<u>(15,699)</u>

¹ Include gain or loss on disposal of investments and investment differences due to changes in equity, net of deferred tax.

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23. Selling and Administrative Expenses

Selling and administrative expenses for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Wages and salaries	179,235	364,231	145,127	273,170
Post-employment benefits (Note 17)	10,434	22,219	10,570	19,297
Employee benefits	36,904	68,861	30,753	55,361
Travel expense	13,233	24,694	11,861	21,213
Water & Utilities	8,631	19,027	7,030	15,792
Packaging expense	2,009	3,432	1,543	3,252
Rental expenses	22,103	41,995	20,363	40,187
Commission expenses	83,545	163,011	73,760	138,253
Depreciation (Note 11 and 13)	23,614	47,428	21,035	41,136
Advertising expense	7,472	12,657	4,946	9,009
Freight expenses	135,108	263,341	108,821	217,245
Training expense	4,681	7,809	3,517	6,170
Amortization (Note 12)	17,620	34,429	10,450	19,245
Sample expense	5,230	9,306	5,812	9,936
Development costs	33,337	61,050	28,654	50,002
Others	60,825	117,199	48,156	89,757
Total	643,981	1,260,689	532,398	1,009,025

24. Breakdown of Expenses by Nature

Cost of sales, and selling and administrative expenses by nature for the three-month and six-month periods ended June 30, 2017 and 2016, consist of:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Changes in inventories of merchandise, finished goods, semi-finished goods and work-in-process	90,338	(5,457)	(45,381)	1,365
Raw materials and consumables used	3,384,270	7,209,585	2,809,897	5,393,704
Purchase of merchandise	344,856	666,536	258,348	508,870
Employee benefit expenses (Note 25)	541,919	1,084,800	473,296	903,152
Advertising expenses	7,822	13,167	5,325	9,560
Freight expenses	144,236	281,736	117,322	234,240
Commission expenses	140,577	269,981	119,022	221,167
Depreciation and amortization	352,389	702,989	333,675	655,494
Operating lease payments	22,049	43,851	20,249	38,254
Other expenses	626,736	1,077,764	515,023	1,057,316
Total	5,655,192	11,344,952	4,606,776	9,023,122

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25. Employee Benefit Expenses

Details of employee benefit expenses for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

<i>(in millions of Korean won)</i>	2017		2016	
	Three months	Six months	Three months	Six months
Salaries	454,258	912,710	396,800	759,932
Post-employment benefits – Defined benefit plan (Note 17)	33,886	69,521	30,874	60,120
Post-employment benefits – Defined contribution plan (Note 17)	168	310	228	337
Others	53,607	102,259	45,394	82,763
Total	541,919	1,084,800	473,296	903,152

26. Finance Income and Costs

Details of finance income and costs for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

<i>(in millions of Korean won)</i>	2017		2016	
	Three months	Six months	Three months	Six months
Finance income				
Interest income ¹	6,340	13,806	9,911	21,284
Dividend income	8	204	-	-
Gain on foreign currency exchange	34,019	77,612	33,710	54,139
Gain on foreign currency translation	23,247	28,765	919	4,063
Gain on disposal of available-for- sale securities	-	-	18	18
Gain on disposal of trading derivatives	-	-	-	1,640
Gain on disposal of hedging derivatives	-	170	-	-
Total	63,614	120,557	44,558	81,144
Finance costs				
Interest expense ²	26,851	53,940	22,229	36,234
Loss on foreign currency exchange	22,811	96,159	32,085	55,809
Loss on foreign currency translation	6,970	7,720	32,113	29,886
Loss on disposal of trading derivatives	-	-	-	3,141
Loss on redemption of debentures	-	-	3,031	3,031
Total	56,632	157,819	89,458	128,101

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¹ Details of interest income for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Deposits held by financial institutions	5,208	11,709	8,662	19,095
Available-for-sale financial assets	-	5	91	91
Other loans and receivables	1,132	2,092	1,158	2,098
Total	6,340	13,806	9,911	21,284

² Details of interest expense for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Interest on bank overdraft and borrowings	20,270	41,186	16,177	28,345
Interest on finance lease liabilities	293	1,030	304	608
Interest on debentures	5,643	10,676	4,645	7,776
Other interest expenses	1,804	3,318	2,008	2,460
Capitalized interest for qualifying assets	(1,159)	(2,270)	(905)	(2,955)
Total	26,851	53,940	22,229	36,234

