

LG Chem, Ltd. and Subsidiaries

Consolidated Interim Financial Statements

March 31, 2019 and 2018

LG Chem, Ltd. and Subsidiaries
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March 31, 2019 and 2018

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Report on Review of Interim Financial Statements

(English Translation of a Report Originally Issued in Korean)

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

Reviewed Financial Statements

We have reviewed the accompanying consolidated interim financial statements of LG Chem, Ltd. and its subsidiaries (collectively referred to as the “Group”). These financial statements consist of the consolidated interim statement of financial position of the Group as at March 31, 2019, and the related consolidated interim statements of profit or loss and comprehensive income for the three-month periods ended March 31, 2019 and 2018, and consolidated interim statements of changes in equity and cash flows for the three-month periods ended March 31, 2019 and 2018, and a summary of significant accounting policies and other explanatory notes, expressed in Korean won.

Management’s Responsibility for the Financial Statements

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

Auditor’s Responsibility

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

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

Conclusion

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

Other Matters

We have audited the consolidated statement of financial position of the Group as at December 31, 2018, and the related consolidated statements of profit or loss, comprehensive income, changes in equity and cash flows for the year then ended, in accordance with Korean Standards on Auditing. We expressed an unqualified opinion on those financial statements, not presented herein, in our audit report dated February 28, 2019. The consolidated statement of financial position as at December 31, 2018, presented herein for comparative purposes, is consistent, in all material respects, with the above audited statement of financial position as at December 31, 2018.

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.

May 14, 2019
Seoul, Korea

This report is effective as of May 14, 2019, the review report date. Certain subsequent events or circumstances, which may occur between the review report date and the time of reading this report, could have a material impact on the accompanying consolidated interim financial statements and notes thereto. Accordingly, the readers of the review report should understand that there is a possibility that the above review report may have to be revised to reflect the impact of such subsequent events or circumstances, if any.

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Financial Position
March 31, 2019 (Unaudited) and December 31, 2018

(in millions of Korean won)

	Notes	March 31, 2019 (Unaudited)	December 31, 2018
Assets			
Current assets			
Cash and cash equivalents	3, 5, 6	3,098,413	2,513,702
Trade receivables	3, 5, 7, 31	4,616,062	4,381,199
Other receivables	3, 5, 7, 31	319,276	326,093
Current financial assets		174	-
Prepaid income taxes		670	1,831
Other current assets	13	657,609	573,460
Inventories	9	4,503,269	4,289,463
Assets held for sale	35	2,764	2,764
Total current assets		13,198,237	12,088,512
Non-current assets			
Other receivables	3, 5, 7	142,571	129,251
Non-current financial assets	3, 5, 8	107,613	93,350
Investments in associates and joint ventures	1, 10, 33	264,510	266,122
Deferred tax assets	28	444,040	408,136
Property, plant and equipment	11	14,823,767	13,839,198
Intangible assets	12	2,114,480	2,006,238
Investment properties		945	950
Other non-current assets	13	116,122	112,380
Total non-current assets		18,014,048	16,855,625
Total assets		31,212,285	28,944,137
Liabilities			
Current liabilities			
Trade payables	3, 5, 31	2,434,112	2,165,969
Other payables	3, 5, 31	2,474,862	2,551,476
Borrowings	3, 5, 14	1,630,131	1,613,146
Current financial liabilities	3, 5, 8	553	18,477
Provisions	15	224,857	119,366
Income tax payables	28	341,840	247,787
Other current liabilities	3, 5, 17	920,073	557,313
Total current liabilities		8,026,428	7,273,534
Non-current liabilities			
Other payables	3, 5	9,680	9,984
Borrowings	3, 5, 14	5,274,651	3,708,001
Non-current financial liabilities	3, 5, 8	30,827	30,384
Provisions	15	235,880	218,287
Net defined benefit liabilities	16	273,760	227,544
Deferred tax liabilities	28	52,547	57,856
Other non-current liabilities	17	109,221	96,419
Total non-current liabilities		5,986,566	4,348,475
Total liabilities		14,012,994	11,622,009

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Financial Position
March 31, 2019 (Unaudited) and December 31, 2018

<i>(in millions of Korean won)</i>	Notes	March 31, 2019 (Unaudited)	December 31, 2018
Equity			
Share capital	1, 19	391,406	391,406
Capital surplus		2,274,623	2,274,623
Other components of equity	21	(374,243)	(374,243)
Accumulated other comprehensive income		(84,348)	(202,994)
Retained earnings	20	14,725,435	14,994,252
Equity attributable to owners of the Parent Company		<u>16,932,873</u>	<u>17,083,044</u>
Non-controlling interest		266,418	239,084
Total equity		<u>17,199,291</u>	<u>17,322,128</u>
Total liabilities and equity		<u>31,212,285</u>	<u>28,944,137</u>

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

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Profit or Loss
Three-Month Periods Ended March 31, 2019 and 2018 (unaudited)

<i>(in millions of Korean won, except per share amounts)</i>	Notes	Period Ended March 31	
		2019 (Unaudited)	2018 (Unaudited)
Revenue	31, 33	6,639,073	6,553,590
Cost of sales	23, 31	(5,469,095)	(5,212,029)
Gross profit		1,169,978	1,341,561
Selling and administrative expenses	22, 23, 31	(894,611)	(690,720)
Operating profit	33	275,367	650,841
Finance income	5, 25	70,235	81,427
Finance costs	5, 25	(74,272)	(67,510)
Share of net profit of associates and joint ventures	10		
accounted for using the equity method	5, 26	6,560	743
Other non-operating income	5, 27, 35	86,682	79,225
Other non-operating expenses	32	(84,990)	(91,530)
Profit before income tax		279,582	653,196
Income tax expense	28	(67,644)	(100,452)
Profit for the period		211,938	552,744
Profit is attributable to:			
Owners of the Parent Company		194,487	531,349
Non-controlling interests		17,451	21,395
Earnings per share attributable to the equity holders of the Parent Company (in won)	29		
Basic earnings per ordinary share		2,537	6,934
Basic earnings per preferred share		2,550	6,947
Diluted earnings per ordinary share		2,530	6,934
Diluted earnings per preferred share		2,543	6,947

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

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Comprehensive Income
Three-Month Periods Ended March 31, 2019 and 2018 (unaudited)

<i>(in millions of Korean won)</i>	Notes	Period Ended March 31	
		2019 (Unaudited)	2018 (Unaudited)
Profit for the period		211,938	552,744
Other comprehensive income			
<i>Items that will not be reclassified to profit or loss</i>			
Remeasurements of net defined benefit liability	16	(4,310)	(2,663)
Gain on valuation of financial assets at fair value through other comprehensive income	8	6,955	2,320
Shares of remeasurements of net defined benefit liabilities of associates		(118)	150
Income tax relating to these items		(730)	(176)
<i>Items that may be subsequently reclassified to profit or loss</i>			
Exchange differences on translation of foreign operations		101,310	81,096
Cash flow hedges	8	25,638	-
Shares of other comprehensive income of joint ventures and associates	10	1,924	1,701
Income tax relating to these items		(5,386)	(3,330)
Other comprehensive income for the period, net of tax		125,283	79,098
Total comprehensive income for the period		337,221	631,842
Total comprehensive income for the period is attributable to:			
Owners of the Parent Company		309,887	602,567
Non-controlling interest		27,334	29,275

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

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Changes in Equity
Three-Month Periods Ended March 31, 2019 and 2018 (Unaudited)

(in millions of Korean won)

	Notes	Attributable to owners of the Parent Company					Non-controlling interests	Total equity
		Share capital	Capital surplus	Other components of equity	Accumulated other comprehensive income	Retained earnings		
Balance at January 1, 2018		391,406	2,274,386	(362,676)	(173,839)	14,039,250	170,050	16,338,577
Comprehensive income								
Profit for the period		-	-	-	-	531,349	21,395	552,744
Remeasurements of net defined benefit liability	16	-	-	-	-	(1,935)	-	(1,935)
Exchange differences on translation of foreign operations		-	-	-	69,886	-	7,880	77,766
Change in the fair value of available-for-sale financial instruments		-	-	-	1,416	-	-	1,416
Others		-	-	-	1,701	150	-	1,851
Total comprehensive income for the period		-	-	-	73,003	529,564	29,275	631,842
Transactions with owners:								
Dividends	30	-	-	-	-	(460,058)	-	(460,058)
Others		-	-	-	-	(121)	-	(121)
Total transactions with owners		-	-	-	-	(460,179)	-	(460,179)
Balance at March 31, 2018 (Unaudited)		391,406	2,274,386	(362,676)	(100,836)	14,108,635	199,325	16,510,240
Balance at January 1, 2019		391,406	2,274,623	(374,243)	(202,994)	14,994,252	239,084	17,322,128
Comprehensive income								
Profit for the period		-	-	-	-	194,487	17,451	211,938
Remeasurements of net defined benefit liability	16	-	-	-	-	(3,128)	-	(3,128)
Exchange differences on translation of foreign operations		-	-	-	93,092	-	9,883	102,975
Gain on valuation of financial assets at fair value through other comprehensive income		-	-	-	5,042	-	-	5,042
Cash flow hedge		-	-	-	18,588	-	-	18,588
Others		-	-	-	1,924	(118)	-	1,806
Total comprehensive income for the period		-	-	-	118,646	191,241	27,334	337,221
Transactions with owners:								
Dividends	30	-	-	-	-	(460,058)	-	(460,058)
Total transactions with owners		-	-	-	-	(460,058)	-	(460,058)
Balance at March 31, 2019 (Unaudited)		391,406	2,274,623	(374,243)	(84,348)	14,725,435	266,418	17,199,291

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

LG Chem, Ltd. and Subsidiaries
Consolidated Interim Statements of Cash Flows
Three-Month Periods Ended March 31, 2019 and 2018 (Unaudited)

(in millions of Korean won)

	Notes	Three-Month Period Ended March 31	
		2019 (Unaudited)	2018 (Unaudited)
Cash flows from operating activities			
Cash generated from operations		674,119	74,846
Interest received		11,448	10,295
Interest paid		(38,055)	(23,636)
Dividends received		10,824	10,000
Income taxes paid		(14,128)	(34,956)
Net cash inflow from operating activities		644,208	36,549
Cash flows from investing activities			
Decrease in other receivables		92,103	467,508
Decrease in other non-current receivables		13,564	21,751
Proceeds from disposal of investments in joint ventures		-	19,499
Proceeds from disposal of financial instruments		1,336	4,659
Proceeds from disposal of property, plant and equipment		51,512	2,364
Proceeds from disposal of intangible assets		3,251	-
Government grants received		9,672	-
Increase in other receivables		(68,094)	(153,225)
Increase in other non-current receivables		(25,284)	(11,566)
Acquisition of investments in associates and joint ventures		-	(2,062)
Acquisition of financial assets		(829)	(3,016)
Acquisition of property, plant and equipment		(1,465,961)	(877,870)
Acquisition of intangible assets		(137,678)	(20,896)
Business combination		(529)	-
Net cash outflow from investing activities		(1,526,937)	(552,854)
Cash flows from financing activities			
Proceeds from borrowings		1,623,976	1,306,047
Repayments of borrowings		(173,867)	(135,740)
Net cash inflow from financing activities		1,450,109	1,170,307
Net increase in cash and cash equivalents		567,380	654,002
Cash and cash equivalents at the beginning of the period		2,513,702	2,249,341
Effects of exchange rate changes on cash and cash equivalents		17,331	13,269
Cash and cash equivalents at the end of the period in the consolidated interim statement of financial position		3,098,413	2,916,612

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

LG Chem, Ltd. and Subsidiaries

Notes to the Consolidated Interim Financial Statements

March 31, 2019 and 2018 (Unaudited), and December 31, 2018

1. General Information

1.1 The Parent Company

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

As at March 31, 2019, the Parent Company has its manufacturing facilities in Yeosu, Daesan, Ochang, Cheongju, Ulsan, Naju, Iksan, Paju, Osong, Onsan and Gimcheon.

The Parent Company is authorized to issue 292 million shares of ordinary shares with par value of ₩5,000 per share. As at March 31, 2019, the Parent Company has issued and outstanding 70,592,343 ordinary shares (₩352,962 million) and 7,688,800 preferred shares (₩38,444 million). The largest shareholder of the Parent Company is LG Corp., which owns 33.34% of the Parent Company's ordinary shares. Preferred shareholders have no voting rights but are entitled to receive dividends at a rate 1% more than those paid to ordinary shareholders.

1.2 Business Overview

The Group is engaged in Basic materials & Chemicals business, Energy solutions, IT & Electronics materials and Advanced materials business, and also engaged in Life Sciences business acquired through a merger with LG Life Sciences, Ltd. in January 2018. In addition, the Parent Company acquired 100% shares of FarmHannong Co., Ltd., in April 2016, which is engaged to manufacture crop protection products, seeds, fertilizers and others.

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

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

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

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

FarmHannong Co., Ltd., subsidiary of the Parent Company, manufactures and sells crop protection products, seeds, fertilizers and others. The crop protection business provides high value products such as environmentally-friendly pesticide. The fertilizer business leads developing a next generation fertilizers such as eco-friendly organic and functional fertilizers, and potting soil. The

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seed business puts priority on retaining various genetic resources and developing rare breeds with high profit in order to remain competitive in a future food industry.

1.3 Consolidated Subsidiaries, Associates and Joint Ventures

	March 31, 2019			
	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. ²	100	USA	December	Sales and trading
LG Chemical India Pvt. Ltd. ³	100	India	December	Synthetic resin manufacturing and sales
LG Polymers India Pvt. Ltd. ³	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. ⁴	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.	75	China	December	PVC, VCM, EDC manufacturing and sales
Tianjin LG BOTIAN Chemical Co., Ltd.	58	China	December	SBS manufacturing and sales
LG Chem (China) Investment Co., Ltd. ⁵	100	China	December	China holding company
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	100	China	December	ABS/EP manufacturing and sales
LG Chem Europe GmbH	100	Germany	December	Sales and trading
LG Chem Poland Sp. z o.o.	100	Poland	December	Polarizer/EP manufacturing
LG Chem Michigan Inc. ²	100	USA	December	Automotive battery research and manufacturing
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. ²	100	USA	December	Water processing membrane research and manufacturing
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	100	China	December	Water processing membrane research and manufacturing
Nanjing LG Chem New Energy Battery Co., Ltd. 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.	100	Poland	December	Automotive battery research and manufacturing
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	70	China	December	ABS manufacturing and sales
FarmHannong Co., Ltd. ⁷	100	Korea	December	Agricultural pesticide manufacturing and sales
Farm Hannong (Heilongjiang) Chemical Co., Ltd. ⁷	100	China	December	Agricultural pesticide manufacturing
LG Life Sciences India Pvt. Ltd.	100	India	December	Pharmaceutical products sales
LG Life Sciences (Beijing) Co., Ltd.	100	China	December	Pharmaceutical products sales
LG Life Sciences (Thailand) Ltd.	100	Thailand	December	Pharmaceutical products sales
Farmhannong America, Inc. ⁷	100	USA	December	Agricultural pesticide sales
LG Chem Hai Phong Vietnam Co., Ltd.	100	Vietnam	December	Polarizer manufacturing and sales

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LG Chem Australia Pty Ltd.	100	Australia	December	ESS sales
LG Chem Mexico S.A. de C.V.	100	Mexico	December	Sales and trading
FarmHannong(Thailand) Ltd. ⁷	100	Thailand	December	Research and development on seeds
LG Chem Hai Phong engineering Plastics Ltd.	100	Vietnam	December	EP manufacturing and sales
LG Chem (Guangzhou) Information & Electronics Materials Co.,Ltd.	100	China	December	Polarizer manufacturing
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD	51	China	December	Battery materials manufacturing and sales
LG Chem Fund I LLC ⁸	100	USA	December	Investments in venture companies
Ugimag Korea Co., Ltd ⁹	100	Korea	December	Electronic parts manufacturing and sales
Uniseal,Inc. ^{2,10}	100	USA	December	Adhesive manufacturing and sales
Uniseal Europe Ltd. ¹⁰	80	England	December	Adhesive manufacturing and sales
LG Chem Nanjing Energy Solution Co., Ltd.	100	China	December	Battery manufacturing and sales
LG Chem Life Science Innovation Center, Inc. ^{2,11}	100	USA	December	Pharmaceutical products research
Associates				
LG Holdings (HK) Ltd.	26	Hong Kong	December	Sales and trading
TECHWIN Co., Ltd.	21	Korea	December	Environment solution and construction of chemical plant
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA. ¹²	100	Brazil	December	Sales and trading
LG Chem Malaysia SDN.BHD. ¹²	100	Malaysia	December	Sales and trading
LG Fuel Cell Systems Inc.	23	USA	December	Power fuel cell research
FJ Composite Material Co., Ltd.	33	Japan	May	Heat diffuser research and manufacturing
WUXI CL New Energy Technology Ltd.	30	China	December	ESS manufacturing and sales
LG Life Sciences Poland Ltd. ¹²	100	Poland	December	Pharmaceutical products sales
Combustion Synthesis Co., Ltd.	30	Japan	March	Nitride-based ceramic powder production
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	49	China	December	Battery materials manufacturing and sales
Joint ventures				
LG VINA Chemical Co., Ltd.	50	Vietnam	December	DOP production and sales
HL Greenpower Co., Ltd.	49	Korea	December	Automotive battery manufacturing and sales
SEETEC Co., Ltd.	50	Korea	December	Plant utility and distribution, research assistance service

¹ As at March 31, 2019, Ningbo LG Yongxing Chemical Co., Ltd. owns 100% of Ningbo Zhenhai LG Yongxing Trading Co., Ltd.'s shares.

