

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Financial Statements
September 30, 2016 and 2015

LG Chem, Ltd. and Subsidiaries
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September 30, 2016 and 2015

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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 statements of financial position of the Group as of September 30, 2016, and the related consolidated interim statements of income and comprehensive income for the three-month and nine-month periods ended September 30, 2016 and 2015, and consolidated interim statements of changes in equity and cash flows for the nine-month periods ended September 30, 2016 and 2015, 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 reviews.

We conducted our reviews in accordance with the quarterly and 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 reviews, 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 of December 31, 2015, and the related consolidated statements of income, 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 in our audit report dated March 9, 2016. These financial statements are not included in this review report. The consolidated statement of financial position as of December 31, 2015, presented herein for comparative purposes, is consistent, in all material respects, with the above audited statement of financial position as of December 31, 2015.

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.

A handwritten signature in black ink that reads "Samil Priscuatahous Coopers". The signature is written in a cursive, flowing style.

October 31, 2016
Seoul, Korea

This report is effective as of October 31, 2016, 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 interim consolidated 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.

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Financial Position
September 30, 2016 and December 31, 2015

<i>(in millions of Korean won)</i>	Notes	September 30, 2016 (Unaudited)	December 31, 2015
ASSETS			
Current assets			
Cash and cash equivalents	3, 5, 6	1,896,079	1,704,918
Trade receivables	3, 5, 7, 32	3,177,618	3,236,622
Other receivables	3, 5, 7, 32	1,166,411	1,163,360
Prepaid income taxes		5,727	1,955
Other current financial assets	3, 5, 8, 9	-	93
Other current assets	14	245,633	203,604
Inventories	10	2,717,069	2,338,553
Non-current assets held for sale	36	67,770	6,500
Total current assets		9,276,307	8,655,605
Non-current assets			
Other receivables	3, 5, 7	244,016	106,484
Other financial assets	3, 5, 8	27,006	15,301
Investments in associates and joint ventures	1, 11, 34	276,088	293,747
Deferred income tax assets	29	114,228	98,459
Property, plant and equipment	12	9,280,793	8,867,209
Intangible assets	13	761,468	501,886
Investment properties	12	14,163	-
Other non-current assets	14	45,622	40,037
Total non-current assets		10,763,384	9,923,123
Total assets		20,039,691	18,578,728
LIABILITIES			
Current liabilities			
Trade payables	3, 5, 32	1,407,308	1,172,488
Other payables	3, 5, 32	881,414	825,606
Borrowings	3, 5, 15	2,890,001	2,150,778
Provisions	16	22,077	9,605
Income tax payables	29	126,173	338,777
Other current liabilities	3, 5, 18	206,919	301,727
Non-current liabilities held for sale	36	31	-
Total current liabilities		5,533,923	4,798,981
Non-current liabilities			
Other payables	3, 5	6,699	1,680
Borrowings	3, 5, 15	397,392	507,928
Provisions	16	157,550	26,907
Net defined benefit liabilities	17	202,314	81,192
Deferred income tax liabilities	29	39,586	30,666
Other non-current liabilities	18	29,933	27,852
Total non-current liabilities		833,474	676,225
Total liabilities		6,367,397	5,475,206

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Financial Position
September 30, 2016 and December 31, 2015

<i>(in millions of Korean won)</i>	Notes	September 30, 2016 (Unaudited)	December 31, 2015
EQUITY			
Equity attributable to owners of the Parent Company			
Share capital	1, 20	369,500	369,500
Capital surplus		1,157,772	1,157,772
Other components of equity	22	(15,699)	(15,699)
Accumulated other comprehensive loss		(134,158)	(52,608)
Retained earnings	21	12,210,427	11,532,500
		<hr/>	<hr/>
		13,587,842	12,991,465
Non-controlling interests		84,452	112,057
Total equity		13,672,294	13,103,522
		<hr/>	<hr/>
Total liabilities and equity		20,039,691	18,578,728
		<hr/>	<hr/>

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

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Income
Three-Month and Nine-Month Periods Ended September 30, 2016 and 2015

(in millions of Korean won,
except per share amounts)

	Notes	2016		2015	
		(Unaudited)		(Unaudited)	
		Three months	Nine months	Three months	Nine months
Revenue	32, 34	5,054,278	15,147,600	5,177,749	15,165,993
Cost of sales	24, 32	(4,091,441)	(12,105,539)	(4,159,918)	(12,328,545)
Gross profit		962,837	3,042,061	1,017,831	2,837,448
Selling, general and administrative expenses	23, 24, 32	(502,840)	(1,511,865)	(471,513)	(1,365,887)
Operating profit	34	459,997	1,530,196	546,318	1,471,561
Finance income	5, 26	49,896	129,940	41,265	117,372
Finance expenses	5, 26	(81,363)	(208,364)	(80,202)	(174,132)
Share of net profits (losses) of associates and joint ventures accounted for using the equity method	11	(1,489)	(6,700)	13,639	12,099
Other non-operating income	5, 27	143,027	344,957	161,951	340,400
Other non-operating expenses	5, 28, 36	(191,486)	(488,278)	(243,292)	(510,574)
Profit before income tax	33	378,582	1,301,751	439,679	1,256,726
Income tax expense	29	(81,154)	(290,714)	(97,310)	(315,237)
Profit for the period		297,428	1,011,037	342,369	941,489
Profit is attributable to:					
Owners of the Parent Company		295,600	1,012,274	350,412	942,653
Non-controlling interests		1,828	(1,237)	(8,043)	(1,164)
Earnings per share for profit attributable to owners of the Parent Company (in won)	30				
Basic and diluted earnings per ordinary share		4,019	13,762	4,764	12,815
Basic and diluted earnings per preferred share		4,031	13,799	4,777	12,853

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

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Comprehensive Income
Three-Month and Nine-Month Periods Ended September 30, 2016 and 2015

(in millions of Korean won)

	Notes	2016		2015	
		(Unaudited)		(Unaudited)	
		Three months	Nine months	Three months	Nine months
Profit for the period		297,428	1,011,037	342,369	941,489
Other comprehensive income					
Items that will not be reclassified to profit or loss:					
Remeasurements of the net defined benefit liability	17	(1,142)	(3,061)	49	(1,174)
Shares of remeasurement on net defined benefit liability of associates		2	7	-	4
Income tax effect relating to components of other comprehensive income		276	741	(12)	284
Items that will be reclassified subsequently to profit or loss:					
Exchange differences on translation of foreign operations		(89,236)	(115,331)	66,649	107,434
Gain on valuation of available-for-sale financial assets		2,397	6,255	-	-
Shares of other comprehensive loss of joint ventures and associates		(4,370)	(7,834)	(28,197)	(27,748)
Reclassification from disposal of joint ventures		-	45,215	-	-
Income tax effect relating to components of other comprehensive income		(4,365)	(17,429)	2,344	3,856
Other comprehensive income (loss) for the period, net of tax		(96,438)	(91,437)	40,833	82,656
Total comprehensive income for the period		200,990	919,600	383,202	1,024,145
Total comprehensive income for the period is attributable to:					
Owners of the Parent Company		204,711	928,411	386,506	1,017,514
Non-controlling interests		(3,721)	(8,811)	(3,304)	6,631

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

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Changes in Equity
Nine-Month Periods Ended September 30, 2016 and 2015

(in millions of Korean won)

	Notes	Attributable to owners of the Parent Company					Total	Non-controlling interests	Total equity
		Share capital	Capital surplus	Other components of equity	Accumulated other comprehensive income (loss)	Retained earnings			
Balance at January 1, 2015		369,500	1,157,772	(15,699)	(62,233)	10,690,605	12,139,945	125,907	12,265,852
Comprehensive income:									
Profit (loss) for the period		-	-	-	-	942,653	942,653	(1,164)	941,489
Remeasurements of the net defined benefit liability	17	-	-	-	-	(890)	(890)	-	(890)
Exchange differences on translation of foreign operations		-	-	-	103,495	-	103,495	7,795	111,290
Others		-	-	-	(27,748)	4	(27,744)	-	(27,744)
Total comprehensive income		-	-	-	75,747	941,767	1,017,514	6,631	1,024,145
Transactions with owners:									
Dividends	31	-	-	-	-	(294,520)	(294,520)	(14,880)	(309,400)
Others		-	-	-	-	(816)	(816)	(272)	(1,088)
Total transactions with owners		-	-	-	-	(295,336)	(295,336)	(15,152)	(310,488)
Balance at September 30, 2015 (Unaudited)		369,500	1,157,772	(15,699)	13,514	11,337,036	12,862,123	117,386	12,979,509
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		-	-	-	-	1,012,274	1,012,274	(1,237)	1,011,037
Remeasurements of the net defined benefit liability	17	-	-	-	-	(2,320)	(2,320)	-	(2,320)
Exchange differences on translation of foreign operations		-	-	-	(112,892)	-	(112,892)	(7,574)	(120,466)
Gain on valuation of available-for-sale financial assets		-	-	-	4,741	-	4,741	-	4,741
Others		-	-	-	26,601	7	26,608	-	26,608
Total comprehensive income (loss)		-	-	-	(81,550)	1,009,961	928,411	(8,811)	919,600
Transactions with owners:									
Dividends	31	-	-	-	-	(331,287)	(331,287)	(15,259)	(346,546)
Issuance of stock by subsidiaries		-	-	-	-	-	-	12,891	12,891
Business combination	35	-	-	-	-	-	-	(16,177)	(16,177)
Others		-	-	-	-	(747)	(747)	(249)	(996)
Total transactions with owners		-	-	-	-	(332,034)	(332,034)	(18,794)	(350,828)
Balance at September 30, 2016 (Unaudited)		369,500	1,157,772	(15,699)	(134,158)	12,210,427	13,587,842	84,452	13,672,294

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

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Cash Flows
Nine-Month Periods Ended September 30, 2016 and 2015

<i>(in millions of Korean won)</i>	Notes	Nine-Month Period Ended September 30	
		2016 (Unaudited)	2015 (Unaudited)
Cash flows from operating activities			
Cash generated from operations	33	2,485,840	2,478,115
Interest received		33,707	28,607
Interest paid		(51,774)	(51,944)
Dividends received		927	33,500
Income taxes paid		(546,893)	(277,262)
Net cash inflow from operating activities		1,921,807	2,211,016
Cash flows from investing activities			
Decrease in other receivables		561,539	826,195
Decrease in non-current other receivables		45,346	18,288
Proceeds from disposal of investments in joint ventures		23,724	-
Proceeds from disposal of available-for-sale financial assets		41	2,991
Proceeds from disposal of property, plant and equipment		13,141	96,796
Proceeds from disposal of intangible assets		540	2,350
Increase in other receivables		(521,888)	(960,818)
Increase in non-current other receivables		(93,875)	(33,738)
Acquisition of investments in associates and joint ventures		(17,555)	(150)
Acquisition of available-for-sale financial assets		(3,346)	(649)
Acquisition of property, plant and equipment		(956,129)	(1,113,290)
Acquisition of intangible assets		(53,072)	(53,642)
Business combination	35	(483,966)	-
Net cash outflow from investing activities		(1,485,500)	(1,215,667)
Cash flows from financing activities			
Proceeds from borrowings		620,551	118,756
Capital contribution from non-controlling interests		12,969	-
Repayments of borrowings		(510,387)	(556,116)
Dividends paid		(346,485)	(309,412)
Net cash outflow from financing activities		(223,352)	(746,772)
Net increase in cash and cash equivalents			
Cash and cash equivalents at the beginning of period		1,704,918	988,016
Effects of exchange rate changes on cash and cash equivalents		(21,794)	9,971
Cash and cash equivalents at the end of period		1,896,079	1,246,564

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

LG Chem, Ltd. and Subsidiaries

Notes to the Consolidated Interim Financial Statements

September 30, 2016 and 2015 (Unaudited), and December 31, 2015

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 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. (formerly LG Chemical Ltd.).

As of September 30, 2016, the Parent Company has its manufacturing facilities in Yeosu, Daesan, Ochang, Cheongju, Ulsan, Naju, Iksan, Paju and Gimcheon.

The Parent Company is authorized to issue 292 million shares of ordinary shares with par value of ₩5,000 per share. As of September 30, 2016, the Parent Company has issued 66,271,100 ordinary shares (₩ 331,356 million) and 7,628,921 preferred shares (₩ 38,144 million). The largest shareholder of the Parent Company is LG Corp., which owns 33.53% 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 solution, IT & Electronic materials, and Advanced materials business. In April 2016, the Parent Company acquired 100% shares of FarmHannong Co.,Ltd. (formerly Dongbu Farm Hannong 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 solution business manufactures and supplies batteries ranging from mobile batteries for mobile phones and laptop computers to automotive batteries for electric vehicles. A demand of small sized batteries for new applications such as electric tools, electric driving devices and cylindrical batteries applied to EV 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. A demand for ESS is expanding with an increasing importance of efficient usage of electricity and generation of renewable energy.

The IT & Electronic material business manufactures and supplies various kinds of IT materials such as polarizer, LCD glass, 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.

FarmHannong Co.,Ltd., a newly acquired subsidiary, 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 and developing rare breed with high profit in order to remain competitive in a future food industry.

