

**LG Chem, Ltd. and Subsidiaries**  
**Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**LG Chem, Ltd. and Subsidiaries**  
**Index**  
**December 31, 2018 and 2017**

---

	<b>Page(s)</b>
<b>Independent Auditor's Report</b> .....	1 - 4
<b>Consolidated Financial Statements</b>	
Consolidated Statements of Financial Position .....	5 - 6
Consolidated Statements of Profit or Loss.....	7
Consolidated Statements of Comprehensive Income.....	8
Consolidated Statements of Changes in Equity .....	9
Consolidated Statements of Cash Flows .....	10
Notes to the Consolidated Financial Statements .....	11 - 95



## Independent Auditor's Report

(English Translation of a Report Originally Issued in Korean)

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

### Opinion

We have audited the accompanying consolidated financial statements of LG Chem, Ltd. and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as at December 31, 2018 and 2017, and consolidated statements of profit or loss, consolidated statements of comprehensive income, consolidated statements of changes in equity and consolidated statements of cash flows for the years then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies and other explanatory information.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as at December 31, 2018 and 2017, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS).

### Basis for Opinion

We conducted our audits in accordance with Korean Standards on Auditing. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Consolidated Financial Statements* section of our report. We are independent of the Group in accordance with the ethical requirements of the Republic of Korea that are relevant to our audit of the consolidated financial statements and we have fulfilled our other ethical responsibilities in accordance with the ethical requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

### Goodwill impairment assessment for Life Sciences Cash Generating Unit

#### *Why we determined as Key Audit Matter*

We focused on goodwill impairment assessment as the goodwill balances (₩1,066,450 million as at December 31, 2018) are significant and the measurement of the 'recoverable amount' of the Group's Cash Generating Units (CGUs) requires management's judgements about the future results of the business, the discount rates to forecast future cash flow and adjustments arising from the perspective of a market participants. Details are described in Note 12.

In particular, we have performed the audit procedures focusing on the goodwill balances recognized in relation to the Life Sciences CGU (W686,229 million as at December 31, 2018) which is the most significant amount among all relevant CGUs with goodwill. The Life Sciences business was acquired by the Group in 2017 and has not recognized impairment since then. We focused on this area due to the significance of size of goodwill balance.

*How our audit addressed the Key Audit Matter*

We obtained an understanding and evaluated the process and relevant controls in connection with management's future cash flow forecasts. In particular, we focused on whether they had identified all the relevant CGUs, including Life Sciences. We found that management had followed their documented process to forecast future cash flow, which was subject to timely oversight and challenge by the Board of Directors and which was consistent with the budgets approved by the Board except for the adjusted amount of cash flows relating to specific fixed assets in the perspective of market participants.

We compared the current year actual results with the prior year forecast to consider whether any forecasts included assumptions that, with hindsight, had been optimistic. Actual performance in Life Sciences was found to be higher than what had been expected and therefore management has reflected actual prior year's revenue growth rates and operating margins in this year's model.

For Life Sciences CGU, we also challenged management's assumptions in forecasts for:

- long term growth rates, by comparing them to economic and industry forecasts; and
- the discount rate, by assessing the cost of capital for the Group and comparable organizations, as well as considering territory specific factors.

In respect of Life Sciences CGU, we compared the assumptions for revenue growth, operating margin and investment expenditures applied to estimation of the future cash flows with both of the actual prior year performances and the current market condition to consider whether the assumptions are consistent. Also, we compared the future cash flow assumptions applied to the measurement of fair value less cost of disposal with both of the observable market data and similar transactions.

We challenged management on the adequacy of their sensitivity calculations over all their CGUs. We determined that the calculations were most sensitive to assumptions for perpetuity growth rates and discount rates. For all CGUs, we calculated the degree to which these assumptions would need to move before an impairment conclusion was triggered. We discussed the likelihood of such a movement with management. Finally, we assessed the completeness of the disclosures with regard to impairment of assets such as the carrying amount of goodwill allocated to each CGU, the basis to determine recoverable amounts of CGU, key assumptions and others.

## **Other Matter**

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

## **Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements**

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with Korean IFRS, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group or to cease operations.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

## **Auditor's Responsibilities for the Audit of the Consolidated Financial Statements**

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Korean Standards on Auditing will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with Korean Standards on Auditing, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we

conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the Group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partner on the audit resulting in this independent auditor's report is Yongbeom Seo.

Seoul, Korea

February 28, 2019

This report is effective as of February 28, 2019, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that there is a possibility that the above audit report may have to be revised to reflect the impact of such subsequent events or circumstances, if any.

**LG Chem, Ltd. and Subsidiaries**  
**Consolidated Statements of Financial Position**  
**December 31, 2018 and 2017**

<i>(in millions of Korean won)</i>	Notes	2018	2017
<b>Assets</b>			
<b>Current assets</b>			
Cash and cash equivalents	3, 5, 6	2,513,702	2,249,341
Trade receivables	3, 5, 7, 31	4,381,199	4,448,669
Other receivables	3, 5, 7, 31	326,093	770,776
Prepaid income taxes		1,831	932
Other current assets	13	573,460	376,814
Inventories	9	4,289,463	3,352,454
Assets held for sale	35	2,764	6,595
Total current assets		12,088,512	11,205,581
<b>Non-current assets</b>			
Other receivables	3, 5, 7	129,251	126,429
Financial assets	3, 5, 8	93,350	23,782
Investments in associates and joint ventures	1, 10, 33	266,122	264,096
Deferred tax assets	28	408,136	281,506
Property, plant and equipment	11	13,839,198	11,211,482
Intangible assets	12	2,006,238	1,823,155
Investment properties		950	1,027
Other non-current assets	13	112,380	104,163
Total non-current assets		16,855,625	13,835,640
<b>Total assets</b>		28,944,137	25,041,221
<b>Liabilities</b>			
<b>Current liabilities</b>			
Trade payables	3, 5, 31	2,165,969	2,014,779
Other payables	3, 5, 31	2,551,476	1,847,222
Borrowings	3, 5, 14	1,613,146	1,451,324
Other current financial liabilities	3, 5, 8	18,477	-
Provisions	15	119,366	62,940
Income tax payables	28	247,787	414,110
Other current liabilities	17	557,313	854,283
Liabilities held for sale	35	-	31
Total current liabilities		7,273,534	6,644,689
<b>Non-current liabilities</b>			
Other payables	3, 5	9,984	8,646
Borrowings	3, 5, 14	3,708,001	1,593,625
Other financial liabilities	3, 5, 8	30,384	-
Provisions	15	218,287	163,476
Net defined benefit liabilities	16	227,544	180,681
Deferred tax liabilities	28	57,856	42,627
Other non-current liabilities	17	96,419	68,900
Total non-current liabilities		4,348,475	2,057,955
<b>Total liabilities</b>		11,622,009	8,702,644

**LG Chem, Ltd. and Subsidiaries**  
**Consolidated Statements of Financial Position**  
**December 31, 2018 and 2017**

<i>(in millions of Korean won)</i>	<b>Notes</b>	<b>2018</b>	<b>2017</b>
<b>Equity</b>			
Share capital	1, 19	391,406	391,406
Capital surplus		2,274,623	2,274,386
Other components of equity	21	(374,243)	(362,676)
Accumulated other comprehensive income		(202,994)	(173,839)
Retained earnings	20	14,994,252	14,039,250
<b>Equity attributable to owners of the Parent Company</b>		<u>17,083,044</u>	<u>16,168,527</u>
<b>Non-controlling interest</b>		239,084	170,050
<b>Total equity</b>		<u>17,322,128</u>	<u>16,338,577</u>
<b>Total liabilities and equity</b>		<u>28,944,137</u>	<u>25,041,221</u>

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



**LG Chem, Ltd. and Subsidiaries**  
**Consolidated Statements of Profit or Loss**  
**Years Ended December 31, 2018 and 2017**

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

	<b>Notes</b>	<b>2018</b>	<b>2017</b>
<b>Revenue</b>	31, 33	28,183,013	25,698,014
<b>Cost of sales</b>	23, 31	<u>(22,836,816)</u>	<u>(20,134,488)</u>
<b>Gross profit</b>		5,346,197	5,563,526
Selling and administrative expenses	22, 33, 31	<u>(3,100,127)</u>	<u>(2,635,069)</u>
<b>Operating profit</b>	33	2,246,070	2,928,457
Finance income	5, 25	210,375	240,434
Finance costs	5, 25	(367,497)	(319,835)
Share of net profit of associates and joint ventures accounted for using the equity method	10	5,085	6,620
Other non-operating income	5, 26	377,193	478,262
Other non-operating expenses	5, 27	<u>(531,179)</u>	<u>(770,043)</u>
<b>Profit before income tax</b>	32	1,940,047	2,563,895
<b>Income tax expense</b>	28	<u>(420,735)</u>	<u>(541,922)</u>
<b>Profit for the year</b>		<u>1,519,312</u>	<u>2,021,973</u>
<b>Profit is attributable to:</b>			
Owners of the Parent Company		1,472,608	1,945,280
Non-controlling interests		46,704	76,693
<b>Earnings per share attributable to the equity holders of the Parent Company (in won)</b>	29		
Basic earnings per ordinary share		19,217	25,367
Basic earnings per preferred share		19,267	25,605
Diluted earnings per ordinary share		19,057	25,367
Diluted earnings per preferred share		19,107	25,605

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

**LG Chem, Ltd. and Subsidiaries**  
**Consolidated Statements of Comprehensive Income**  
**Years Ended December 31, 2018 and 2017**