² During the three-month period ended March 31, 2019, the Group acquired additional shares of LG Chem Michigan Inc. for ₩1,128 million. In addition, LG Chem Michigan Inc. owns 100% of LG Chem America, Inc., LG NanoH20, Inc., Uniseal,Inc. and LG Chem Life Science Innovation Center, Inc. 's shares.

³ As at March 31, 2019, LG Chemical India Pvt. Ltd. owns 100% of LG Polymers India Pvt. Ltd.'s shares.

⁴ As at March 31, 2019, the Group acquired additional shares of LG Chem (Nanjing) Information & Electronics Materials Co.,Ltd. for ₩124,298 million.

⁵ During the three-month period ended March 31, 2019, the Parent Company acquired additional shares of LG Chem (China) Investment Co.,Ltd. for ₩24,944 million.

⁶ Although the Parent Company owns less than 50% of the voting rights of Nanjing LG Chem New Energy Battery Co., Ltd., the Parent Company is considered to have control over the investee as the Parent Company can exercise the majority voting rights in its decision-making process in accordance with the shareholders' agreement.

⁷ As at March 31, 2019, FarmHannong Co., Ltd. owns 100% of Farm Hannong (Heilongjiang) Chemical Co., Ltd., Farmhannong America, Inc. and FarmHannong(Thailand) Ltd.,.

⁸ The Parent Company acquired additional shares LG CHEM FUND I LLC for ₩1,402 million.

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⁹ During the three-month period ended March 31, 2019, the Parent Company acquired additional shares of Ugimag Korea Co., Ltd for ₩ 4,500 million.

¹⁰ Uniseal, Inc. holds 80% of Uniseal Europe Ltd.

¹¹ LG Chem Life Science Innovation Center, Inc. was newly established during the three-month period ended March 31, 2019, and the Group acquired 100% shares of LG Chem Life Science Innovation Center, Inc. for ₩1,128 million.

¹² Classified as an investment in associate due to its small size.

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)

	March 31, 2019				
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the period
Subsidiaries					
Ningbo LG Yongxing Chemical Co., Ltd.	858,082	244,472	613,610	444,034	37,542
Ningbo Zhenhai LG Yongxing Trade Co., Ltd.	6,092	1,916	4,176	4,279	73
LG Chem HK Ltd.	18,179	35	18,144	-	(12)
LG Chem America, Inc.	222,615	201,302	21,313	198,042	(584)
LG Chemical India Pvt. Ltd.	32,755	24	32,731	-	10
LG Polymers India Pvt. Ltd.	128,225	46,317	81,908	56,931	3,006
LG Chemical (Guangzhou) Engineering Plastics Co., Ltd.	107,277	54,074	53,203	47,844	1,456
LG Chem (Nanjing) Information & Electronics Materials Co., Ltd.	3,373,721	1,834,078	1,539,643	739,744	(3,487)
LG Chem (Taiwan), Ltd.	122,291	59,204	63,087	42,093	1,603
LG Chem Display Materials (Beijing) Co., Ltd.	42,852	14,467	28,385	25,087	1,377
Tianjin LG Bohai Chemical Co., Ltd.	278,545	148,535	130,010	138,646	17,465
Tianjin LG BOTIAN Chemical Co., Ltd.	48,162	42,497	5,665	34,219	1,984
LG Chem (China) Investment Co., Ltd.	438,503	180,837	257,666	14,769	1,027
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	53,505	14,285	39,220	17,364	(485)
LG Chem Europe GmbH	352,349	317,801	34,548	225,811	(134)
LG Chem Poland Sp. z o.o.	73,704	39,040	34,664	31,854	(563)
LG Chem Michigan Inc.	698,268	420,694	277,574	116,113	(23,551)
LGC Petrochemical India Private Ltd.	3,178	511	2,667	960	106
HAENGBOKNURI CO., LTD.	2,861	1,252	1,609	2,432	54
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	8,119	7,130	989	7,828	56
LG Chem Japan Co., Ltd.	4,517	565	3,952	1,592	152
LG NanoH2O, Inc. ¹	20,160	4,782	15,378	7,725	794
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	4,429	1	4,428	-	1,330
Nanjing LG Chem New Energy Battery Co., Ltd.	870,489	736,750	133,739	202,563	7,596
LG Chem (Chongqing) Engineering Plastics Co., Ltd.	35,718	10,944	24,774	8,472	(485)
LG Chem Wroclaw Energy sp. z o.o.	2,108,589	1,636,047	472,542	337,732	(26,639)
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	314,312	235,597	78,715	107,463	(313)
FarmHannong Co., Ltd. ¹	1,131,216	717,254	413,962	228,206	26,544
LG Life Sciences India Pvt. Ltd.	5,948	6,329	(381)	1,009	(476)
LG Life Sciences (Beijing) Co., Ltd.	1,296	42	1,254	248	16
LG Life Sciences (Thailand) Ltd.	18,511	11,188	7,323	9,587	1,453
LG Chem Hai Phong Vietnam Company Ltd.	22,813	20,833	1,980	6,974	(2,780)
LG Chem Australia Pty Ltd.	1,261	587	674	416	(24)

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LG Chem Mexico S.A. de C.V.	685	82	603	350	45
LG Chem Hai Phong engineering Plastics Ltd.	15,974	512	15,462	-	(251)
LG Chem (Guangzhou) Information & electronics Materials Co., Ltd.	137,893	7,343	130,550	-	(1,402)
LEYOU NEW ENERGY MATERIALS(WUXI) Co., LTD	112,679	15,202	97,477	-	(898)
LG Chem Fund I LLC	6,276	-	6,276	-	(834)
Ugimag Korea Co., Ltd	42,630	30,719	11,911	4,918	(1,719)
Uniseal, Inc. ¹	33,991	5,740	28,251	16,210	788
LG Chem Nanjing Energy Solution Co., Ltd.	132,386	20,965	111,421	-	(3,435)
LG Chem Life Science Innovation Center, Inc.	1,149	10	1,139	42	1

Associates

LG Holdings (HK) Ltd.	260,816	44,641	216,175	12,149	5,313
TECHWIN Co., Ltd.	112,881	56,115	56,766	-	-
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	299	135	164	470	86
LG Chem Malaysia SDN.BHD.	329	6	323	199	23
LG Fuel Cell Systems Inc.	5	2	3	-	(3)
FJ Composite Material Co., Ltd.	7,536	3,997	3,538	405	10
WUXI CL New Energy Technology Ltd.	6,701	2,621	4,080	-	(372)
LG Life Sciences Poland Ltd.	202	129	73	104	3
Combustion Synthesis Co., Ltd.	803	48	755	14	(158)
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	61,378	5,935	55,443	-	233

Joint ventures

LG VINA Chemical Co., Ltd.	28,081	20,735	7,346	13,907	151
HL Greenpower Co., Ltd.	342,147	299,364	42,783	168,154	849
SEETEC Co., Ltd.	321,119	39,674	281,445	136,423	3,503

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, 2018			2018	
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the period
Subsidiaries					
Ningbo LG Yongxing Chemical Co., Ltd.	759,966	204,733	555,233	538,322	68,450
Ningbo Zhenhai LG Yongxing Trade Co., Ltd.	5,599	1,642	3,957	7,426	148
LG Chem HK Ltd.	17,884	42	17,842	130,039	211
LG Chem America, Inc.	225,686	204,163	21,523	170,416	828
LG Chemical India Pvt. Ltd.	32,705	19	32,686	-	-
LG Polymers India Pvt. Ltd.	118,542	41,852	76,690	60,864	3,437
LG Chemical (Guangzhou) Engineering Plastics Co., Ltd.	95,906	46,013	49,893	52,597	(1,568)
LG Chem (Nanjing) Information & Electronics Materials Co., Ltd.	3,073,898	1,706,052	1,367,846	717,508	23,440
LG Chem (Taiwan), Ltd.	129,680	63,300	66,380	42,598	(1,212)
LG Chem Display Materials (Beijing) Co., Ltd.	44,617	18,580	26,037	22,006	283
Tianjin LG Bohai Chemical Co., Ltd.	281,710	173,408	108,302	140,365	10,136
Tianjin LG BOTIAN Chemical Co., Ltd.	45,562	42,030	3,532	36,954	3,067
LG Chem (China) Investment Co., Ltd.	405,664	174,737	230,927	13,546	1,331
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	60,467	22,165	38,302	21,142	(549)

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LG Chem Europe GmbH	336,761	302,034	34,727	161,439	2,419
LG Chem Poland Sp. z o.o.	75,187	39,958	35,229	31,976	1,147
LG Chem Michigan Inc.	675,367	377,280	298,087	82,536	3,632
LGC Petrochemical India Private Ltd.	2,950	463	2,487	1,058	81
HAENGBOKNURI CO., LTD.	2,755	1,201	1,554	2,083	86
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	7,757	6,791	966	7,723	56
LG Chem Japan Co., Ltd.	4,261	518	3,743	1,415	151
LG NanoH2O, Inc. ¹	19,577	5,255	14,322	4,222	792
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	4,155	1,167	2,988	-	(172)
Nanjing LG Chem New Energy Battery Co., Ltd.	786,416	664,865	121,551	116,049	(2,043)
LG Chem (Chongqing) Engineering Plastics Co., Ltd.	35,967	11,599	24,368	8,550	(730)
LG Chem Wroclaw Energy sp. z o.o.	1,555,511	1,056,111	499,400	10,752	(9,086)
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	287,824	211,589	76,235	77,415	3,042
FarmHannong Co., Ltd. ¹	1,075,222	687,757	387,465	236,936	28,231
LG Life Sciences India Pvt. Ltd.	4,164	4,056	108	2,482	(150)
LG Life Sciences (Beijing) Co., Ltd.	1,237	44	1,193	233	(6)
LG Life Sciences (Thailand) Ltd.	17,432	11,799	5,633	6,118	1,263
LG Chem Hai Phong Vietnam Company Ltd.	23,134	18,420	4,714	3,499	759
LG Chem Austrailia Pty Ltd.	768	85	683	413	100
LG Chem Mexico S.A. de C.V.	646	99	547	-	(83)
LG Chem Hai Phong engineering Plastics Ltd.	15,574	115	15,459	-	-
LG Chem (Guangzhou) Information & electronics Materials Co.,Ltd.	147,413	20,119	127,294	-	-
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD	106,817	11,904	94,913	-	-
LG Chem Fund I LLC	5,598	-	5,598	-	-
Ugimag Korea Co., Ltd	40,344	31,214	9,130	-	-
Uniseal, Inc.	38,503	11,596	26,907	-	-
LG Chem Nanjing Energy Solution Co., Ltd.	131,144	20,293	110,851	-	-
Associates					
LG Holdings (HK) Ltd.	245,651	42,181	203,470	12,413	4,295
TECHWIN Co., Ltd.	79,106	32,206	46,900	-	-
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	172	93	79	329	(131)
LG Chem Malaysia SDN.BHD.	305	17	288	178	(9)
LG Fuel Cell Systems Inc.	11,845	5,182	6,663	1,447	(13,606)
FJ Composite Material Co., Ltd.	6,393	2,916	3,477	533	(51)
WUXI CL New Energy Technology Ltd.	6,714	2,407	4,307	-	(140)
LG Life Sciences Poland Ltd.	158	155	3	27	(57)
Combustion Synthesis Co., Ltd.	991	28	963	85	(93)
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	55,749	2,444	53,305	-	-
Joint ventures					
LG VINA Chemical Co., Ltd.	28,668	19,862	8,806	13,376	474
HL Greenpower Co., Ltd.	314,328	274,399	39,929	114,126	181
SEETEC Co., Ltd.	346,423	48,187	298,236	125,471	3,254

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.

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1.5 Changes in Scope for Consolidation

Subsidiaries newly included in the consolidation for the three-month period ended March 31, 2019, are as follows:

Subsidiary	Reason
LG Chem Life Science Innovation Center, Inc.	Newly established

2. Summary of Significant Accounting Policies

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

2.1 Basis of Preparation

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

The Group's consolidated interim financial statements for the three-month period ended March 31, 2019, have been prepared in accordance with Korean IFRS 1034 *Interim Financial Reporting*. These consolidated interim financial statements have been prepared in accordance with Korean IFRS which is effective or early adopted as at March 31, 2019.

(a) New and amended standards and interpretations adopted by the Group

The Group has applied the following new and amended standards and interpretations for the first time for their annual reporting period commencing January 1, 2019.

- Enactment of Korean IFRS 1116 *Leases*

Korean IFRS 1116 *Leases* replaces Korean IFRS 1017 *Leases*. Under Korean IFRS 1116, with implementation of a single lease model, lessee is required to recognize assets and liabilities for all lease which lease term is over 12 months and underlying assets are not low value assets. A lessee is required to recognize a right-of-use asset and a lease liability representing its obligation to make lease payments.

With implementation of Korean IFRS 1116 *Lease*, the Group has changed accounting policy. The Group has adopted Korean IFRS 1116 retrospectively, as permitted under the specific transitional provisions in the standard, and recognized the cumulative impact of initially applying the standard as at January 1, 2019, the date of initial application. The Group has not restated comparatives for the 2018 reporting period. The impact of the adoption of the leasing standard and the new accounting policies are disclosed in Note 11.

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- Amendments to Korean IFRS 1109 *Financial Instruments*

The narrow-scope amendments made to Korean IFRS 1109 *Financial Instruments* enable entities to measure certain prepayable financial assets with negative compensation at amortized cost. When a modification of a financial liability measured at amortized cost that does not result in the derecognition, a modification gain or loss shall be recognized in profit or loss. The amendment does not have a significant impact on the consolidated interim financial statements.

- Amendments to Korean IFRS 1019 *Employee Benefits*

The amendments require that an entity shall calculate current service cost and net interest for the remainder of the reporting period after a plan amendment, curtailment or settlement based on updated actuarial assumptions from the date of the change. The amendments also require that a reduction in a surplus must be recognized in profit or loss even if that surplus was not previously recognized because of the impact of the asset ceiling. The amendment does not have a significant impact on the consolidated interim financial statements.

- Amendments to Korean IFRS 1028 *Investments in Associates and Joint Ventures*

The amendments clarify that an entity shall apply Korean IFRS 1109 to financial instruments in an associate or joint venture to which the equity method is not applied. These include long-term interests that, in substance, form part of the entity's net investment in an associate or joint venture. The amendment does not have a significant impact on the consolidated interim financial statements.