27. Other Non-Operating Income

Details of other non-operating income for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Gain on foreign currency exchange	58,532	179,621	82,423	176,618
Gain on foreign currency translation	104,815	43,493	66,605	18,689
Gain on disposal of property, plant and equipment	875	1,632	4,898	5,947
Gain on disposal of intangible assets	-	4,867	-	-
Gain on disposal of associates	1,952	1,952	-	-
Others	11,809	39,494	9,138	19,020
Total	177,983	271,059	163,064	220,274

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28. Other Non-Operating Expenses

Details of other non-operating expenses for the three-month and six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Loss on foreign currency exchange	68,780	189,233	101,188	196,474
Loss on foreign currency translation	58,498	16,623	66,337	29,330
Loss on disposal of property, plant and equipment	4,972	26,107	6,955	13,999
Loss on disposal of intangible assets	1,020	1,807	969	1,124
Impairment loss on property, plant and equipment (Note 11)	107	12,869	1,210	2,425
Impairment loss on intangible assets (Note 12)	1,123	4,272	-	-
Loss on disposal of investments in joint ventures	-	-	41,252	41,252
Donations	13,379	17,120	1,629	6,576
Others	34,788	65,306	8,118	23,955
Total	182,667	333,337	227,658	315,135

29. Income Taxes

Income tax expense is recognized based on management's best estimate of the weighted average annual income tax rate expected for the full financial year. The estimated average annual rate used for the year ended December 31, 2017, is 21.1% (for the six-month period ended June 30, 2016: 21.3%).

30. Earnings per Share

Basic earnings per share is calculated by dividing the profit attributable to owners of the Parent Company by the weighted average number of shares in issue excluding shares purchased by the Parent Company and held as treasury shares. As at the reporting date, the Parent Company has no potential ordinary shares. Preferred shares have a right to participate in the profits of the Parent Company. These participation rights have been considered in presenting the EPS for ordinary shares and preferred shares.

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Basic earnings per share attributable to the owners of the Parent Company for the three-month and six-month periods ended June 30, 2017 and 2016, is computed as follows:

Basic earnings per ordinary share

*(in millions of Korean won and
in number of shares)*

	2017		2016	
	Three months	Six months	Three months	Six months
Profit attributable to ordinary shares ¹	519,199	997,376	337,751	642,205
Weighted average number of ordinary shares outstanding ²	68,940,610	68,940,610	65,911,305	65,911,305
Basic earnings per ordinary shares <i>(in won)</i>	7,531	14,467	5,124	9,743

Basic earnings per preferred share

*(in millions of Korean won and
in number of shares)*

	2017		2016	
	Three months	Six months	Three months	Six months
Profit attributable to preferred shares ¹	57,878	111,191	39,160	74,469
Weighted average number of preferred shares outstanding ²	7,672,479	7,672,479	7,623,402	7,623,402
Basic earnings per preferred shares <i>(in won)</i>	7,544	14,492	5,137	9,768

¹ Profit attributable to ordinary and preferred shares are as follows:

(in millions of Korean won)

	2017		2016	
	Three months	Six months	Three months	Six months
Profit attributable to the equity holders of the Parent Company	577,077	1,108,567	376,911	716,674
Ordinary shares dividends (A)	86,175	172,351	74,150	148,300
Preferred shares dividends (B)	9,687	19,373	8,672	17,343
Undistributed earnings for the period	481,215	916,843	294,089	551,031
Undistributed earnings available for ordinary shares (C)	433,024	825,025	263,601	493,905
Undistributed earnings available for preferred shares (D)	48,191	91,818	30,488	57,126
Profit for the period attributable to ordinary shares (A+C)	519,199	997,376	337,751	642,205
Profit for the period attributable to preferred shares (B+D)	57,878	111,191	39,160	74,469

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² Weighted average numbers of shares are calculated as follows:

Ordinary shares outstanding	2017			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2017. 1. 1 - 2017. 6. 30	65,911,305	181	11,929,946,205
Share issuance due to business combination	2017. 1. 1 - 2017. 6. 30	4,321,243	181	782,144,983
Purchase of treasury shares	2017. 1. 1 - 2017. 6. 30	(1,284,891)	181	(232,565,271)
Purchase of treasury shares	2017. 1. 17 - 2017. 6. 30	(7,730)	165	(1,275,450)
Total				12,478,250,467

Weighted average number of ordinary shares outstanding: $12,478,250,467 \div 181 = 68,940,610$
shares

Preferred shares outstanding	2017			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2017. 1. 1 - 2017. 6. 30	7,623,402	181	1,379,835,762
Share issuance due to business combination	2017. 1. 1 - 2017. 6. 30	59,879	181	10,838,099
Purchase of treasury shares	2017. 1. 1 - 2017. 6. 30	(10,328)	181	(1,869,368)
Purchase of treasury shares	2017. 1. 17 - 2017. 6. 30	(520)	165	(85,800)
Total				1,388,718,693