<i>(in millions of Korean won)</i>	<b>Notes</b>	<b>2018</b>	<b>2017</b>
<b>Profit for the year</b>		<u>1,519,312</u>	<u>2,021,973</u>
<b>Other comprehensive income</b>			
<i>Items that will not be reclassified to profit or loss</i>			
Remeasurements of net defined benefit liability	16	(76,019)	(700)
Gain on valuation of financial assets at fair value through other comprehensive income		(7,903)	-
Shares of remeasurements of net defined benefit liabilities of associates		(609)	301
Income tax relating to these items		22,999	383
<i>Items that may be subsequently reclassified to profit or loss</i>			
Exchange differences on translation of foreign operations		(12,974)	(127,130)
Cash flow hedges		(18,477)	-
Shares of other comprehensive income of joint ventures and associates		(306)	(9,724)
Changes in valuation of available-for-sale financial instruments		-	(5,550)
Income tax relating to these items		6,812	(3,657)
<b>Other comprehensive income for the year, net of tax</b>		<u>(86,477)</u>	<u>(146,077)</u>
<b>Total comprehensive income for the year</b>		<u>1,432,835</u>	<u>1,875,896</u>
<b>Total comprehensive income for the year is attributable to:</b>			
Owners of the Parent Company		1,387,802	1,808,415
Non-controlling interest		45,033	67,481

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

**LG Chem, Ltd. and Subsidiaries**  
**Consolidated Statements of Changes in Equity**  
**Years Ended December 31, 2018 and 2017**

(in millions of Korean won)

Notes	Attributable to owners of the Parent Company						Non-controlling interests	Total equity
	Share capital	Capital surplus	Other components of equity	Accumulated other comprehensive income	Retained earnings	Total		
<b>Balance at January 1, 2017</b>	369,500	1,157,772	(15,699)	(36,993)	12,462,772	13,937,352	113,615	14,050,967
<b>Comprehensive income</b>								
Profit for the year	-	-	-	-	1,945,280	1,945,280	76,693	2,021,973
Remeasurements of net defined benefit liability	16	-	-	-	(320)	(320)	3	(317)
Exchange differences on translation of foreign operations		-	-	(123,098)	-	(123,098)	(9,215)	(132,313)
Change in the fair value of available-for-sale financial instruments		-	-	(4,024)	-	(4,024)	-	(4,024)
Others		-	-	(9,724)	301	(9,423)	-	(9,423)
<b>Total comprehensive income for the year</b>		-	-	(136,846)	1,945,261	1,808,415	67,481	1,875,896
<b>Transactions with owners:</b>								
Business combination	34	21,906	1,116,614	(337,211)	-	801,309	-	801,309
Purchase of treasury shares	34	-	-	(2,250)	-	(2,250)	-	(2,250)
Equity transactions within the Group		-	-	(7,516)	-	(7,516)	7,516	-
Dividends	30	-	-	-	(368,055)	(368,055)	(17,627)	(385,682)
Others		-	-	-	(728)	(728)	(935)	(1,663)
<b>Total transactions with owners</b>		21,906	1,116,614	(346,977)	(368,783)	422,760	(11,046)	411,714
<b>Balance at December 31, 2017</b>		391,406	2,274,386	(362,676)	(173,839)	14,039,250	170,050	16,338,577
<b>Balance at January 1, 2018</b>		391,406	2,274,386	(362,676)	(173,839)	14,039,250	170,050	16,338,577
<b>Comprehensive income</b>								
Profit for the year		-	-	-	-	1,472,608	46,704	1,519,312
Remeasurements of net defined benefit liability	16	-	-	-	-	(55,205)	-	(55,205)
Exchange differences on translation of foreign operations		-	-	(9,572)	-	(9,572)	(1,671)	(11,243)
Gain on valuation of financial assets at fair value through other comprehensive income		-	-	(5,718)	-	(5,718)	-	(5,718)
Cash flow hedge		-	-	(13,396)	-	(13,396)	-	(13,396)
Others		-	-	(306)	(609)	(915)	-	(915)
<b>Total comprehensive income for the year</b>		-	-	(28,992)	1,416,794	1,387,802	45,033	1,432,835
<b>Transactions with owners:</b>								
Dividends	30	-	-	-	(460,058)	(460,058)	(33,822)	(493,880)
Equity transactions within the Group		-	237	(11,567)	-	(11,330)	11,600	270
Establishment of subsidiaries		-	-	-	-	-	46,893	46,893
Others		-	-	(163)	(1,734)	(1,897)	(670)	(2,567)
<b>Total transactions with owners</b>		-	237	(11,567)	(163)	(461,792)	24,001	(449,284)
<b>Balance at December 31, 2018</b>		391,406	2,274,623	(374,243)	(202,994)	14,994,252	239,084	17,322,128

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

**LG Chem, Ltd. and Subsidiaries**  
**Consolidated Statements of Cash Flows**  
**Years Ended December 31, 2018 and 2017**

<i>(in millions of Korean won)</i>	Notes	2018	2017
<b>Cash flows from operating activities</b>			
Cash generated from operations	32	2,887,846	3,716,426
Interest received		47,570	28,983
Interest paid		(131,780)	(101,053)
Dividends received		10,010	11,154
Income taxes paid		(688,677)	(474,762)
<b>Net cash inflow from operating activities</b>		<u>2,124,969</u>	<u>3,180,748</u>
<b>Cash flows from investing activities</b>			
Decrease in other receivables		1,016,425	979,781
Decrease in other non-current receivables		51,325	83,259
Proceeds from disposal of investments in subsidiaries		-	343
Proceeds from disposal of investments in associates and joint ventures		21,116	-
Proceeds from disposal of financial instruments		12,469	-
Proceeds from disposal of property, plant and equipment		442,030	402,661
Proceeds from disposal of intangible assets		2,637	8,022
Government grants received		15,946	60,335
Proceeds from disposal of business		-	2,022
Increase in other receivables		(535,972)	(769,618)
Increase in other non-current receivables		(42,135)	(68,605)
Acquisition of investments in associates and joint ventures		(34,992)	(28,720)
Acquisition of financial instruments		(89,240)	(3,001)
Acquisition of property, plant and equipment		(4,219,355)	(2,252,616)
Acquisition of intangible assets		(110,281)	(97,978)
Business combination, net of cash acquired		(169,019)	43,759
<b>Net cash outflow from investing activities</b>		<u>(3,639,046)</u>	<u>(1,640,356)</u>
<b>Cash flows from financing activities</b>			
Proceeds from borrowings		2,989,606	1,385,063
Capital contribution from non-controlling interests		46,893	-
Repayments of borrowings		(748,112)	(1,733,668)
Dividends paid		(493,880)	(385,682)
Purchase of treasury shares		-	(2,250)
Purchase of a subsidiary's treasury shares		(659)	-
<b>Net cash inflow (outflow) from financing activities</b>		<u>1,793,848</u>	<u>(736,537)</u>
<b>Net increase in cash and cash equivalents</b>			
Cash and cash equivalents at the beginning of the financial year		2,249,341	1,474,367
Effects of exchange rate changes on cash and cash equivalents		(15,410)	(28,881)
<b>Cash and cash equivalents at the end of the year in the consolidated statement of financial position</b>		<u>2,513,702</u>	<u>2,249,341</u>

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

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

#### 1. General Information

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

##### 1.1 The Parent Company

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

As at December 31, 2018, 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 December 31, 2018, the Parent Company has issued 70,592,343 ordinary shares (₩352,962 million) and 7,688,800 preferred shares (₩38,444 million). The largest shareholder of the Parent Company is LG Corp., which owns 33.34% of the Parent Company's ordinary shares. Preferred shareholders have no voting rights but are entitled to receive dividends at a rate 1% more than those paid to ordinary shareholders.

##### 1.2 Business Overview

The Group is engaged in Basic materials & Chemicals business, Energy solutions, IT & Electronics materials and Advanced materials business, and also engaged in Life Sciences business acquired through a merger with LG Life Sciences, Ltd. in January 2017. In 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.

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

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

### 1.3 Consolidated Subsidiaries, Associates and Joint Ventures

	December 31, 2018			
	Percentage of ownership (%)	Business location	Closing month	Business activities
<b>Consolidated subsidiaries</b>				
Ningbo LG Yongxing Chemical Co., Ltd. <sup>1</sup>	75	China	December	ABS/SBL manufacturing and sales
Ningbo Zhenhai LG Yongxing Trade Co., Ltd. <sup>1</sup>	75	China	December	ABS sales
LG Chem HK Ltd.	100	Hong Kong	December	Sales and trading
LG Chem America, Inc. <sup>2</sup>	100	USA	December	Sales and trading
LG Chemical India Pvt. Ltd. <sup>3</sup>	100	India	December	Synthetic resin manufacturing and sales
LG Polymers India Pvt. Ltd. <sup>3</sup>	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. <sup>4</sup>	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. <sup>5</sup>	75	China	December	PVC, VCM, EDC manufacturing and sales
Tianjin LG BOTIAN Chemical Co., Ltd. <sup>5</sup>	58	China	December	SBS manufacturing and sales
LG Chem (China) Investment Co., Ltd. <sup>6</sup>	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. <sup>2</sup>	100	USA	December	Automotive battery research and manufacturing
LGC Petrochemical India Private Ltd.	100	India	December	Synthetic resin manufacturing and sales
HAENGBOKNURI CO., LTD. <sup>7</sup>	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. <sup>2</sup>	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. <sup>8</sup>	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. <sup>9</sup>	100	Poland	December	Automotive battery research and manufacturing
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	70	China	December	ABS manufacturing and sales
FarmHannong Co., Ltd. <sup>10</sup>	100	Korea	December	Agricultural pesticide manufacturing and sales
Farm Hannong (Heilongjiang) Chemical Co., Ltd. <sup>10</sup>	100	China	December	Agricultural pesticide manufacturing
LG Life Sciences India Pvt. Ltd.	100	India	December	Pharmaceutical products sales