- Enactment to Interpretation of Korean IFRS 2123 *Uncertainty over Income Tax Treatments*

The Interpretation explains how to recognize and measure deferred and current income tax assets and liabilities where there is uncertainty over a tax treatment, and includes guidance on how to determine whether each uncertain tax treatment is considered separately or together. It also presents examples of circumstances where a judgement or estimate is required to be reassessed. The enactment does not have a significant impact on the consolidated interim financial statements.

- Annual Improvements to Korean IFRS 2015 – 2017 Cycle:

• Korean IFRS 1103 *Business Combination*

The amendments clarify that when a party to a joint arrangement obtains control of a business that is a joint operation, and had rights to the assets and obligations for the liabilities relating to that joint operation immediately before the acquisition date, the transaction is a business combination achieved in stages. In such cases, the acquirer shall remeasure its entire previously held interest in the joint operation. The amendment does not have a significant impact on the consolidated interim financial statements.

• Korean IFRS 1111 *Joint Agreements*

The amendments clarify that when a party that participates in, but does not have joint control of, a joint operation might obtain joint control of the joint operation in which the activity of the joint operation constitutes a business. In such cases, previously held interests in the joint operation are not remeasured. The amendment does not have a significant impact on the consolidated interim financial statements.

• Paragraph 57A of Korean IFRS 1012 *Income Tax*

The amendment is applied to all the income tax consequences of dividends and requires an entity to recognize the income tax consequences of dividends in profit or loss, other comprehensive

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income or equity according to where the entity originally recognized those past transactions or events. The amendment does not have a significant impact on the consolidated interim financial statements.

- Korean IFRS 1023 *Borrowing Costs*

The amendments clarify that if a specific borrowing remains outstanding after the related qualifying asset is ready for its intended use (or sale), it becomes part of general borrowings. The amendment does not have a significant impact on the consolidated interim financial statements.

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

Certain new accounting standards and interpretations that have been published that are not mandatory for annual reporting period commencing January 1, 2019 and have not been early adopted by the Group are set out below.

- Amendment of Korean IFRS 1001 *Financial Statement Presentation* and Korean IFRS 1108 *Accounting Policies, Changes in Accounting Estimates and Errors* – definition of materiality
- Amendment of Korean IFRS 1103 *Business Combination* – definition of business

2.2 Significant Accounting Policies

Significant accounting policies and method of computation used in the preparation of the condensed consolidated interim financial statements are consistent with those of the consolidated financial statements for the year ended December 31, 2018, except for the changes due to the application of amendment and enactments of standards described in Note 2.1.(a) and the ones 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 financial performance of the Group. The Group uses derivative financial instruments to hedge certain risk exposures.

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

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(1) Market risk

1) Foreign exchange risk

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

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

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

As at March 31, 2019 and December 31, 2018, 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>	March 31, 2019		December 31, 2018	
	Assets	Liabilities	Assets	Liabilities
USD	2,216,793	3,760,786	2,458,886	2,396,650
EUR	204,183	1,512,446	197,975	892,963
JPY	28,242	114,669	27,849	114,399
CNY and others	99,824	6,511	128,392	6,085

As at March 31, 2019 and December 31, 2018, if the Group's functional currency had weakened / strengthened by 10% against the US dollar with all other variables held constant, profit before income tax would have been affected as follows:

<i>(in millions of Korean won)</i>	March 31, 2019		December 31, 2018	
	10% Increase	10% Decrease	10% Increase	10% Decrease
USD	(154,399)	154,399	6,224	(6,224)

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 reporting date.

2) Price risk

The Group is exposed to equity securities price risk arises from investments held by the Group and classified in the consolidated interim statement of financial position as non-current financial assets. The Group's equity investments are publicly traded and are related to the KOSDAQ, NASDAQ and HSI index.

The table below summarizes the impact of increases/decreases of the listed stock price index on the Group's equity before tax effects as at March 31, 2019 and December 31, 2018. The analysis is based on the assumption that the equity index has increased/decreased by 10% with all other variables held constant, and that all the Group's equity instruments moved in line with the index.

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<i>(in millions of Korean won)</i>	March 31, 2019		December 31, 2018	
	10% Increase	10% Decrease	10% Increase	10% Decrease
KOSDAQ	597	(597)	315	(315)
NASDAQ	306	(306)	168	(168)
HSI	7,361	(7,361)	7,798	(7,798)
Total	8,264	(8,264)	8,281	(8,281)

3) Interest rate risk

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

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

The table below summarizes the impact of increases/decreases of interest rate on the Group's equity and post-tax profit for the three-month periods ended March 31, 2019 and 2018. The analysis is based on the assumption that the interest rate has increased/decreased by 1% (100 basis points) with all other variables held constant.

<i>(in millions of Korean won)</i>	Impact on post-tax profit		Impact on equity	
	2019	2018	2019	2018
Increase	(24,438)	(14,501)	(24,438)	(14,501)
Decrease	24,438	14,501	24,438	14,501

(2) Credit risk

Credit risk arises from trade receivables and that the Group holds, as well as debt instruments at amortized cost or fair value through other comprehensive income.

A. Trade receivables

The Group applies the simplified approach to measuring expected credit losses which uses a lifetime expected loss allowance for trade receivables. To measure the expected credit losses, trade receivables have been grouped based on shared credit risk characteristics and the days past due. The loss allowance provision as at March 31, 2019 is as follows. Expected credit losses include forward-looking information.

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(in millions of Korean won)

	Receivables not past due ¹	Receivables past due but not impaired ¹	Impaired receivables ²	Total
March 31, 2019				
(trade receivables)				
Gross carrying amount	4,437,726	180,412	5,190	4,623,328
Expected loss rate	0.1%	0.4%	76.3%	0.2%
Loss allowance provision	2,595	710	3,961	7,266
December 31, 2018				
(trade receivables)				
Gross carrying amount	4,115,060	268,488	5,561	4,389,109
Expected loss rate	0.1%	0.4%	78.0%	0.2%
Loss allowance provision	2,512	1,063	4,335	7,910

¹ See Note 7.(3)

² Impaired receivables are those for which impairment indicators have been confirmed, such as significant lack of collectability (See Note 7.(3)).

Movements in the loss allowance provision for trade receivables for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

(in millions of Korean won)

	Trade receivables	
	March 31, 2019	December 31, 2018
Beginning balance	7,910	7,552
Business combination (Note 34)	-	23
Increase in loss allowance recognized in profit or loss during the three-month period ended March 31, 2019	(475)	701
Receivables written off during the three-month period ended March 31, 2019, as uncollectible	-	(333)
Exchange differences	(169)	(33)
Ending balance	7,266	7,910

As at March 31, 2019, the carrying amount of trade receivables representing the maximum exposure to credit risk amounts to ₩4,623,328 million (December 31, 2018: ₩4,389,109 million).

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B. Other financial assets at amortized cost

Movements in loss allowance provision for other financial assets at amortized cost for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

(in millions of Korean won)

	2019
	Other receivables
Beginning balance	2,727
Increase in loss allowance recognized as 'other expenses' in profit or loss during the three-month period ended March 31, 2019	633
Exchange differences	(1,251)
Ending balance	2,108

(in millions of Korean won)

	2018
	Other receivables
Beginning balance - Korean IFRS 1039	959
Amounts restated through beginning balance of retained earnings	-
Loss allowance as at initial application date - calculated under Korean IFRS 1109	959
Increase in loss allowance recognized as 'other expenses' in profit or loss during the year ended December 31, 2018	1,783
Exchange differences	(16)
Ending balance	2,726

All of the financial assets at amortized costs are considered to have low credit risk, and the loss allowance recognized during the period was, therefore, limited to 12 months expected losses.

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 new customers. The credit risks relating to trade receivables are also mitigated by insurance contracts, collateral as well as payment guarantees.

The Group has entered into export bond 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 collateral 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 contract 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

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

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

(in millions of Korean won)

	March 31, 2019			
	Less than 1 year	Between 1-2 years	Between 2-5 years	Over 5 years
Borrowings (excluding lease liabilities)	1,811,675	1,216,640	2,934,195	1,560,974
Lease liabilities	17,490	24,127	34,731	49,822
Trade and other payables	4,908,974	9,472	110	98
Total	6,738,139	1,250,239	2,969,036	1,610,894

(in millions of Korean won)

	December 31, 2018			
	Less than 1 year	Between 1-2 years	Between 2-5 years	Over 5 years
Borrowings (excluding financial lease liabilities)	1,694,761	840,260	2,250,480	910,985
Finance lease liabilities	5,177	5,177	15,887	5,000
Trade and other payables	4,717,445	6,710	3,177	97
Total	6,417,383	852,147	2,269,544	916,082

As at March 31, 2019, the Group has entered into swap contracts for which cash flow hedge accounting is applied, to avoid market price fluctuation of raw materials.

(in millions of Korean won)

	March 31, 2019				
	Purpose of the contracts	Hedged items	Financial institution	Maturity	Fair value
Merchandise (raw materials) swap ¹	Cash flow hedge	Non-ferrous metal	Citi bank	~2021. 12	7,161

Details of derivative assets and liabilities as at March 31, 2019 and December 31, 2018, are as follows:

	March 31, 2019		December 31, 2018	
	Assets	Liabilities	Assets	Liabilities
Merchandise (raw materials) swap ¹	7,714	553	-	18,477
Total	7,714	553	-	18,477

¹ Gain (loss) resulting from the contracts to avoid cash flow fluctuation risk of expected future transaction is accounted for as accumulated other comprehensive income (Note 5).

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3.2 Capital Risk Management

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

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

The gearing ratio and debt-to-equity ratio as at March 31, 2019 and December 31, 2018, were as follows:

<i>(in millions of Korean won, except for ratios)</i>	March 31, 2019	December 31, 2018
Total borrowings (Note 14) (A)	6,904,782	5,321,147
Less: cash and cash equivalents (B)	(3,098,413)	(2,513,702)
Net debt (C=A+B)	3,806,369	2,807,445
Total liabilities (D)	14,012,994	11,622,009
Total equity (E)	17,199,291	17,322,128
Total capital (F=C+E)	21,005,660	20,129,573
Gearing ratio (C/F)	18.1%	13.9%
Debt-to-equity ratio (D/E)	81.5%	67.1%

3.3 Fair Value

(1) Carrying amount and fair value of financial instruments by category as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019		December 31, 2018	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial assets (current)				
Cash and cash equivalents	3,098,413	1	2,513,702	1
Deposits held by financial institutions	23,054	1	42,902	1
Trade receivables	4,616,062	1	4,381,199	1
Other receivables (excluding deposits held by financial institutions)	296,222	1	283,191	1
Financial assets (non-current)				
Deposits held by financial institutions	64,347	1	64,331	1
Other receivables (excluding deposits held by financial institutions)	78,225	1	64,919	1
Other non-current financial assets (carried at cost)	-	-	-	-
Other non-current financial assets (carried at fair value)				
Marketable financial assets	55,085	55,085	49,214	49,214
Non-marketable financial assets	44,815	1	44,136	-
Non-current derivative financial assets	7,714	7,714	-	-

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	March 31, 2019		December 31, 2018	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial liabilities (current)				
Trade and other payables	4,908,974	¹	4,717,445	¹
Current borrowings				
(excluding lease liabilities)	1,615,137	¹	1,608,138	¹
Current lease liabilities	14,994	²	5,008	¹
Current derivative financial liabilities	553	553	18,477	18,477
Financial liabilities (non-current)				
Non-current borrowings				
(excluding lease liabilities)	5,184,924	5,301,763	3,684,765	3,740,154
Non-current lease liabilities	89,727	²	23,236	24,689
Other non-current payables	9,680	¹	9,984	¹
Other non-current financial liabilities				
(Conversion rights)	30,827	30,827	30,384	30,384

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 Fair values for these financial assets and liabilities are not disclosed above in accordance with related Korean IFRS.

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

Fair values of financial liabilities(non-current) are based on cash outflows discounted by using Korean won currency note yield in the same credit grade with the Parent Company (AA+), and the applied discount rates as at March 31, 2019 and December 31, 2018, are as follows:

(in percentage)	March 31, 2019	December 31, 2018
Discount rate	1.90% ~ 2.40%	2.01% ~ 2.53%

(3) Fair value hierarchy

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

- Level 1: The fair value of financial instruments traded in active markets (such as publicly traded derivatives and equity securities) is based on quoted market prices at the end of the reporting period. The quoted market price used for financial assets held by the Group is the current bid price. These instruments are included in level 1.

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

- Level 3: If one or more of the significant inputs is not based on observable market data, the instrument is included in level 3. This is the case for unlisted equity securities.

Fair value hierarchy classifications of the financial instruments that are measured at fair value or

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their fair value are disclosed as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019			
	Level 1	Level 2	Level 3	Total
Financial assets/liabilities measured at fair value				
Other non-current financial assets (marketable financial assets)	55,085	-	-	55,085
Non-current derivative financial assets	-	7,714	-	7,714
Current derivative financial liabilities	-	553	-	553
Non-current financial liabilities (conversion rights)	-	-	30,827	30,827
Financial assets/liabilities not measured at fair value				
Non-current borrowings (excluding finance lease liabilities)	-	4,667,974	633,789	5,301,763
<i>(in millions of Korean won)</i>				
	December 31, 2018			
	Level 1	Level 2	Level 3	Total
Financial assets/liabilities measured at fair value				
Other non-current financial assets (marketable financial assets)	49,214	-	-	49,214
Other current financial liabilities (derivative instruments)	-	18,477	-	18,477
Other non-current financial liabilities (conversion rights)	-	-	30,384	30,384
Financial assets/liabilities not measured at fair value				
Non-current borrowings (excluding finance lease liabilities)	-	3,120,475	619,679	3,740,154
Non-current finance lease liabilities	-	24,689	-	24,689

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(4) Valuation Technique and the Inputs

Valuation techniques and inputs used in level 3 fair value measurements are as follows:

(in millions of Korean won)

March 31, 2019					
	Fair value	Level	Valuation Technique	Inputs	Coverage of Level 3 inputs
Financial liabilities					
– Convertible Bond					
Convertible Bond	633,789	3	Binominal option pricing model	Annual rates of credit volatility	-0.5%p ~ +0.5%p
Equity Conversion Option	30,827	3	Binominal option pricing model	Annual rates of credit volatility Underlying asset (equity) volatility	-0.5%p ~ +0.5%p -5% ~ +5%

(in millions of Korean won)

December 31, 2018					
	Fair value	Level	Valuation Technique	Inputs	Coverage of Level 3 inputs
Financial liabilities					
– Convertible Bond					
Convertible Bond	619,679	3	Binominal option pricing model	Annual rates of credit volatility	-0.5%p ~ +0.5%p
Equity Conversion Option	30,384	3	Binominal option pricing model	Annual rates of credit volatility Underlying asset (equity) volatility	-0.5%p ~ +0.5%p -5% ~ +5%

(5) Sensitivity analysis for Recurring Fair Value Measurements Categorized Within Level 3

Sensitivity analysis of financial instruments is performed to measure favorable and unfavorable changes in the fair value of financial instruments which are affected by the unobservable parameters, using a statistical technique. When the fair value is affected by more than two input parameters, the most favorable or most unfavorable amounts are presented.

The results of the sensitivity analysis for the effect on profit or loss from changes in inputs for convertible notes categorized as level 3 and subject to sensitivity analysis, are as follows:

(in millions of Korean won)

	March 31, 2019	
	The effect on profit	The effect on loss
Financial liabilities		
– Convertible Bond		
Annual rates of credit volatility	6,353	(6,449)
Financial liabilities		
– Equity Conversion Option		
Annual rates of credit volatility	986	(957)
Underlying asset (equity) volatility	3,303	(3,380)

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<i>(in millions of Korean won)</i>	December 31, 2018	
	The effect on profit	The effect on loss
Financial liabilities		
– Convertible Bond		
Annual rates of credit volatility	6,899	(7,011)
Financial liabilities		
– Equity Conversion Option		
Annual rates of credit volatility	985	(966)
Underlying asset (equity) volatility	3,237	(3,434)

4. Critical Accounting Estimates and Assumptions

The preparation of financial statements requires the Group to make 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 condensed consolidated interim financial statements are the same as those applied to the consolidated financial statements for the year ended December 31, 2018, except for the estimates used to determine income tax expense, and accounting estimates and assumptions for implementation of Korean IFRS 1116 explained as below.