LG Chem, Ltd. and Subsidiaries
Notes to the Consolidated Interim Financial Statements
September 30, 2016 and 2015 (Unaudited), and December 31, 2015

1.3 Consolidated Subsidiaries, Associates and Joint Ventures

	September 30, 2016			
	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.	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. ⁵	100	USA	December	Water processing membrane research and manufacturing
NanoH2O Singapore Private Ltd. ⁵	100	Singapore	December	Water processing membrane research and manufacturing
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd. ⁵	100	China	December	Water processing membrane research and manufacturing
Nanjing LG Chem New Energy Battery Co., Ltd. ⁶	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. ⁷	100	Poland	December	Automotive battery research and manufacturing
FarmHannong Co.,Ltd. ⁸	100	Korea	December	Agricultural pesticide manufacturing
Cecel.Co.,Ltd ⁸	71	Korea	December	Biologicals manufacturing
FarmCeres Co.,Ltd. ⁸	100	Korea	December	Agricultural materials distribution
FarmBiotec Co.,Ltd. ⁸	100	Korea	December	Sanitizer and insecticide for house manufacturing
AGROTECH CO.,LTD. ⁸	100	Korea	December	Agricultural pesticide manufacturing
FarmPFI Co., Ltd. ⁸	100	Korea	December	Other food additives manufacturing
FarmHwaong Co.,Ltd. ^{8,9}	58	Korea	December	Vegetables and fruit farming
SaemangeumFarm Co.,Ltd ⁸	90	Korea	December	Crop farming

LG Chem, Ltd. and Subsidiaries

Notes to the Consolidated Interim Financial Statements

September 30, 2016 and 2015 (Unaudited), and December 31, 2015

Dongbu Farm Hannong (Heilongjiang) Chemical Corp. ⁸	100	China	December	Agricultural pesticide manufacturing
Dongbu Farm Hannong Australia Pty., Ltd. ⁸	100	Australia	December	Fertilizer manufacturing and distribution

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. ¹⁰	100	Brazil	December	Sales and trading
LG Chem Malaysia SDN.BHD. ¹⁰	100	Malaysia	December	Sales and trading
LG Fuel Cell Systems Inc. ¹¹	22	USA	December	Power fuel cell research
Superfert Dongbu Pty Ltd. ⁸	50	Australia	December	Fertilizer 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
CNOOC & LG Petrochemicals Co., Ltd.	50	China	December	ABS manufacturing and sales
KLPE Limited Liability Partnership ¹²	50	Kazakhstan	December	PE manufacturing and sales

¹ As of September 30, 2016, Ningbo LG Yongxing Chemical Co.,Ltd. owns 100% of Ningbo Zhenhai LG Yongxing Trade Co., Ltd.'s shares.

² As of September 30, 2016, LG Chemical India Pvt. Ltd. owns 100% of LG Polymer India Pvt. Ltd.'s shares.

³ During the period, the Parent Company acquired additional shares of LG Chem (Nanjing) Information & Electronics Materials Co., Ltd. for ₩ 28,206 million.

⁴ As of September 30, 2016, Tianjin LG Bohai Chemical Co., Ltd. owns 20.30% of Tianjin LG BOTIAN Chemical Co., Ltd.'s shares.

⁵ As of September 30, 2016, LG NanoH2O, Inc. owns 100% of NanoH2O Singapore Private Ltd.'s shares. The Parent Company acquired 100% shares of NanoH2O (Jiangsu) Water Processing Technology Co. Ltd. for ₩ 6,400 million from NanoH2O Singapore Private Ltd during the nine-month period ended September 30, 2016.

⁶ Although the Parent Company owns 50% of the voting rights of LG Chem (Nanjing) 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.

⁷ LG Chem Wroclaw Energy sp.z o.o. was established during the nine-month period ended September 30, 2016, and the Parent Company newly acquired 100% shares of LG Chem Wroclaw Energy sp.z o.o. for ₩ 10,468 million.

⁸ The Parent Company newly acquired 100% shares of Dongbu Farm Hannong Co.,Ltd. for ₩ 424,500 million. Dongbu Farm Hannong Co.,Ltd. changed its name to FarmHannong Co.,Ltd., and the Parent Company acquired additional shares for ₩ 300,000 million during the nine-month period ended September 30, 2016. FarmHannong Co.,Ltd. holds 100% shares of FarmCeres Co.,Ltd., FarmBiotec Co.,Ltd., AGROTECH CO.,LTD., FarmPFI Co., Ltd., SaemangeumFarm

LG Chem, Ltd. and Subsidiaries
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Co.,Ltd, Dongbu Farm Hannong (Heilongjiang) Chemical Corp. and Dongbu Farm Hannong Australia Pty., Ltd., and also holds 71.05% shares of Cecel.Co.,Ltd, 57.87% shares of FarmHwaong Co.,Ltd. and 50% shares of Superfert Dongbu Pty Ltd. Meanwhile, FarmHannong Co.,Ltd. merged with FarmHungnong Co.,Ltd. and ChemGreen Energy Co.,Ltd. during the nine-month period ended September 30, 2016.

⁹ As of September 30, 2016, FarmHwaong Co.,Ltd.'s assets and liabilities are classified as non-current assets and liabilities held for sale (Note 36).

¹⁰ Classified as an investment in associate due to its small size.

¹¹ The Parent Company acquired additional shares of LG Fuel Cell Systems Inc. for ₩ 17,555 million during the nine-month period ended September 30, 2016.

¹² The Parent Company decided to discontinue the business of KLPE Limited Liability Partnership and collected ₩ 23,724 million of investments through capital reduction with consideration (Note 11).

LG Chem, Ltd. and Subsidiaries
Notes to the Consolidated Interim Financial Statements
September 30, 2016 and 2015 (Unaudited), and December 31, 2015

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)

	September 30, 2016				
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the period
Consolidated subsidiaries					
Ningbo LG Yongxing Chemical Co.,Ltd.	578,685	201,451	377,234	1,094,367	49,223
Ningbo Zhenhai LG Yongxing Trade Co.,Ltd.	6,286	3,815	2,471	24,040	515
LG Chem HK Ltd.	97,430	80,231	17,199	374,648	698
LG Chem America, Inc.	181,497	163,989	17,508	479,060	2,031
LG Chemical India Pvt. Ltd.	32,676	59	32,617	-	8
LG Polymers India Pvt. Ltd.	92,081	28,128	63,953	154,327	9,354
LG Chemical (Guangzhou) Engineering Plastics Co.,Ltd.	94,603	31,491	63,112	110,149	4,829
LG Chem (Nanjing) Information & Electronics Materials Co.,Ltd.	2,133,989	1,476,575	657,414	1,629,011	(33,424)
LG Chem (Taiwan), Ltd.	114,600	53,867	60,733	145,996	4,006
LG Chem Display Materials (Beijing) Co.,Ltd.	33,635	7,446	26,189	43,091	1,867
Tianjin LG Bohai Chemical Co.,Ltd.	314,394	271,111	43,283	316,887	(52,155)
Tianjin LG BOTIAN Chemical Co.,Ltd.	54,868	53,284	1,584	101,218	10,863
LG Chem (China) Investment Co.,Ltd.	310,250	202,607	107,643	38,637	5,560
LG Chem (Tianjin) Engineering Plastics Co.,Ltd.	56,441	11,270	45,171	67,798	3,152
LG Chem Europe GmbH	174,166	148,352	25,814	314,630	8,649
LG Chem Poland Sp. z o.o.	48,192	18,632	29,560	58,060	2,806
LG Chem Michigan Inc.	209,995	143,757	66,238	151,158	34,422
LG Chem Power Inc.	23,751	17,275	6,476	29,581	4,469
LGC Petrochemical India Private Ltd.	1,911	428	1,483	3,036	342
HAENGBOKNURI CO.,LTD.	1,808	647	1,161	4,372	7
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	3,651	2,299	1,352	16,774	285
LG Chem Japan Co.,Ltd.	3,066	259	2,807	4,096	438
LG NanoH2O, Inc. ¹	12,494	6,867	5,627	11,518	(80)
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	5,978	-	5,978	-	(29)
Nanjing LG Chem New Energy Battery Co.,Ltd.	238,415	195,782	42,633	65,265	(8,288)
LG Chem (Chongqing) Engineering Plastics Co.,Ltd.	35,804	29,653	6,151	4,601	(1,773)
LG Chem Wroclaw Energy sp. z o.o.	10,468	-	10,468	-	-
FarmHannong Co.,Ltd. ¹	1,135,914	582,844	553,070	275,122	(87,266)
Associates					
LG Holdings (HK) Ltd.	356,852	92,247	264,605	26,220	13,642
TECWIN Co., Ltd.	54,375	20,160	34,215	-	-
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	92	90	2	-	-
LG Chem Malaysia SDN.BHD.	188	25	163	-	-
LG Fuel Cell Systems Inc.	65,421	66,870	(1,449)	1,787	(35,266)
Joint ventures					
LG VINA Chemical Co., Ltd.	17,558	9,313	8,245	39,469	1,715
HL Greenpower Co., Ltd.	132,309	100,203	32,106	118,634	(1,694)
SEETEC Co., Ltd.	378,335	41,937	336,398	348,379	12,440
CNOOC & LG Petrochemicals Co., Ltd.	241,965	232,755	9,210	174,267	(18,314)

LG Chem, Ltd. and Subsidiaries

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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, 2015				
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the year
Consolidated subsidiaries					
Tianjin LG DAGU Chemical Co.,Ltd. ¹	-	-	-	270,731	(10,510)
Ningbo LG Yongxing Chemical Co.,Ltd.	663,855	241,238	422,617	1,565,866	78,702
Ningbo Zhenhai LG Yongxing Trade Co.,Ltd.	7,592	5,421	2,171	20,397	396
LG Chem HK Ltd.	141,299	123,634	17,665	526,785	519
LG Chem America, Inc.	140,912	124,340	16,572	651,564	1,348
LG Chemical India Pvt. Ltd.	32,714	24	32,690	56	75
LG Polymers India Pvt. Ltd.	83,470	24,269	59,201	191,675	5,508
LG Chemical (Guangzhou) Engineering Plastics Co.,Ltd.	99,325	33,686	65,639	143,607	10,930
LG Chem (Nanjing) Information & Electronics Materials Co.,Ltd.	1,806,199	1,093,230	712,969	2,089,196	28,648
LG Chem (Taiwan), Ltd.	128,178	60,282	67,896	254,171	11,375
LG Chem Display Materials (Beijing) Co.,Ltd.	38,551	11,920	26,631	78,270	2,278
Tianjin LG Bohai Chemical Co.,Ltd.	376,831	277,324	99,507	391,032	(95,576)
Tianjin LG BOTIAN Chemical Co.,Ltd.	58,701	68,109	(9,408)	128,770	11,327
LG Chem (China) Investment Co.,Ltd.	170,212	65,865	104,347	46,435	5,881
LG Chem (Tianjin) Engineering Plastics Co.,Ltd.	60,359	14,347	46,012	89,033	5,709
LG Chem Europe GmbH	121,161	102,859	18,302	338,029	3,924
LG Chem Poland Sp. z o.o.	60,186	31,880	28,306	79,101	973
LG Chem Michigan Inc.	207,006	170,928	36,078	91,710	8,345
LG Chem Power Inc.	9,258	6,811	2,447	34,524	1,998
LGC Petrochemical India Private Ltd.	1,380	159	1,221	3,645	376
HAENGBOKNURI CO.,LTD	1,823	669	1,154	4,803	229
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	3,020	1,835	1,185	33,139	834
LG Chem Japan Co.,Ltd.	2,450	329	2,121	4,500	499
LG NanoH2O, Inc.	25,184	19,506	5,678	19,730	(21,198)
Nanjing LG Chem New Energy Battery Co.,Ltd.	83,282	41,949	41,333	737	(3,541)
LG Chem (Chongqing) Engineering Plastics Co.,Ltd.	9,666	1,133	8,533	-	(823)
Associates					
LG Holdings (HK) Ltd.	388,565	114,797	273,768	53,235	15,067
TECWIN Co., Ltd.	54,375	20,160	34,215	63,834	2,725
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	92	90	2	1,515	104
LG Chem Malaysia SDN.BHD.	188	25	163	334	28
LG Fuel Cell Systems Inc.	37,788	69,553	(31,765)	2,388	(38,309)
Joint ventures					
LG VINA Chemical Co.,Ltd.	18,172	8,839	9,333	59,739	2,131
HL Greenpower Co., Ltd.	97,772	63,978	33,794	102,388	(2,510)
SEETEC Co., Ltd.	372,616	48,658	323,958	507,701	19,121
CNOOC & LG Petrochemicals Co.,Ltd.	287,448	258,875	28,573	221,192	(27,835)
KLPE Limited Liability Partnership	191,947	8,884	183,063	-	51,128

¹ During 2015, Tianjin LG Bohai Chemical Co., Ltd. merged with Tianjin LG DAGU Chemical Co., Ltd. The financial information above was the information before the merger.