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

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. <sup>10,11</sup>	100	USA	December	Agricultural pesticide sales
LG Chem Hai Phong Vietnam Co., Ltd.	100	Vietnam	December	Polarizer manufacturing and sales
LG Chem Australia Pty Ltd.	100	Australia	December	ESS sales
LG Chem Mexico S.A. de C.V. <sup>12</sup>	100	Mexico	December	Sales and trading
FarmHannong(Thailand) Ltd. <sup>10,13</sup>	100	Thailand	December	Research and development on seeds
LG Chem Hai Phong engineering Plastics Ltd. <sup>14</sup>	100	Vietnam	December	EP manufacturing and sales
LG Chem (Guangzhou) Information & Electronics Materials Co.,Ltd. <sup>15</sup>	100	China	December	Polarizer manufacturing
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD <sup>16</sup>	51	China	December	Battery materials manufacturing and sales
LG Chem Fund I LLC <sup>17</sup>	100	USA	December	Investments in venture companies
Ugimag Korea Co., Ltd <sup>18</sup>	100	Korea	December	Electronic parts manufacturing and sales
Uniseal, Inc. <sup>19</sup>	100	USA	December	Adhesive manufacturing and sales
Uniseal Europe Ltd. <sup>19</sup>	80	England	December	Adhesive manufacturing and sales
LG Chem Nanjing Energy Solution Co., Ltd. <sup>20</sup>	100	China	December	Battery manufacturing and sales
<b>Associates</b>				
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. <sup>21</sup>	100	Brazil	December	Sales and trading
LG Chem Malaysia SDN.BHD. <sup>21</sup>	100	Malaysia	December	Sales and trading
LG Fuel Cell Systems Inc. <sup>22</sup>	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. <sup>23</sup>	30	China	December	ESS manufacturing and sales
LG Life Sciences Poland Ltd. <sup>21</sup>	100	Poland	December	Pharmaceutical products sales
Combustion Synthesis Co., Ltd. <sup>24</sup>	30	Japan	March	Nitride-based ceramic powder production
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD. <sup>25</sup>	49	China	December	Battery materials manufacturing and sales
<b>Joint ventures</b>				
LG VINA Chemical Co., Ltd. <sup>26</sup>	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

<sup>1</sup> As at December 31, 2018, Ningbo LG Yongxing Chemical Co., Ltd. owns 100% of Ningbo Zhenhai LG Yongxing Trading Co., Ltd.'s shares.

<sup>2</sup> During the year, LG Chem Power Inc. was merged into LG Chem Michigan Inc. In addition, LG Chem Michigan Inc. owns 100% of LG Chem America, Inc. and LG NanoH2O, Inc.'s shares. During the year, the Group acquired additional shares of LG Chem Michigan Inc. for ₩146,419 million.

<sup>3</sup> As at December 31, 2018, LG Chemical India Pvt. Ltd. owns 100% of LG Polymers India Pvt. Ltd.'s shares.

<sup>4</sup> During the year, the Group acquired additional shares of LG Chem (Nanjing) Information & Electronics Materials Co.,Ltd. for ₩288,188 million.

<sup>5</sup> During the year, the Parent Company acquired 17.25% of Tianjin LG BOTIAN Chemical Co.,Ltd.'s shares, out of 20.30% shares owned by Tianjin LG Bohai Chemical Co.,Ltd.

<sup>6</sup> During the year, the Parent Company acquired additional shares of LG Chem (China) Investment Co.,Ltd. for ₩54,946 million.

<sup>7</sup> During the year, Sarangnuri Ltd. was merged into HAENGBOKNURI CO., LTD.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

- <sup>8</sup> 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.
- <sup>9</sup> During the year, the Parent Company acquired additional shares of LG Chem Wroclaw Energy sp. Z o.o. for ₩456,894 million.
- <sup>10</sup> As at December 31, 2018, FarmHannong Co., Ltd. owns 100% of Farm Hannong (Heilongjiang) Chemical Co., Ltd., Farmhannong America, Inc. and FarmHannong(Thailand) Ltd.,.
- <sup>11</sup> During the year, LG Life Sciences America Inc. changed its name to Farmhannong America, Inc.
- <sup>12</sup> LG Chem Mexico S.A. de C.V. was established during the year, and the Parent Company newly acquired 100% shares of LG Chem Mexico S.A. de C.V. for ₩394 million.
- <sup>13</sup> During the year, the Group newly acquired 100% shares of FarmHannong(Thailand) Ltd. for ₩2,586 million.
- <sup>14</sup> LG Chem Hai Phong Engineering Plastics Ltd. was established during the year, and the Parent Company newly acquired 100% shares of LG Chem Hai Phong Engineering Plastics Ltd. for ₩15,344 million.
- <sup>15</sup> LG Chem (Guangzhou) Information & electronics Materials Co.,Ltd. was established during the year, and the Parent Company newly acquired 100% shares of LG Chem (Guangzhou) Information & electronics Materials Co.,Ltd. for ₩127,752 million.
- <sup>16</sup> LEYOU NEW ENERGY MATERIALS(WUXI)CO. was established during the year, and the Parent Company newly acquired 51% shares of LEYOU NEW ENERGY MATERIALS(WUXI)CO.,LTD for ₩48,808 million.
- <sup>17</sup> LG CHEM FUND I LLC was established during the year, and the Parent Company newly acquired 100% shares of LG CHEM FUND I LLC for ₩7,886 million.
- <sup>18</sup> During the year, the Parent Company newly acquired 100% shares of Ugimag Korea Co., Ltd in the amount of ₩23,020 million.
- <sup>19</sup> During the year, the Parent Company newly acquired 100% shares of Uniseal,Inc. in the amount of ₩143,327 million. Uniseal,Inc. holds 80% of Uniseal Europe Ltd.
- <sup>20</sup> LG Chem Nanjing Energy Solution Co., Ltd. was established during the year, and the Parent Company newly acquired 100% shares of LG Chem Nanjing Energy Solution Co., Ltd. in the amount of ₩112,570 million.
- <sup>21</sup> Classified as an investment in associate due to its small size.
- <sup>22</sup> During the year, the Parent Company acquired additional shares of LG Fuel Cell System Inc. for ₩5,036 million, and LG Fuel Cell Systems Inc. was determined to be liquidated and the entire amount was recognized as impairment loss for ₩26,498 million.
- <sup>23</sup> During the year, the Parent Company acquired additional shares of WUXI CL New Energy Technology Ltd. for ₩559 million.
- <sup>24</sup> Combustion Synthesis Co., Ltd. was established during the year, and the Parent Company newly acquired shares of Combustion Synthesis Co., Ltd. for ₩1,503 million.
- <sup>25</sup> HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO.,LTD. was established during the year, and the Parent Company newly acquired 49% shares of HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO.,LTD. for ₩26,128 million.
- <sup>26</sup> During the year, the Parent Company acquired additional shares of LG VINA Chemical Co.,Ltd. for ₩1,767 million.

**1.4 Summarized Financial Information of Subsidiaries, Associates and Joint Ventures**

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

*(in millions of Korean won)*

	December 31, 2018				
	Assets	Liabilities	Equity	Revenue	Profit (loss) for the year
<b>Subsidiaries</b>					



**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Ningbo LG Yongxing Chemical Co., Ltd.	759,966	204,733	555,233	2,085,097	137,434
Ningbo Zhenhai LG Yongxing Trade Co., Ltd.	5,599	1,642	3,957	23,230	495
LG Chem HK Ltd.	17,884	42	17,842	328,009	29
LG Chem America, Inc.	225,686	204,163	21,523	828,900	1,167
LG Chemical India Pvt. Ltd.	32,705	19	32,686	-	30
LG Polymers India Pvt. Ltd.	118,542	41,852	76,690	246,369	799
LG Chemical (Guangzhou) Engineering Plastics Co., Ltd.	95,906	46,013	49,893	223,231	(15,180)
LG Chem (Nanjing) Information & Electronics Materials Co., Ltd.	3,073,898	1,706,052	1,367,846	3,319,589	(17,786)
LG Chem (Taiwan), Ltd.	129,680	63,300	66,380	170,550	5,952
LG Chem Display Materials (Beijing) Co., Ltd.	44,617	18,580	26,037	84,610	1,493
Tianjin LG Bohai Chemical Co., Ltd.	281,710	173,408	108,302	548,895	19,487
Tianjin LG BOTIAN Chemical Co., Ltd.	45,562	42,030	3,532	152,638	1,402
LG Chem (China) Investment Co., Ltd.	405,664	174,737	230,927	58,958	4,112
LG Chem (Tianjin) Engineering Plastics Co., Ltd.	60,467	22,165	38,302	89,708	(7,267)
LG Chem Europe GmbH	336,761	302,034	34,727	699,445	5,620
LG Chem Poland Sp. z o.o.	75,187	39,958	35,229	126,760	2,316
LG Chem Michigan Inc.	675,367	377,280	298,087	325,578	12,140
LGC Petrochemical India Private Ltd.	2,950	463	2,487	4,273	469
HAENGBOKNURI CO., LTD.	2,755	1,201	1,554	8,762	248
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	7,757	6,791	966	34,426	(151)
LG Chem Japan Co., Ltd.	4,261	518	3,743	5,640	540
LG NanoH2O, Inc. <sup>1</sup>	19,577	5,255	14,322	26,482	4,577
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	4,155	1,167	2,988	-	78
Nanjing LG Chem New Energy Battery Co., Ltd.	786,416	664,865	121,551	643,405	19,788
LG Chem (Chongqing) Engineering Plastics Co., Ltd.	35,967	11,599	24,368	38,068	(5,062)
LG Chem Wroclaw Energy sp. z o.o.	1,555,511	1,056,111	499,400	472,019	(82,867)
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	287,824	211,589	76,235	407,812	(5,803)
FarmHannong Co., Ltd. <sup>1</sup>	1,075,222	687,757	387,465	599,756	(49,988)
LG Life Sciences India Pvt. Ltd.	4,164	4,056	108	10,299	(1,989)
LG Life Sciences (Beijing) Co., Ltd.	1,237	44	1,193	1,119	25
LG Life Sciences (Thailand) Ltd.	17,432	11,799	5,633	27,548	2,017
LG Chem Hai Phong Vietnam Company Ltd.	23,134	18,420	4,714	27,050	1,378
LG Chem Australia Pty Ltd.	768	85	683	1,677	176
LG Chem Mexico S.A. de C.V.	646	99	547	904	138
LG Chem Hai Phong engineering Plastics Ltd.	15,574	115	15,459	-	(176)
LG Chem (Guangzhou) Information & electronics Materials Co.,Ltd.	147,413	20,119	127,294	-	1,825
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD	106,817	11,904	94,913	-	249
LG Chem Fund I LLC	5,598	-	5,598	-	(2,238)
Ugimag Korea Co., Ltd	40,344	31,214	9,130	4,206	(2,275)
Uniseal, Inc.	38,503	11,596	26,907	15,694	38
LG Chem Nanjing Energy Solution Co., Ltd.	131,144	20,293	110,851	-	(2,109)
<b>Associates</b>					
LG Holdings (HK) Ltd.	245,651	42,181	203,470	49,373	15,495
TECHWIN Co., Ltd.	79,106	32,206	46,900	106,404	8,619
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	172	93	79	1,599	44
LG Chem Malaysia SDN.BHD.	305	17	288	633	44
LG Fuel Cell Systems Inc.	11,845	5,182	6,663	7,897	(53,409)
FJ Composite Material Co., Ltd.	6,393	2,916	3,477	2,029	(238)