(1) Lease

On adoption of Korean IFRS 1116, the Group recognized lease liabilities in relation to leases which had previously been classified as ‘operating leases’ under the principles of Korean IFRS 1017. These liabilities were measured at the present value of the remaining lease payments, discounted using the lessee’s incremental borrowing rate as at January 1, 2019.

For leases previously classified as ‘finance leases’, the Group recognized the carrying amount of the lease asset and lease liability immediately before the initial application as the carrying amount of the right-of-use asset and the lease liability at the date of initial application. Right-of use assets were measured at the amount equal to the lease liability, adjusted by the amount of any prepaid or accrued lease payments relating to that lease as at December 31, 2018 (Note 11).

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5. Financial Instruments by Category

Categorizations of financial instruments as at March 31, 2019 and December 31, 2018, are as follows:

(in millions of Korean won)

Financial assets	March 31, 2019			Total
	Financial assets at amortized cost	Financial assets at fair value through profit or loss	Financial assets at fair value through other comprehensive income	
Cash and cash equivalents	3,098,413	-	-	3,098,413
Trade receivables	4,280,904	-	335,158	4,616,062
Other receivables	319,276	-	-	319,276
Other non-current receivables	142,571	-	-	142,571
Current financial assets	-	-	174	174
Non-current financial assets	-	16,676	90,937	107,613
Total	7,841,164	16,676	426,269	8,284,109

(in millions of Korean won)

Financial liabilities	March 31, 2019			Total
	Financial liabilities at fair value through profit or loss	Financial liabilities at amortized cost	Other financial liabilities ¹	
Trade payables	-	2,434,112	-	2,434,112
Other payables	-	2,474,862	-	2,474,862
Borrowings (current)	-	1,615,137	14,994	1,630,131
Other current payables (dividends payable)	-	460,058	-	460,058
Current financial liabilities	-	-	553	553
Non-current financial liabilities	30,827	-	-	30,827
Other non-current payables	-	9,680	-	9,680
Borrowings (non-current)	-	5,184,924	89,727	5,274,651
Total	30,827	12,178,773	105,274	12,314,874

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(in millions of Korean won)

	December 31, 2018			Total
	Financial assets at amortized cost	Financial assets at fair value through profit or loss	Financial assets at fair value through other comprehensive income	
Financial assets				
Cash and cash equivalents	2,513,702	-	-	2,513,702
Trade receivables	3,986,675	-	394,524	4,381,199
Other receivables	326,093	-	-	326,093
Other non-current receivables	129,251	-	-	129,251
Other non-current financial assets	-	16,077	77,273	93,350
Total	6,955,721	16,077	471,797	7,443,595

(in millions of Korean won)

	December 31, 2018			Total
	Financial liabilities at fair value through profit or loss	Financial liabilities at amortized cost	Other financial liabilities ¹	
Financial liabilities				
Trade payables	-	2,165,969	-	2,165,969
Other payables	-	2,551,476	-	2,551,476
Borrowings (current)	-	1,608,138	5,008	1,613,146
Current financial liabilities	-	-	18,477	18,477
Non-current financial liabilities	30,384	-	-	30,384
Other non-current payables	-	9,984	-	9,984
Borrowings (non-current)	-	3,684,765	23,236	3,708,001
Total	30,384	10,020,332	46,721	10,097,437

¹ Other financial liabilities include financial lease liabilities that are not subject to the categorizations and financial liabilities that are related to transfer transactions not qualified for derecognition.

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Net gains or losses on each category of financial instruments for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Dividend income		
Financial assets at fair value through other comprehensive income	25	-
Interest income		
Financial assets at amortized cost	11,708	11,264
Interest expense		
Derivative instruments	-	-
Financial liabilities at amortized cost	(44,506)	(28,010)
Other financial liabilities	(652)	(260)
Gain on valuation		
Financial assets at fair value through profit or loss	30	-
Financial assets at fair value through other comprehensive income	6,992	3,657
Derivative instruments	25,371	-
Loss on redemption of debentures		
Financial liabilities at amortized cost	-	(13)
Loss on disposal		
Financial assets at fair value through profit or loss	-	-
Derivative instruments	-	-
Financial assets at fair value through other comprehensive income	-	(1,337)
Gain (loss) on foreign currency translation		
Financial assets at amortized cost	27,369	(15,282)
Financial liabilities at amortized cost	(2,147)	42,154
Other financial liabilities	(190)	-
Gain (loss) on foreign currency transaction		
Financial assets at amortized cost	19,982	1,396
Financial liabilities at amortized cost	(4,041)	9,417
Other financial liabilities	-	(93)

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6. Cash and Cash Equivalents

Details of cash and cash equivalents as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Bank deposits and cash on hand	729,928	872,337
Deposits held by financial institutions and others	2,368,485	1,641,365
Total	3,098,413	2,513,702

As at March 31, 2019, cash and cash equivalents include ₩3,864 million which is subject to a restriction on the use in association with the national R&D projects.

7. Trade and Other Receivables

Trade and other receivables and its provisions for impairment, as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019		
	Gross amount	Provision for impairment	Carrying amount
Trade receivables	4,623,328	(7,266)	4,616,062
Other current receivables	321,384	(2,108)	319,276
Other non-current receivables ¹	142,571	-	142,571
Total	5,087,283	(9,374)	5,077,909

<i>(in millions of Korean won)</i>	December 31, 2018		
	Gross amount	Provision for impairment	Carrying amount
Trade receivables	4,389,109	(7,910)	4,381,199
Other current receivables	328,819	(2,726)	326,093
Other non-current receivables ¹	129,251	-	129,251
Total	4,847,179	(10,636)	4,836,543

¹ As at March 31, 2019, ₩947 million of other non-current receivables represents deposits which are restricted from withdrawal in connection with maintaining checking accounts (2018: ₩931 million).

Details of other receivables as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Current		
Non-trade receivables	246,733	242,740
Deposits held by financial institutions ¹	23,054	42,902
Accrued income	4,203	3,533
Guarantee deposits provided	45,286	36,918
	319,276	326,093

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Non-current

Non-trade receivables	16,181	7,030
Deposits held by financial institutions ²	64,347	64,331
Loans	390	312
Guarantee deposits provided	61,653	57,578
	142,571	129,251
Total	461,847	455,344

¹ As at March 31, 2019, ₩300 million (2018: ₩300 million) is pledged as a collateral for borrowings and others.

² As at March 31, 2019, ₩63,400 million (2018: ₩63,400 million) is restricted from being withdrawn in relation to large, small and medium-sized companies cooperation agreement and others.

The aging analysis of trade and other receivables as at March 31, 2019 and December 31, 2018, is as follows:

(in millions of Korean won)

	March 31, 2019		December 31, 2018	
	Trade receivables	Other receivables	Trade receivables	Other receivables
Receivables not past due	4,437,726	446,737	4,115,060	445,357
Past due but not impaired				
Up to 3 months	151,144	12,778	247,287	6,850
Between 3-6 months	12,616	1,366	5,631	1,907
Over 6 months	16,652	965	15,570	1,847
	180,412	15,109	268,488	10,604
Impaired receivables	5,190	2,109	5,561	2,109
	4,623,328	463,955	4,389,109	458,070

Movements on the provision for impairment of trade and other receivables for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

(in millions of Korean won)

	March 31, 2019			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	7,910	-	2,726	-
Business combination (Note 34)	-	-	-	-
Additions (Reversal)	(475)	-	633	-
Write-off	-	-	-	-
Exchange differences	(169)	-	(1,251)	-
Ending balance	7,266	-	2,108	-

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	December 31, 2018			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
Beginning balance	7,552	-	959	-
Business combination (Note 34)	23	-	-	-
Additions	701	-	1,783	-
Write-off	(333)	-	-	-
Exchange differences	(33)	-	(16)	-
Ending balance	<u>7,910</u>	<u>-</u>	<u>2,726</u>	<u>-</u>

As at March 31, 2019 and December 31, 2018, the carrying amounts of trade and other receivables are approximation of their fair values.

The Group transferred trade and other receivables to financial institutions for ₩502,274 million at March 31, 2019, and derecognized the trade and other receivables from the financial statements at the date of disposal, as substantial all the risks and rewards were transferred.

8. Other Financial Assets

Details of other financial assets as at March 31, 2019 and December 31, 2018, are as follows:

(in millions of Korean won)

	March 31, 2019	December 31, 2018
Other financial assets		
Financial assets at fair value through other comprehensive income (futures contract) (current)	174	-
Financial assets at fair value through other comprehensive income (excluding futures contract) (non-current)	83,224	77,273
Financial assets at fair value through other comprehensive income (futures contract) (non-current)	7,714	-
Financial assets at fair value through profit or loss (excluding futures contract) (non-current)	<u>16,675</u>	<u>16,077</u>
	<u>107,787</u>	<u>93,350</u>
Other financial liabilities		
Financial liabilities at fair value through other comprehensive income (futures contract) (current)	553	18,477
Financial liabilities at fair value through profit or loss (conversion rights) (non-current)	<u>30,827</u>	<u>30,384</u>
	<u>31,380</u>	<u>48,861</u>

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Changes in equity securities and debts instruments included in other financial assets for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Beginning balance	93,350	23,782
Acquisitions / Transfer	876	89,240
Disposals	(1,349)	(14,009)
Gain (loss) on valuation (before income tax effects) through other comprehensive income	5,613	(7,566)
Gain (loss) on valuation (before income tax effects) through profit or loss	30	73
Exchange differences	1,379	1,830
Ending balance	99,899	93,350

During the three-month period ended March 31, 2019 and the year ended December 31, 2018, the Group did not recognize impairment for other financial assets.

9. Inventories

Details of inventories as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019		
	Gross Amount	Valuation allowance	Carrying amount
Merchandise	155,842	(3,686)	152,156
Finished / Semi-finished products	2,622,571	(116,583)	2,505,988
Work-in-process	20,381	-	20,381
Raw materials	1,157,013	(16,370)	1,140,643
Supplies	160,518	-	160,518
Materials-in-transit	523,583	-	523,583
Total	4,639,908	(136,639)	4,503,269

<i>(in millions of Korean won)</i>	December 31, 2018		
	Gross Amount	Valuation allowance	Carrying amount
Merchandise	167,842	(958)	166,884
Finished / Semi-finished products	2,480,102	(125,479)	2,354,623
Work-in-process	15,530	-	15,530
Raw materials	1,111,386	(18,573)	1,092,813
Supplies	154,304	-	154,304
Materials-in-transit	505,309	-	505,309
Total	4,434,473	(145,010)	4,289,463

During the three-month period ended March 31, 2019, the cost of inventories recognized as expense and included in 'cost of sales' amounted to ₩4,157,665 million (2018: ₩3,958,339 million).

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10. Investments in Associates and Joint Ventures

Changes in investments in associates and joint ventures for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

(in millions of Korean won)

	March 31, 2019						
	Beginning balance	Acquisitions / transfer	Dividends	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income of associates and joint ventures	Others	Ending balance
LG VINA Chemical Co., Ltd	4,479	-	-	76	207	-	4,762
HL Greenpower Co., Ltd.	19,565	-	-	1,500	-	(118)	20,947
LG Holdings (HK) Ltd.	54,735	-	-	1,381	668	-	56,784
TECHWIN Co., Ltd.	9,828	-	-	2,096	(15)	-	11,909
SEETEC Co., Ltd.	145,649	-	(10,000)	1,618	-	-	137,267
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	150
FJ Composite Materials Co., LTD.	2,315	-	-	(67)	57	-	2,305
WUXI CL New Energy Technology Ltd.	1,288	-	-	(112)	43	-	1,219
LG Life Sciences Poland Ltd.	17	-	-	-	-	-	17
Combustion Synthesis Co., Ltd.	1,397	-	-	(47)	30	24	1,404
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	26,120	-	-	114	933	-	27,167
	<u>266,122</u>	<u>-</u>	<u>(10,000)</u>	<u>6,559</u>	<u>1,923</u>	<u>(94)</u>	<u>264,510</u>

(in millions of Korean won)

	December 31, 2018						
	Beginning balance	Acquisitions / transfer	Dividends	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income of associates and joint ventures	Others	Ending balance
LG VINA Chemical Co., Ltd	3,327	1,767	(810)	246	(51)	-	4,479
HL Greenpower Co., Ltd.	20,239	-	-	(467)	-	(207)	19,565
LG Holdings (HK) Ltd.	51,028	-	-	4,029	(322)	-	54,735
TECHWIN Co., Ltd.	8,010	-	-	1,818	-	-	9,828
SEETEC Co., Ltd.	146,741	-	(10,000)	9,368	-	(460)	145,649
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	579	-	-	-	-	-	579
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	150
LG Fuel Cell Systems Inc.	30,334	5,036	-	(9,647)	718	(26,441)	-
FJ Composite Materials Co., LTD.	2,669	-	-	(198)	(156)	-	2,315
WUXI CL New Energy Technology Ltd.	1,002	559	-	(224)	(49)	-	1,288
LG Life Sciences Poland Ltd.	17	-	-	-	-	-	17
Combustion Synthesis Co., Ltd.	-	1,503	-	(118)	(4)	16	1,397

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HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	-	26,129	-	279	(288)	-	26,120
	<u>264,096</u>	<u>34,994</u>	<u>(10,810)</u>	<u>5,086</u>	<u>(152)</u>	<u>(27,092)</u>	<u>266,122</u>

11. Property, Plant and Equipment

Changes in property, plant and equipment for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

(in millions of Korean won)

in millions of Korean won)	March 31, 2019											
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Right-of- use assets	Constructi on-in- progress	Machinery -in-transit	Total
Beginning balance	1,620,153	3,187,757	827,775	4,691,884	12,865	471,130	149,599	115,901	-	2,588,018	174,116	13,839,198
Cost	1,657,105	3,959,198	1,407,903	14,412,619	41,803	1,233,217	420,342	315,049	-	2,641,276	174,116	26,262,628
Accumulated depreciation	-	(735,173)	(566,151)	(9,564,688)	(28,783)	(750,202)	(268,298)	(196,996)	-	-	-	(12,110,291)
Accumulated impairment	(36,952)	(36,268)	(13,977)	(156,047)	(155)	(11,885)	(2,445)	(2,152)	-	(53,258)	-	(313,139)
Changes in accounting policy	-	-	(17,697)	(9,668)	-	-	-	-	138,938	-	-	111,573
Restated beginning balance	1,620,153	3,187,757	810,078	4,682,216	12,865	471,130	149,599	115,901	138,938	2,588,018	174,116	13,950,771
Acquisitions/ Transfer	5,444	298,687	38,546	459,214	3,859	51,747	8,606	6,704	8,245	1,188,372	73,968	2,143,392
Disposals/ Transfer	(2,123)	(265)	(386)	(93,247)	(10,087)	(8,168)	(616)	-	(4,295)	(840,742)	(31,798)	(991,727)
Exchange differences	116	26,278	3,637	49,814	36	3,357	1,000	-	1,331	16,796	-	102,365
Depreciation	-	(26,125)	(12,867)	(262,910)	(858)	(37,307)	(10,862)	(19,545)	(5,768)	-	-	(376,242)
Impairment	-	(307)	(16)	(4,191)	-	(265)	(13)	-	-	-	-	(4,792)
Ending balance	1,623,590	3,486,025	838,992	4,830,896	5,815	480,494	147,714	103,060	138,451	2,952,444	216,286	14,823,767
Cost	1,660,542	4,291,403	1,423,626	14,812,099	31,760	1,273,154	428,818	321,753	172,071	3,005,395	216,286	27,636,907
Accumulated depreciation	-	(768,366)	(570,338)	(9,824,195)	(25,794)	(779,629)	(278,593)	(216,541)	(33,620)	-	-	(12,497,076)
Accumulated impairment	(36,952)	(37,012)	(14,296)	(157,008)	(151)	(13,031)	(2,511)	(2,152)	-	(52,951)	-	(316,064)

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Korean won)

in millions of Korean won)