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1.5 Changes in Scope for Consolidation

Subsidiaries newly included in the consolidation for the nine-month period ended September 30, 2016, are as follows:

Subsidiary	Reason
FarmHannong Co.,Ltd.	Business combination
Cecel.Co.,Ltd	Business combination
FarmCeres Co.,Ltd.	Business combination
FarmBiotec Co.,Ltd.	Business combination
AGROTECH CO.,LTD.	Business combination
FarmPFI Co., Ltd.	Business combination
FarmHwaong Co.,Ltd.	Business combination
SaemangeumFarm Co.,Ltd	Business combination
FarmHungnong Co.,Ltd.	Business combination
ChemGreen Energy Co.,Ltd	Business combination
Dongbu Farm Hannong (Heilongjiang) Chemical Corp.	Business combination
Dongbu Farm Hannong Australia Pty., Ltd.	Business combination
LG Chem Wroclaw Energy sp. z o.o.	Newly established

Subsidiaries excluded from the consolidation for the nine-month period ended September 30, 2016, are as follows:

Subsidiary	Reason
FarmHungnong Co.,Ltd.	Merged with FarmHannong Co.,Ltd.
ChemGreen Energy Co.,Ltd	Merged with FarmHannong Co.,Ltd.

2. 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.

Certain information attached to the Korean language financial statements, but not required for a fair presentation of the Group's financial position, financial performance or cash flows, is not presented in the accompanying consolidated interim financial statements.

The Group's consolidated interim financial statements for the nine-month period ended September 30, 2016, 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 of September 30, 2016.

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Notes to the Consolidated Interim Financial Statements

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(a) New and amended standards adopted by the Group

The Group newly applied the following amended and enacted standards and interpretations for the annual period beginning on January 1, 2016, and this application does not have a material impact on the financial statements.

- Amendment to Korean IFRS 1001, *Presentation of Financial Statements*
- Amendment to Korean IFRS 1011, *Construction Contract*; Korean IFRS 1037, *Provisions, Contingent Liabilities and Contingent Assets*; and Interpretation 2115, *Arrangements for Property Construction*
- Amendment to Korean IFRS 1016, *Property, Plant and Equipment*, and Korean IFRS 1041, *Agriculture and Fishing: Productive Plants*
- Amendment to Korean IFRS 1016, *Property, Plant and Equipment*, and Korean IFRS 1038, *Intangible assets: Amortization Based on Revenue*
- Amendment to Korean IFRS 1110, *Consolidated Financial Statements*, Korean IFRS 1112, *Disclosures of Interests in Other Entities* and Korean IFRS 1028, *Investments in Associates and Joint Ventures*
- Amendment to Korean IFRS 1111, *Joint Arrangements*
- Annual Improvements to Korean IFRS 2012-2014 Cycle

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

- Korean IFRS 1109, *Financial Instruments*
- Korean IFRS 1115, *Revenue from Contracts with Customers*

2.2 Accounting Policies

Significant accounting policies and method adopted in the preparation of the consolidated interim financial statements are consistent with those of the consolidated financial statements for the year ended December 31, 2015, 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.

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 Group's financial performance. The Group uses derivative financial instruments to hedge certain 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.

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(1) Market risk

1) Foreign exchange risk

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

Management has set up a policy to require consolidated 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 of September 30, 2016 and December 31, 2015, 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>	September 30, 2016		December 31, 2015	
	Assets	Liabilities	Assets	Liabilities
USD	1,714,816	2,772,766	1,789,793	2,440,000
EUR	105,101	130,063	78,023	127,879
JPY	22,223	106,044	16,686	135,589
GBP and others	38,573	2,206	43,027	1,318

As of September 30, 2016 and December 31, 2015, if the Group's functional currency had weakened / strengthened by 10% against the US dollar with all other variables held constant, profit before tax for the period would have been affected as follows:

<i>(in millions of Korean won)</i>	September 30, 2016		December 31, 2015	
	10% Increase	10% Decrease	10% Increase	10% Decrease
USD	(105,795)	105,795	(65,021)	65,021

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 because of investments held by the Group and classified as available-for-sale. The Group's investments in equity of other entities that are publicly traded are related to KOSPI index.

The impact of increases/decreases of the listed stock price indices on the Group's equity before tax effects as of September 30, 2016 and December 31, 2015, is as follows. The analysis is based on the assumption that the stock price indices had increased/decreased by 10% with all other variables held constant and all the Group's listed equity securities moved according to the historical correlation with the index.

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<i>(in millions of Korean won)</i>	September 30, 2016		December 31, 2015	
	10% Increase	10% Decrease	10% Increase	10% Decrease
KOSPI	1,508	(1,508)	1,067	(1,067)

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 caused by fluctuations in interest rates and minimizing 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 impact of 1% (100 basis points) higher/lower of interest rate with all other variables held constant on the Group's post-tax profit for the nine-month periods ended September 30, 2016 and 2015, and on equity as of September 30, 2016 and 2015, is as follows:

<i>(in millions of Korean won)</i>	Impact on post-tax profit		Impact on equity	
	2016	2015	2016	2015
Increase	(19,077)	(17,949)	(19,077)	(17,949)
Decrease	19,077	17,949	19,077	17,949

(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 of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016		
	Before allowance	Allowance for doubtful accounts	Book value (maximum exposure)
Loans and receivables (excluding cash on hand)	6,518,816	(34,757)	6,484,059
Financial assets at fair value through profit or loss	-	-	-
Total	6,518,816	(34,757)	6,484,059

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<i>(in millions of Korean won)</i>	December 31, 2015		
	Before allowance	Allowance for doubtful accounts	Book value (maximum exposure)
Loans and receivables (excluding cash on hand)	6,224,592	(13,270)	6,211,322
Financial assets at fair value through profit or loss	93	-	93
Total	6,224,685	(13,270)	6,211,415

Details of financial guarantees provided by the Group are disclosed in Notes 3.1.(3) and 19.

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 if 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.

(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 on any of its borrowing facilities. Such forecasting takes into consideration the Group's debt financing plans, covenant compliance, compliance with internal statement of financial position ratio targets and, if applicable external regulatory or legal requirements - for example, currency restrictions.

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

(in millions of Korean won)

	September 30, 2016			
	Less than 1 year	1 to 2 years	2 to 5 years	Over 5 years
Borrowings (excluding finance lease liabilities)	2,914,433	281,541	91,597	-
Finance lease liabilities	5,000	5,000	15,000	17,500
Trade and other payables	2,288,722	5,994	531	174
Total	5,208,155	292,535	107,128	17,674

(in millions of Korean won)

	December 31, 2015			
	Less than 1 year	1 to 2 years	2 to 5 years	Over 5 years
Borrowings (excluding finance lease liabilities)	2,168,916	429,876	51,354	-
Finance lease liabilities	5,000	5,000	15,000	20,000
Trade and other payables	1,998,094	1,680	-	-
Total	4,172,010	436,556	66,354	20,000

- 2) The Group has no derivatives contracts as of September 30, 2016. The table below analyzes the derivatives into relevant maturity groupings based on the remaining maturity as of December 31, 2015.

(in millions of Korean won)

	December 31, 2015			
	Less than 1 year	1 to 2 years	2 to 5 years	Over 5 years
Gross settled derivatives				
Trading derivatives inflow	23,533	-	-	-
Trading derivatives outflow	(23,440)	-	-	-
Total	93	-	-	-

- 3) The Group has no financial guarantee contracts as of September 30, 2016 and December 31, 2015.

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 in order 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 of September 30, 2016 and December 31, 2015, are as follows:

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<i>(in millions of Korean won, except for ratios)</i>	September 30, 2016	December 31, 2015
Total borrowings (Note 15) (A)	3,287,393	2,658,706
Less: cash and cash equivalents (B)	<u>(1,896,079)</u>	<u>(1,704,918)</u>
Net debt (C=A+B)	<u>1,391,314</u>	<u>953,788</u>
Total liabilities (D)	6,367,397	5,475,206
Total equity (E)	13,672,294	13,103,522
Total capital (F=C+E)	15,063,608	14,057,310
Gearing ratio (C/F)	9.2%	6.8%
Debt-to-equity ratio (D/E)	46.6%	41.8%

3.3 Fair Value

(1) Carrying amount and fair value of financial instruments by category as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	<u>September 30, 2016</u>		<u>December 31, 2015</u>	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial assets (current)				
Cash and cash equivalents	1,896,079	1	1,704,918	1
Financial deposits	981,963	1	988,628	1
Trade receivables	3,177,618	1	3,236,622	1
Other receivables (excluding financial deposits)	184,448	1	174,732	1
Derivative financial instruments	-	-	93	93
Financial assets (non-current)				
Financial deposits	64,750	1	21,418	1
Other non-current receivables (excluding financial deposits)	179,266	1	85,066	1
Other non-current financial assets (carried at cost)	11,523	2	6,055	2
Other non-current financial assets (carried at fair value)	15,483	15,483	9,246	9,246
Financial liabilities (current)				
Trade and other payables	2,288,722	1	1,998,094	1
Current borrowings (excluding finance lease liabilities)	2,885,078	1	2,145,893	1
Current finance lease liabilities	4,923	1	4,885	1
Dividends payable	12	1	1,055	1
Financial liabilities (non-current)				
Non-current borrowings (excluding finance lease liabilities)	364,947	1	473,842	479,411
Non-current finance lease liabilities	32,445	34,609	34,086	35,361
Other non-current payables	6,699	1	1,680	1

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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 and are measured at cost (September 30, 2016: ₩ 11,523 million, December 31, 2015: ₩ 6,055 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 these available-for-sale equity securities in the near future.

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

1) Derivative financial instruments

The Group determines derivative financial instruments based on current market conditions. These valuation techniques maximize the use of observable market data where it is available and rely as little as possible on entity specific estimates. The fair value of derivative financial instruments is determined using forward exchange rates at the end of the reporting period with the resulting value discounted back to present value.

2) Financial liabilities (non-current)

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 of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Discount rate	1.43%~1.90%	1.88%~2.60%

(3) Fair value hierarchy

Assets measured at fair value or for which the fair value is disclosed are categorized within the fair value hierarchy, 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).

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Fair value hierarchy classifications of the financial assets and financial liabilities that are measured at fair value or its fair value is disclosed as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016			
	Level 1	Level 2	Level 3	Total
Financial assets/liabilities that are measured at fair value				
Other non-current financial assets (carried at fair value)	15,483	-	-	15,483
Non-current financial lease liabilities	-	34,609	-	34,609

(in millions of Korean won)

	December 31, 2015			
	Level 1	Level 2	Level 3	Total
Financial assets/liabilities that are measured at fair value				
Derivative financial instruments	-	93	-	93
Other non-current financial assets (carried at fair value)	9,246	-	-	9,246
Non-current borrowings (excluding finance lease liabilities)	-	479,411	-	479,411
Non-current financial lease liabilities	-	35,361	-	35,361

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.

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5. Financial Instruments by Category

Categorizations of financial instruments as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

Financial assets	September 30, 2016			Total
	Loans and receivables	Financial assets at fair value through profit or loss	Available-for-sale financial assets	
Cash and cash equivalents	1,896,079	-	-	1,896,079
Trade receivables	3,177,618	-	-	3,177,618
Other receivables	1,166,411	-	-	1,166,411
Other non-current receivables	244,016	-	-	244,016
Other non-current financial assets	-	-	27,006	27,006
Total	6,484,124	-	27,006	6,511,130

(in millions of Korean won)

Financial liabilities	September 30, 2016			Total
	Financial liabilities at fair value through profit or loss	Other financial liabilities at amortized cost	Other financial liabilities ¹	
Trade payables	-	1,407,308	-	1,407,308
Other payables	-	881,414	-	881,414
Borrowings (current)	-	1,896,446	993,555	2,890,001
Other current liabilities (dividends payable)	-	12	-	12
Other non-current payables	-	6,699	-	6,699
Borrowings (non-current)	-	364,947	32,445	397,392
Total	-	4,556,826	1,026,000	5,582,826

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Financial assets	December 31, 2015			
	Loans and receivables	Financial assets at fair value through profit or loss	Available-for-sale financial assets	Total
Cash and cash equivalents	1,704,918	-	-	1,704,918
Trade receivables	3,236,622	-	-	3,236,622
Other receivables	1,163,360	-	-	1,163,360
Other current financial assets	-	93	-	93
Other non-current receivables	106,484	-	-	106,484
Other non-current financial assets	-	-	15,301	15,301
Total	6,211,384	93	15,301	6,226,778

(in millions of Korean won)

Financial liabilities	December 31, 2015			
	Financial liabilities at fair value through profit or loss	Other financial liabilities at amortized cost	Other financial liabilities ¹	Total
Trade payables	-	1,172,488	-	1,172,488
Other payables	-	825,606	-	825,606
Borrowings (current)	-	1,113,312	1,037,466	2,150,778
Other current liabilities (dividends payable)	-	1,055	-	1,055
Other non-current payables	-	1,680	-	1,680
Borrowings (non-current)	-	473,842	34,086	507,928
Total	-	3,587,983	1,071,552	4,659,535

¹ Other financial liabilities include capital lease liabilities that have been excluded from the scope of 'financial liabilities by category' and financial liabilities related to transfer transactions not qualified for derecognition.