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

WUXI CL New Energy Technology Ltd.	6,714	2,407	4,307	-	(747)
LG Life Sciences Poland Ltd.	158	155	3	221	10
Combustion Synthesis Co., Ltd.	991	28	963	104	(492)
HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD.	55,749	2,444	53,305	-	570
<b>Joint ventures</b>					
LG VINA Chemical Co., Ltd.	28,668	19,862	8,806	60,755	597
HL Greenpower Co., Ltd.	314,328	274,399	39,929	418,871	2,049
SEETEC Co., Ltd.	346,423	48,187	298,236	529,680	18,738

<sup>1</sup> 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)

	<b>December 31, 2017</b>				
	<b>Assets</b>	<b>Liabilities</b>	<b>Equity</b>	<b>Revenue</b>	<b>Profit (loss) for the year</b>
<b>Subsidiaries</b>					
Ningbo LG Yongxing Chemical Co.,Ltd.	1,007,732	449,049	558,683	2,097,317	232,595
Ningbo Zhenhai LG Yongxing Trade Co.,Ltd.	10,420	6,927	3,493	43,385	890
LG Chem HK Ltd.	96,752	79,690	17,062	487,636	396
LG Chem America, Inc.	191,011	171,566	19,445	781,113	1,920
LG Chemical India Pvt. Ltd.	32,716	5	32,711	-	34
LG Polymers India Pvt. Ltd.	93,999	15,651	78,348	238,797	11,943
LG Chemical (Guangzhou) Engineering Plastics Co.,Ltd.	109,443	44,342	65,101	201,482	2,071
LG Chem (Nanjing) Information & Electronics Materials Co.,Ltd.	2,410,548	1,301,136	1,109,412	2,817,288	102,289
LG Chem (Taiwan), Ltd.	122,310	60,462	61,848	192,555	2,969
LG Chem Display Materials (Beijing) Co.,Ltd.	40,158	14,196	25,962	72,867	1,377
Tianjin LG Bohai Chemical Co.,Ltd.	349,416	255,165	94,251	528,610	48,575
Tianjin LG BOTIAN Chemical Co.,Ltd.	48,438	46,298	2,140	165,257	4,553
LG Chem (China) Investment Co.,Ltd.	324,605	153,146	171,459	60,401	4,688
LG Chem (Tianjin) Engineering Plastics Co.,Ltd.	64,708	19,057	45,651	95,533	98
LG Chem Europe GmbH	231,237	202,012	29,225	528,759	5,674
LG Chem Poland Sp. z o.o.	64,841	30,877	33,964	98,519	2,038
LG Chem Michigan Inc.	232,301	138,085	94,216	223,182	21,011
LG Chem Power Inc.	18,640	6,013	12,627	41,423	1,468
LGC Petrochemical India Private Ltd.	2,502	390	2,112	4,510	478
HAENGBOKNURI CO.,LTD.	2,292	939	1,353	7,075	194
LG CHEM TK Kimya SANAYI VE TIC. Ltd. STI.	6,618	5,113	1,505	24,737	399
LG Chem Japan Co.,Ltd.	3,462	470	2,992	5,604	511
LG NanoH2O, Inc. <sup>1</sup>	10,269	971	9,298	14,360	2,569
NanoH2O (Jiangsu) Water Processing Technology Co. Ltd.	4,103	1,173	2,930	-	(2,022)
Nanjing LG Chem New Energy Battery Co.,Ltd.	478,421	375,998	102,423	244,319	6,252
LG Chem (Chongqing) Engineering Plastics Co.,Ltd.	35,028	5,559	29,469	27,157	(2,734)
LG Chem Wroclaw Energy sp. z o.o.	330,033	202,131	127,902	14,998	(8,394)
LG Chem(HUIZHOU) Petrochemical Co., Ltd.	290,840	208,170	82,670	372,867	15,961
FarmHannong Co.,Ltd. <sup>1</sup>	1,152,122	621,754	530,368	603,851	8,982
LG Life Sciences India Pvt. Ltd.	7,143	4,923	2,220	12,961	19
LG Life Sciences (Beijing) Co., Ltd.	1,191	20	1,171	851	6
LG Life Sciences (Thailand) Ltd.	10,008	6,595	3,413	21,340	1,909

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Sarangnuri Ltd.	227	60	167	275	48
LG Chem Hai Phong Vietnam Company Ltd.	4,480	1,266	3,214	996	217
LG Chem Australia Pty Ltd.	559	12	547	162	112

**Associates**

LG Holdings (HK) Ltd.	249,896	60,681	189,215	23,770	16,467
TECHWIN Co., Ltd.	79,106	32,206	46,900	106,404	8,619
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO LTDA.	164	123	41	1,977	67
LG Chem Malaysia SDN.BHD.	252	19	233	558	32
LG Fuel Cell Systems Inc.	48,444	4,701	43,743	2,477	(42,551)
FJ Composite Material Co., Ltd.	7,052	2,858	4,194	881	(481)
WUXI CL New Energy Technology Ltd.	4,521	1,180	3,341	-	(587)
LG Life Sciences Poland Ltd.	124	72	52	139	(17)

**Joint ventures**

LG VINA Chemical Co., Ltd.	17,539	9,242	8,297	39,349	1,900
HL Greenpower Co., Ltd.	190,881	151,728	39,153	419,696	6,172
SEETEC Co., Ltd.	344,189	43,751	300,438	494,510	14,347

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

**1.5 Changes in Scope for Consolidation**

Subsidiaries newly included in the consolidation for the year ended December 31, 2018, are as follows:

Subsidiary	Reason
LG Chem Mexico S.A. de C.V.	Newly established
FarmHannong(Thailand) Ltd.	Newly established
LG Chem Hai Phong Engineering Plastics Ltd.	Newly established
LG Chem (Guangzhou) Information & Electronics Materials Co.,Ltd.	Newly established
LEYOU NEW ENERGY MATERIALS(WUXI) Co.,LTD	Newly established
LG Chem Fund I LLC	Newly established
Ugimag Korea Co., Ltd	Business combination
Uniseal,Inc.	Business combination
Uniseal Europe Ltd.	Business combination
LG Chem Nanjing Energy Solution Co., Ltd.	Newly established

Subsidiaries excluded from the consolidation for the year ended December 31, 2018, are as follows:

Subsidiary	Reason
LG Chem Power Inc.	Merged into LG Chem Michigan Inc.
Sarangnuri Ltd.	Merged into HAENGBOKNURI CO., LTD.
FarmHwaong Co., Ltd	Liquidated

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**2. Summary of Significant Accounting Policies**

The principal accounting policies applied in the preparation of these consolidated financial statements are set out below. These policies have been consistently applied to all the years 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 financial statements have been condensed, restructured and translated into English from the Korean language financial statements.

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

The consolidated financial statements of the Group have been prepared in accordance with Korean IFRS. These are the standards, subsequent amendments and related interpretations issued by the International Accounting Standards Board (IASB) that have been adopted by the Republic of Korea. The preparation of financial statements requires the use of critical accounting estimates. Management also needs to exercise judgement in applying the Group's accounting policies. The areas involving a higher degree of judgment or complexity, or areas where assumptions and estimates are significant to the consolidated financial statements are disclosed in Note 4.

**2.2 Changes in Accounting Policy and Disclosures**

*(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, 2018.

- Korean IFRS 1109 *Financial Instruments*

The Group has applied Korean IFRS 1109 *Financial Instruments* on January 1, 2018, the date of initial application. In accordance with the transitional provisions in Korean IFRS 1109, comparative figures have not been restated, and the differences between previous book amounts and book amounts at the date of initial application are recognized to retained earnings (or equity). The application of the standard has following impacts on the financial statements.

On the date of initial application, January 1, 2018, the financial instruments of the Group with any reclassifications noted, were as follows:

	Measurement category		Carrying amount		
	Korean IFRS 1039	Korean IFRS 1109	Korean IFRS 1039	Korean IFRS 1109	Difference
<b>Current financial assets</b>					
		Amortized costs	4,448,669	4,218,196	(230,473)
Trade receivables	Amortized costs	Fair value through other comprehensive income	-	230,473	230,473

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Cash and cash equivalents	Amortized costs	Amortized costs	2,249,341	2,249,341	-
Other receivables	Amortized costs	Amortized costs	770,776	770,776	-

**Non-current financial assets**

Equity instruments	Available-for-sale financial assets	Fair value through other comprehensive income	23,782	16,982	(6,800)
Debt instruments	Available-for-sale financial assets	Fair value through profit or loss	-	6,800	6,800
Other receivables	Amortized costs	Amortized costs	126,429	126,429	-

(i) Financial assets at amortized cost classified as fair value through other comprehensive income

Certain trade receivables were reclassified from financial assets at amortized cost to fair value through other comprehensive income, as the Group's business model is achieved both by collecting contractual cash flows and selling of these assets. The contractual cash flows of these investments are solely principal and interest. As a result, debt instruments with a fair value of ₩230,473 million were reclassified from financial assets at amortized cost to financial assets at fair value through other comprehensive income on January 1, 2018.

(ii) Reclassification of equity investments from available-for-sale to fair value through other comprehensive income

The Group elected to present changes in the fair value of all its equity investments previously classified as available-for-sale, because these investments are not held for trading, in other comprehensive income. As a result, assets with a fair value of ₩230,473 million were reclassified from available-for-sale financial assets to financial assets at fair value through other comprehensive income. As at January 1, 2018, as related accumulated other comprehensive income of ₩ 418 million were not reclassified to profit or loss even though these assets are disposed of.