	December 31, 2018										
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Construction-in-progress	Machinery-in-transit	Total
Beginning balance	1,568,295	2,762,588	654,629	4,169,473	13,654	403,522	105,759	73,399	1,317,877	142,286	11,211,482
Cost	1,605,247	3,438,000	1,190,383	13,157,481	39,945	1,085,752	352,106	211,585	1,361,431	142,286	22,584,216
Accumulated depreciation	-	(637,025)	(521,806)	(8,840,809)	(26,143)	(669,189)	(243,973)	(136,034)	-	-	(11,074,979)
Accumulated impairment	(36,952)	(38,387)	(13,948)	(147,199)	(148)	(13,041)	(2,374)	(2,152)	(43,554)	-	(297,755)
Business combination (Note 34)	12,115	13,497	632	22,163	247	1,992	159	-	1,310	-	52,115
Acquisitions/ Transfer	42,589	523,470	222,046	2,336,407	2,235	217,702	86,201	113,754	4,741,547	181,833	8,467,784
Disposals/ Transfer	(2,817)	(5,098)	(1,765)	(792,444)	(183)	(11,304)	(2,624)	(3,485)	(3,461,294)	(150,003)	(4,431,017)
Exchange differences	(29)	(6,950)	(466)	(20,254)	(2)	(138)	320	-	(1,865)	-	(29,384)
Depreciation	-	(95,479)	(47,000)	(986,099)	(3,066)	(139,783)	(40,127)	(67,767)	-	-	(1,379,321)
Impairment	-	(4,295)	(343)	(37,727)	(25)	(862)	(104)	-	(9,557)	-	(52,913)
Reversal of impairment	-	24	42	365	5	1	15	-	-	-	452
Ending balance	1,620,153	3,187,757	827,775	4,691,884	12,865	471,130	149,599	115,901	2,588,018	174,116	13,839,198
Cost	1,657,105	3,959,198	1,407,903	14,412,619	41,803	1,233,217	420,342	315,049	2,641,276	174,116	26,262,628
Accumulated depreciation	-	(735,173)	(566,151)	(9,564,688)	(28,783)	(750,202)	(268,298)	(196,996)	-	-	(12,110,291)
Accumulated impairment	(36,952)	(36,268)	(13,977)	(156,047)	(155)	(11,885)	(2,445)	(2,152)	(53,258)	-	(313,139)

During the three-month period ended March 31, 2019, the Group capitalized ₩5,563 million of borrowing costs (2018: ₩2,691 million), in relation to acquisition of property, plant and equipment, on property, plant and equipment. The capitalization rate of borrowings used to determine the amount of borrowing costs eligible for capitalization is 2.40% (2018: 2.74%).

Line items including depreciation in the consolidated statements of profit or loss for the three-month periods ended March 31, 2019 and 2018, are as follows:

(in millions of Korean won)	2019	2018
Cost of sales	341,087	301,927
Selling and administrative expenses	33,915	27,211
Others	1,240	835
Total	376,242	329,973

Lease

The Group has applied Korean IFRS 1116 retrospectively with the cumulative effect of initially applying the new lease standard recognized at the date of initial application, as permitted under the specific transitional provisions in the standard. Accordingly, reclassifications and adjustments arising from the new lease standard were recognized in the statement of financial position as at January 1, 2019.

- Adjustments recognized on adoption of Korean IFRS 1116 Lease

On adoption of Korean IFRS 1116, the Group recognized lease liabilities in relation to leases which had previously been classified as 'operating leases' under the principles of Korean IFRS 1017. These liabilities were measured at the present value of the remaining lease payments, discounted using the lessee's incremental borrowing rate as at January 1, 2019. The weighted average lessee's incremental borrowing rate applied to the lease liabilities on January 1, 2019 was 2.45%.

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For leases previously classified as 'finance leases', the Group recognized the carrying amount of the lease asset and lease liability immediately before the initial application as the carrying amount of the right-of-use asset and the lease liability at the date of initial application.

Right-of use assets were measured at the amount equal to the lease liability, adjusted by the amount of any prepaid or accrued lease payments relating to that lease recognized in the consolidated statement of financial position as at December 31, 2018. There were no onerous lease contracts that would have required an adjustment to the right-of-use assets at the date of initial application.

(i) Amounts recognized in the consolidated interim statement of financial position

The consolidated interim statement of financial position shows the following amounts relating to leases:

<i>(in millions of Korean won)</i>	March 31, 2019	January 1, 2019
Right-of-use assets ¹		
Land	72,974	72,203
Buildings	14,071	17,019
Structures	20,749	17,975
Machinery	14,152	14,893
Vehicles	13,505	13,663
Tools	14	17
Equipment	2,986	3,168
	<u>138,451</u>	<u>138,938</u>

¹ Included in the line item 'Property, plant and equipment' in the consolidated interim statements of financial position.

<i>(in millions of Korean won)</i>	March 31, 2019	January 1, 2019
Lease liabilities ¹		
Current	14,994	11,905
Non-current	89,727	92,910
	<u>104,721</u>	<u>104,815</u>

¹ Included in the line item 'borrowings' in the consolidated interim statements of financial position. In the previous year, the Group only recognized lease liabilities in relation to leases that were classified as 'finance leases' under Korean IFRS 1017 *Leases*. These were presented as part of the Group's borrowings.

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(ii) Amounts recognized in the consolidated interim statement of profit or loss

The consolidated interim statement of profit or loss shows the following amounts relating to leases:

<i>(in millions of Korean won)</i>	2019
Depreciation of right-of-use assets	
Land	599
Buildings	1,986
Structures	846
Machinery	741
Vehicles	1,387
Tools	3
Equipment	206
	<hr/> 5,768
Interest expense relating to lease liabilities (included in finance cost)	652
Expense relating to short-term leases (included in cost of goods sold and administrative expenses)	14,803
Expense relating to leases of low-value assets that are not short-term leases (included in cost of goods sold and administrative expenses)	2,489
Expense relating to variable lease payments not included in lease liabilities (included in cost of goods sold and administrative expenses)	6

The total cash outflow for leases during the three-month period ended March 31, 2019 was ₩ 14,225 million.

Financial line items affected by the initial application of Korea IFRS 1116 in the consolidated interim statement of financial position as at January 1, 2019 are as follows:

- property, plant and equipment: decreased by ₩27,365 million
- right-of-use assets: increased by ₩138,938 million
- long-term prepaid expenses: decreased by ₩35,005 million
- lease liabilities: increased by ₩76,571 million

(iii) Practical expedients applied

In applying Korean IFRS 1116 for the first time, the Group has used the following practical expedients permitted by the standard:

- the use of a single discount rate to a portfolio of leases with reasonably similar characteristics
- reliance on previous assessments on whether leases are onerous

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- the accounting for operating leases with a remaining lease term of less than 12 months as at January 1, 2019, as short-term leases
- the exclusion of initial direct costs for the measurement of the right-of-use asset at the date of initial application, and
- the use of hindsight in determining the lease term where the contract contains options to extend or terminate the lease

- The Group's leasing activities and how these are accounted for

The Group leases various offices, warehouses, machinery and cars. Lease contracts are typically made for fixed periods, but may have extension options. Lease terms are negotiated on an individual basis and contain a wide range of different terms and conditions. The lease agreements do not impose any covenants, but leased assets shall not be provided as collateral for borrowing purposes.

Until the 2018 financial year, leases of property, plant and equipment were classified as either finance or operating leases. Payments made under operating leases (net of any incentives received from the lessor) were charged to profit or loss on a straight-line basis over the period of the lease.

From January 1, 2019, leases are recognized as a right-of-use asset and a corresponding liability at the date at which the leased asset is available for use by the Group. Each lease payment is allocated between the liability and finance cost. The finance cost is charged to profit or loss over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period. The right-of-use asset is depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis.

Assets and liabilities arising from a lease are initially measured on a present value basis. Lease liabilities include the net present value of the following lease payments:

- fixed payments (including in-substance fixed payments), less any lease incentives receivable
- variable lease payment that are based on an index or a rate
- amounts expected to be payable by the lessee under residual value guarantees
- the exercise price of a purchase option if the lessee is reasonably certain to exercise that option, and
- payments of penalties for terminating the lease, if the lease term reflects the lessee exercising that option

The lease payments are discounted using the interest rate implicit in the lease, if that rate can be readily determined. If that rate cannot be readily determined, the lessee's incremental borrowing rate is used. The lessee's incremental borrowing is defined as the rate of interest that a lessee would have to pay to borrow over a similar term, and with a similar security, the funds necessary to obtain an asset of a similar value to the right-of-use asset in a similar economic environment.

Right-of-use assets are measured at cost comprising the following:

- the amount of the initial measurement of lease liability
- any lease payments made at or before the commencement date less any lease incentives

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received

- any initial direct costs, and
- restoration costs

Payments associated with short-term leases and leases of low-value assets are recognized on a straight-line basis as an expense in profit or loss. Short-term leases are leases with a lease term of 12 months or less. Low-value assets comprise IT-equipment and small items of office furniture.

(i) Variable lease payments

Some property leases contain variable payment terms that are linked to usage generated from warehouses. Variable lease payments that depend on the usage are recognized in profit or loss in the period in which the condition that triggers those payments occurs.

(ii) Extension and termination options

Extension and termination options are included in a number of property and equipment leases across the Group. These terms are used to maximize operational flexibility in terms of managing contracts. The majority of extension and termination options held are exercisable only by the Group and not by the respective lessor. In determining the lease term, management considers all facts and circumstances that create an economic incentive to exercise an extension option, or not to exercise a termination option. Periods covered by extension options (or termination options) are only included in the lease term if it is reasonably certain to exercise an extension option, or not to exercise a termination option.

12. Intangible Assets

Changes in intangible assets for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

(in millions of Korean won)

	March 31, 2019					
	Development costs	Industrial property rights	Goodwill	Memberships	Others	Total
Beginning balance	220,860	405,282	1,017,855	50,885	311,356	2,006,238
Separate acquisitions/ Transfer ¹	7,837	130,957	-	-	2,479	141,273
Additions – internal development	2,461	-	-	-	-	2,461
Disposals/ Transfer	(5,980)	(903)	-	(86)	(31)	(7,000)
Exchange differences	379	927	(999)	19	93	419
Amortization	(11,172)	(8,282)	-	-	(9,457)	(28,911)
Ending balance	<u>214,385</u>	<u>527,981</u>	<u>1,016,856</u>	<u>50,818</u>	<u>304,440</u>	<u>2,114,480</u>

¹ Intangible assets acquired from Dupont related to S-OLED are included.

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	December 31, 2018					
	Development costs	Industrial property rights	Goodwill	Memberships	Others	Total
Beginning balance	192,046	371,381	925,593	50,806	283,329	1,823,155
Business combination (Note 34)	-	4	85,020	-	51,829	139,704
Separate acquisitions/ Transfer	83,049	63,008	-	702	34,750	181,509
Additions – internal development	16,065	-	-	-	-	16,065
Disposals/ Transfer	(15,149)	(69)	-	(623)	(23,150)	(38,991)
Exchange differences	(115)	1,433	7,242	-	(120)	5,589
Amortization	(42,276)	(30,475)	-	-	(35,197)	(107,948)
Impairment	(12,760)	-	-	-	(85)	(12,845)
Ending balance	220,860	405,282	1,017,855	50,885	311,356	2,006,238

Line items including amortization of intangible assets for the three-month periods ended March 31, 2019 and 2018, as follows:

(in millions of Korean won)

	2019	2018
Cost of sales	5,951	5,847
Selling and administrative expenses	22,960	20,250
Total	28,911	26,097

The Group recognized total research and development costs of ₩262,558 million (2018: ₩228,648 million) as expenses.

Changes in greenhouse gas emission permits for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

(in thousands of tons
and millions of
Korean won)

	March 31, 2019			
	2018		2019	
	Quantity	Amount	Quantity	Amount
Beginning balance	7,903	7,359	7,546	-
Allocation with nil consideration	-	-	-	-
Purchase	-	-	-	-
Borrowings/ Carry forwards between years	-	-	-	-
Surrendered to the government	-	-	-	-
Ending balance	7,903	7,359	7,546	-

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<i>(in thousands of tons and millions of Korean won)</i>	December 31, 2018					
	2017		2018		2019	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Beginning balance	7,520	18,635	6,648	-	-	-
Allocation with nil consideration	160	-	897	-	7,546	-
Additional purchases	481	11,826	-	-	-	-
Borrowings/Carry forwards between years	(358)	(7,359)	358	7,359	-	-
Surrendered to the government	(7,803)	(23,102)	-	-	-	-
Ending balance	-	-	7,903	7,359	7,546	-

13. Other Current and Non-Current Assets

Details of other current and non-current assets as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Current		
Prepayments to suppliers and prepaid expenses	194,745	138,502
Prepaid value added tax	361,850	373,187
Others	101,014	61,771
Total	657,609	573,460
Non-current		
Long-term prepayments and long-term prepaid expenses	115,990	112,223
Others	132	157
Total	116,122	112,380

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14. Borrowings

Borrowings as at March 31, 2019 and December 31, 2018, consist of:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Current		
Short-term borrowings	1,210,756	1,254,142
Current portion of long-term borrowings of bank loans	304,469	304,004
Current-portion of debentures	99,912	49,992
Finance lease liabilities	14,994	5,008
	<u>1,630,131</u>	<u>1,613,146</u>
Non-current		
Long-term borrowings	1,577,634	981,858
Debentures	3,607,290	2,702,907
Finance lease liabilities	89,727	23,236
	<u>5,274,651</u>	<u>3,708,001</u>
Total	<u>6,904,782</u>	<u>5,321,147</u>

Details of short-term borrowings as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	Bank	Latest maturity date	Interest rate(%) as at March 31, 2019	March 31, 2019	December 31, 2018
Bank loans	Nonghyup Bank, others	Dec. 15, 2019	2.49 and others	1,210,756	1,254,142
Total				<u>1,210,756</u>	<u>1,254,142</u>

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Details of long-term borrowings as at March 31, 2019 and December 31, 2018, are as follows:

(in millions of Korean won)	March 31, 2019				
	Bank	Annual interest rate (%)	Amount in Korean won	Current	Non-current
Borrowings in Korean won	KEB Hana Bank ¹	1.75	264	264	-
	KDB	1Y + 1.45 ~ 1.99	8,509	-	8,509
Borrowings in foreign currencies	HSBC	3LIBOR + 1.00 ~ 1.05	244,285	39,767	204,518
	Sumitomo Mitsui Banking Corporation	3LIBOR + 0.98~1.05	121,769	55,633	66,136
	Agricultural Bank of China	USD: 3LIBOR + 0.80 CNY: PBOC × 0.90	43,100	10,039	33,061
	Construction Bank of China	PBOC × 0.90	22,824	3,888	18,936
	Communications Bank of China	PBOC × 0.90~1.00	40,692	4,370	36,322
	CITI	USD: 3LIBOR + 0.95 Euro: EURIBOR + 0.70 CNY: PBOC	211,710	2,272	209,438
	Bank of America	3LIBOR + 0.90 CNY: PBOC	44,374	-	44,374
	ING BANK	6EURIBOR + 0.70 ~ 0.83	153,479	-	153,479
	UOB	6LIBOR + 1.15~1.55	110,277	53,466	56,811
	Standard Chartered Bank	3LIBOR + 1.20~ 1.60	56,408	17,777	38,631
	Mizuho Banking Corporation	3LIBOR + 0.98~1.02	79,493	52,257	27,236
	BNP PARIBAS	3Euribor + 0.80	19,185	19,185	-
	CNOOC Finance	PBOC × 0.90	56,865	23,117	33,748
	Hangseng	3LIBOR + 1.00	30,677	3,409	27,268
	Bank of China	3LIBOR + 0.95	30,252	12,271	17,981
	MUFG	3Libor + 1.00	173,323	2,839	170,484
	ANZ	3Libor + 1.42	113,621	-	113,621
	Industrial and Commercial Bank of Chin	PBOC	26,216	1,966	24,250
	CIMB	3LIBOR + 1.50	38,982	1,949	37,033
	KEB Hana Bank	3EURIBOR + 0.62	255,798	-	255,798
Total			<u>1,882,103</u>	<u>304,469</u>	<u>1,577,634</u>

¹ Other receivables are pledged as collateral for the above long-term borrowings (Note 18).