Weighted average number of preferred shares outstanding: $1,388,718,693 \div 181 = 7,672,479$
shares

Ordinary shares outstanding	2016			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2016. 1. 1 - 2016. 6. 30	65,911,305	182	11,995,857,510
Total				11,995,857,510

Weighted average number of ordinary shares outstanding: $11,995,857,510 \div 182 = 65,911,305$
shares

Preferred shares outstanding	2016			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2016. 1. 1 - 2016. 6. 30	7,623,402	182	1,387,459,164
Total				1,387,459,164

Weighted average number of preferred shares outstanding: $1,387,459,164 \div 182 = 7,623,402$
shares.

There were no dilutive potential outstanding ordinary shares at the reporting date. Accordingly, diluted earnings per share attributable to the equity holders of the Parent Company is identical to basic earnings per share.

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31. Dividends

The ₩368,055 million (2016: ₩331,287 million) of dividends for the year ended December 31, 2016, was paid to the shareholders of the Parent Company in April 2017.

32. Related Party Transactions

As at June 30, 2017 and December 31, 2016, LG Corp. is an entity exercising a significant influence over the Group, which owns 33.34% of the Parent Company's ordinary shares.

Details of associates and other related parties that have sales and other transactions with the Group or have receivables and payables balances as at June 30, 2017 and December 31, 2016, are as follows, and the details of investments in subsidiaries, associates and joint ventures are described in Note 1.3:

Related party	Related party's subsidiary (Domestic)	Related party's subsidiary (Overseas)	Details
SERVEONE	-	Serveone(Nanjing) Co., LTD. and others	Subsidiary of LG Corp.
LG CNS Co., Ltd.	LG N-Sys Inc.	LG CNS America Inc. and others	Subsidiary of LG Corp.
LG Siltron Incorporated	-	-	Subsidiary of LG Corp.
LG Management Development Institute	-	-	Subsidiary of LG Corp.
LG Sports Ltd.	-	-	Subsidiary of LG Corp.
LG Holdings Japan	-	-	Subsidiary of LG Corp.
LG MMA Corporation	-	-	Joint venture of LG Corp.
LG Display Co., Ltd.	-	LG Display Yantai Co., Ltd. and others	LG Enterprise group ¹
LG Electronics, Inc.	LG Innotek Co., Ltd. and others	Inspur LG Digital Mobile Communications Co., Ltd. and others	LG Enterprise group ¹
LG International Corp.	Pantos Logistics Co., Ltd. and others	LG International (Japan) Ltd. and others	LG Enterprise group ¹
LG Hausys, Ltd.	-	LG Hausys Tianjin Co., Ltd. and others	LG Enterprise group ¹
LG Household & Health Care Ltd.	Coca-Cola Beverage Co.	-	LG Enterprise group ¹
LG Life Sciences Ltd. ²	-	-	LG Enterprise group ¹
LG Uplus Corp.	-	-	LG Enterprise group ¹
G II R Inc.	HS AD Inc.	-	LG Enterprise group ¹
Silicon Works Co., Ltd.	-	-	LG Enterprise group ¹

¹ Although the entity is not the related party of the Group in accordance with Korean IFRS 1024, the entity belongs to a large enterprise group in accordance with the Monopoly Regulation and Fair Trade Act.

² On January 1, 2017, LG Life Sciences Ltd. was merged into the Parent Company.

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Sales and purchases with related parties for the six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017			
	Sales and others	Purchase and others		
		Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Others
Entity with a significant influence over the Group				
LG Corp.	-	-	-	31,044
Associates and joint ventures				
SEETEC Co., Ltd.	9,147	58,921	17	45,204
TECWIN Co., Ltd.	-	138	1,730	44
HL Greenpower Co., Ltd.	116,217	324	-	-
Others	4	-	-	1,350
Other related parties				
LG MMA Corporation	41,128	107,017	-	3,094
SERVEONE and its subsidiaries	7,206	241,546	98,634	141,859
LG CNS Co., Ltd. and its subsidiaries	8,961	292	46,780	33,283
Others	6	-	-	6,219
Others				
LG Display Co., Ltd. and its subsidiaries	649,891	-	-	12
LG Electronics Inc. and its subsidiaries	477,203	122,640	63,704	9,085
LG International Corp. and its subsidiaries	157,935	242,645	167	175,120
LG Hausys, Ltd. and its subsidiaries	107,551	4,700	-	3,849
Others	13,610	14,417	362	3,888
Total	1,588,859	792,640	211,394	454,051

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(in millions of Korean won)