(iii) Reclassification of equity investments from available-for-sale to fair value through profit or loss

As at January 1, 2018, the Group classified equity investments, amounted of ₩6,800 million from available-for-sale to fair value through profit or loss, and did not classified to amortized costs as their cash flows are not solely payment of principal.

(iv) Other financial assets

Equity securities held for trading and contingent consideration are all required to be held as fair value through profit or loss under Korean IFRS 1109. There was no impact on the amounts recognized in relation to these assets from the adoption of Korean IFRS 1109.

- Korean IFRS 1115 *Revenue from Contracts with Customers*

The Group has elected to apply Korean IFRS 1115 *Revenue from Contracts with Customers*. In accordance with the transition provisions in Korean IFRS 1115, comparative figures have not been restated. The Group does not expect the amendment to have a significant impact on the consolidated financial statements and there were no significant adjustments on the consolidated financial statement in the current year in accordance with Korean IFRS 1018 *Revenue*.

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

- Amendments to Korean IFRS 1102 *Share-based Payment*

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

- Enactment of Interpretation 2122 *Foreign Currency Transaction and Advance Consideration*
- Amendments to Korean IFRS 1040 *Investment Property*

#### *(b) New 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, 2018 and have not been early adopted by the Group are set out below.

- Korean IFRS 1116 Leases

Korean IFRS 1116 Leases issued on May 22, 2017 is effective for annual periods beginning on or after January 1, 2019, with early adoption permitted. This standard will replace Korean IFRS 1017 Leases, 2104 Determining whether an Arrangement contains a Lease, 2015 Operating Leases-Incentives, 2027 Evaluating the Substance of Transactions Involving the Legal Form of a Lease. The Group will apply the standards for annual periods beginning on or after January 1, 2019.

At inception of a contract, the Group shall assess whether the contract is, or contains, a lease. Also, at the date of initial application, the Group shall assess whether the contract is, or contains, a lease in accordance with the standard. However, the Group will not need to reassess all contracts if the Group elected to apply the practical expedient not to apply the standard to contracts that were not previously identified as containing a lease applying Korean IFRS 1017 and Interpretation 2104.

For a contract that is, or contains, a lease, the Group shall account for each lease component within the contract as a lease separately from non-lease components of the contract.

A lessee is required to recognize a right-of-use asset representing its right to use the underlying leased asset and a lease liability representing its obligation to make lease payments. The lessee may elect not to apply the requirements to short-term lease (a lease term of 12 months or less at the commencement date) and low value assets (e.g. underlying assets below \$ 5,000). In addition, as a practical expedient, the lessee may elect, by class of underlying asset, not to separate non-lease components from lease components, and instead account for each lease component and any associated non-lease components as a single lease component.

The accounting treatment as a lessor did not change significantly from the one under Korean IFRS 1017 Leases.

The Group plans to apply Korean IFRS 1116 retrospectively with the cumulative effect of initially applying the standard as at January 1, 2019. The Group will not restate any comparative information. Instead, the cumulative effect of applying the standard will be recognized as an adjustment to the opening balance of retained earnings (or another component of equity, as appropriate) at the date of initial application.

- 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. These amendments will be applied for annual periods beginning on or after January 1, 2019, with early adoption permitted.

- Amendments to Korean IFRS 1019 Employee Benefits

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

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 amendments are effective for plan amendments, curtailments and settlements occurring in reporting periods that begin on or after January 1, 2019.

#### - 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. These amendments will be applied for annual periods beginning on or after January 1, 2019, with early adoption permitted. In accordance with the transitional provisions in Korean IFRS 1109, the restatement of the comparative information is not required and the cumulative effects of initially applying the amendments retrospectively should be recognized in the beginning balance of retained earnings (or other components of equity, as appropriate) at the date of initial application.

#### - 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. This Interpretation will be applied for annual periods beginning on or after January 1, 2019, and an entity can either restate the comparative financial statements retrospectively or recognize the cumulative effect of initially applying the Interpretation as an adjustment in the beginning balance at the date of initial application.

#### - 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. These amendments will be applied to business combinations for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after 1 January 2019, with early adoption permitted.

- 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. These amendments will be applied to transactions in which an entity obtains joint control on or after the beginning of the first annual reporting period beginning on or after 1 January 2019, with early adoption permitted.

- 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

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

income or equity according to where the entity originally recognized those past transactions or events. These amendments will be applied for annual reporting periods beginning on or after January 1, 2019, with early adoption permitted.

- **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. These amendments will be applied to borrowing costs incurred on or after the beginning of the first annual reporting period beginning on or after January 1, 2019, with early adoption permitted.

### 2.3 Consolidation

The Group has prepared the consolidated financial statements in accordance with Korean IFRS 1110 *Consolidated Financial Statements*.

#### (1) Subsidiaries

Subsidiaries are all entities over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power to direct the activities of the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the Group. They are deconsolidated from the date that control ceases.

The acquisition method of accounting is used to account for business combinations by the Group. The consideration transferred is measured at the fair values of the assets transferred, and identifiable assets acquired and liabilities and contingent liabilities assumed in a business combination are measured initially at their fair values at the acquisition date. The Group recognizes any non-controlling interest in the acquired entity on an acquisition-by-acquisition basis either at fair value or at the non-controlling interest's proportionate share of the acquired entity's net identifiable assets. All other non-controlling interests are measured at fair values, unless otherwise required by other standards. Acquisition-related costs are expensed as incurred.

The excess of consideration transferred, amount of any non-controlling interest in the acquired entity and acquisition-date fair value of any previous equity interest in the acquired entity over the fair value of the net identifiable assets acquired is recorded as goodwill. If those amounts are less than the fair value of the net identifiable assets of the business acquired, the difference is recognized directly in the profit or loss as a bargain purchase.

Intercompany transactions, balances and unrealized gains on transactions between group companies are eliminated. Unrealized losses are also eliminated unless the transaction provides evidence of an impairment of the transferred asset. Accounting policies of subsidiaries have been changed where necessary to ensure consistency with the policies adopted by the Group.

#### (2) Associates

Associates are entities over which the Group has significant influence but not control or joint control. Investments in associates are accounted for using the equity method of accounting, after initially being recognized at cost. Unrealized gains on transactions between the Group and its associates are eliminated to the extent of the Group's interest in the associates. If there is objective evidence of impairment for the investment in the associate, the Group recognizes the difference between the recoverable amount of the associate and its carrying amount as impairment loss.

#### (3) Joint Arrangements



# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

A joint arrangement, wherein two or more parties have joint control, is classified as either a joint operation or a joint venture. A joint operator recognizes its direct right to the assets, liabilities, revenues and expenses of joint operations and its share of any jointly held or incurred assets, liabilities, revenues and expenses. Interests in joint ventures are accounted for using the equity method, after initially being recognized at cost in the consolidated statement of financial position.

#### 2.4 Segment Reporting

Information of each operating segment is reported in a manner consistent with the business segment reporting provided to the chief operating decision-maker (Note 33). The chief operating decision-maker, who is responsible for allocating resources and assessing performance of the operating segments, has been identified as the Corporate Management Committee that makes strategic decisions.

#### 2.5 Foreign Currency Translation

##### *(1) Functional and presentation currency*

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which each entity operates (the "functional currency"). The consolidated financial statements are presented in Korean won, which is the Parent Company's functional and presentation currency.

##### *(2) Transactions and balances*

Foreign currency transactions are translated into the functional currency using the exchange rates at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities denominated in foreign currencies at year end exchange rates are generally recognized in profit or loss.

Non-monetary items that are measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined. Translation differences on assets and liabilities carried at fair value are reported as part of the fair value gain or loss. For example, translation differences on non-monetary assets and liabilities such as equities held at fair value through profit or loss are recognized in profit or loss as part of the fair value gain or loss and translation differences on non-monetary assets such as equities classified as available-for-sale financial assets are recognized in other comprehensive income.

##### *(3) Translation into the presentation currency*

The results and financial position of foreign operations that have a functional currency different from the presentation currency are translated into the presentation currency as follows:

- i) assets and liabilities for each statement of financial position presented are translated at the closing rate at the end of the reporting period;
- ii) income and expenses for each statement of income are translated at monthly average exchange rates; and
- iii) equity is translated at the historical exchange rate; and
- iv) all resulting exchange differences are recognized in other comprehensive income.

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

#### 2.6 Cash and Cash Equivalents

Cash and cash equivalents include cash in hand, deposits held at call with banks, other short-term highly liquid investments with original maturities of three months or less.

#### 2.7 Financial Assets

##### *(a) Classification*

From January 1, 2018, the Group classifies its financial assets in the following measurement categories:

- those to be measured at fair value through profit or loss
- those to be measured at fair value through other comprehensive income, and
- those to be measured at amortized cost.

The classification depends on the Group's business model for managing the financial assets and the contractual terms of the cash flows.

For financial assets measured at fair value, gains and losses will either be recorded in profit or loss or other comprehensive income. For investments in debt instruments, this will depend on the business model in which the investment is held. The Group reclassifies debt investments when, and only when its business model for managing those assets changes.

For investments in equity instruments that are not held for trading, this will depend on whether the Group has made an irrevocable election at the time of initial recognition to account for the equity investment at fair value through other comprehensive income.

##### *(b) Measurement*

At initial recognition, the Group measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition of the financial asset. Transaction costs of financial assets carried at fair value through profit or loss are expensed in profit or loss. Financial assets with embedded derivatives are considered in their entirety when determining whether their cash flows are solely payment of principal and interest.

##### *A. Debt instruments*

Subsequent measurement of debt instruments depends on the Group's business model for managing the asset and the cash flow characteristics of the asset. The Group classifies its debt instruments into one of the following three measurement categories:

- **Amortized cost:**  
Assets that are held for collection of contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortized cost. A gain or loss on a debt investment that is subsequently measured at amortized cost and is not part of a hedging relationship is recognized in profit or loss when the asset is derecognized or impaired. Interest income from these financial assets is included in 'finance income'

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

using the effective interest rate method.