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(in millions of Korean won)	December 31, 2018				
	Bank	Annual interest rate (%)	Amount in Korean won	Current	Non-current
Borrowings in Korean won	KEB Hana Bank ¹	1.75	353	353	-
	KDB	1Y + 1.45 ~ 1.99	8,508	-	8,508
Borrowings in foreign currencies	HSBC	3LIBOR + 1.00 ~ 1.05	240,167	39,097	201,070
	Sumitomo Mitsui Banking Corporation	3LIBOR + 0.98~1.05	94,568	50,265	44,303
	Agricultural Bank of China	USD: 3LIBOR + 0.80 CNY: PBOC × 0.90	42,694	8,665	34,029
	Construction Bank of China	PBOC × 0.90	23,890	3,750	20,140
	Communications Bank of China	PBOC	40,617	2,751	37,866
	CITI	USD: 3LIBOR + 0.95 Euro: EURIBOR + 0.90	146,957	-	146,957
	Bank of America	3LIBOR + 0.90	11,181	11,181	-
	ING BANK	6EURIBOR + 0.70 ~ 0.83	153,422	-	153,422
	UOB	6LIBOR + 1.15 ~ 1.55	108,954	53,101	55,853
	Standard Chartered Bank	3LIBOR + 1.60	26,216	26,216	-
	Mizuho Banking Corporation	3LIBOR + 0.98~1.02	78,154	48,030	30,124
	BNP PARIBAS	Euro: EURIBOR + 0.99 PLN: WIBOR + 0.55	19,178	19,178	-
	CNOOC Finance	PBOC × 0.90	54,850	22,298	32,552
	Hangseng	3LIBOR + 1.00	31,836	3,352	28,484
	Bank of China	3LIBOR + 0.95	29,743	12,065	17,678
	MUFG	3LIBOR + 1.00	44,659	2,791	41,868
	ANZ	3LIBOR + 1.42	111,705	-	111,705
	Industrial and Commercial Bank of Chin	PBOC	18,210	911	17,299
Total			<u>1,285,862</u>	<u>304,004</u>	<u>981,858</u>

¹ Other receivables are pledged as collateral for the above long-term borrowings (Note 18).

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Details of debentures as at March 31, 2019 and December 31, 2018, are as follows:

		March 31, 2019				
		Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
50-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.95	2020.05.19	120,000	-	120,000
50-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.28	2022.05.19	400,000	-	400,000
50-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.53	2024.05.19	280,000	-	280,000
51-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.56	2021.02.20	190,000	-	190,000
51-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.88	2023.02.20	240,000	-	240,000
51-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.07	2025.02.20	270,000	-	270,000
51-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.29	2028.02.20	300,000	-	300,000
52-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.02	2022.03.13	160	-	160
52-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.11	2024.03.13	240,000	-	240,000
52-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.21	2026.03.13	200,000	-	200,000
52-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.40	2029.03.13	400,000	-	400,000
1-1st USD Overseas Convertible bonds¹	Credit Suisse	-	2021.04.16	250,316	-	250,316
1-2nd EUR Overseas Convertible bonds²	Credit Suisse	-	2021.04.16	402,655	-	402,655
Debentures in Korean won (non-guaranteed)	NH Investment & Securities Co., Ltd. and others	1.93	2020.02.16	100,000	100,000	-
	NH Investment & Securities Co., Ltd. and others	2.26	2022.02.16	100,000	-	100,000
	NH Investment & Securities Co., Ltd. and others	2.71	2021.03.02	50,000	-	50,000
	NH Investment & Securities Co., Ltd. and others	3.00	2023.03.02	40,000	-	40,000
Less: discount on debentures				(35,769)	(88)	(35,681)
Total				3,707,202	99,912	3,607,290

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¹ Details of 1-1st USD overseas convertible bonds are as follows:

	Details
Aggregate principal amount	USD 220,000,000
Issue price	USD 220,000,000
Coupon rate (%)	0.00
Issue date	April 16, 2018
Maturity date	April 16, 2021
Redemption	- Redemption at maturity: Outstanding bond principal, which is not repaid early or which call option is not exercised on, is repaid at maturity as a lump sum. - Prepayment: The issuer has a call option.
Underlying shares	509,606 registered ordinary shares (treasury shares)
Conversion price (Korean won/shares)	460,000
Conversion period	From May 27, 2018 to April 06, 2021
Call option by the issuer	- Share price (based on closing price) is higher than 130% of conversion price for more than 20 trading days during 30 consecutive trading days in a row, after 1 year from the closing date. - The amount of outstanding bonds is less than 10% in aggregate principal amount of the bonds originally issued (clean up call). - As a result of changes relating to tax laws in Korea, the issuer becomes obliged to pay any additional amounts.
Call option by bondholders	- The shares cease to be listed or admitted to trading or are suspended for a period equal to or exceeding 30 consecutive trading days. - The occurrence of a change of control

² Details of 1-2nd EUR overseas convertible bonds are as follows:

	Details
Aggregate principal amount	EUR 315,200,000
Issue price	EUR 315,200,000
Coupon rate (%)	0.00
Issue date	April 16, 2018
Maturity date	April 16, 2021
Redemption	- Redemption at maturity: Outstanding bond principal, which is not repaid early or which call option is not exercised on, is repaid at maturity as a lump sum. - Prepayment: The issuer has a call option.
Underlying shares	775,128 registered ordinary shares (treasury shares)
Conversion price (Korean won/shares)	533,600
Conversion period	From May 27, 2018 to April 06, 2021
Call option by the issuer	- Share price (based on closing price) is higher than 130% of conversion price for more than 20 trading days during 30 consecutive trading days in a row, after 1 year from the closing date. - The amount of outstanding bonds is less than 10% in aggregate principal amount of the bonds originally issued (clean up call). - As a result of changes relating to tax laws in Korea, the issuer becomes obliged to pay any additional amounts.
Call option by bondholders	- The shares cease to be listed or admitted to trading or are suspended for a period equal to or exceeding 30 consecutive trading days. - The occurrence of a change of control

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		December 31, 2018				
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
48th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.77	2019.02.21	50,000	50,000	-
50-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	1.95	2020.05.19	120,000	-	120,000
50-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.28	2022.05.19	400,000	-	400,000
50-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.53	2024.05.19	280,000	-	280,000
51-1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.56	2021.02.20	190,000	-	190,000
51-2nd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.88	2023.02.20	240,000	-	240,000
51-3rd Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.07	2025.02.20	270,000	-	270,000
51-4th Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	3.29	2028.02.20	300,000	-	300,000
1-1st USD Overseas Convertible bonds¹	Credit Suisse	-	2021.04.16	245,982	-	245,982
1-2nd EUR Overseas Convertible bonds²	Credit Suisse	-	2021.04.16	403,191	-	403,191
Debentures in Korean won (non-guaranteed)	NH Investment & Securities Co., Ltd. and others	1.93	2020.02.16	100,000	-	100,000
	NH Investment & Securities Co., Ltd. and others	2.26	2022.02.16	100,000	-	100,000
	NH Investment & Securities Co., Ltd. and others	2.71	2021.03.02	50,000	-	50,000
	NH Investment & Securities Co., Ltd. and others	3.00	2023.03.02	40,000	-	40,000
Less: discount on debentures				(36,274)	(8)	(36,266)
Total				2,752,899	49,992	2,702,907

¹ Certain property, plant and equipment are pledged as collateral for the above debentures (Note 18).

Details of lease liabilities as at March 31, 2019 and December 31, 2018, are as follows:

(in millions of Korean won)

		March 31, 2019			
Leaser	Annual interest rate (%)	Latest maturity date	Total amount	Current	Non-current
Hyundai Oil Bank and others	1.98 ~ 4.13	2068.12.31	104,721	14,994	89,727

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Leaser	December 31, 2018				
	Annual interest rate (%)	Latest maturity date	Total amount	Current	Non-current
Hyundai Oil Bank	3.12	2024.12.31	27,168	4,886	22,282
CHUNGBUK					
TECHNOPARK	4.13	2023.12.31	1,076	122	954
Total			28,244	5,008	23,236

The present value of lease liabilities as at March 31, 2019 and December 31, 2018, is as follows:

(in millions of Korean won)

	March 31, 2019			December 31, 2018		
	Minimum lease payments	Future finance costs	Present value	Minimum lease payments	Future finance costs	Present value
Within 1 year	17,490	2,496	14,994	5,177	169	5,008
Between 1-5 years	58,858	12,910	45,948	21,065	2,014	19,051
Over 5 years	49,822	6,043	43,779	5,000	815	4,185

15. Provisions

Changes in provisions for other liabilities and charges for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, as follows:

(in millions of Korean won)

	March 31, 2019				
	Warranty ¹	Greenhouse gas emission ²	Legal Claims ³	Restoration ⁴	Total
Beginning balance	198,575	11,700	402	126,976	337,653
Additions	139,371	5,149	7	(879)	143,648
Used	(18,615)	-	-	(1,949)	(20,564)
Ending balance	319,331	16,849	409	124,148	460,737
Less : current portion	(181,760)	(16,849)	-	(26,248)	(224,857)
Total	137,571	-	409	97,900	235,880

(in millions of Korean won)

	December 31, 2018				
	Warranty ¹	Greenhouse gas emission ²	Legal claims ³	Restoration ⁴	Total
Beginning balance	92,662	23,069	20,629	90,056	226,416
Additions	208,511	11,733	7,070	50,439	277,753
Used	(102,598)	(23,102)	(27,297)	(13,519)	(166,516)
Ending balance	198,575	11,700	402	126,976	337,653
Less : current portion	(81,146)	(11,700)	-	(26,520)	(119,366)
Total	117,429	-	402	100,456	218,287

¹ Warranty provisions have been accrued for the estimated warranty costs to be incurred due to quality control, exchange, refunds with the regard to products based on historical experience. In addition, provisions related to operational loss compensation for ESS fire accidents are included.

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² Greenhouse gas emission provisions have been accrued for estimated expenditures to be obligated for any excess emission. The estimated emission as at March 31, 2019 amounts to 1,964 thousand tons (March 31, 2018: 1,963 thousand tons).

³ Lawsuit provisions have been accrued for certain pending cases.

⁴ As at March 31, 2019, restoration provisions have been accrued for the estimated expenses to restore land pollutions and others.

16. Net Defined Benefit Liabilities

Details of net defined benefit liabilities recognized in the consolidated interim statements of financial position as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Present value of defined benefit obligations ¹	1,196,947	1,167,524
Fair value of plan assets	(923,187)	(939,980)
Liabilities in the consolidated interim statement of financial position	273,760	227,544

¹ The present value of retirement benefit obligations is net of existing contributions to the National Pension Plan of ₩802 million as at March 31, 2019 (2018: ₩837 million).

The amounts recognized in the consolidated interim statements of profit or loss for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Current service cost ¹	40,378	35,908
Interest cost	1,528	1,437
Total, included in employee benefit expenses	41,906	37,345

¹ The above amounts excluded ₩359 million (2018: ₩258 million) of expenses capitalized to construction in progress and development costs.

Post-employment benefits recognized for defined contribution plan for the three-month period ended March 31, 2019, amounted to ₩2,218 million (2018: ₩1,630 million).

Post-employment benefits recognized in the consolidated interim statements of profit or loss for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Cost of sales	29,517	26,174
Selling and administrative expenses	14,607	12,801
Total	44,124	38,975

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Movements in the present value of defined benefit obligations for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Beginning balance	1,167,524	1,049,511
Business combination	-	2,461
Transfer in	2,095	12,012
Transfer out	(682)	(8,412)
Current service cost	40,737	146,272
Past service cost	-	812
Interest expense	7,662	32,609
Remeasurements:		
Actuarial loss from change in demographic assumptions	-	2,553
Actuarial gain from change in financial assumptions	-	62,476
Actuarial loss from experience adjustments	-	2,139
Others	-	(91)
Exchange differences	71	(666)
Payments from plans	(20,460)	(134,152)
Ending balance	1,196,947	1,167,524

Movements in the fair value of plan assets for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Beginning balance	939,980	868,830
Transfer in	-	1,546
Transfer out	(62)	(628)
Interest income	6,134	26,763
Remeasurements:		
Return on plan assets (excluding amounts included in interest income)	(4,298)	(8,942)
Contributions:		
Employers	-	155,567
Payments from plans	(18,066)	(102,229)
Administrative costs	(501)	(927)
Ending balance	923,187	939,980

The actual return on plan assets for the three-month period ended March 31, 2019, was ₩1,836 million (December 31, 2018: ₩17,821 million).

The significant actuarial assumptions as at March 31, 2019 and December 31, 2018, are as follows:

	March 31, 2019	December 31, 2018
Discount rate	2.7% ~ 3.0%	2.7% ~ 3.5%
Salary growth rate	2.2% ~ 5.0%	2.2% ~ 5.0%

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The sensitivity analysis for changes in key actuarial assumptions as at March 31, 2019, is as follows:

<i>(in millions of Korean won)</i>	Increase by 0.5%	Decrease by 0.5%
Discount rate:		
Increase (decrease) in defined benefit obligations	(64,890)	71,106
Salary growth rate:		
Increase (decrease) in defined benefit obligations	69,350	(64,009)

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

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

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

Plan assets as at March 31, 2019 and December 31, 2018, consist of:

<i>(in millions of Korean won)</i>	March 31, 2019		December 31, 2018	
	Amount	Composition	Amount	Composition
Insurance contracts with guaranteed yield	915,252	98%	922,829	98%
Equity linked bonds	7,561	1%	15,576	1%
Time deposits	374	1%	1,575	1%
	<u>923,187</u>	<u>100%</u>	<u>939,980</u>	<u>100%</u>

Plan assets consist of various debt instruments with principal and interest protection and others which have no quoted market prices in an active market.

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17. Other Current and Non-Current Liabilities

Details of other current and non-current liabilities as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Current		
Advances from customers	84,200	128,308
Dividends payable	460,058	-
Withholdings	148,926	117,442
Unearned revenues	60,961	13,105
Accrued expenses	165,928	298,458
Total	920,073	557,313
Non-current		
Long-term accrued expenses	53,657	52,359
Long-term unearned revenues	15,272	15,272
Long-term advanced received	40,292	28,788
Total	109,221	96,419

18. Commitments and Contingencies

- (1) As at March 31, 2019, the Parent Company and certain subsidiaries have been guaranteed from Seoul Guarantee Insurance Company for the execution of contracts and others.
- (2) As at March 31, 2019, the Parent Company has provided one blank promissory note to Korea National Oil Corporation as a collateral in relation to petroleum import surcharges.
- (3) As at March 31, 2019, the Parent Company and certain subsidiaries have various specific line of credit agreements with several financial institutions, as follows:

(unit: Korean won in millions, foreign currencies in millions)

Classification	The Parent Company		Certain Overseas Subsidiaries					
	KRW	USD	KRW	USD	CNY	EUR	INR	THB
Limit of bank overdraft	59,100	-	-	180	2,153	29	-	10
Limit of the letter of credit	32,000	478	-	322	200	2	-	-
Limit of discount of notes from export	-	1,153	-	-	-	-	-	-
Limit of payment guarantees in other foreign currency	-	135	-	-	-	-	-	-
Limit of loan arrangements	-	-	117,914	2,363	5,772	630	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 USD 55 million.