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Net gains (losses) on each category of financial instruments for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Financial assets at fair value through profit or loss				
Loss on valuation/ disposal (profit or loss)	-	(1,501)	(2,763)	(2,043)
Available-for-sale financial assets				
Gain on disposal	-	18	-	32
Dividend income	-	-	-	-
Loans and receivables				
Interest income	9,423	30,707	8,485	28,136
Gain (loss) on foreign currency translation	(32,376)	(44,730)	6,814	42,674
Gain (loss) on foreign exchange	(95,008)	(95,140)	122,660	112,960
Other financial liabilities at amortized cost				
Interest expense	(17,616)	(51,144)	(13,514)	(42,510)
Gain (loss) on foreign currency translation	16,399	(11,719)	(39,885)	(54,056)
Gain (loss) on foreign exchange	9,145	(11,981)	(63,322)	(70,090)
Loss on redemption of debentures	-	(3,031)	-	-
Other financial liabilities				
Interest expense	(3,152)	(8,813)	(2,518)	(7,329)
Gain (loss) on foreign currency translation	16,351	20,358	2,597	(21,078)
Gain (loss) on foreign exchange	45,549	45,281	(70,444)	(60,275)

6. Cash and Cash Equivalents

Details of cash and cash equivalents as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016	December 31, 2015
Bank deposits and cash on hand	430,161	272,824
Financial deposits, others	1,465,918	1,432,094
Total	1,896,079	1,704,918

As of September 30, 2016, deposits amounting to ₩ 5,827 million (December 31, 2015: ₩ 8,667 million), which are held by a subsidiary and restricted for remittance to the Parent Company due to regulation on foreign currency in the relevant country, are included in cash and cash equivalents.

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7. Trade and Other Receivables

Trade and other receivables, net of allowance for doubtful accounts, as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016		
	Original amount	Allowance for doubtful accounts	Carrying amount
Trade receivables ¹	3,190,810	(13,192)	3,177,618
Other current receivables	1,186,986	(20,575)	1,166,411
Other non-current receivables ²	245,006	(990)	244,016
Total	4,622,802	(34,757)	4,588,045

(in millions of Korean won)

	December 31, 2015		
	Original amount	Allowance for doubtful accounts	Carrying amount
Trade receivables ¹	3,249,561	(12,939)	3,236,622
Other current receivables	1,163,691	(331)	1,163,360
Other non-current receivables ²	106,484	-	106,484
Total	4,519,736	(13,270)	4,506,466

¹ As of September 30, 2016, trade receivables transferred to financial institutions have been accounted for as a collateralized borrowing and the financial assets not fully derecognized are as follows (Note 15):

(in millions of Korean won)

	Loans and receivables (trade receivables collateralized borrowings)	
	September 30, 2016	December 31, 2015
Carrying amount of transferred assets	988,632	1,032,581
Carrying amount of related liabilities	(988,632)	(1,032,581)

² As of September 30, 2016, ₩ 858 million of other non-current receivables represents deposits which are restricted from withdrawal in connection with maintaining checking accounts (December 31, 2015: ₩ 3,318 million).

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Details of other receivables as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Current		
Non-trade receivables	137,593	127,621
Financial deposits ¹	981,963	988,628
Accrued income	5,298	7,944
Loans	13,611	12,452
Deposits	27,946	26,715
	<u>1,166,411</u>	<u>1,163,360</u>
Non-current		
Non-trade receivables	27,422	29,316
Financial deposits ²	64,750	21,418
Loans	319	318
Deposits	151,525	55,432
	<u>244,016</u>	<u>106,484</u>
Total	<u>1,410,427</u>	<u>1,269,844</u>

¹ As of September 30, 2016, ₩ 1,338 million is pledged as collateral for borrowings and others.

² As of September 30, 2016, ₩ 63,400 million is restricted from being withdrawn in relation to large, small and medium-sized companies corporation agreement and others.

The aging analysis of these trade and other receivables as of September 30, 2016 and December 31, 2015, is as follows:

<i>(in millions of Korean won)</i>	September 30, 2016		December 31, 2015	
	Trade receivables	Other receivables	Trade receivables	Other receivables
Receivables not past due	<u>3,116,348</u>	<u>1,398,133</u>	<u>3,149,419</u>	<u>1,256,491</u>
Past due but not impaired				
Up to 3 months	58,653	3,509	68,341	5,797
3 to 6 months	2,671	3,485	9,277	2,869
Over 6 months	2,420	5,630	2,618	5,018
	<u>63,744</u>	<u>12,624</u>	<u>80,236</u>	<u>13,684</u>
Impaired receivables	<u>10,718</u>	<u>21,235</u>	<u>19,906</u>	<u>-</u>
	<u>3,190,810</u>	<u>1,431,992</u>	<u>3,249,561</u>	<u>1,270,175</u>

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Movements on the allowances for doubtful accounts for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	12,939	-	331	-
Business combination	1,237	-	21,644	990
Additions	616	-	-	-
Write-off	-	-	-	-
Reversals	-	-	(256)	-
Exchange differences	(1,600)	-	(1,144)	-
Ending balance	13,192	-	20,575	990

(in millions of Korean won)

	December 31, 2015			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	16,581	-	-	-
Business combination	-	-	-	-
Additions	-	-	331	-
Write-off	(777)	-	-	-
Reversals	(2,506)	-	-	-
Exchange differences	(359)	-	-	-
Ending balance	12,939	-	331	-

As of September 30, 2016 and December 31, 2015, the carrying amounts of trade and other receivables are approximation of their fair values.

8. Other Financial Assets

Details of other financial assets as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016	December 31, 2015
Other financial assets		
Derivative financial assets (Note 9)	-	93
Available-for-sale financial assets	27,006	15,301
Less: current portion	-	(93)
	27,006	15,301

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Changes in available-for-sale financial assets for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Beginning balance	15,301	6,153
Business combination	2,270	-
Acquisition/ Transfer	3,351	12,852
Disposal	(23)	(2,959)
Gain (loss) on valuation (before income tax effect)	6,255	(780)
Exchange differences	(148)	35
Ending balance	<u>27,006</u>	<u>15,301</u>
Less: current portion	-	-
	<u>27,006</u>	<u>15,301</u>

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

No impairment losses on available-for-sale financial assets were recognized for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015.

9. Derivative Financial Instruments

Details of derivative financial assets and liabilities as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016		December 31, 2015	
	Assets	Liabilities	Assets	Liabilities
Current				
Held-for-trading	-	-	93	-
	<u>-</u>	<u>-</u>	<u>93</u>	<u>-</u>

The Group has no derivative contracts as of September 30, 2016. Details of derivative financial contracts as of December 31, 2015, are as follows:

Classification	Contractor	Contract date	December 31, 2015		
			Contract amount (in thousands)	Contract period	Contract terms
Forward exchange	Two contracts in Woori bank	2015.12.21, others	US\$ 10,000, Others	2016.01.04 ~ 2016.01.05	₩1,177.60/ US\$ 1, others

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10. Inventories / Biological assets

Details of inventories as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016		
	Acquisition cost	Valuation allowance	Carrying amount
Merchandise	99,293	(3,230)	96,063
Finished products	891,770	(47,509)	844,261
Semi-finished products	601,286	(29,438)	571,848
Work in progress ¹	735	-	735
Raw materials	787,413	(10,134)	777,279
Supplies	110,223	-	110,223
Materials-in-transit	316,660	-	316,660
Total	2,807,380	(90,311)	2,717,069

(in millions of Korean won)

	December 31, 2015		
	Acquisition cost	Valuation allowance	Carrying amount
Merchandise	77,133	(1,264)	75,869
Finished products	899,341	(45,135)	854,206
Semi-finished products	416,435	-	416,435
Work in progress ¹	275	-	275
Raw materials	658,564	(4,036)	654,528
Supplies	99,811	-	99,811
Materials-in-transit	237,429	-	237,429
Total	2,388,988	(50,435)	2,338,553

¹ Biological assets are included in work in progress, and details of net fair value amount by biological asset group as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)	September 30, 2016	December 31, 2015	Remark
Work in progress	56	-	Bees for pollination

Fair value of the Group's biological assets applied a standard selling price based on actual selling price to external customers and the standard unit price is set based on the Group's recent trading price.

During the nine-month period ended September 30, 2016, the cost of inventories amounting to ₩ 8,941,112 million (2015: ₩ 9,184,613 million) was recognized as expense and included in 'cost of sales'.

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11. Investments in Associates and Joint Ventures

Changes in investments in associates and joint ventures for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016								
	Beginning balance	Acquisitions /transfer	Dividends	Share of profit (loss) of associates	Share of other comprehensive loss of associates	Impairment loss	Disposal	Others	Ending balance
LG VINA Chemical Co., Ltd.	3,742	-	(926)	686	(195)	-	-	-	3,307
HL Greenpower Co., Ltd.	16,559	-	-	(830)	-	-	-	7	15,736
LG Holdings (HK) Ltd.	73,012	-	-	3,547	(5,929)	-	-	-	70,630
TECWIN Co., Ltd.	6,535	-	-	679	-	-	-	-	7,214
SEETEC Co., Ltd.	155,539	-	-	7,525	-	-	-	-	163,064
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	(576)	-	-	-	-	3
LG Chem Malaysia SDN.BHD	150	-	-	13	-	-	-	-	163
CNOOC & LG Petrochemicals Co., Ltd.	14,287	-	-	(9,157)	(524)	-	-	-	4,606
KLPE Limited Liability Partnership	20,079	-	-	264	(582)	-	(19,761)	-	-
LG Fuel Cell Systems Inc.	3,265	17,555	-	(8,851)	(604)	-	-	-	11,365
Superfert Dongbu Pty Ltd	-	-	-	-	-	-	-	-	-
	<u>293,747</u>	<u>17,555</u>	<u>(926)</u>	<u>(6,700)</u>	<u>(7,834)</u>	<u>-</u>	<u>(19,761)</u>	<u>7</u>	<u>276,088</u>

(in millions of Korean won)

	December 31, 2015								
	Beginning balance	Acquisitions /transfer	Dividends	Share of profit (loss) of associates	Share of other comprehensive income (loss) of associates	Impairment loss	Disposal	Others	Ending balance
LG VINA Chemical Co., Ltd.	3,682	-	(993)	861	192	-	-	-	3,742
HL Greenpower Co., Ltd.	17,815	-	-	(1,266)	-	-	-	10	16,559
LG Holdings (HK) Ltd.	68,121	-	-	3,918	973	-	-	-	73,012
TECWIN Co., Ltd.	6,155	-	-	383	(3)	-	-	-	6,535
SEETEC Co., Ltd.	177,767	-	(33,500)	11,276	-	-	-	(4)	155,539
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	-	150	-	-	-	-	-	-	150
CNOOC & LG Petrochemicals Co., Ltd.	27,864	-	-	(13,918)	341	-	-	-	14,287
KLPE Limited Liability Partnership ¹	175,414	-	-	18,683	(34,089)	(139,929)	-	-	20,079
LG Fuel Cell Systems Inc.	12,053	-	-	(8,924)	141	-	-	(5)	3,265
	<u>489,450</u>	<u>150</u>	<u>(34,493)</u>	<u>11,013</u>	<u>(32,445)</u>	<u>(139,929)</u>	<u>-</u>	<u>1</u>	<u>293,747</u>

¹ During 2015, the Kazakhstan KLPE Limited Liability Partnership, managed as a separate cash-generating unit (hereafter 'CGU') in Basic materials & Chemicals segments, has been tested for impairment because its economic performance is lower than expected. The recoverable amounts of CGU have been determined based on value-in-use calculations.