- Fair value through other comprehensive income:  
Assets that are held for collection of contractual cash flows and for selling the financial assets, where the assets' cash flows represent solely payments of principal and interest, are measured at fair value through other comprehensive income. Movements in the carrying amount are taken through other comprehensive income, except for the recognition of impairment loss (reversal of impairment loss), interest income and foreign exchange gains and losses which are recognized in profit or loss. When the financial asset is derecognized, the cumulative gain or loss previously recognized in other comprehensive income is reclassified from equity to profit or loss. Interest income from these financial assets is included in 'finance income' using the effective interest rate method. Foreign exchange gains and losses are presented in 'finance income / costs or other non-operating income / expenses' and impairment losses are presented in 'other non-operating expenses'.
- Fair value through profit or loss:  
Assets that do not meet the criteria for amortized cost or fair value through other comprehensive income are measured at fair value through profit or loss. A gain or loss on a debt investment that is subsequently measured at fair value through profit or loss and is not part of a hedging relationship is recognized in profit or loss and presented net in the statement of profit or loss within 'finance income / costs or other non-operating income / expenses' in the year in which it arises.

#### *B. Equity instruments*

The Group subsequently measures all equity investments at fair value. Where the Group's management has elected to present fair value gains and losses on equity investments, which held for long-term investment or strategic purpose, in other comprehensive income, there is no subsequent reclassification of fair value gains and losses to profit or loss following the derecognition of the investment. Dividend income from such investments continue to be recognized in profit or loss as 'finance income' when the right to receive payments is established.

Changes in the fair value of financial assets at fair value through profit or loss are recognized in 'other non-operating income or expenses' in the statement of profit or loss as applicable. Impairment loss (reversal of impairment loss) on equity investments measured at fair value through other comprehensive income are not reported separately from other changes in fair value.

#### *(c) Impairment*

The Group assesses on a forward looking basis the expected credit losses associated with its debt instruments carried at amortized cost and fair value through other comprehensive income. The impairment methodology applied depends on whether there has been a significant increase in credit risk. For trade receivables and lease receivables, the Group applies the simplified approach, which requires expected lifetime credit losses to be recognized from initial recognition of the receivables.

#### *(d) Recognition and Derecognition*

Regular way purchases and sales of financial assets are recognized or derecognized on trade-date, the date on which the Group commits to purchase or sell the asset. Financial assets are

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

derecognized when the rights to receive cash flows from the financial assets have expired or have been transferred and the Group has transferred substantially all the risks and rewards of ownership.

If a transfer does not result in derecognition because the Group has retained substantially all the risks and rewards of ownership of the transferred asset, the Group continues to recognize the transferred asset in its entirety and recognizes a financial liability for the consideration received. The Group classified the financial liability as 'borrowings' in the statement of financial position.

#### 2.8 Derivative Financial Instruments

Derivatives are initially recognized at fair value on the date a derivative contract is entered into and are subsequently remeasured to their fair value at the end of each reporting period. The accounting for subsequent changes in fair value depends on whether the derivative is designated as a hedging instrument, and if so, the nature of the item being hedged. The Group has hedge relationships and designates certain derivatives as either:

- hedges of the fair value of recognized assets or liabilities or a firm commitment (fair value hedges)
- hedges of a particular risk associated with the cash flows of recognized assets and liabilities and highly probable forecast transactions (cash flow hedges), or
- hedges of a net investment in a foreign operation (net investment hedges)

At inception of the hedge relationship, the Group documents the economic relationship between hedging instruments and hedged items including whether changes in the cash flows of the hedging instruments are expected to offset changes in the cash flows of hedged items.

The full fair value of a hedging derivative is classified as a non-current asset or liability when the remaining maturity of the hedged item is more than 12 months; it is classified as a current asset or liability when the remaining maturity of the hedged item is less than 12 months. A non-derivative financial asset and a non-derivative financial liability is classified as a current or non-current based on its expected maturity and its settlement, respectively.

##### Cash flow hedge

The effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges is recognized in the cash flow hedge reserve within equity, limited to the cumulative change in fair value (present value) of the hedged item (the present value of the cumulative change in the future expected cash flows of the hedged item) from the inception of the hedge. The ineffective portion is recognized in 'other non-operating income (expenses)'.

When option contracts are used to hedge forecast transactions, the Group designates only the intrinsic value of the option contract as the hedging instrument. Gains or losses relating to the effective portion of the change in intrinsic value of the option contracts are recognized in the cash flow hedge reserve within equity. The changes in the time value of the option contracts that relate to the hedged item ('aligned time value') are recognized within the costs of hedging in other comprehensive income within equity.

When forward contracts are used to hedge forecast transactions, the Group generally designates only the change in fair value of the forward contract related to the spot element as the hedging instrument. Gains or losses relating to the effective portion of the change in the spot element of the forward contracts are recognized in the cash flow hedge reserve within equity. The change in the forward element of the contract that relates to the hedged item is recognized within other comprehensive income within equity. In some cases, the Group may designate the full change in fair value of the forward contract (including forward points) as the hedging instrument. In such cases, the gains or losses relating to the effective portion of the change in fair value of the entire

# **LG Chem, Ltd. and Subsidiaries**

## **Notes to the Consolidated Financial Statements**

### **December 31, 2018 and 2017**

---

forward contract are recognized in the cash flow hedge reserve within equity.

Amounts accumulated in equity are reclassified in the periods when the hedged item affects profit or loss, as follows:

- Where the hedged item subsequently results in the recognition of a non-financial asset (such as inventory), both the deferred hedging gains and losses and the deferred time value of the option contracts or deferred forward points, if any, are included within the initial cost of the asset. The deferred amounts are ultimately recognized in profit or loss as the hedged item affects profit or loss (for example through cost of sales).
- The gain or loss relating to the effective portion of the interest rate swaps hedging variable rate borrowings is recognized in profit or loss within 'finance cost' at the same time as the interest expense on the hedged borrowings.

When a hedging instrument expires, or is sold, terminated, exercised, or when a hedge no longer meets the criteria for hedge accounting, any accumulated cash flow hedge reserve at that time remains in equity until the forecast transaction occurs, resulting in the recognition of a non-financial asset such as inventory. When the forecast transaction is no longer expected to occur, the cash flow hedge reserve and deferred costs of hedging that were reported in equity are immediately reclassified to profit or loss.

Changes in the fair value of any derivative instrument that does not qualify for hedge accounting are recognized immediately in profit or loss within 'other non-operating income (expenses)' or 'finance income (costs)' based on the nature of transactions.

#### **2.9 Trade Receivables**

Trade receivables are recognized initially at fair value and subsequently measured at amortized cost using the effective interest method, less loss allowance.

#### **2.10 Inventories**

Inventories are stated at the lower of cost and net realizable value. Cost is determined using weighted average cost method, except for goods in transit which is determined using the specific identification method.

#### **2.11 Assets Held for sale**

Assets are classified as held for sale when their carrying amount will be recovered principally through a sale transaction rather than through continuing use and a sale is considered highly probable. The assets are measured at the lower amount between their carrying amount and the fair value less costs to sell.

#### **2.12 Property, Plant and Equipment**

Property, plant and equipment are stated at historical cost less accumulated depreciation and accumulated impairment losses. Historical cost includes expenditure that is directly attributable to the acquisition of the items.

Depreciation of all property, plant and equipment, except for land, is calculated using the straight-line method to allocate their cost or revalued amounts, net of their residual values, over their estimated useful lives as follows:

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

---

	<b>Useful lives</b>
Buildings	25 - 50 years
Structures	5 - 50 years
Machinery	4 - 19 years
Others	1 - 6 years

The assets' depreciation method, residual values and useful lives are reviewed, and adjusted if appropriate, at the end of each reporting period.

### **2.13 Investment Property**

Investment property is property held to earn rentals or for capital appreciation or both. An investment property is measured initially at its cost. An investment property is measured after initial measurement at depreciated cost (less any accumulated impairment losses). The Group depreciates investment properties, except for land, using the straight-line method over their useful lives of 25 ~ 50 years.

### **2.14 Borrowing Costs**

General and specific borrowing costs that are directly attributable to the acquisition, construction or production of a qualifying asset are capitalized during the period of time that is required to complete and prepare the asset for its intended use or sale. Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization. Other borrowing costs are expensed in the period in which they are incurred.

### **2.15 Government Grants**

Grants from the government are recognized at their fair value where there is a reasonable assurance that the grant will be received and the Group will comply with all attached conditions. Government grants related to assets are presented in the statement of financial position by deducting the grant in arriving at the carrying amount of the asset, and government grants related to income are deferred and later deducted from the related expense.

### **2.16 Intangible Assets**

The excess of consideration transferred and amount of acquisition-date fair value of any previous equity interest in the acquired entity over the fair value of the net identifiable assets acquired is recorded as goodwill. Goodwill is carried at its cost less accumulated impairment losses. Impairment losses on goodwill are not reversed.

Intangible assets, except for goodwill, are initially recognized at its historical cost and carried at its cost less accumulated amortization and accumulated impairment losses.

Development costs that are directly attributable to internally generated by the Group are recognized when the criteria; such as, technically feasible, generate probable future economic benefits and other, are met. Membership rights that have an indefinite useful life are not subject to amortization because there is no foreseeable limit to the period over which the assets are expected to be utilized. The Group amortizes intangible assets with a limited useful life using the straight-line method over the following periods:

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

---

	<b>Useful lives</b>
Development costs	3 - 15 years
Industrial property rights	5 - 15 years
Others	6 - 20 years

### **2.17 Research and Development**

Costs associated with research are recognized as an expense as incurred. Costs that are identifiable, controllable and directly attributable to development projects are recognized as intangible asset when the following criteria are met:

- It is technically feasible to complete the development project so that it will be available for use;
- Management intends to complete the development project for its own use or selling;
- There is an ability to use or sell the development project;
- It can be demonstrated how the development project will generate probable future economic benefits;
- Adequate technical, financial resources and other resources to complete the development and to use or sell the development project are available; and
- The expenditure attributable to the development project during its development can be reliably measured.