	2016			
	Sales and others	Purchase and others		
		Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Others
Entity with a significant influence over the Group				
LG Corp.	-	-	-	24,082
Associates and joint ventures				
SEETEC Co., Ltd.	6,301	48,306	14	40,018
TECWIN Co., Ltd.	-	37	535	-
HL Greenpower Co., Ltd.	38,158	-	-	-
Others	1,195	-	-	1,155
Other related parties				
LG MMA Corporation	59,339	79,218	-	1,655
SERVEONE and its subsidiaries	8,380	213,933	60,548	51,385
LG CNS Co., Ltd. and its subsidiaries	7,135	1,816	34,224	27,846
Others	-	-	-	5,343
Others				
LG Display Co., Ltd. and its subsidiaries	686,464	-	-	13
LG Electronics Inc. and its subsidiaries	277,957	134,082	12,516	4,018
LG International Corp. and its subsidiaries	137,228	164,026	8	96,521
LG Hausys, Ltd. and its subsidiaries	91,910	-	5,426	1,283
Others	11,016	18,391	89	3,817
Total	1,325,083	659,809	113,360	257,136

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Balances of receivables and payables arising from sales and purchases of goods and services as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)

	June 30, 2017			
	Receivables			Total
	Trade receivables and others	Loan receivables	Other receivables	
Entity with a significant influence over the Group				
LG Corp.	-	-	9,172	9,172
Associates and joint ventures				
SEETEC Co., Ltd.	-	-	-	-
TECWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	50,424	-	-	50,424
Others	-	-	859	859
Other related parties				
LG MMA Corporation	5,918	-	399	6,317
SERVEONE and its subsidiaries	2,149	-	27,943	30,092
LG CNS Co., Ltd. and its subsidiaries	8,554	-	43	8,597
Others	-	-	4,902	4,902
Others				
LG Display Co., Ltd. and its subsidiaries	181,676	-	2,304	183,980
LG Electronics Inc. and its subsidiaries	282,195	-	33,509	315,704
LG International Corp. and its subsidiaries	36,539	-	902	37,441
LG Hausys, Ltd. and its subsidiaries	40,516	-	178	40,694
Others	153	-	1,570	1,723
Total	608,124	-	81,781	689,905

(in millions of Korean won)

	June 30, 2017			
	Payables			Total
	Trade payables	Borrowings	Other payables	
Entity with a significant influence over the Group				
LG Corp.	-	-	3,577	3,577
Associates and joint ventures				
SEETEC Co., Ltd.	12,780	-	10,620	23,400
TECWIN Co., Ltd.	1	-	488	489
HL Greenpower Co., Ltd.	-	-	-	-
Others	-	-	48	48
Other related parties				
LG MMA Corporation	24,722	-	-	24,722
SERVEONE and its subsidiaries	1,647	-	230,032	231,679
LG CNS Co., Ltd. and its subsidiaries	108	-	39,897	40,005
Others	-	-	394	394
Others				
LG Display Co., Ltd. and its subsidiaries	-	-	4	4
LG Electronics Inc. and its subsidiaries	78,573	-	46,205	124,778
LG International Corp. and its subsidiaries	8,402	-	54,101	62,503
LG Hausys, Ltd. and its subsidiaries	3,526	-	754	4,280
Others	1,888	-	3,474	5,362
Total	131,647	-	389,594	521,241

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	December 31, 2016			
	Receivables			Total
	Trade receivables and others	Loan receivables	Other receivables	
Entity with a significant influence over the Group				
LG Corp.	-	-	6,572	6,572
Associates and joint ventures				
SEETEC Co., Ltd.	-	-	-	-
TECWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	43,493	-	-	43,493
LG Fuel Cell Systems Inc.	-	9,857	341	10,198
Others	-	-	20	20
Other related parties				
LG MMA Corporation	8,858	-	583	9,441
SERVEONE and its subsidiaries	3,128	-	26,183	29,311
LG CNS Co., Ltd. and its subsidiaries	17,152	-	45	17,197
Others	-	-	4,314	4,314
Others				
LG Display Co., Ltd. and its subsidiaries	105,174	-	81,467	186,641
LG Electronics Inc. and its subsidiaries	236,834	-	22,294	259,128
LG International Corp. and its subsidiaries	37,592	-	904	38,496
LG Hausys, Ltd. and its subsidiaries	36,381	-	341	36,722
Others	1,005	-	937	1,942
Total	489,617	9,857	144,001	643,475

(in millions of Korean won)