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During 2015, the amount of impairment loss recognized as other non-operating expenses and key assumptions used for calculation of value in use are as follows:

<i>(in millions of Korean won)</i>	December 31, 2015
	KLPE Limited Liability Partnership
Impaired amount	139,929
Pre-tax discount rate	8.8%
Growth rate for subsequent years after five years	0.0%

12. Property, Plant, Equipment and Investment Properties

Changes in property, plant and equipment for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 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)	412,422	49,286	6,684	126,551	937	3,451	2,293	-	2,465	-	604,089
Acquisitions/ Transfer	-	139,148	42,307	609,981	1,031	113,614	31,800	29,346	915,937	38,237	1,921,401
Disposals/ Transfer	(1,439)	(4,967)	(98)	(8,891)	(16)	(5,152)	(538)	-	(975,844)	(25,953)	(1,022,898)
Exchange differences	(492)	(30,443)	(4,312)	(103,811)	(56)	(7,973)	(1,879)	-	18,972	-	(129,994)
Depreciation	-	(47,501)	(33,765)	(705,885)	(2,767)	(92,653)	(23,085)	(48,627)	-	-	(954,283)
Impairment	-	(243)	(1)	(1,961)	-	(56)	(164)	-	-	-	(2,425)
Transfer to non-current assets held for sale (Note 36)	-	-	-	(1,685)	-	(162)	(459)	-	-	-	(2,306)
Ending balance	1,320,732	2,115,289	617,312	4,142,573	8,653	360,904	90,509	116,156	485,844	22,821	9,280,793
Cost	1,322,599	2,684,369	1,097,159	12,192,846	40,583	949,477	309,349	237,270	526,194	22,821	19,382,667
Accumulated depreciation	-	(546,106)	(466,571)	(8,013,339)	(31,790)	(579,731)	(217,203)	(121,114)	-	-	(9,975,854)
Accumulated impairment	(1,867)	(22,974)	(13,276)	(36,934)	(140)	(8,842)	(1,637)	-	(40,350)	-	(126,020)

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	December 31, 2015										
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Construction-in-progress	Machinery-in-transit	Total
Beginning balance	910,503	1,965,575	573,870	4,079,635	8,788	308,911	89,214	85,194	593,115	84,731	8,699,536
Cost	911,867	2,436,140	978,989	10,880,815	36,885	737,092	269,026	251,722	643,843	84,731	17,231,110
Accumulated depreciation	-	(446,856)	(393,474)	(6,707,065)	(27,958)	(419,906)	(178,020)	(166,528)	-	-	(8,339,807)
Accumulated impairment	(1,364)	(23,709)	(11,645)	(94,115)	(139)	(8,275)	(1,792)	-	(50,728)	-	(191,767)
Acquisitions/ Transfer	49	151,299	77,079	1,188,477	4,696	180,650	26,105	113,412	1,492,527	84,262	3,318,556
Disposals/ Transfer	(1)	(51,839)	(1,057)	(145,462)	(442)	(22,908)	(3,747)	-	(1,575,993)	(158,456)	(1,959,905)
Exchange differences	193	5,191	614	5,705	14	1,205	278	-	4,324	-	17,524
Depreciation	-	(60,175)	(42,635)	(900,488)	(3,528)	(116,268)	(29,335)	(63,169)	-	-	(1,215,598)
Impairment	(503)	(7,846)	(1,376)	(4,449)	(13)	(2,118)	(218)	-	(204)	-	(16,727)
Reversal of impairment	-	7,804	2	11,250	9	469	244	-	10,545	-	30,323
Transfer to non-current assets held for sale (Note 36)	-	-	-	(6,394)	-	(106)	-	-	-	-	(6,500)
Ending 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)

During the nine-month period ended September 30, 2016, the Group capitalized ₩ 3,834 million of borrowing costs (2015: ₩ 3,831 million), which recognized from borrowing in relation to acquisition of property, plant and equipment, to property, plant and equipment. The capitalization rate of borrowings used to determine the amount of borrowing costs eligible for capitalization is 1.85% (2015: 1.88%).

As of September 30, 2016, certain property, plant and equipment have been pledged as collateral for borrowings and credit line agreements (Note 19).

Line items including depreciation in the statements of income for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)	2016		2015	
	Three months	Nine months	Three months	Nine months
Cost of sales	299,910	889,453	286,856	846,063
Selling, general and administrative expenses	22,552	63,687	18,458	54,871
Others	561	1,143	41	287
Total	323,023	954,283	305,355	901,221

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Details of machinery classified as a finance lease as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Cost- capitalized finance leases	42,669	42,669
Accumulated depreciation	<u>(7,467)</u>	<u>(4,267)</u>
Net book value	<u>35,202</u>	<u>38,402</u>

The Group has entered into non-cancellable finance lease contracts with lease term of ten years in regard to machineries, and the contract includes an agreement that the ownership of the assets is transferred by the end of the lease term.

The Group reviews annually to determine if there is any indication that property, plant and equipment may be impaired.

During 2015, LED Encap division, managed as separate CGU in advanced Materials segments, was tested for impairment due to significant price drop of products.

During 2015, the US battery division for vehicles, managed as a separate CGU in Energy solution business segments, has been tested for reversal of impairment because the Group expects that future economic performance will significantly exceed the past expectation.

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

The amount of impairment loss (reversal) recognized as other non-operating expenses (income) and key assumptions used for calculation of value in use for the year ended December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	December 31, 2015	
	LED Encap	US battery division for vehicles (U.S.)
Impaired (reversed) amount		
Property, plant and equipment	16,727	(24,803)
Intangible assets	1,093	(99)
Key assumptions		
Pre-tax discount rate	11.7%	13.8%
Growth rate for subsequent years after five years	0%	0%

The Group decided to dispose certain non-current assets during the nine-month period ended September 30, 2016 and the year ended December 31, 2015. The differences between net fair value and book value were recognized as impairment losses (reversal of impairment losses) (Note 36).

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Changes in investment properties for the nine-month period ended September 30, 2016, are as follows:

(in millions of Korean won)

	September 30, 2016		
	Land	Buildings	Total
Beginning balance	-	-	-
Cost	-	-	-
Accumulated depreciation	-	-	-
Business combination (Note 35)	10,268	3,967	14,235
Acquisitions/ Transfer	-	-	-
Disposals/ Transfer	-	-	-
Depreciation	-	(72)	(72)
Ending balance	10,268	3,895	14,163
Cost	10,268	4,756	15,024
Accumulated depreciation	-	(861)	(861)

As of September 30, 2016, 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 nine-month periods ended September 30, 2016, are as follows:

(in millions of Korean won)

	September 30, 2016	
	Three months	Nine months
Rental revenue	191	381
Depreciation	(36)	(72)
	155	309

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13. Intangible Assets

Changes in intangible assets for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016					
	Software 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)						
Acquisitions/ Transfer	20,435	106,413	85,721	1,674	26,933	241,176
Disposals/ Transfer	(7,440)	(737)	-	(826)	(55)	(9,058)
Exchange differences	(634)	(2,766)	(7,119)	(45)	(383)	(10,947)
Amortization	(15,436)	(13,201)	-	-	(10,221)	(38,858)
Ending balance	93,350	320,946	222,201	52,754	72,217	761,468

(in millions of Korean won)

	December 31, 2015					
	Software development costs	Industrial property rights	Goodwill	Memberships	Others	Total
Beginning balance	56,011	173,600	211,521	50,224	33,664	525,020
Acquisitions/ Transfer	32,244	41,861	-	2,405	23,017	99,527
Disposals/ Transfer	(9,416)	(3,434)	-	(2,996)	(32)	(15,878)
Exchange differences	73	2,858	7,443	9	91	10,474
Amortization	(17,283)	(13,121)	-	-	(10,494)	(40,898)
Impairment	(56)	(985)	(75,365)	-	(52)	(76,458)
Reversal of impairment	97	-	-	-	2	99
Ending balance	61,670	200,779	143,599	49,642	46,196	501,886

Line items including amortization of intangible assets for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Cost of sales	2,985	8,557	2,731	8,035
Selling, general and administrative expenses	11,057	30,301	7,661	21,401
Total	14,042	38,858	10,392	29,436

Research and development costs recognized as expenses for the nine-month period ended September 30, 2016, amount to ₩ 484,301 million (2015: ₩ 434,818 million).

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Goodwill is allocated to the Group's CGUs identified for each operating segment. The carrying amounts of goodwill allocation to CGUs as of September 30, 2016, are as follows:

(in millions of Korean won)

CGUs	Goodwill allocation
Goodwill arising on the acquisition of LG Petrochemical Co., Ltd.	
NCC	2,361
ABS	1,250
PO	1,063
PVC	759
Acrylic	653
Plasticizer	143
BPA	125
Others	1,839
	<u>8,193</u>
Goodwill arising on the acquisition of SAP business	
Acrylic	25,222
	<u>25,222</u>
Goodwill arising on the acquisition of LG NanoH2O, Inc.	
Water purification	103,067
	<u>103,067</u>
Goodwill arising on the acquisition of FarmHannong Co.,Ltd.	
FarmHannong Co.,Ltd.	82,154
	<u>82,154</u>
Goodwill arising on the acquisition of PSAA business	
Pressure Sensitive Adhesive Application	3,565
	<u>3,565</u>
Total	<u>222,201</u>

During 2015, the US water purification division, managed as a separate cash-generating unit in Information & Electronic Materials segments, has been tested for impairment because its economic performance is lower than expected. The recoverable amounts of CGU have been determined based on value-in-use calculations. These calculations use pre-tax cash flow projections based on financial budgets approved by management covering a five-year period. Management determined the estimated pre-tax cash flow based on past performance and its expectations of market development. Value-in-use is measured by applying the pre-tax discount rates reflecting specific risks relating to the relevant operating segments. The carrying value exceeding its recoverable amount is all attributed to goodwill.

During 2015, the amount of impairment loss recognized as other non-operating expenses and key assumptions used for calculation of value in use are as follows:

<i>(in millions of Korean won)</i>	Acquisition of LG Petrochemical Co., Ltd.	Acquisition of SAP business	Acquisition of LG NanoH2O, Inc.
Impaired amount	-	-	75,365
Key assumptions			
Pre-tax discount rate	11.7%	11.7%	9.3%
Growth rate for subsequent years after five years	0%	0%	0.5%

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14. Other Current and Non-Current Assets

Details of other current and non-current assets as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Current		
Prepayments to suppliers	89,747	96,914
Prepaid expenses	29,921	20,839
Prepaid value added tax	77,578	70,015
Others	48,387	15,836
Total	<u>245,633</u>	<u>203,604</u>
Non-current		
Long-term prepaid expenses	34,708	29,118
Others	10,914	10,919
Total	<u>45,622</u>	<u>40,037</u>

15. Borrowings

Borrowings as of September 30, 2016 and December 31, 2015, consist of:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Current		
Short-term borrowings	2,331,455	1,839,678
Current-portion of long-term borrowings of bank loans	213,783	206,304
Current-portion of debentures	339,840	99,911
Finance lease liabilities	4,923	4,885
	<u>2,890,001</u>	<u>2,150,778</u>
Non-current		
Long-term borrowings	295,312	274,069
Debentures	69,635	199,773
Finance lease liabilities	32,445	34,086
	<u>397,392</u>	<u>507,928</u>
Total	<u>3,287,393</u>	<u>2,658,706</u>

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Details of short-term borrowings as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	Bank	Latest maturity date	Interest rate(%) as at September 30, 2016	September 30, 2016	December 31, 2015
Notes discounted ¹ (Negotiable notes)	Woori Bank, others	Mar. 29, 2017	Libor + 0.50 and others	988,632	1,032,581
Bank loans ²	Standard Chartered Bank, others	Sep. 29, 2017	Libor + 0.75 and others	<u>1,342,823</u>	<u>807,097</u>
Total				<u>2,331,455</u>	<u>1,839,678</u>

¹ As of September 30, 2016, trade receivables transferred to financial institutions are accounted for as collateralized borrowing transaction (Note 7).

² Certain property, plant and equipment have been pledged as collateral for the borrowings (Note 19).

Details of long-term borrowings as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016					
	Bank	Interest rate (%)	Latest maturity date	Total amount in won	Current	Non-current
Borrowings in Korean won	KEB Hana Bank ¹	1.75	Dec. 15,2019	1,146	353	793
Borrowings in foreign currencies	Sumitomo Mitsui Banking Corporation	3Libor + 0.60	Apr. 03,2017	21,926	21,926	-
	Standard Chartered Bank	3Libor + 1.00	Nov. 20,2017	48,905	9,781	39,124
	Agricultural Bank of China	3Libor + 0.80	Jun. 29,2020	32,100	5,365	26,735
	Bank of America	6Libor + 1.60	Oct. 24,2017	32,849	-	32,849
	Bank of America	3Libor + 1.50	Aug. 13,2018	32,849	-	32,849
	Bank of China	3Libor + 0.95	May 05,2021	27,276	-	27,276
	CITI	6Libor + 2.00	Mar. 10,2017	16,424	16,424	-
	HSBC	3Libor + 1.05	Sep. 19,2018	43,798	-	43,798
	HSBC	3Libor + 1.45	Nov. 11,2016	43,798	43,798	-
	HSBC	3Libor + 1.05	Apr. 19,2019	54,657	6,560	48,097
	JP Morgan	3Libor + 0.85	Jan. 15,2018	43,791	-	43,791
	Mizuho Banking Corporation	3Libor + 1.02	Apr. 16,2017	43,798	43,798	-
	Mizuho Banking Corporation	3Libor + 0.75	May 27,2017	65,778	65,778	-
Total				<u>509,095</u>	<u>213,783</u>	<u>295,312</u>

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

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		December 31, 2015				
		Bank	Interest rate (%)	Latest maturity date	Total amount in won	Current
Borrowings in foreign currencies	Sumitomo Mitsui Banking Corporation	3Libor + 0.60	Apr. 03,2017	23,440	-	23,440
	Standard Chartered Bank	3Libor + 2.20	Sep. 25,2016	16,226	16,226	-
	Standard Chartered Bank	3Libor + 1.0	Nov. 20,2017	28,364	2,836	25,528
	Agricultural Bank of China	3Libor + 0.80	Dec. 28,2019	24,338	2,839	21,499
	Bank of America	6Libor + 1.60	Oct. 24,2017	34,769	-	34,769
	Bank of America	3Libor + 1.50	Aug. 13,2018	34,769	-	34,769
	CITI	6Libor + 2.00	Mar. 10,2017	19,703	2,318	17,385
	HSBC	3Libor + 2.10	Jan. 22,2016	23,180	23,180	-
	HSBC	3COF	Apr. 08,2016	8,245	8,245	-
	HSBC	3Libor + 2.10	Aug. 04,2016	34,769	34,769	-
	HSBC	3Libor + 1.45	Sep. 19,2016	46,359	46,359	-
	HSBC	3Libor + 1.45	Nov. 11,2016	46,359	46,359	-
	JP Morgan	3Libor + 1.75	Jul. 15,2016	23,173	23,173	-
	Mizuho Banking Corporation	3Libor + 1.02	Apr. 16,2017	46,359	-	46,359
	Mizuho Banking Corporation	3Libor + 0.75	May 27,2017	70,320	-	70,320
	Total				<u>480,373</u>	<u>206,304</u>