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- (4) As at March 31, 2019, the Parent Company and certain subsidiaries have B2B purchase arrangements with several financial institutions with limit of ₩450,000 million and ₩126,000 million, respectively.
- (5) As at March 31, 2019, in relation to price fixing of mobile batteries, the consumers in Canada and Israel have filed two class actions against the Parent Company and certain overseas subsidiaries. However, the ultimate outcome of these cases cannot be determined at the reporting date.
- (6) In addition, as at March 31, 2019, the Parent Company and certain subsidiaries have been named as a plaintiff in 12 and 20 legal actions, respectively, involving ₩18,938 million and ₩3,227 million in claims, respectively. They have been named as a defendant in 104 and 44 legal actions, respectively, with ₩5,416 million and ₩10,511 million in claims, respectively. The ultimate outcome of these cases cannot be determined at the reporting date.
- (7) As at March 31, 2019, the Parent Company is under investigation by the related authorities in relation to the manipulation of the emission of fine dust-causing substance in the Yeosu Industrial Complex, and the final outcome of these investigations cannot be determined at the reporting date.
- (8) The Parent Company has entered into manufacture and production technical contracts with ExxonMobil and others.
- (9) 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.
- (10) As at March 31, 2019, the Parent Company has entered into payment guarantee contract of US\$ 5 million, EUR 6 million and ₩2,983 million with financial institutions to guarantee the warrant of certain installed products. Also, certain subsidiaries have entered into payment guarantee contract of CNY 375 million with financial institutions in relation to custom of imported raw materials.
- (11) As at March 31, 2019 and December 31, 2018, assets pledged as collateral for the borrowings are as follows:

(in millions of Korean won)

March 31, 2019				
	Secured amount	Borrowings / Loan	Limit	Secured party
Other receivables	300	Non-current borrowings	264	KEB Hana Bank
Factory	20,880	Non-current borrowings	16,250	KDB
	<u>21,180</u>		<u>16,514</u>	

(in millions of Korean won)

December 31, 2018				
	Secured amount	Borrowings / Loan	Limit	Secured party
Other receivables	300	Non-current borrowings	353	KEB Hana Bank
Factory	20,880	Non-current borrowings	16,800	KDB

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Dormitory	600	Non-current borrowings	1,038	Woori Bank
	<u>21,780</u>		<u>18,191</u>	

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

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Property, plant and equipment	2,322,661	2,041,834

19. Share Capital

Changes in share capital and share premium for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

<i>(in millions of Korean won and in shares)</i>	Ordinary shares		Preferred shares		Share premium
	Number of shares	Share capital	Number of shares	Share capital	
January 1, 2018	70,592,343	352,962	7,688,800	38,444	2,014,038
December 31, 2018	70,592,343	352,962	7,688,800	38,444	2,014,038
March 31, 2019	<u>70,592,343</u>	<u>352,962</u>	<u>7,688,800</u>	<u>38,444</u>	<u>2,014,038</u>

Changes in treasury shares for the three-month period ended March 31, 2019 and for the year ended December 31, 2018, are as follows:

<i>(in millions of Korean won and in shares)</i>	Number of shares		Carrying amount	Gain on disposal of treasury shares
	Ordinary shares	Preferred shares		
January 1, 2018	1,652,416	16,367	354,945	13,855
Acquisition of fractional shares	1	-	-	-
December 31, 2018	<u>1,652,417</u>	<u>16,367</u>	<u>354,945</u>	<u>13,855</u>
March 31, 2019	<u>1,652,417</u>	<u>16,367</u>	<u>354,945</u>	<u>13,855</u>

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20. Retained Earnings

Retained earnings as at March 31, 2019 and December 31, 2018, consist of:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Legal reserve ¹	330,151	329,554
Discretionary reserve ²	13,608,917	12,541,819
Retained earnings before appropriation	786,368	2,122,879
Total	14,725,435	14,994,252

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

² The 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.

21. Other Components of Equity

Details of other components of equity as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Treasury shares (Note 19)	(354,945)	(354,945)
Capital transactions within the Group ¹	(19,298)	(19,298)
Total	(374,243)	(374,243)

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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22. Selling and Administrative Expenses

Selling and administrative expenses for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Wages and salaries	236,902	192,033
Post-employment benefits (Note 16)	14,607	12,801
Employee benefits	42,128	34,106
Travel expense	16,303	13,270
Water & utilities	13,884	13,694
Packaging expense	1,855	1,994
Rental expenses	23,772	20,313
Commission expenses	111,602	94,365
Depreciation (Note 11)	33,918	27,214
Advertising expense	6,415	5,507
Freight expenses	139,553	132,886
Training expense	4,625	3,976
Amortization (Note 12)	22,960	20,250
Sample expense	4,663	4,080
Development costs	46,666	39,365
Others	174,758	74,866
Total	894,611	690,720

23. Breakdown of Expenses by Nature

Cost of sales, and selling and administrative expenses by nature for the three-month periods ended March 31, 2019 and 2018, consist of:

<i>(in millions of Korean won)</i>	2019	2018
Changes in inventories of merchandise, finished goods, semi-finished goods and work in process	(141,488)	(254,491)
Raw materials and consumables used	4,019,424	3,917,501
Purchase of merchandise	279,554	295,329
Employee benefit expenses (Note 24)	678,364	560,789
Advertising expenses	6,691	5,710
Freight expenses	151,333	142,870
Commission expenses	185,097	156,258
Depreciation and amortization	403,916	355,238
Rental expenses and usage fee	22,042	23,448
Other expenses	758,774	700,097
Total	6,363,707	5,902,749

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24. Employee Benefit Expenses

Details of employee benefit expenses for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Salaries	574,987	471,273
Post-employment benefits – Defined benefit plan (Note 16)	41,906	37,345
Post-employment benefits – Defined contribution plan (Note 16)	2,218	1,630
Others	59,253	50,541
Total	678,364	560,789

25. Finance Income and Costs

Details of finance income and costs for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Finance income		
Interest income ¹	11,708	11,264
Dividend income	25	-
Gain on foreign exchange	26,061	35,649
Gain on foreign currency translation	32,391	34,514
Gain on disposal of hedging derivatives	50	-
Total	70,235	81,427
Finance costs		
Interest expense ²	39,827	25,579
Loss on foreign exchange	19,270	35,834
Loss on foreign exchange translations	14,902	6,084
Loss on valuation of derivative instruments	273	-
Loss on redemption of debentures	-	13
Total	74,272	67,510

¹ Details of interest income for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Deposits held by financial institutions	10,346	9,843
Other loans and receivables	1,362	1,421
Total	11,708	11,264

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² Details of interest expense for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Interest on bank overdraft and borrowings	22,716	9,870
Interest on finance lease liabilities	652	253
Interest on debentures	18,851	16,747
Other interest expenses	2,939	1,400
Capitalized interest for qualifying assets	(5,331)	(2,691)
Total	39,827	25,579

26. Other Non-Operating Income

Details of other non-operating income for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Gain on foreign exchange	41,251	54,308
Gain on foreign currency translation	37,450	18,710
Gain on disposal of property, plant and equipment	2,299	135
Gain on disposal of intangible assets	160	-
Others	5,522	6,072
Total	86,682	79,225

27. Other Non-Operating Expenses

Details of other non-operating expenses for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Loss on foreign exchange	32,101	43,403
Loss on foreign currency translation	29,908	20,268
Loss on disposal of property, plant and equipment	12,444	13,210
Loss on disposal of intangible assets	889	49
Impairment loss on property, plant and equipment (Note 11)	4,792	1,274
Donations	323	3,496
Others	4,533	9,830
Total	84,990	91,530

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28. Tax Expense and Deferred Tax

Income tax expense is recognized based on the best estimate of weighted average annual income tax rate expected for the full financial year. The estimated average annual income tax rate used for the year ending December 31, 2019, is 24.3% (the estimated tax rate for the year ended December 31, 2018: 23.1%).

29. Earnings per Share

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

Basic earnings per share attributable to the owners of the Parent Company for the three-month periods ended March 31, 2019 and 2018, is computed as follows:

Basic earnings per ordinary share

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

	2019	2018
Profit attributable to ordinary shares ¹	174,924	478,050
Weighted average number of ordinary shares outstanding ²	68,939,926	68,939,927
Basic earnings per ordinary shares (in won)	<u>2,537</u>	<u>6,934</u>

Basic earnings per preferred share

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

	2019	2018
Profit attributable to preferred shares ¹	19,563	53,299
Weighted average number of preferred shares outstanding ²	7,672,433	7,672,433
Basic earnings per preferred shares (in won)	<u>2,550</u>	<u>6,947</u>

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

(in millions of Korean won)

	2019	2018
Profit attributable to the equity holders of the Parent Company	194,487	531,349
Ordinary shares dividends (A)	103,410	103,410
Preferred shares dividends (B)	11,604	11,605
Undistributed earnings for the year	79,473	416,334
Undistributed earnings available for ordinary shares (C)	71,514	374,640
Undistributed earnings available for preferred shares (D)	7,959	41,694
Profit for the year attributable to ordinary shares (A+C)	174,924	478,050
Profit for the year attributable to preferred shares (B+D)	19,563	53,299

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² Weighted average numbers of shares are calculated as follows:

Ordinary shares outstanding	2019			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2019. 1. 1 - 2019. 3. 31	68,939,926	90	6,204,593,340
Total				6,204,593,340

Weighted average number of ordinary shares outstanding: $6,204,593,340 / 90 = 68,939,926$ shares

Preferred shares outstanding	2019			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2019. 1. 1 - 2019. 3. 31	7,672,433	90	690,518,970
Total				690,518,970

Weighted average number of preferred shares outstanding: $690,518,970 / 90 = 7,672,433$ shares

Ordinary shares outstanding	2018			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2018. 1. 1 - 2018. 3. 31	68,939,927	90	6,204,593,430
Total				6,204,593,430

Weighted average number of ordinary shares outstanding: $6,204,593,430 / 90 = 68,939,927$ shares

Preferred shares outstanding	2018			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2018. 1. 1 - 2018. 3. 31	7,672,433	90	690,518,970
Total				690,518,970

Weighted average number of preferred shares outstanding: $690,518,970 / 90 = 7,672,433$ shares

Diluted earnings per share is calculated based on the weighted average number of ordinary shares outstanding, adjusted for the assumption that all of dilutive potential ordinary shares to be converted. The Parent Company has one category of dilutive potential ordinary shares: convertible bonds, which were issued during the year ended December 31, 2018. Convertible bonds are considered to be converted into potential ordinary shares and the amount, subtracting income tax effect from related gain and loss such as interest expense on convertible bonds, is added to profit for the period attributable to ordinary shares and preferred shares.

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<i>(in millions of Korean won and in number of shares)</i>	2019
Diluted earnings per ordinary shares	
Profit for the period attributable to the ordinary shares	174,924
Gain and loss on convertible bonds (after tax effects)	2,759
Profit used in calculating diluted earnings per share	177,683
Weighted average number of ordinary shares outstanding	68,939,926
Adjustments for calculation of diluted earnings per share:	
Assumed conversion of convertible bonds	1,284,734
Weighted average number of ordinary shares and potential ordinary shares used as the denominator in calculating diluted earnings per share	70,224,660
Diluted earnings per share attributable to the ordinary shares (in won)	2,530

<i>(in millions of Korean won and in number of shares)</i>	2019
Diluted earnings per preferred shares	
Profit for the period attributable to preferred shares	19,563
Gain and loss on convertible bonds (after tax effects)	(54)
Profit used in calculating diluted earnings per share	19,509
Weighted average number of preferred shares outstanding	7,672,433
Adjustments for calculation of diluted earnings per share:	
Assumed conversion of convertible bonds	-
Weighted average number of preferred shares and potential preferred shares used as the denominator in calculating diluted earnings per share	7,672,433
Diluted earnings per share attributable to the preferred shares (in won)	2,543

30. Dividends

The ₩460,058 million (2018: ₩460,058 million) of dividends for the year ended December 31, 2018, was paid to the shareholders of the Parent Company in April 2019.

31. Related Party Transactions

As at March 31, 2019 and December 31, 2018, LG Corp. is an entity exercising a significant influence over the Group, which owns 33.34% of the Parent Company's ordinary shares.

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Details of associates and other related parties that have sales and other transactions with the Group or have receivables and payables balances as at March 31, 2019 and December 31, 2018, are as follows, and the details of investments in subsidiaries, associates and joint ventures are described in Note 1.3:

Related party	Related party's subsidiary (Domestic)	Related party's subsidiary (Overseas)	Details
S&I corp.	SERVEONE	Serveone(Nanjing).Co.,LTD, and others	Subsidiary of LG Corp.
LG CNS Co., Ltd.	Biz Tech Partners Co., Ltd. and others	LG CNS America Inc. and others	Subsidiary of LG Corp.
LG Management Development Institute	-	-	Subsidiary of LG Corp.
LG Sports Ltd.	-	-	Subsidiary of LG Corp.
LG Holdings Japan	-	-	Subsidiary of LG Corp.
LG MMA Corporation	-	-	Joint venture of LG Corp.
LG Display Co., Ltd.	-	LG Display (China) Co., Ltd. and others	LG Enterprise group ¹
LG Electronics, Inc.	LG Innotek Co., Ltd. and others	Inspur LG Digital Mobile Communications Co., Ltd. and others	LG Enterprise group ¹
LG International Corp.	Pantos Logistics Co., Ltd. and others	LG International (Japan) Ltd. and others	LG Enterprise group ¹
LG Hausys, Ltd.	-	LG Hausys Tianjin Co., Ltd. and others	LG Enterprise group ¹
LG Household & Health Care Ltd.	Coca-Cola Beverage Co. and others	-	LG Enterprise group ¹
LG Uplus Corp.	-	-	LG Enterprise group ¹
G II R Inc.	HS AD Inc.	GIIR Rus LLC	LG Enterprise group ¹

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

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Sales and purchases with related parties for the three-month periods ended March 31, 2019 and 2018, are as follows:

(in millions of Korean won)

	2019			
	Sales and others	Purchase and others		
		Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Others
Entity with a significant influence over the Group				
LG Corp.	2,655	-	-	16,399
Associates and joint ventures				
SEETEC Co., Ltd.	3,252	40,071	210	20,446
TECWIN Co., Ltd.	3	17	1,242	31
HL Greenpower Co., Ltd.	190,486	-	-	137
Others	-	-	-	654
Other related parties				
LG MMA Corporation	28,280	52,233	-	1,576
S&I Corporation and its subsidiaries	3,685	157,037	163,462	47,645
LG CNS Co., Ltd. and its subsidiaries	3,240	253	39,130	21,312
Others	-	-	-	5,077
Others				
LG Display Co., Ltd. and its subsidiaries	286,656	34	505	130
LG Electronics Inc. and its subsidiaries	261,648	145,886	95,077	5,921
LG International Corp. and its subsidiaries	55,717	116,668	3,062	138,999
LG Hausys, Ltd. and its subsidiaries	46,908	3,586	252	1,808
Others	3,965	6,218	-	1,853
Total	886,495	522,003	302,940	261,988

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(in millions of Korean won)

	2018			
	Sales and others	Purchase of raw materials /merchandises	Purchase and others	
			Acquisition of property, plant and equipment and intangible assets	Others
Entity with a significant influence over the Group				
LG Corp.	-	-	-	15,723
Associates and joint ventures				
SEETEC Co., Ltd.	5,270	29,259	-	20,185
TECWIN Co., Ltd.	-	96	1,021	4
HL Greenpower Co., Ltd.	70,346	-	-	-
Others	8	-	-	767
Other related parties				
LG MMA Corporation	30,781	64,723	-	2,086
SERVEONE and its subsidiaries	3,332	131,112	101,383	40,250
LG CNS Co., Ltd. and its subsidiaries	31,331	102	31,055	24,267
Others	-	-	-	4,317
Others				
LG Display Co., Ltd. and its subsidiaries	296,701	-	1,564	-
LG Electronics Inc. and its subsidiaries	241,350	74,629	112,837	7,113
LG International Corp. and its subsidiaries	74,767	137,436	485	88,626
LG Hausys, Ltd. and its subsidiaries	52,733	628	-	2,009
Others	3,944	7,235	367	2,298
Total	810,563	445,220	248,712	207,645

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Balances of receivables and payables arising from sales and purchases of goods and services as at March 31, 2019 and December 31, 2018, are as follows:

(in millions of Korean won)