Generally, internally generated development projects have the following stages; formulation and selection of a project, verification of idea and technology, development and testing, decision of commercialization, test of final application. Expenditures can be capitalized as intangible assets only after the decision of commercialization. Expenditures incurred in other stages are recognized as expenses on the research phase.

Internally generated development projects in the Life Sciences business have the following stages; formulation of potential candidates, preclinical research, clinical researches such as phase 1, 2 and 3 trials, approval of regulatory body and new product launch. Expenditures incurred from new drug development project are recognized as expensed on the research phase. However, expenditures incurred during clinical phase 1~3 trials from development projects for generic drugs or biosimilars are recognized as intangible assets depending on the nature of the products.

Expenditures incurred from technology license agreement with the third parties are recognized as intangible assets.

Development costs previously recognized as an expense are not recognized as an asset in a subsequent period. Capitalized development costs that are recognized as intangible assets are amortized using the straight-line method over their estimated useful lives when the assets are available for use and are tested for impairment.

### **2.18 Impairment of Non-financial Assets**

Goodwill and intangible assets that have an indefinite useful life are not subject to amortization and are tested annually for impairment, or more frequently if events or changes in circumstances indicate that they might be impaired. Other assets are tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognized for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs of disposal and value in use. Non-financial assets other than goodwill that suffered an impairment

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

are reviewed for possible reversal of the impairment at the end of each reporting period.

#### **2.19 Trade and Other Payables**

These amounts represent liabilities for goods and services provided to the Group prior to the end of reporting period which are unpaid. Trade and other payables are presented as current liabilities, unless payment is not due within 12 months after the reporting period. They are recognized initially at their fair value and subsequently measured at amortized cost using the effective interest method.

#### **2.20 Financial Liabilities**

##### *(a) Classification and measurement*

The Group's financial liabilities at fair value through profit or loss are financial instruments held for trading. A financial liability is held for trading if it is incurred principally for the purpose of repurchasing in the near term. A derivative that is not a designated as hedging instruments and an embedded derivative that is separated are also classified as held for trading.

The Group classifies non-derivative financial liabilities, except for financial liabilities at fair value through profit or loss, financial guarantee contracts and financial liabilities that arise when a transfer of financial assets does not qualify for derecognition, as financial liabilities carried at amortized cost and present as 'trade payables', 'borrowings', and 'other payables' in the statement of financial position.

##### *(b) Derecognition*

Financial liabilities are removed from the statement of financial position when it is extinguished; for example, when the obligation specified in the contract is discharged or cancelled or expired or when the terms of an existing financial liability are substantially modified.

#### **2.21 Compound Financial Instruments**

Compound financial instruments issued by the Group are convertible notes that can be converted into equity instruments at the option of the holder.

The liability component of a compound financial instrument is recognized initially at the fair value of each component. The bond component is subsequently recognized at amortized cost until extinguished on conversion or maturity of the bonds. The conversion option component is subsequently recognized at fair value through profit or loss. Any directly attributable transaction costs are allocated to the liability and equity components in proportion to their initial carrying amounts.

#### **2.22 Current and Deferred Tax**

The tax expense for the year consists of current and deferred tax. Current and deferred tax is recognized in profit or loss, except to the extent that it relates to items recognized in other comprehensive income or directly in equity. In this case, the tax is also recognized in other comprehensive income or directly in equity, respectively. The tax expense is measured at the amount expected to be paid to the taxation authorities, using the tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period.

Deferred income tax is provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated



# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

financial statements. However, deferred income tax is not accounted for if it arises from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither accounting nor taxable profit or loss.

Deferred tax assets are recognized only if it is probable that future taxable amounts will be available to utilize those temporary differences and losses.

The Group recognizes a deferred tax liability all taxable temporary differences associated with investments in subsidiaries, associates, and interests in joint arrangements, except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. In addition, The Group recognizes a deferred tax asset for all deductible temporary differences arising from such investments to the extent that it is probable the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

Deferred tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets and liabilities and when the deferred tax balances relate to the same taxation authority. Current tax assets and tax liabilities are offset where the entity has a legally enforceable right to offset and intends either to settle on a net basis.

#### 2.23 Provisions

Provisions are measured at the present value of the expenditures expected to be required to settle the obligation and the increase in the provision due to passage of time is recognized as interest expense.

#### 2.24 Greenhouse Gas Emissions Permits and Obligations

With enforcement of *The Act on the Allocation and Trading of Greenhouse Gas Emission Permits*, the permits that are received free of charge from the government are measured at zero while permits purchased are measured at acquisition cost and stated net of accumulated impairment loss. Emissions obligations are measured as the sum of the carrying amount of the allocated permits that will be submitted to the government and the best estimate of expenditure required to settle the obligation at the end of reporting period for any excess emission. The permits and emissions obligations are classified as intangible assets and provisions, respectively, in the consolidated statement of financial position.

#### 2.25 Employee Benefits

##### *(a) Post-employment benefits*

The Group operates both defined contribution and defined benefit pension plans. For defined contribution plans, the Group pays contribution to publicly or privately administered pension insurance plans on mandatory, contractual or voluntary basis. The Group has no further payment obligation once the contribution have been paid. The contribution are recognized as employee benefit expense when they are due. A defined benefit plan is a pension plan that is not a defined contribution plan.

Generally, post-employment benefits are payable after the completion of employment, and the benefit amount depended on the employee's age, periods of service or salary levels. The liability recognized in the statement of financial position in respect of defined benefit pension plans is the present value of the defined benefit obligation at the end of the reporting period less the fair value of plan assets. The defined benefit obligation is calculated annually by independent actuaries

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

using the projected unit credit method. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using interest rates of high-quality corporate bonds that are denominated in the currency in which the benefits will be paid, and that have terms approximating to the terms of the related obligation. Remeasurement gains and losses arising from experience adjustments and changes in actuarial assumptions are recognized in the period in which they occur, directly in other comprehensive income.

Changes in the present value of the defined benefit obligation resulting from plan amendments or curtailments are recognized immediately in profit or loss as past service costs.

#### *(b) Other long-term employee benefits*

Certain entities within the Group provide long-term employee benefits that are entitled to employees with service period for ten years and above. The expected costs of these benefits are accrued over the period of employment using the same accounting methodology as used for defined benefit pension plans. The Group recognizes service cost, net interest on other long-term employee benefits and remeasurements as profit or loss for the years. These liabilities are valued annually by an independent qualified actuary.

## **2.26 Revenue Recognition**

The adoption of Korean IFRS 1115 does not have a significant impact on the financial statements.

#### *(a) Identify performance obligation*

With regard to the contract of selling products to the customer, the Group identifies the services provided separately to the customer as a different performance obligation. When the Group makes a sales contract with the customer, the standard warranty period for each product and customer is set up considering the legal warranty period. Even though the standard warranty period has been expired, the warranties are recognized as a revenue and is identified as a separate performance obligation when the Group provides additional warranties for the quality of product or when the customer has an option to purchase additional warranties separately.

#### *(b) A performance obligation satisfied at a point in time*

The revenue from the sale of goods is recognized at the time they are delivered to the customer. Delivery occurs when the products have been shipped to the specific location, the risks of obsolescence and loss have been transferred to the customer, and either the customer has accepted the products in accordance with the sales contract, the acceptance provisions have lapsed, or the group has objective evidence that all criteria for acceptance have been satisfied.

The goods are often sold with volume discounts, and it is the group's policy to sell its products to the customer with a right of return. Accumulated experience is used to estimate for the discounts and the refund, and the volume discounts is calculated based on the periodical forecast sales. The warranty provision for the sales and refund is reasonably estimated and recognized properly.

#### *(c) Refunds*

A gross contract liability for the expected refunds to customers is recognized as adjustment to revenue, and the Group has a right to recover the product from the customer where the customer exercises his right of return and recognizes an asset and a corresponding adjustment to cost of sales. A right to recover the products is measured at former carrying amount of the product less the costs to recover the products.

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

---

#### *(d) Significant financing component*

As a practical expedient, the Group need not adjust the promised amount of consideration for the effects of a significant financing component as the period between when the entity transfers a promised good or service to a customer and when the customer pays for that good or service is generally one year or less.

#### **2.27 Lease**

A lease is an agreement, whereby the lessor conveys to the lessee, in return for a payment or series of payments, the right to use an asset for an agreed period of time. Leases in which a significant portion of the risks and rewards of ownership are not transferred to the Group are classified as operating leases. Payments made under operating leases are charge to profit or loss on a straight-line basis over the period of lease.

Leases where the Group, as lessee, has substantially all the risks and rewards of ownership are classified as finance leases. Finance leases are capitalized at the lease's inception at the fair value of the leased property or, if lower, the present value of the minimum lease payments. The corresponding rental obligations, net of finance charges, are included in other short-term and long-term payables. Each lease payment is allocated between the liability and finance cost.

If the Group is a lessor, a lease is classified as a finance lease if it transfers substantially all the risks and rewards incidental to ownership at the inception of the lease. A lease other than a finance lease is classified as an operating lease. Lease income from operating leases is recognized in income on a straight-line basis over the lease term. Initial direct costs incurred by the lessor in negotiating and arranging an operating lease is added to the carrying amount of the leased asset and recognized as an expense over the lease term on the same basis as the lease income.

### **3. Financial Risk Management**

#### **3.1 Financial Risk Factors**

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

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

#### **(1) Market risk**

##### **1) Foreign exchange risk**

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

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

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 December 31, 2018 and 2017, 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>	<b>December 31, 2018</b>		<b>December 31, 2017</b>	
	<b>Assets</b>	<b>Liabilities</b>	<b>Assets</b>	<b>Liabilities</b>
USD	2,458,886	2,396,650	2,337,448	1,561,175
EUR	197,975	892,963	174,464	21,226
JPY	27,849	114,399	36,304	109,162
CNY and others	128,392	6,085	60,616	1,512

As at December 31, 2018 and 2017, 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>	<b>December 31, 2018</b>		<b>December 31, 2017</b>	
	<b>10% Increase</b>	<b>10% Decrease</b>	<b>10% Increase</b>	<b>10% Decrease</b>
USD	6,224	(6,224)	77,627	(77,627)

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 KOSPI, 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 December 31, 2018 and December 31, 2017. The analysis is based on the assumption that the equity index has increased/decreased by 10% with all other variables held constant, and that all the Group's equity instruments moved in line with the index.