	December 31, 2016			
	Payables			Total
	Trade payables	Borrowings	Other payables	
Entity with a significant influence over the Group				
LG Corp.	-	-	420	420
Associates and joint ventures				
SEETEC Co., Ltd.	10,009	-	9,695	19,704
TECWIN Co., Ltd.	76	-	140	216
HL Greenpower Co., Ltd.	-	-	-	-
LG Fuel Cell Systems Inc.	-	-	-	-
Others	-	-	95	95
Other related parties				
LG MMA Corporation	15,777	-	-	15,777
SERVEONE and its subsidiaries	726	-	228,113	228,839
LG CNS Co., Ltd. and its subsidiaries	25,757	-	19,494	45,251
Others	-	-	301	301
Others				
LG Display Co., Ltd. and its subsidiaries	-	-	30	30
LG Electronics Inc. and its subsidiaries	78,137	-	4,786	82,923
LG International Corp. and its subsidiaries	19,814	-	24,579	44,393
LG Hausys, Ltd. and its subsidiaries	4,401	-	456	4,857
Others	2,801	-	4,085	6,886
Total	157,498	-	292,194	449,692

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Fund transactions with related parties for the six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017		2016	
	Equity contributions in cash (capital reduction)	Loan (Repayment)	Equity contributions in cash (capital reduction)	Loan (Repayments)
Associates and joint ventures				
FJ Composite Materials Co., Ltd.	3,015	-	-	-
LG Fuel Cell Systems Inc.	24,527	(9,584)	3,636	-
KLPE Limited Liability Partnership	-	-	(23,724)	-
WUXI CL New Energy Technology Ltd	1,178	-	-	-
Total	28,720	(9,584)	(20,088)	-

Dividends received from related parties for the six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017	2016
Associates and joint ventures		
SEETEC Co., Ltd.	10,000	-
LG VINA Chemical Co., Ltd.	846	-
Total	10,846	-

Dividends paid to related party for the six-month periods ended June 30, 2017 and 2016, are as follows:

(in millions of Korean won)

	2017	2016
Entity with a significant influence over the Group		
LG Corp.	111,097	111,081
Total	111,097	111,081

Compensation for key management of the Group for the six-month periods ended June 30, 2017 and 2016, consists of:

(in millions of Korean won)

	2017	2016
Short-term employee benefits	39,375	26,123
Post-employment benefits	1,737	1,639
Total	41,112	27,762

Key management includes directors and audit committee members having duties and responsibilities over planning, operations and controlling of the Group's business activities.

There are no provisions recognized against receivables from related parties as at June 30, 2017.

As at June 30, 2017, there is no payment guarantees provided by the Group for related parties.

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33. Cash Generated from Operations

Reconciliation between profit before income tax and cash generated from operations for the six-month periods ended June 30, 2017 and 2016, is as follows:

<i>(in millions of Korean won)</i>	2017	2016
Profit before income tax	1,427,895	923,170
Adjustments for:		
Depreciation	659,003	630,714
Amortization	43,986	24,816
Post-employment benefits	69,521	60,120
Finance income	(85,793)	(48,140)
Finance costs	78,853	100,930
Foreign exchange differences	(71,632)	2,092
Gain on valuation of inventories	(10,494)	(13,318)
Gain on disposal of property, plant and equipment	(1,632)	(5,947)
Gain on disposal of intangible assets	(4,867)	-
Loss on disposal of property, plant and equipment	26,107	13,999
Loss on disposal of intangible assets	1,807	1,124
Impairment loss on property, plant and equipment	12,869	2,425
Impairment loss on intangible assets	4,272	-
Loss on disposal of investments in joint ventures	-	41,252
Gain on disposal of investments in associates	(1,952)	-
Additions to provisions	93,255	34,461
Other expense (income)	265	6,002
Increase in inventories	(11,860)	(60,751)
Decrease (increase) in trade receivables	(553,662)	218,592
Decrease (increase) in other receivables	(1,647)	14,625
Decrease (increase) in other current assets	(53,172)	15,630
Increase in settlement of derivatives	(2,114)	(1,408)
Increase (decrease) in trade payables	(141,797)	68,712
Decrease in other payables	(41,059)	(50,523)
Increase (decrease) in other current liabilities	43,672	(65,126)
Decrease in net defined benefit liabilities	(6,421)	(10,601)
Decrease in provisions	(32,100)	(22,754)
Other cash flows from operations	1,573	(67,748)
Cash generated from operations	1,442,876	1,812,348

The significant non-cash transactions for the six-month periods ended June 30, 2017 and 2016, are as follows:

<i>(in millions of Korean won)</i>	2017	2016
Transfer of construction-in-progress	529,146	671,930
Transfer of machinery-in-transit	38,006	16,083
Reclassification of long-term borrowings into current maturities	372,111	207,496
Reclassification of asset held for sale	3,405	2,306