	March 31, 2019			
	Receivables			Total
	Trade receivables and others	Loan receivables	Other receivables	
Entity with a significant influence over the Group				
LG Corp.	-	-	8,796	8,796
Associates and joint ventures				
SEETEC Co., Ltd.	1,527	-	238	1,765
TECHWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	126,796	-	-	126,796
Others	-	-	23	23
Other related parties				
LG MMA Corporation	10,639	-	394	11,033
S&I Corporation and its subsidiaries	2,142	-	28,069	30,211
LG CNS Co., Ltd. and its subsidiaries	11,066	-	-	11,066
Others	606	-	4,350	4,956
Others				
LG Display Co., Ltd. and its subsidiaries	231,170	-	998	232,168
LG Electronics Inc. and its subsidiaries	374,347	-	44,969	419,316
LG International Corp. and its subsidiaries	36,897	-	3,710	40,607
LG Hausys, Ltd. and its subsidiaries	36,250	-	50	36,300
Others	251	-	896	1,147
Total	831,691	-	92,493	924,184

(in millions of Korean won)

	March 31, 2019			
	Payables			Total
	Trade payables	Borrowings	Other payables	
Entity with a significant influence over the Group				
LG Corp.	-	-	152,419	152,419
Associates and joint ventures				
SEETEC Co., Ltd.	12,207	-	9,907	22,114
TECHWIN Co., Ltd.	-	-	1,418	1,418
HL Greenpower Co., Ltd.	-	-	-	-
Others	-	-	215	215
Other related parties				
LG MMA Corporation	15,997	-	-	15,997
S&I Corporation and its subsidiaries	11,400	-	506,682	518,082
LG CNS Co., Ltd. and its subsidiaries	92	-	91,697	91,789
Others	-	-	1,708	1,708
Others				
LG Display Co., Ltd. and its subsidiaries	19	-	616	635
LG Electronics Inc. and its subsidiaries	143,191	-	202,463	345,654
LG International Corp. and its subsidiaries	45,844	-	63,665	109,509
LG Hausys, Ltd. and its subsidiaries	463	-	4,688	5,151
Others	1,779	-	4,641	6,420
Total	230,992	-	1,040,119	1,271,111

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(in millions of Korean won)

	December 31, 2018			
	Receivables			Total
	Trade receivables and others	Loan receivables	Other receivables	
Entity with a significant influence over the Group				
LG Corp.	-	-	11,286	11,286
Associates and joint ventures				
SEETEC Co., Ltd.	4,520	-	300	4,820
TECHWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	89,122	-	-	89,122
Others	-	-	837	837
Other related parties				
LG MMA Corporation	12,402	-	610	13,012
S&I Corporation and its subsidiaries	2,859	-	27,949	30,808
LG CNS Co., Ltd. and its subsidiaries	13,155	-	108	13,263
Others	549	-	4,357	4,906
Others				
LG Display Co., Ltd. and its subsidiaries	182,223	-	1,978	184,201
LG Electronics Inc. and its subsidiaries	245,029	-	61,263	306,292
LG International Corp. and its subsidiaries	43,346	-	712	44,058
LG Hausys, Ltd. and its subsidiaries	16,005	-	47	16,052
Others	59	-	721	780
Total	609,269	-	110,168	719,437

(in millions of Korean won)

	December 31, 2018			
	Payables			Total
	Trade payables	Borrowings	Other payables	
Entity with a significant influence over the Group				
LG Corp.	-	-	5,102	5,102
Associates and joint ventures				
SEETEC Co., Ltd.	17,384	-	10,728	28,112
TECHWIN Co., Ltd.	-	-	871	871
HL Greenpower Co., Ltd.	-	-	225	225
Others	-	-	250	250
Other related parties				
LG MMA Corporation	19,803	-	-	19,803
S&I Corporation and its subsidiaries	5,044	-	469,309	474,353
LG CNS Co., Ltd. and its subsidiaries	162	-	167,494	167,656
Others	-	-	689	689
Others				
LG Display Co., Ltd. and its subsidiaries	14	-	4	18
LG Electronics Inc. and its subsidiaries	131,680	-	360,155	491,835
LG International Corp. and its subsidiaries	14,918	-	85,452	100,370
LG Hausys, Ltd. and its subsidiaries	439	-	2,233	2,672
Others	1,659	-	3,852	5,511
Total	191,103	-	1,106,364	1,297,467

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Fund transactions with related parties for the three-month periods ended March 31, 2019 and 2018, are as follows:

(in millions of Korean won)

	2019		2018	
	Equity contributions in cash	Loan (Repayment)	Equity contributions in cash (capital reduction)	Loan (Repayment)
Associates and joint ventures				
WUXI CL New Energy Technology Ltd.	-	-	559	-
Combustion Synthesis Co., Ltd.	-	-	1,503	-
Total	-	-	2,062	-

Dividends received from related parties for the three-month periods ended March 31, 2019 and 2018, are as follows:

(in millions of Korean won)

	2019	2018
Associates and joint ventures		
SEETEC Co., Ltd.	10,000	10,000
Total	10,000	10,000

There are no dividends paid by the Group to related parties for the three-month periods ended March 31, 2019 and 2018.

Compensation for key management of the Group for the three-month periods ended March 31, 2019 and 2018, consists of:

(in millions of Korean won)

	2019	2018
Short-term employee benefits	27,647	16,902
Post-employment benefits	1,669	1,412
Total	29,316	18,314

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

There are no provisions recognized against receivables from related parties as at March 31, 2019.

As at March 31, 2019, there is no payment guarantees provided by the Group for related parties.

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32. Cash Generated from Operations

Reconciliation between profit before income tax and cash generated from operations for the three-month periods ended March 31, 2019 and 2018, is as follows:

<i>(in millions of Korean won)</i>	2019	2018
Profit before income tax	279,582	653,196
Adjustments for:		
Depreciation	376,242	329,141
Amortization	28,911	26,097
Post-employment benefits	41,906	37,345
Finance income	(81,818)	(64,489)
Finance costs	85,814	51,932
Foreign exchange differences	(473)	(136)
Loss on valuation of inventories	(8,371)	(6,027)
Gain on disposal of property, plant and equipment	(2,299)	(135)
Gain on disposal of intangible assets	(160)	-
Loss on disposal of property, plant and equipment	12,443	13,210
Loss on disposal of intangible assets	889	49
Impairment loss on property, plant and equipment	4,791	1,274
Additions to provisions	143,648	55,799
Other expense (income)	(2,985)	2,945
Increase in inventories	(161,765)	(394,396)
Increase in trade receivables	(171,857)	(225,552)
Decrease in other receivables	25,841	38,963
Increase in other current assets	(76,515)	(25,832)
Increase (decrease) in trade payables	210,092	(42,277)
Decrease (increase) in other payables	14,683	(184,555)
Decrease (increase) in other current liabilities	33,100	(144,401)
Decrease in provisions	(20,564)	(2,758)
Decrease in net defined benefit liabilities	(418)	(39,376)
Other cash flows from operations	(56,598)	(5,171)
Cash generated from operations	674,119	74,846

Changes in liabilities arising from financial activities for the three-month period ended March 31, 2019, are as follows:

<i>(in millions of Korean won)</i>		2019						
	At January 1, 2019	Cash flows from financing activities	Exchange differences	Amortization	Reclassification of current portion	Effect of change in exchange rate	Lease liabilities	At March 31, 2019
Short-term borrowings	1,563,153	(103,386)	(7,931)	-	10,610	67,773	-	1,530,219
Long-term borrowings	1,005,094	606,451	(16,691)	652	(10,610)	5,895	76,570	1,667,361
Debentures	2,752,900	947,044	3,573	3,686	-	-	-	3,707,203
Conversion rights	30,384	-	443	-	-	-	-	30,827
Total	5,351,531	1,450,109	(20,606)	4,338	-	73,668	76,570	6,935,610

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The significant non-cash transactions for the three-month periods ended March 31, 2019 and 2018, are as follows:

<i>(in millions of Korean won)</i>	2019	2018
Transfer of construction-in-progress	840,742	409,132
Transfer of machinery-in-transit	31,798	23,959
Reclassification of long-term borrowings into current portion	129,270	50,044

33. 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 Electronics Inc., OCI Group Co. Ltd., Mitsubishi Corp. and others
Energy solutions	Mobile batteries, Automotive batteries, Electricity storage batteries and others	Hewlett-Packard Co., General Motors Corp., and others
IT & Electronic materials and Advanced materials	Polarizers, 3D FPR, LCD Photoresist, OLED materials, Battery materials and others	LG Display Co., Ltd., Samsung Display Co., Ltd., BOE, AUO and others
Life sciences	Growth hormone, Vaccine, Antidiabetic, agricultural chemicals and others	HUADONG NINGBO, UNICEF, Intervet and others
Common and others	Crop protection products, Seeds, Fertilizers, General management, sales and R&D and others	National Agriculture Cooperative Federation and others

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The segment information on revenue, profit and loss for the three-month periods ended March 31, 2019 and 2018, is as follows:

<i>(in millions of Korean won)</i>	2019					
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Life sciences	Common and others³	Total
Total segment revenue	3,993,628	1,650,133	901,257	143,471	229,663	6,918,152
Inter-segment revenue	52,094	-	210,531	1,267	15,186	279,078
Revenue from external customers ¹	3,941,534	1,650,133	690,726	142,204	214,476	6,639,073
Operating profit (loss) ²	401,973	(147,911)	225	11,826	9,254	275,367

<i>(in millions of Korean won)</i>	2018					
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Life sciences	Common and others³	Total
Total segment revenue	4,359,078	1,244,497	759,230	131,149	239,729	6,733,683
Inter-segment revenue	66,731	-	112,362	743	257	180,093
Revenue from external customers ¹	4,292,347	1,244,497	646,868	130,406	239,472	6,553,590
Operating profit (loss) ²	636,944	2,060	(9,682)	7,034	14,485	650,841

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.

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The segment information on assets and liabilities as at March 31, 2019 and December 31, 2018, is as follows:

<i>(in millions of Korean won)</i>	March 31, 2019					
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Life sciences	Common and others³	Total
Reportable segment asset ¹	10,517,003	8,925,631	4,225,000	1,925,282	5,619,369	31,212,285
Investments in associates and joint ventures	5,491	22,166	27,167	17	209,669	264,510
Reportable segment liability ¹	3,974,533	4,946,038	975,997	194,714	3,921,712	14,012,994

<i>(in millions of Korean won)</i>	December 31, 2018					
	Basic materials & Chemicals	Energy solutions	IT & Electronic materials and Advanced materials	Life sciences	Common and others³	Total
Reportable segment asset ¹	10,050,131	8,110,146	4,055,445	1,873,916	4,854,499	28,944,137
Investments in associates and joint ventures	5,208	20,853	26,120	17	213,924	266,122
Reportable segment liability ¹	3,223,114	4,243,999	902,100	194,420	3,058,376	11,622,009

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 three-month periods ended March 31, 2019 and 2018, and as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	Sales		Non-current assets¹	
	2019	2018	March 31, 2019	December 31, 2018
Korea ²	2,053,667	2,162,313	12,157,591	11,678,654
China	2,186,582	2,130,518	2,919,014	2,542,444
Asia	878,229	1,149,692	55,791	45,648
America	443,675	371,138	545,470	533,924
Europe	971,845	658,053	1,261,325	1,045,716
Others	105,076	81,876	-	-
Total	6,639,074	6,553,590	16,939,191	15,846,386

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

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

There is no single external customer contributes over 10% of the Group's revenue for the three-

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month periods ended March 31, 2019 and 2018.

34. Business Combination

On October 1, 2018, the Group acquired 100% shares of Uniseal, Inc., which manufactures automotive adhesive. As a result of the business combination, the Group expects increase in sales through market diversification.

Goodwill arising from the business combination is attributable to the acquired customer base and sales increase expected from combining the operations of the Parent Group and Uniseal, Inc. The Group recognized a goodwill amounting to ₩64,851 million for the related business combination in the prior year. In 2019, certain intangible assets and goodwill have been subsequently adjusted to reflect the final result of purchase price allocation. In this regard, the Group's prior year financial statement has been partially amended with no effect on total equity.

The following table summarizes the consideration paid for Uniseal, Inc., 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	143,327
Total consideration	<u>143,327</u>
Recognized amounts of identifiable assets acquired and liabilities assumed ¹	
Cash and cash equivalents	456
Trade and other receivables ²	9,082
Inventories	5,594
Property, plant and equipment	22,475
Intangible assets	51,829
Trade and other payables	(4,932)
Other payables	(183)
Deferred tax liabilities	<u>(14,399)</u>
Fair value of identifiable net assets	<u>69,922</u>
Goodwill	<u>73,405</u>
Total	<u>143,327</u>

¹ For goodwill at December 31, 2018, the results of the purchase price allocation for the recognition of identifiable assets acquired and liabilities assumed was incomplete. The allocation has been completed during the three-month period ended March 31, 2019.

² The fair value of trade and other receivables equals to the gross contractual amounts.

The contingent consideration arrangement requires the Group to pay in cash the former owners of Uniseal, Inc. if the revenue during the year ended August 31, 2019, exceeds \$60 million.

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On October 1, 2018, the Group acquired 100% shares of Ugimag Korea Co., Ltd, which manufactures parts of electronic products and automobiles. As a result of the business combination, the Group expects sales growth increase through enlarging materials business.

Goodwill of W11,615 million arising from the business combination is attributable to the acquired customer base and expected sales growth combining the operations of the Parent Group and Ugimag Korea Co., Ltd.

The following table summarizes the consideration paid for Ugimag Korea 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	23,020
Total consideration	23,020
Recognized amounts of identifiable assets acquired and liabilities assumed ¹	
Cash and cash equivalents	359
Trade and other receivables ¹	7,576
Prepaid income tax	1
Inventories	4,403
Property, plant and equipment	29,640
Intangible assets	4
Trade and other payables	(4,100)
Borrowings	(23,908)
Other liabilities	(2,570)
Fair value of identifiable net assets	11,405
Goodwill	11,615
Total	23,020

¹ The fair value of trade and other receivables equals to the gross contractual amounts.

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35. Assets Held for sale

The Group decided to dispose of Electrolyte business, 2CCL business and others with the approval of management in February 2016 and January 2017, respectively. The related assets were reclassified as assets held for sale, and the disposal is expected to be completed in 2019. Research Institute, which was acquired during the course of the business combination of FarmHannong Co., Ltd., are also included. The assets and liabilities of Electrolyte business was completely disposed during this period, and the assets and liabilities of 2CCL business and others are expected to be disposed in 2019.

Details of assets and liabilities of disposal group classified as held for sale as at March 31, 2019 and December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Assets of disposal group		
Property, plant and equipment	2,406	2,406
Intangible assets	358	358
Total	2,764	2,764

Assets of the disposal group were measured at fair value immediately before the initial classification of the assets as held for sale and there are no the related other non-operating expenses for the three-month periods ended March 31, 2019 and 2018.

36. Assets and Liabilities related to Contracts with Customers

Assets and liabilities related to contracts with customers as at March 31, 2019 and December 31, 2018 are as follows:

<i>(in millions of Korean won)</i>	March 31, 2019	December 31, 2018
Contract assets		
Total contract assets	4,777	4,323
Contract liabilities		
Advances in relation to revenue from the Group's main business activities	40,352	47,265
Expected services to be transferred	32,792	34,823
Expected customer incentives	9,833	10,530
Unearned revenue	22,914	16,781
Expected refunds	9,792	9,139
Total contract liabilities	115,683	118,538

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Revenue recognized in relation to contract liabilities

The following table shows how much of the revenue recognized in the current reporting period relates to carried-forward contract liabilities and how much relates to performance obligations that were satisfied in a prior year.

(in millions of Korean won)

March 31, 2019

Revenue recognized in the current year from the contract liability balance at the beginning of the year	3,258
Unearned revenue	1,723
Expected services to be transferred	1,535
Revenue recognized from performance obligations satisfied in previous periods	-

37. Events after the Reporting Period

With the approval of the Corporate Management Committee on March 25, 2019, the Group decided to issue overseas public foreign currency debentures. According to the approval, the Group issued foreign currency debentures amounting to USD 1,000 million and EUR 500 million on April 15, 2019.

(in thousands of USD and EUR)

Maturity date

Amount

USD foreign currency debenture	Oct. 15, 2024	USD	500,000
	Apr. 15, 2029	USD	500,000
EUR foreign currency debenture	Apr. 15, 2023	EUR	500,000