Details of debentures as of September 30, 2016 and December 31, 2015, are as follows:

		September 30, 2016				
		Financial institution	Interest rate (%)	Latest maturity date	Total amount in won	Current
Debtentures in Korean won (non-guaranteed)	Woori Security and others	4.03	Dec. 05,2016	100,000	100,000	-
	Woori Security and others	4.11	Mar. 29,2017	200,000	200,000	-
	Bookook Securities Co.,Ltd. and others	6.30	Dec. 09,2016	39,984	39,984	-
	Ebest Investment & securities Co., Ltd. and others	4.75	Oct. 24,2017	30,000	-	30,000
Debtentures in Korean won (collateralized) ¹	IBK Securities Co., Ltd. and others	4.70	Mar. 05,2018	40,000	-	40,000
Less: discount on debentures				(509)	(144)	(365)
Total				<u>409,475</u>	<u>339,840</u>	<u>69,635</u>

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

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		December 31, 2015				
	Financial institution	Interest rate (%)	Latest maturity date	Total amount in won	Current	Non-current
Debentures in Korean won	Woori Security and others	4.03	Dec. 05,2016	100,000	100,000	-
	Woori Security and others	4.11	Mar. 29,2017	200,000	-	200,000
Less: discount on debentures				(316)	(89)	(227)
Total				299,684	99,911	199,773

Details of finance lease liabilities as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

		September 30, 2016			
Leaser	Interest rate (%)	Latest maturity date	Total Amount in won	Current	Non-current
Hyundai Oil Bank	3.12	Dec. 31,2024	37,368	4,923	32,445

(in millions of Korean won)

		December 31, 2015			
Leaser	Interest rate (%)	Latest maturity date	Total Amount in won	Current	Non-current
Hyundai Oil Bank	3.12	Dec. 31,2024	38,971	4,885	34,086

Finance lease liabilities as of September 30, 2016 and December 31, 2015, consist of:

(in millions of Korean won)

	September 30, 2016			December 31, 2015		
	Minimum lease payments	Future finance costs	Present value	Minimum lease payments	Future finance costs	Present value
Within 1 year	5,000	77	4,923	5,000	115	4,885
1 to 5 years	20,000	1,762	18,238	20,000	1,903	18,097
Over 5 years	17,500	3,293	14,207	20,000	4,011	15,989

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16. Provisions

Changes in provisions for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016					Total
	Sales returns ¹	Warranty ²	Greenhouse gas emission ³	Restoration ⁴	Legal claims ⁵	
Beginning balance	5,214	27,578	3,720	-	-	36,512
Business combination	5,026	-	-	90,865	2,685	98,576
Additions	22,902	14,432	19,235	605	21,529	78,703
Used	(22,813)	(3,934)	(7,417)	-	-	(34,164)
Ending balance	10,329	38,076	15,538	91,470	24,214	179,627
Less : current portion	(5,507)	(1,032)	(15,538)	-	-	(22,077)
Total	4,822	37,044	-	91,470	24,214	157,550

(in millions of Korean won)

	December 31, 2015			Total
	Sales returns ¹	Warranty ²	Greenhouse gas emission ³	
Beginning balance	3,917	24,782	-	28,699
Additions	42,411	5,785	3,720	51,916
Used	(41,114)	(2,989)	-	(44,103)
Ending balance	5,214	27,578	3,720	36,512
Less : current portion	(5,214)	(671)	(3,720)	(9,605)
Total	-	26,907	-	26,907

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.

⁴ Restoration provisions have been accrued based on the estimated expenses to restore land pollutions.

⁵ Lawsuit provisions have been accrued for certain pending cases.

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17. Net Defined Benefit Liability

The amounts recognized in the statements of financial position as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Present value of retirement benefit obligations ¹	843,666	717,770
Fair value of plan assets	<u>(641,352)</u>	<u>(636,578)</u>
Liability in the statement of financial position	<u>202,314</u>	<u>81,192</u>

¹ The present value of retirement benefit obligations is net of existing contributions to the National Pension Plan of ₩ 846 million as of September 30, 2016 (December 31, 2015: ₩ 802 million).

The amounts recognized in the statements of income for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

<i>(in millions of Korean won)</i>	2016		2015	
	Three months	Nine months	Three months	Nine months
Current service cost ¹	30,040	88,804	25,358	76,083
Interest cost	<u>827</u>	<u>2,183</u>	<u>671</u>	<u>2,012</u>
Total, included in employee benefit expenses	<u>30,867</u>	<u>90,987</u>	<u>26,029</u>	<u>78,095</u>

¹ The above amounts excluded ₩ 49 million (2015: ₩ 506 million) of expenses capitalized to construction in progress and development costs.

Post-employment benefits recognized for defined contribution plan for the nine-month period ended September 30, 2016, amounted to ₩ 640 million (2015: ₩ 258 million).

Post-employment benefits recognized in the statements of income for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

<i>(in millions of Korean won)</i>	2016		2015	
	Three months	Nine months	Three months	Nine months
Cost of sales	20,783	61,943	20,206	55,728
Selling, general and administrative expenses	<u>10,387</u>	<u>29,684</u>	<u>5,938</u>	<u>22,625</u>
Total	<u>31,170</u>	<u>91,627</u>	<u>26,144</u>	<u>78,353</u>

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Changes in the present value of defined benefit obligations for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Beginning balance	717,770	605,712
Business combination (Note 35)	51,353	-
Transfer in	7,792	7,620
Transfer out	(5,497)	(5,132)
Current service cost	88,853	102,133
Interest expense	15,196	18,704
Remeasurements:		
Actuarial gains and losses arising from changes in demographic assumptions	-	371
Actuarial gains and losses arising from changes in financial assumptions	-	30,875
Actuarial gains and losses arising from experience adjustments	-	(12,108)
Others	-	412
Exchange differences	162	283
Payments from plans	(31,963)	(31,100)
Ending balance	<u>843,666</u>	<u>717,770</u>

Changes in the fair value of plan assets for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Beginning balance	636,578	518,820
Business combination (Note 35)	13,080	-
Transfer in	1,384	642
Transfer out	(2,560)	(260)
Interest income	13,013	16,022
Remeasurements:		
Return on plan assets (excluding amounts included in interest income)	(3,061)	(1,239)
Contributions:		
Employers	297	120,151
Payments from plans	(17,379)	(15,295)
Administrative costs	-	(2,263)
Ending balance	<u>641,352</u>	<u>636,578</u>

The actual return on plan assets for the nine-month period ended September 30, 2016, is ₩ 9,952 million (for the year ended December 31, 2015: ₩ 14,783 million).

The principal actuarial assumptions used as of September 30, 2016 and December 31, 2015, are as follows:

	September 30, 2016	December 31, 2015
Discount rate	2.3 ~ 3.0%	2.8%
Future salary increase	2.3 ~ 5.1%	5.1%

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The sensitivity analysis for changes in key actuarial assumptions as of September 30, 2016, is as follows:

<i>(in millions of Korean won)</i>	Increase by 1%	Decrease by 1%
Discount rate:		
Increase (decrease) in defined benefit obligations	(82,623)	98,640
Future salary increase:		
Increase (decrease) in defined benefit obligations	95,641	(81,802)

A decrease in corporate bond yields will increase plan liabilities, and this is a significant risk exposure of the Group.

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 previous period.

Plan assets as of September 30, 2016 and December 31, 2015, consist of:

<i>(in millions of Korean won)</i>	September 30, 2016				December 31, 2015			
	Quoted price	Unquoted price	Total	Compo- sition	Quoted price	Unquoted price	Total	Compo- sition
Insurance contracts with guaranteed yield	641,352	-	641,352	100%	636,578	-	636,578	100%

18. Other Current and Non-Current Liabilities

Details of other current and non-current liabilities as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Current		
Advances from customers	59,956	49,793
Dividends payable	12	1,055
Withholding	42,122	17,270
Unearned revenues	10,057	6,889
Non-trade payables	10,851	175,040
Accrued expenses	83,921	51,680
Total	<u>206,919</u>	<u>301,727</u>
Non-current		
Long-term accrued expenses	<u>29,933</u>	<u>27,852</u>

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19. Commitments and Contingencies

- (1) As of September 30, 2016, the Parent Company and certain subsidiaries have been provided with guarantees from the Seoul Guarantee Insurance for the execution of supply contracts.
- (2) As of September 30, 2016, 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 of September 30, 2016, the Parent Company and certain subsidiaries have various specific line of credit agreements with several financial institutions, as follows:

(in millions of Korean won, in millions of foreign currencies)

Classification	The Parent Company		Certain Overseas Subsidiaries					
	KRW	USD	KRW	USD	CNY	EUR	INR	PLN
Limit of bank overdraft	53,100	50	-	103	300	10	-	32
Limit of the letter of credit	35,000	364	-	203	-	-	-	-
Limit of discount of notes from export	-	1,517	-	-	-	-	-	-
Limit of guaranteed payments in other foreign currency	-	161	-	-	-	-	-	-
Limit of loan arrangements	-	-	147,646	1,794	3,491	24	3,200	-

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\$ 190 million.

- (4) As of September 30, 2016, the Parent Company and certain subsidiaries have B2B purchase arrangements with several financial institutions with limit of ₩ 310,000 million and ₩ 15,000 million, respectively.
- (5) As of September 30, 2016, 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 of September 30, 2016, the Parent Company and certain overseas subsidiaries have been named as a plaintiff in 12 and 27 legal actions, respectively, involving ₩ 34,599 million and ₩ 6,632 million in claims, respectively. They have been named as a defendant in 9 and 15 legal actions, respectively, with ₩ 23,873 million and ₩ 5,156 million in claims, respectively. The ultimate outcome of these cases cannot be determined at the reporting date.
- (7) As of September 30, 2016, 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.

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(9) As of September 30, 2016, the Parent Company has entered into payment guarantee contract of US\$ 2 million and EUR 17 million with financial institutions to guarantee the warrant of certain installed products. The Parent Company has entered into a payment guarantee contract of US\$ 38 million with a financial institution in relation to advance received from a customer for certain sales. Also, certain subsidiaries have entered into payment guarantee contract of CNY 150 million with financial institutions regarding custom of imported raw materials.

(10) As of September 30, 2016, the Parent Company has guaranteed the repayment of various obligations of its subsidiaries. The outstanding balance of such guarantees as of September 30, 2016, amounts to US\$ 134 million and CNY 15 million (total equivalent to ₩ 149,030 million) (December 31, 2015: US\$ 150 million and EUR 3 million, total equivalent to ₩ 179,642 million). Details of guarantees provided as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

Guarantor	Guarantee beneficiary	Guarantee period	Financial institution	Amount of guarantee		Outstanding loan amount	
				September 30, 2016	December 31, 2015	September 30, 2016	December 31, 2015
The Parent Company	LG Chem Europe GmbH	Jan. 02,2015 ~ Jan. 02,2016	Shinhan Bank	-	3,842	-	-
"	LG Chem Michigan, Inc.	May 27,2014 ~ May 27,2017	Mizuho Bank	65,778	70,320	65,778	70,320
"	"	Mar. 31,2014 ~ Mar. 31,2017	Sumitomo Mitsui Banking Corporation	21,926	23,440	21,926	23,440
"	"	Apr. 01,2015 ~ Mar. 31,2016	Sumitomo Mitsui Banking Corporation	-	23,440	-	-
"	"	Aug. 18,2015 ~ Aug. 18,2017	Wells Fargo	21,926	23,440	16,445	23,440
"	LG NanoH2O, Inc.	Oct. 01,2015 ~ Sep. 30,2016	Citibank	32,889	35,160	5,482	12,892
Farm Hannong Co.,Ltd.	Dongbu Farm Hannong (Heilongjiang) Chemical Corp.	June 03,2016 ~ Dec. 09,2016	Korea Development Bank	1,314	-	1,148	-
"	"	June 17,2016 ~ Dec. 09,2016	Korea Development Bank	1,051	-	902	-
"	"	Sep. 21,2015 ~ Jun. 14,2017	Korea Development Bank	689	-	656	-
"	"	Dec. 16,2015 ~ Dec. 16,2016	Export-Import Bank of Korea	1,752	-	1,752	-
"	"	July 15,2016 ~ Jun. 14,2017	Kookmin Bank	1,049	-	1,049	-
"	"	Sep. 05,2016 ~ Jun. 14,2017	Kookmin Bank	656	-	656	-
Total				149,030	179,642	115,794	130,092

Meanwhile, as of September 30, 2016, the Group provided no financial guarantee to its associates in relation to their borrowings.

In addition, the Parent Company provides Letter of Comfort (LOC) in relation to certain borrowings of subsidiaries.