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34. Segment Information

General information about the Group's reportable segments is as follows:

Segment	Products or services	Major customers
Basic materials & Chemicals	ABS, PC, EP, PE, PP, Acrylic, Alcohol, SAP, PVC, Synthetic rubber, Special resin, BPA, Ethylene, Propylene and others	LG International Corp., LG Electronics Inc., DongbuDaewoo Electronics Inc., OCI Company Co. Ltd., Mitsubishi Corp. and others
Energy solutions	Mobile batteries, Automotive batteries, Electricity storage batteries and others	Hewlett-Packard Co., General Motors Corp., and others
IT & Electronic materials and Advanced materials ¹	Polarizers, 3D FPR, LCD Photoresist, OLED materials, Battery materials and others	LG Display Co., Ltd., Samsung Display Co., Ltd., BOE, AUO and others
Life Sciences ²	Growth hormone, Vaccine, Antidiabetic, agricultural chemicals and others	HUADONG NINGBO, UNICEF, Intervet and others
Common and others	Crop protection products, Seeds, Fertilizers, General management, sales and R&D	National Agriculture Cooperative Federation and others

¹ The Group presents IT & Electronic materials and Advanced materials as Advanced materials has been included in IT & Electronic materials since 2016. The comparative information was restated to reflect such changes.

² Life Sciences segment was disclosed separately as LG Life Sciences, Ltd. was merged into the Parent Company on January 1, 2017.

The segment information on revenue, profit or loss for the six-month periods ended June 30, 2017 and 2016, is as follows:

	2017					Total
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Life Sciences	Common and others³	
Total segment revenue	8,813,848	2,119,164	1,475,236	264,660	440,024	13,112,932
Inter-segment revenue	88,996	-	148,901	1,050	5,255	244,202
Revenue from external customers ¹	8,724,852	2,119,164	1,326,335	263,610	434,769	12,868,730
Operating profit (loss) ²	1,419,233	(2,894)	52,763	39,469	15,207	1,523,778

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	2016				Total
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Common and others ³	
Total segment revenue	7,164,723	1,623,371	1,276,853	192,504	10,257,451
Inter-segment revenue	81,756	668	77,757	3,949	164,130
Revenue from external customers ¹	7,082,967	1,622,703	1,199,096	188,555	10,093,321
Operating profit (loss) ²	1,115,296	(31,547)	(22,601)	9,051	1,070,199

¹ Revenue from external customers consists of sales of goods. Interest income and dividend income are included in finance income.

² Management assesses the performance of the operating segments based on a measurement of operating profit of segment.

³ Common and other segments include operating segments not qualifying as a reportable segment, supporting divisions as well as R&D divisions.

The segment information on assets and liabilities as at June 30, 2017 and December 31, 2016, is as follows:

(in millions of Korean won)

	June 30, 2017					Total
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Life Sciences	Common and others	
Reportable segment asset ¹	8,682,234	4,594,455	3,385,985	1,587,008	4,421,437	22,671,119
Investments in associates and joint ventures	2,998	19,194	-	17	258,660	280,869
Reportable segment liability ¹	2,476,751	1,944,219	758,873	334,083	1,622,557	7,136,483

(in millions of Korean won)

	December 31, 2016				Total
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Common and others	
Reportable segment asset ¹	8,441,909	4,434,851	3,423,864	4,186,436	20,487,060
Investments in associates and joint ventures	4,604	16,927	-	239,297	260,828
Reportable segment liability ¹	3,342,989	1,985,652	1,007,775	99,677	6,436,093

¹ Assets and liabilities are measured in a manner consistent with those in the financial statements, and allocated on the basis of segment operation.

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The external sales and non-current assets by geographical segments from continuing operations for the six-month periods ended June 30, 2017 and 2016, and as at June 30, 2017 and December 31, 2016, are as follows:

(in millions of Korean won)

	Sales		Non-current assets ¹	
	2017	2016	June 30, 2017	December 31, 2016
Korea ²	4,275,362	3,229,757	9,914,087	8,533,239
China	4,257,396	3,263,929	1,693,031	1,672,386
Asia	2,412,192	1,946,811	30,788	27,532
America	717,567	610,831	237,156	251,696
Europe	1,031,754	899,695	81,575	29,711
Others	174,459	142,298	-	-
Total	12,868,730	10,093,321	11,956,637	10,514,564

¹ Represents aggregate amount of property, plant and equipment, intangible assets and investment properties.

² Domestic sales include the exports made through local letters of credit.

There is no single external customer contributes over 10% of the Group's revenue for the six-month periods ended June 30, 2017 and 2016.