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(11) As of September 30, 2016, assets pledged as collaterals for the borrowings are as follows:

(in millions of Korean won)

	September 30, 2016			
	Secured amount	Borrowings / Loan	Limit	Secured party
Other receivables	300	Non-current borrowings (Won currency borrowings)	1,146	KEB Hana Bank
Jeongeup potting soil facility	19,600	Short-term borrowings (Bank loans)	3,723	Korea Development Bank
Banwol agrochemicals facility	23,382			
Jeonju pesticides facility		Won currency debentures (Collateralized)	40,000	Creditors
Gumi facility,	52,000			
Anseong facility, Genetics institute				
	<u>95,282</u>		<u>44,869</u>	

(12) Capital expenditure contracted for as of the reporting date but not yet incurred is as follows:

(in millions of Korean won)

	September 30, 2016	December 31, 2015
Property, plant and equipment	480,075	297,362

20. Equity

Changes in share capital and share premium for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

(in millions of Korean won and in shares)

	Ordinary shares		Preferred shares		Share premium
	Number of shares	Amount	Number of shares	Amount	
January 1, 2015	66,271,100	331,356	7,628,921	38,144	897,424
December 31, 2015	66,271,100	331,356	7,628,921	38,144	897,424
September 30, 2016	66,271,100	331,356	7,628,921	38,144	897,424

Changes in treasury shares for the nine-month period ended September 30, 2016 and for the year ended December 31, 2015, are as follows:

(in millions of Korean won and in shares)

	Number of shares		Carrying amount	Gain on sale of treasury shares (capital surplus)
	Ordinary shares	Preferred shares		
January 1, 2015	359,795	5,519	15,484	13,855
December 31, 2015	359,795	5,519	15,484	13,855
September 30, 2016	359,795	5,519	15,484	13,855

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21. Retained Earnings

Details of retained earnings as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Legal reserve ¹	298,840	296,178
Discretionary reserve ²	10,408,789	9,551,785
Retained earnings before appropriation	<u>1,502,798</u>	<u>1,684,537</u>
Total	<u>12,210,427</u>	<u>11,532,500</u>

¹ The Commercial Code of the Republic of Korea requires the Group 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 capital stock. The reserve is not available for cash dividends payment, but may be transferred to capital stock 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 Group 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 as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Treasury shares (Note 20)	(15,484)	(15,484)
Capital transactions within the Group ¹	<u>(215)</u>	<u>(215)</u>
Total	<u>(15,699)</u>	<u>(15,699)</u>

¹ Includes 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, General and Administrative Expenses

Selling, general and administrative expenses for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Wages and salaries	105,508	378,678	125,228	355,701
Post-employment benefits (Note 17)	10,387	29,684	5,938	22,625
Welfare expense	29,039	84,400	26,579	77,380
Travel expense	10,580	31,793	10,168	28,113
Water & utilities	9,265	25,058	6,708	19,898
Packaging expense	1,536	4,787	1,530	4,832
Charge for use	16,914	57,101	24,936	70,456
Commission expense	73,026	211,279	62,051	176,902
Depreciation (Note 12)	22,552	63,687	18,458	54,871
Advertising expense	5,185	14,194	3,683	11,485
Freight expense	106,129	323,374	106,859	330,184
Training expense	4,510	10,679	3,350	8,835
Amortization (Note 13)	11,057	30,301	7,661	21,401
Sample expense	3,975	13,911	5,331	14,379
Development costs	41,120	91,122	22,800	59,556
Others	52,057	141,817	40,233	109,269
Total	502,840	1,511,865	471,513	1,365,887

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24. Expenses by Nature

Cost of sales, and selling, general and administrative expenses by nature for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Changes in inventories of finished goods and work in process	6,785	8,150	(80,904)	174,326
Raw materials and consumables used	2,761,359	8,155,063	2,801,566	8,076,448
Purchase of merchandise	269,029	777,899	329,851	933,839
Employee benefit expense (Note 25)	380,623	1,283,775	429,102	1,232,722
Advertising expense	5,498	15,058	3,996	12,361
Transportation expense	114,380	348,620	114,027	351,229
Service fees	119,979	341,146	103,885	289,451
Depreciation, amortization	336,540	992,070	315,706	930,370
Operating lease payments	19,862	58,116	18,503	50,464
Other expenses	580,226	1,637,507	595,699	1,643,222
Total	4,594,281	13,617,404	4,631,431	13,694,432

25. Employee Benefit Expense

Details of employee benefit expenses for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Wages and salaries	303,834	1,063,766	359,128	1,027,538
Post-employment benefits – Defined benefit plan (Note 17)	30,867	90,987	26,029	78,095
Post-employment benefits – Defined contribution plan (Note 17)	303	640	115	258
Others	45,619	128,382	43,830	126,831
Total	380,623	1,283,775	429,102	1,232,722

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26. Finance Income and Expenses

Details of finance income and expenses for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Finance income				
Interest income ¹	9,423	30,707	8,485	28,136
Gain on foreign exchange	33,077	87,216	26,525	79,390
Gain on foreign currency translation	7,396	10,359	3,121	4,497
Gain on disposal of available-for-sale financial assets	-	18	-	32
Gain on disposal of trading derivatives	-	1,640	3,134	5,317
Gain on valuation of trading derivatives	-	-	-	-
Total	49,896	129,940	41,265	117,372
Finance expense				
Interest expense ²	19,889	56,123	14,501	46,008
Loss on foreign exchange	54,867	110,676	31,302	83,967
Loss on foreign currency translations	6,607	35,393	28,502	36,797
Loss on disposal of trading derivatives	-	3,141	5,863	7,326
Loss on valuation of trading derivatives	-	-	34	34
Loss on redemption of debentures	-	3,031	-	-
Total	81,363	208,364	80,202	174,132

¹ Details of interest income for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Bank deposits	8,303	27,398	7,265	25,741
Available-for-sale financial assets	-	91	-	-
Other loans and receivables	1,120	3,218	1,220	2,395
Total	9,423	30,707	8,485	28,136

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² Details of interest expense included in the finance expenses for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Interest on bank overdraft and borrowings	15,279	43,624	12,091	37,027
Interest on finance lease liabilities	289	897	320	986
Interest on debentures	4,709	12,485	3,130	10,390
Other interest expenses	491	2,951	491	1,436
Capitalized interest for qualifying assets	(879)	(3,834)	(1,531)	(3,831)
Total	19,889	56,123	14,501	46,008

27. Other Non-Operating Income

Details of other non-operating income for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Gain on foreign exchange	89,366	265,984	137,347	238,045
Gain on foreign currency translation	36,958	37,302	5,798	46,964
Gain on disposal of property, plant and equipment	167	6,114	7,065	8,024
Reversal of impairment loss on property, plant and equipment (Note 12)	-	-	5,520	30,323
Reversal of impairment loss on intangible assets (Note 13)	-	-	-	99
Others	16,536	35,557	6,221	16,945
Total	143,027	344,957	161,951	340,400

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28. Other Non-Operating Expenses

Details of other non-operating expenses for the three-month and nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Three months	Nine months	Three months	Nine months
Loss on foreign exchange	107,890	304,364	143,676	250,873
Loss on foreign currency translation	37,373	48,359	10,891	47,124
Loss on disposal of property, plant and equipment	5,434	19,433	27,486	68,804
Loss on disposal of intangible assets	149	1,273	1	321
Impairment loss on property, plant and equipment (Note 12)	-	2,425	-	-
Impairment loss on intangible assets (Note 13)	-	-	-	75,365
Impairment loss on investments in joint ventures (Note 11)	-	-	50,552	50,552
Loss on disposal of investments in joint ventures	-	41,252	-	-
Others	40,640	71,172	10,686	17,535
Total	191,486	488,278	243,292	510,574

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, 2016, is 21.2% (for the nine-month period ended September 30, 2015: 21.7%).

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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 of 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.

Basic earnings per share attributable to the owners of the Parent Company for the three-month and nine-month periods ended September 30, 2016 and 2015, is computed as follows:

<i>(in millions of Korean won)</i>	2016		2015	
	Three months	Nine months	Three months	Nine months
Profit attributable to ordinary shares ¹	264,870	907,075	313,998	844,671
Weighted average number of ordinary shares outstanding ²	65,911,305	65,911,305	65,911,305	65,911,305
Basic earnings per ordinary share (in won)	4,019	13,762	4,764	12,815

<i>(in millions of Korean won)</i>	2016		2015	
	Three months	Nine months	Three months	Nine months
Profit attributable to preferred shares ¹	30,730	105,199	36,414	97,982
Weighted average number of preferred shares outstanding ²	7,623,402	7,623,402	7,623,402	7,623,402
Basic earnings per preferred share (in won)	4,031	13,799	4,777	12,853

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

<i>(in millions of Korean won)</i>	2016	
	Three months	Nine months
Profit for the period attributable to owners of the Parent Company	295,600	1,012,274
Ordinary shares dividends (A)	74,150	222,451
Preferred shares dividends (B)	8,672	26,015
Undistributed earnings for the period	212,778	763,808
Undistributed earnings available for ordinary shares (C)	190,720	684,624
Undistributed earnings available for preferred shares (D)	22,058	79,184
Profit for the period attributable to ordinary shares (A+C)	264,870	907,075
Profit for the period attributable to preferred shares (B+D)	30,730	105,199

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	2015	
	Three months	Nine months
Profit for the period attributable to owners of the Parent Company		
Ordinary shares dividends (A)	350,412	942,653
Preferred shares dividends (B)	65,911	197,734
Undistributed earnings for the period	7,719	23,156
Undistributed earnings available for ordinary shares (C)	276,782	721,763
Undistributed earnings available for preferred shares (D)	248,087	646,937
Profit for the period attributable to ordinary shares (A+C)	28,695	74,826
Profit for the period attributable to preferred shares (B+D)	313,998	844,671
	36,414	97,982

² Weighted average numbers of shares are calculated as follows:

(in shares)	2016	2015
Ordinary shares outstanding	66,271,100	66,271,100
Ordinary treasury shares	(359,795)	(359,795)
Weighted average number of ordinary shares outstanding	<u>65,911,305</u>	<u>65,911,305</u>
Preferred shares outstanding	7,628,921	7,628,921
Preferred treasury shares	(5,519)	(5,519)
Weighted average number of preferred shares outstanding	<u>7,623,402</u>	<u>7,623,402</u>

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

31. Dividends

The ₩ 331,287 million (2015: ₩ 294,520 million) of dividends for the year ended December 31, 2015, was paid to the shareholders of the Parent Company in April 2016.

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32. Related Party Transactions

As of September 30, 2016 and December 31, 2015, LG Corp. is an entity exercising a significant influence over the Group, which owns 33.53% 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 of September 30, 2016 and December 31, 2015, are as follows, and the details of investments in subsidiaries, associates and joint ventures are described in Note 1.3:

Related parties	Related parties' subsidiaries (Domestic)	Related parties' subsidiaries (overseas)	Details
SERVEONE	-	Serveone(Nanjing) Co., LTD. and others	Subsidiary of LG Corp.
LG CNS Co., Ltd.	LG N-Sys Inc., BNE PARTNERS Inc., Ever ON Co., Ltd.	LG CNS China 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 MMA Corporation	-	-	Joint venture of LG Corp.

Sales and purchases with related parties for the nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016			
	Sales and others	Purchase of raw material /merchandise	Purchase and others	
Purchase of property, plant and equipment and intangible assets			Others	
Entity with significant influence over the Group				
LG Corp.	-	-	-	36,637
Associates and joint ventures				
SEETEC Co., Ltd.	8,784	76,165	14	61,114
TECWIN Co., Ltd.	-	70	1,144	-
HL Greenpower Co., Ltd.	66,607	-	-	-
Others	1,134	-	-	1,729
Other related parties				
LG MMA Corporation	60,817	100,411	-	2,656
SERVEONE and its subsidiaries	11,894	339,172	104,813	74,744
LG CNS Co., Ltd. and its subsidiaries	9,169	2,718	57,837	40,011
Others	-	-	-	8,460
Key management	-	-	-	30,749
Total	158,405	518,536	163,808	256,100

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	2015			
	Sales and others	Purchase and others		
		Purchase of raw material /merchandise	Acquisition of property, plant and equipment and intangible assets	Others
Entity with significant influence over the Group				
LG Corp.	-	-	-	37,549
Associates and joint ventures				
SEETEC Co., Ltd.	19,024	100,475	205	60,896
TECWIN Co., Ltd.	-	51	2,009	14
HL Greenpower Co., Ltd.	40,957	-	-	-
Others	453	-	-	1,147
Other related parties				
LG MMA Corporation	70,111	102,303	-	2,466
SERVEONE and its subsidiaries	14,051	297,544	232,059	70,641
LG CNS Co., Ltd. and its subsidiaries	8,146	15,030	44,047	40,278
Others	17	-	-	7,761
Key management	-	-	-	46,759
Total	<u>152,759</u>	<u>515,403</u>	<u>278,320</u>	<u>267,511</u>

Balances of receivables and payables arising from sales and purchases of goods and services as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

	September 30, 2016			
	Receivables			Total
	Trade receivables and others	Loan receivables	Other receivables	
Entity with significant influence over the Group				
LG Corp.	-	-	6,583	6,583
Associates and joint ventures				
SEETEC Co., Ltd.	-	-	-	-
TECWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	33,291	-	-	33,291
LG Fuel Cell Systems Inc.	-	9,220	-	9,220
Superfert Dongbu Pty Ltd.	-	-	20,170	20,170
Others	-	-	191	191
Other related parties				
LG MMA Corporation	6,464	-	377	6,841
SERVEONE and its subsidiaries	1,645	-	26,183	27,828
LG CNS Co., Ltd. and its subsidiaries	5,108	-	-	5,108
Others	-	-	3,712	3,712
Key management	-	-	-	-
Total	<u>46,508</u>	<u>9,220</u>	<u>57,216</u>	<u>112,944</u>

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	September 30, 2016			
	Payables			
	Trade payables	Borrowings	Other payables	Total
Entity with significant influence over the Group				
LG Corp.	-	-	-	-
Associates and joint ventures				
SEETEC Co., Ltd.	-	-	18,445	18,445
TECWIN Co., Ltd.	589	-	-	589
HL Greenpower Co., Ltd.	-	-	-	-
LG Fuel Cell Systems Inc.	-	-	-	-
Superfert Dongbu Pty Ltd.	-	-	-	-
Others	-	-	68	68
Other related parties				
LG MMA Corporation	11,302	-	-	11,302
SERVEONE and its subsidiaries	2,710	-	154,248	156,958
LG CNS Co., Ltd. and its subsidiaries	12,819	-	16,001	28,820
Others	-	-	780	780
Key management	-	-	53,653	53,653
Total	27,420	-	243,195	270,615

(in millions of Korean won)

	December 31, 2015			
	Receivables			
	Trade receivables and others	Loan receivables	Other receivables	Total
Entity with significant influence over the Group				
LG Corp.	-	-	11,463	11,463
Associates and joint ventures				
SEETEC Co., Ltd.	-	-	-	-
TECWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	12,833	-	-	12,833
LG Fuel Cell Systems Inc.	-	9,857	-	9,857
Others	-	-	451	451
Other related parties				
LG MMA Corporation	7,801	-	410	8,211
SERVEONE and its subsidiaries	1,929	-	26,199	28,128
LG CNS Co., Ltd. and its subsidiaries	10,228	-	-	10,228
Others	-	-	3,722	3,722
Key management	-	-	-	-
Total	32,791	9,857	42,245	84,893

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(in millions of Korean won)

	December 31, 2015			
	Payables			
	Trade payables	Borrowings	Other payables	Total
Entity with significant influence over the Group				
LG Corp.	-	-	-	-
Associates and joint ventures				
SEETEC Co., Ltd.	-	-	20,725	20,725
TECWIN Co., Ltd.	-	-	215	215
HL Greenpower Co., Ltd.	-	-	5	5
LG Fuel Cell Systems Inc.	-	-	-	-
Others	-	-	60	60
Other related parties				
LG MMA Corporation	8,310	-	-	8,310
SERVEONE and its subsidiaries	1,332	-	149,785	151,117
LG CNS Co., Ltd. and its subsidiaries	1,176	-	30,577	31,753
Others	-	-	296	296
Key management	-	-	59,234	59,234
Total	10,818	-	260,897	271,715

Fund transactions with related parties for the nine-month periods ended September 30, 2016 and 2015, are as follows:

(in millions of Korean won)

	2016		2015	
	Equity contributions in cash (capital reduction)	Loan (Repayment)	Equity contributions in cash	Loan (Repayment)
Associates and joint ventures				
LG Fuel Cell Systems Inc. (Note 11)	17,555	-	-	5,012
KLPE Limited Liability Partnership (Note 11)	(23,724)	-	-	-
LG Chem Malaysia SDN.BHD.	-	-	150	-
Total	(6,169)	-	150	5,012

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Dividends received from a related party for the nine-month periods ended September 30, 2016 and 2015, are as follows:

<i>(in millions of Korean won)</i>	2016	2015
Associate and joint venture		
SEETEC Co., Ltd.	-	33,500
LG VINA Chemical Co., Ltd.	927	993
Total	<u>927</u>	<u>34,493</u>

Dividends paid to related party for the nine-month periods ended September 30, 2016 and 2015, are as follows:

<i>(in millions of Korean won)</i>	2016	2015
Entity with significant influence over the Group		
LG Corp.	111,081	98,753
Total	<u>111,081</u>	<u>98,753</u>

Compensation for key management of the Group for the nine-month periods ended September 30, 2016 and 2015, consists of:

<i>(in millions of Korean won)</i>	2016	2015
Short-term wages and salaries	28,315	44,674
Pension costs	2,434	2,085
Total	<u>30,749</u>	<u>46,759</u>

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

Allowance for doubtful accounts from related parties and related bad debt expenses (reversal) as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016		December 31, 2015	
	Allowance for doubtful accounts	Bad debt expenses (reversal)	Allowance for doubtful accounts	Bad debt expenses (reversal)
Associate and joint venture				
Superfert Dongbu Pty Ltd.	20,170	(256)	-	-
Total	<u>20,170</u>	<u>(256)</u>	<u>-</u>	<u>-</u>

Details of the guarantees provided by the Parent Company for related parties at the end of reporting period are disclosed in Note 19.

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33. Cash Generated From Operations

Reconciliation between operating profit and net cash inflow (outflow) from operating activities for the nine-month periods ended September 30, 2016 and 2015, is as follows:

<i>(in millions of Korean won)</i>	2016	2015
Profit before income tax	1,301,751	1,256,726
Adjustments for:		
Depreciation	953,212	900,934
Amortization	38,858	29,436
Post-employment benefit	90,987	78,095
Finance income	(80,983)	(86,017)
Financial expenses	145,021	137,286
Foreign exchange differences	(39,117)	74,341
Loss on valuation of inventories	12,972	10,922
Gain on disposal of property, plant and equipment	(6,114)	(8,024)
Loss on disposal of property, plant and equipment	19,433	68,804
Loss on disposal of intangible assets	1,273	321
Impairment loss on property, plant and equipment	2,425	-
Impairment loss on intangible assets	-	75,365
Reversal of impairment loss on property, plant and equipment	-	(30,323)
Reversal of impairment loss on intangible assets	-	(99)
Loss on disposal of investments in joint ventures	41,252	-
Impairment loss on investments in joint ventures	-	50,552
Additions to provisions	78,703	25,281
Other income (expense)	7,793	(14,713)
Inventories	(182,193)	250,293
Trade receivables	155,588	127,653
Other receivables	449	(13,870)
Other current assets	(36,517)	(63,536)
Settlement of derivatives	(1,408)	(1,226)
Trade payables	208,529	(261,623)
Other payables	6,605	(171,626)
Other current liabilities	(111,791)	152,418
Net defined benefit liabilities	(11,410)	(70,742)
Provisions	(34,164)	(25,243)
Other cash flows from operations	(75,314)	(13,270)
Cash generated from operations	<u>2,485,840</u>	<u>2,478,115</u>

The principal non-cash transactions for the nine-month periods ended September 30, 2016 and 2015, are as follows:

<i>(in millions of Korean won)</i>	2016	2015
Transfer of construction-in-progress	975,844	1,250,558
Transfer of machinery-in-transit	25,953	136,768
Reclassification of long-term borrowings into current maturities	210,961	242,482
Reclassification of non-current asset held for sale	2,306	6,500
Acquisition of financial lease assets	-	42,669

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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., National Plastic Co. Ltd., Youl Chon Chemical Co. Ltd., OCI Company Co. Ltd., Mitsubishi Corp. and others
Energy solutions	Portable 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
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 is included in IT & Electronic materials since 2016. The comparative information was restated to reflect such changes.

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The segment information on revenue, profit and loss for the nine-month periods ended September 30, 2016 and 2015, is as follows:

(in millions of Korean won)

	2016				Total
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Common and others³	
Total segment revenue	10,689,417	2,502,227	1,917,154	281,180	15,389,978
Inter-segment revenue	125,614	-	110,706	6,058	242,378
Revenue from external customers ¹	10,563,803	2,502,227	1,806,448	275,122	15,147,600
Operating profit (loss) ²	1,632,496	(45,636)	(38,780)	(17,884)	1,530,196

(in millions of Korean won)

	2015				Total
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Common and others³	
Total segment revenue	11,200,741	2,165,681	2,053,046	4,603	15,424,071
Inter-segment revenue	138,756	-	114,719	4,603	258,078
Revenue from external customers ¹	11,061,985	2,165,681	1,938,327	-	15,165,993
Operating profit (loss) ²	1,394,982	(28,333)	105,120	(208)	1,471,561

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 of September 30, 2016 and December 31, 2015, is as follows:

(in millions of Korean won)

	September 30, 2016				Total
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Common and others	
Total assets for the segment ¹	7,824,858	3,977,613	3,356,003	4,881,217	20,039,691
Investments in associates and joint ventures	8,079	15,736	-	252,273	276,088
Total liabilities for the segment ¹	3,104,740	1,735,712	1,086,702	440,243	6,367,397

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(in millions of Korean won)

	December 31, 2015				Total
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Common and others	
Total assets for the segment ¹	8,094,328	3,796,738	3,174,287	3,513,375	18,578,728
Investments in associates and joint ventures	38,837	16,559	-	238,351	293,747
Total liabilities for the segment ¹	2,516,170	1,707,676	888,111	363,249	5,475,206

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

The external sales and non-current assets by geographical segments from continuing operations for the nine-month periods ended September 30, 2016 and 2015, and as of September 30, 2016 and December 31, 2015, are as follows:

(in millions of Korean won)

	Sales		Non-current assets ¹	
	2016	2015	September 30, 2016	December 31, 2015
Korea ²	4,861,712	4,888,358	8,426,181	7,767,917
China	4,984,759	5,074,183	1,355,227	1,306,950
Asia	2,886,207	3,054,333	26,030	28,250
America	918,804	858,763	226,596	242,132
Europe	1,285,155	1,071,827	22,390	23,846
Others	210,963	218,529	-	-
Total	15,147,600	15,165,993	10,056,424	9,369,095

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 external customer attributing to more than 10% of total revenue for the nine-month periods ended September 30, 2016 and 2015.

35. Business Combination

During the nine-month period ended September 30, 2016, the Parent Company acquired 100% shares of FarmHannong Co.,Ltd. (formerly Dongbu Farm Hannong 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 ₩ 82,156 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
Property, plant and equipment, and investment property	575,318
Intangible assets	141,968
Inventories	242,458
Trade and other (non-current) receivables	272,140
Assets held for sale	65,591
Other assets	10,667
Trade and other (non-current) payables	(150,385)
Borrowings	(678,687)
Deferred income tax liabilities	(8,442)
Net defined benefit liabilities	(38,073)
Provisions	(98,576)
Other liabilities	(23,649)
Total identifiable net assets	<u>326,167</u>
Less: non-controlling interest	<u>16,177</u>
	<u>342,344</u>
Goodwill	<u>82,156</u>
	<u>424,500</u>

The fair value of trade and other (non-current) receivables is ₩ 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 is expected to be uncollectible.

The revenues of ₩ 275,122 million and net loss of ₩ 14,641 million arise after the acquisition date reflected in the consolidated statement of income.

If the acquisition had occurred on January 1, 2016, the consolidated revenue and profit for the period ended September 30, 2016, would have been ₩ 15,407,304 million and ₩ 1,027,508 million, respectively.

During the nine-month period ended September 30, 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 ₩ 3,565 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 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	
Property, plant and equipment	43,006
Intangible assets	13,487
Inventories	10,544
Trade receivables	15,958
Other assets	1,298
Trade payables	(12,355)
Net defined benefit liabilities	(200)
Total identifiable net assets	<u>71,738</u>
Goodwill	<u>3,565</u>
	<u>75,303</u>

The fair value and gross contractual amount for trade receivables at the acquisition date are ₩ 15,958 million, respectively. No trade receivables are expected to be uncollectible.

The revenues of ₩ 7,931 million and net loss of ₩ 75 million arise after the acquisition date reflected in the consolidated statement of income.

If the acquisition had occurred on January 1, 2016, the consolidated revenue and profit for the period ended September 30, 2016, would have been ₩ 15,197,707 million and ₩ 1,000,443 million, respectively.

36. Non-current Assets and Liabilities Held-for-sale

The Group decided to dispose of certain non-current assets related to the separator division with the approval of the management on September 25, 2015, and the disposal was completed during the nine-month period ended September 30, 2016. The Group also decided to dispose of the electrolyte division with the approval of the management on February 29, 2016. The related assets were reclassified as non-current assets held for sale. The disposal is expected to be completed in 2016. Assets and liabilities of FarmHwaong Co.,Ltd., which is acquired as held for sale due to business combination with FarmHannong Co.,Ltd. in April 2016, also are included.

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Details of assets of disposal group classified as held-for-sale as of September 30, 2016 and December 31, 2015, are as follows:

<i>(in millions of Korean won)</i>	September 30, 2016	December 31, 2015
Assets of disposal group		
Property, plant and equipment	29,942	6,500
Investment properties	37,699	-
Other receivables and others	129	-
	<u>67,770</u>	<u>6,500</u>
Liabilities of disposal group		
Other payables and others	31	-
	<u>31</u>	<u>-</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 (income) is as follows:

<i>(in millions of Korean won)</i>	2016	2015
Impairment loss (reversal) on property, plant and equipment	1,216	(5,520)
	<u>1,216</u>	<u>(5,520)</u>