35. Business Combination

In order to enhance future-oriented business portfolio and leap into a global player of red bio industry by enlarging investment in long-term and stable new drugs development, the Parent Company merged LG Life Sciences, Ltd. on January 1, 2017.

Goodwill of ₩686,229 million arising from the business combination is attributable to sales increase expected from combining the operations of the Group and Life Sciences business. Goodwill recognized through the business combination is not deductible for income tax purposes.

The following table summarizes the consideration paid for business combination, the fair value of assets acquired and liabilities assumed at the acquisition date:

(in millions of Korean won)

	Amount
Consideration	
Equity Securities (Ordinary 4,321,243 shares, Preferred 59,879 shares) ¹	1,138,593
Total consideration	<u>1,138,593</u>
Recognized amounts of identifiable assets acquired and liabilities assumed	
Cash and cash equivalents	43,832
Trade and other (non-current) receivables	112,703
Inventories	123,083
Property, plant and equipment	493,321
Intangible assets	273,550
Other assets	8,315
Trade payables	(38,736)
Borrowings	(729,745)
Provisions	(6,053)

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Net defined benefit liabilities	(11,922)
Other liabilities	(153,195)
Treasury shares (Ordinary 1,284,891 shares, Preferred 10,328 shares) ¹	337,211
Fair value of identifiable net assets	452,364
Goodwill	686,229
Total	1,138,593

¹The fair value of ordinary shares, preferred shares and treasury shares acquired were based on the market price at the acquisition date.

With regard to the above business combination, stock issuance cost of ₩73 million was deducted from equity.

The fair value and gross contractual amount for trade and other (non-current) receivables at the acquisition date amount to ₩114,721 million, of which ₩2,018 million is expected to be uncollectible.

The revenues of ₩263,610 million and profit of ₩33,406 million for the six-month period ended June 30, 2017 arose after the acquisition date are reflected in the consolidated interim statement of profit or loss.

On April 1, 2016, the Parent Company acquired 100% shares of FarmHannong Co., Ltd. (formerly Dongbu FarmHannong Co., Ltd.), which is engaged to manufacture domestic agricultural pesticides. As a result of the business combination, the Group expects increase in sales through diversification in market such as entering into new industry and others.

Goodwill of ₩86,858 million arising from the business combination is attributable to the acquired customer base and sales increase expected from combining the operations of the Parent Company and FarmHannong Co., Ltd.

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The following table summarizes the consideration paid for FarmHannong Co., Ltd., the fair value of assets acquired and liabilities assumed at the acquisition date:

<i>(in millions of Korean won)</i>	Amount
Consideration	
Cash and cash equivalents	424,500
Total consideration	<u>424,500</u>
Recognized amounts of identifiable assets acquired and liabilities assumed	
Cash and cash equivalents	15,837
Trade and other (non-current) receivables	272,140
Inventories	236,255
Assets held for sale	65,591
Property, plant and equipment	561,083
Intangible assets	141,968
Investment properties	14,235
Other assets	9,198
Trade and other (non-current) payables	(150,385)
Borrowings	(678,687)
Provisions	(98,576)
Net defined benefit liabilities	(38,073)
Deferred tax liabilities	(5,472)
Other liabilities	<u>(23,649)</u>
Fair value of identifiable net assets	321,465
Less: non-controlling interest	<u>16,177</u>
	<u>337,642</u>
Goodwill	<u>86,858</u>
Total	<u>424,500</u>

The fair value of trade and other (non-current) receivables was ₩272,140 million including trade receivables with a fair value of ₩200,619 million. The gross contractual amount for trade receivables at the acquisition date amounts to ₩296,011 million, of which ₩23,871 million was expected to be uncollectible.

On August 31, 2016, the Parent Company acquired assets and liabilities relating to Pressure Sensitive Adhesive Application business from LG Hausys, Ltd. As a result of the business combination, the Parent Company expects an increase in sales through diversification of market such as adding business portfolio by expanding a business field to an industrial adhesive film area.

Goodwill of ₩4,112 million arose from the business combination is resulted from the customer relationship newly acquired and sales increase from combination of the Parent Company and Pressure Sensitive Adhesive Application business.

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The following table summarizes the consideration paid for LG Hausys, Ltd. relating to acquiring Pressure Sensitive Adhesive Application business, the fair value of assets acquired and liabilities assumed at the acquisition date:

<i>(in millions of Korean won)</i>	Amount
Consideration	
Cash and cash equivalents	75,303
Total consideration	<u>75,303</u>
Recognized amounts of identifiable assets acquired and liabilities assumed	
Trade receivables	15,958
Inventories	9,998
Property, plant and equipment	43,006
Intangible assets	13,487
Other assets	1,298
Trade payables	(12,356)
Net defined benefit liabilities	(200)
Fair value of identifiable net assets	<u>71,191</u>
Goodwill	<u>4,112</u>
Total	<u>75,303</u>

The fair value and gross contractual amount for trade receivables at the acquisition date were ₩15,958 million. None of trade receivables were expected to be uncollectible.

The Group has the right to be reimbursed from LG Hausys, Ltd. for damages resulted from lawsuits filed prior to the business combination of the Pressure Sensitive Adhesive Application business.

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On November 1, 2016, the Parent Company acquired assets and liabilities relating to Positive electrode business from GSEM Co., Ltd. As a result of the business combination, the Parent Company expects to result in upgrade of Positive electrode manufacturing technologies and enhancement of competency in battery production through vertical integration.

The following table summarizes the consideration paid for GSEM CO., LTD. in relation to acquiring Positive Electrode business, the fair value of assets acquired and liabilities assumed at the acquisition date:

<i>(in millions of Korean won)</i>	Amount
Consideration	
Cash and cash equivalents	59,307
Total consideration	59,307
Recognized amounts of identifiable assets acquired and liabilities assumed	
Cash and cash equivalents	800
Inventories	12,318
Property, plant and equipment	47,155
Intangible assets	153
Investment properties	1,041
Other assets	928
Provisions	(800)
Net defined benefit liabilities	(838)
Other liabilities	(1,450)
Fair value of identifiable net assets	59,307
Goodwill	-
Total	59,307

On December 31, 2016, the Parent Company acquired additional 20% shares of LG Chem (HUIZHOU) Petrochemical Co., Ltd. (formerly, CNOOC & LG Petrochemicals Co., Ltd.), a joint venture, and acquired control in accordance with the shareholders' agreement. As a result of the business combination, the Group expects increase in sales by expanding market share.

Goodwill of ₩14,253 million arose from the business combination is resulted from increase in market share and economies of scale after acquiring control.

The following table summarizes the consideration paid for LG Chem(HUIZHOU) Petrochemical Co., Ltd., the fair value of assets acquired and liabilities assumed at the acquisition date:

<i>(in millions of Korean won)</i>	Amount
Consideration	
Cash and cash equivalents	58,771
Fair value of investment in joint venture before business combination	8,306
Total consideration	67,077
Recognized amounts of identifiable assets acquired and liabilities assumed	
Cash and cash equivalents	63,968
Trade and other non-current receivables	7,139
Inventories	31,547
Property, plant and equipment	163,129

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Intangible assets	19,785
Deferred tax assets	21,605
Other assets	32,421
Trade and other non-current payables	(99,747)
Borrowings	(159,096)
Deferred tax liabilities	(1,377)
Other liabilities	(3,912)
Fair value of identifiable net assets	75,462
Less: non-controlling interest	(22,638)
	52,824
Goodwill	14,253
Total	67,077

The shares of LG Chem(HUIZHOU) Petrochemical Co., Ltd. held by the Parent Company before business combination were measured at the fair value and the Parent Company recognized a gain on disposal of investments in joint ventures of ₩4,004 million.

The fair value of trade and other (non-current) receivables at the acquisition date were ₩7,139 million. None of trade and other non-current receivables were expected to be uncollectible.

36. Assets Held for sale

The Group decided to dispose of Electrolyte division, 2CCL business and others, and certain portion of battery facilities with the approval of management in February 2016, January 2017, and May 2017, respectively. The related assets were reclassified as assets held for sale, and the disposal is expected to be completed in 2017. Assets and liabilities of Research Institute and FarmHwaong Co., Ltd., which is acquired during the course of the business combination of FarmHannong Co., Ltd., are also included. The disposal is expected to be completed in 2017.

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Details of assets of disposal group classified as held for sale as at June 30, 2017 and December 31, 2016, are as follows:

<i>(in millions of Korean won)</i>	June 30, 2017	December 31, 2016
Assets of disposal group		
Property, plant and equipment	7,291	7,213
Intangible assets	359	-
Other receivables and others	799	891
Total	<u>8,449</u>	<u>8,104</u>
Liabilities of disposal group		
Other payables and others	31	42
Total	<u>31</u>	<u>42</u>

Assets of the disposal group were measured at fair value immediately before the initial classification of the assets as held for sale and the related other non-operating expenses for the six-month periods ended June 30, 2017 and 2016, are as follows:

<i>(in millions of Korean won)</i>	2017	2016
Impairment loss on property, plant and equipment	10,382	1,216
Impairment loss on intangible assets	4	-
Total	<u>10,386</u>	<u>1,216</u>