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>		<b>December 31, 2017</b>	
	<b>10% Increase</b>	<b>10% Decrease</b>	<b>10% Increase</b>	<b>10% Decrease</b>
KOSPI	-	-	553	(553)
KOSDAQ	315	(315)	-	-
NASDAQ	168	(168)	-	-
HSI	7,798	(7,798)	-	-

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

<b>Total</b>	8,281	(8,281)	553	(553)
--------------	-------	---------	-----	-------

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 year. 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>	<b>Impact on post-tax profit</b>		<b>Impact on equity</b>	
	<b>2018</b>	<b>2017</b>	<b>2018</b>	<b>2017</b>
Increase	(19,136)	(13,017)	(19,136)	(13,017)
Decrease	19,136	13,017	19,136	13,017

(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 December 31, 2018, is as follows. Expected credit losses include forward-looking information.

<i>(in millions of Korean won)</i>	<b>Receivables not past due<sup>1</sup></b>	<b>Receivables past due but not impaired<sup>1</sup></b>	<b>Impaired receivables<sup>2</sup></b>	<b>Total</b>
<b>December 31, 2018</b> (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
<b>January 1, 2018</b> (trade receivables)				

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Gross carrying amount	4,302,204	148,908	5,109	4,456,221
Expected loss rate	0.1%	0.1%	68.6%	0.2%
Loss allowance provision	3,871	174	3,507	7,552

<sup>1</sup> See Note 7.(3)

<sup>2</sup> 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 years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>Trade receivables</b>	
	<b>2018</b>	<b>2017<sup>1</sup></b>
<b>Beginning balance - Korean IFRS 1039</b>	7,552	12,219
Amounts restated through beginning balance of retained earnings	-	-
Loss allowance as at January 1, 2018 - calculated under Korean IFRS 1109	7,552	12,219
Business combination (Note 34)	23	2,018
Increase in loss allowance recognized in profit or loss during the year	701	(4,464)
Receivables written off during the year as uncollectible	(333)	(644)
Exchange differences	(33)	(1,577)
<b>Ending balance</b>	<b>7,910</b>	<b>7,552</b>

<sup>1</sup> The amounts as at December 31, 2017, were calculated under Korean IFRS 1039.

As at December 31, 2018, the carrying amount of trade receivables representing the maximum exposure to credit risk amounts to ₩4,389,109 million (2017: ₩4,456,221 million).

*B. Other financial assets at amortized cost*

Movements in loss allowance provision for other financial assets at amortized cost for the year ended December 31, 2018, are as follows:

<i>(in millions of Korean won)</i>	<b>Other receivables</b>
<b>Beginning balance - Korean IFRS 1039</b>	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	1,783

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

profit or loss during the year	
Exchange differences	(16)
<b>Ending balance</b>	<b><u>2,726</u></b>

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

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)

	<b>December 31, 2018</b>			
	<b>Less than 1 year</b>	<b>Between 1-2 years</b>	<b>Between 2-5 years</b>	<b>Over 5 years</b>
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
<b>Total</b>	<b><u>6,417,383</u></b>	<b><u>852,147</u></b>	<b><u>2,269,544</u></b>	<b><u>916,082</u></b>

(in millions of Korean won)

**December 31, 2017**

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

	Less than 1 year	Between 1-2 years	Between 2-5 years	Over 5 years
Borrowings (excluding financial lease liabilities)	1,472,881	333,734	1,076,000	327,225
Finance lease liabilities	5,253	5,177	15,532	10,532
Trade and other payables	3,862,001	6,927	1,576	142
<b>Total</b>	<b>5,340,135</b>	<b>345,838</b>	<b>1,093,108</b>	<b>337,899</b>

As at December 31, 2018, 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)*

	December 31, 2018				
	Purpose of the contracts	Hedged items	Financial institution	Maturity	Fair value
Merchandise (raw materials) swap <sup>1</sup>	Cashflow hedge	Non-ferrous metal	Citi bank	~2021. 12	18,477

Details of derivative assets and liabilities as at December 31, 2018 and 2017, are as follows:

*(in millions of Korean won)*

	December 31, 2018		December 31, 2017	
	Assets	Liabilities	Assets	Liabilities
Merchandise (raw materials) swap <sup>1</sup>	-	18,477	-	-
<b>Total</b>	<b>-</b>	<b>18,477</b>	<b>-</b>	<b>-</b>

<sup>1</sup> 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).

### 3.2 Capital Risk Management

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

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

The gearing ratio and debt-to-equity ratio as at December 31, 2018 and 2017, were as follows:

*(in millions of Korean won, except for ratios)*

	December 31, 2018	December 31, 2017
Total borrowings (Note 14) (A)	5,321,147	3,044,949
Less: cash and cash equivalents (B)	(2,513,702)	(2,249,341)
Net debt (C=A+B)	2,807,445	795,608
Total liabilities (D)	11,622,009	8,702,644
Total equity (E)	17,322,128	16,338,577
Total capital (F=C+E)	20,129,573	17,134,185



**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Gearing ratio (C/F)	13.9%	4.6%
Debt-to-equity ratio (D/E)	67.1%	53.3%

**3.3 Fair Value**

(1) Carrying amount and fair value of financial instruments by category as at December 31, 2018 and 2017, are as follows:

(in millions of Korean won)

	December 31, 2018		December 31, 2017	
	Carrying amount	Fair value	Carrying amount	Fair value
<b>Financial assets (current)</b>				
Cash and cash equivalents	2,513,702	1	2,249,341	1
Deposits held by financial institutions	42,902	1	529,701	1
Trade receivables	4,381,199	1	4,448,669	1
Other receivables (excluding deposits held by financial institutions)	283,191	1	241,075	1
<b>Financial assets (non-current)</b>				
Deposits held by financial institutions	64,331	1	64,308	1
Other receivables (excluding deposits held by financial institutions)	64,919	1	62,121	1
Other non-current financial assets (carried at cost)	-	-	17,718	2
Other non-current financial assets (carried at fair value)				
Marketable financial assets	49,214	49,214	6,064	6,064
Non-marketable financial assets	44,136	1	-	-
<b>Financial liabilities (current)</b>				
Trade and other payables	4,717,445	1	3,862,001	1
Current borrowings (excluding finance lease liabilities)	1,608,138	1	1,446,187	1
Current finance lease liabilities	5,008	1	5,137	1
Current derivative financial liabilities	18,477	18,477	-	-
<b>Financial liabilities (non-current)</b>				
Non-current borrowings (excluding finance lease liabilities)	3,684,765	3,740,154	1,566,258	1,560,147
Non-current finance lease liabilities	23,236	24,689	27,367	28,776
Other non-current payables	9,984	1	8,646	1
Other non-current financial liabilities (Conversion rights)	30,384	30,384	-	-

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

<sup>2</sup> As at December 31, 2017, all other non-current financial assets of the Group consist of available-for-sale equity securities. These equity securities are measured at cost as the range of reasonable fair value estimates is significant and the probabilities of the various estimates cannot be reasonably assessed.

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

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

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 Group (AA+), and the applied discount rates as at December 31, 2018 and December 31, 2017, are as follows:

<i>(in percentage)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Discount rate	2.01%~2.53%	1.95%~2.90%

(3) Fair value hierarchy

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

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

Fair value hierarchy classifications of the financial instruments that are measured at fair value or its fair value is disclosed as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>			
	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Total</b>
<b>Financial assets/liabilities measured at fair value</b>				
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
<b>Financial assets/liabilities not measured at fair value</b>				
Non-current borrowings (excluding finance lease liabilities)	-	3,120,475	619,679	3,740,154
Non-current finance lease liabilities	-	24,689	-	24,689

<i>(in millions of Korean won)</i>	<b>December 31, 2017</b>			
	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Total</b>
<b>Financial assets/liabilities measured at fair value</b>				
Other non-current financial assets (carried at fair value)	6,064	-	-	6,064
<b>Financial assets/liabilities not measured at fair value</b>				
Non-current borrowings (excluding finance lease liabilities)	-	1,560,147	-	1,560,147
Non-current finance lease liabilities	-	28,776	-	28,776

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

(4) Valuation Technique and the Inputs

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

<i>(in millions of Korean won)</i>	<b>Fair value</b>	<b>Level</b>	<b>Valuation Technique</b>	<b>Inputs</b>	<b>Coverage of Level 3 inputs</b>
<b>Financial liabilities</b>					
<b>- Convertible Bond</b>					
Convertible Bond	619,679	3	Present value technique	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 -0.5% ~ +0.5%

(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:

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

<i>(in millions of Korean won)</i>	<b>December 31, 2017</b>	
	<b>The effect on profit</b>	<b>The effect on loss</b>
<b>Financial liabilities</b>		
<b>- Convertible Bond</b>		
Annual rates of credit volatility	-	-
<b>Financial liabilities</b>		
<b>- Equity Conversion Option</b>		
Annual rates of credit volatility	-	-
Underlying asset (equity) volatility	-	-

**4. Critical Accounting Estimates and Assumptions**

The preparation of financial statements requires the Group makes estimates and assumptions concerning the future. The estimates and judgements are continuously evaluated with consideration to factors such as events reasonably predictable in the foreseeable future within the present circumstance according to historical experience. The resulting accounting estimates will,

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

---

by definition, seldom equal the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are addressed below.

(1) Impairment test of goodwill

The Group tests whether goodwill has suffered any impairment on an annual basis. The recoverable amount of a cash generating unit (CGU) is determined based on value-in-use or fair value less cost of disposal calculations (Note 12).

(2) Income taxes

The Group recorded, based on its best estimate, current taxes and deferred taxes that the Group will be liable in the future for the operating results as at the financial year end. However, the final tax outcome in the future may be different from the amounts that were initially recorded. Such differences will impact the current and deferred tax assets and liabilities in the period in which such determination is made (Note 28).

(3) Provisions

The Group recognizes provisions for product warranties and estimated returns as explained in Note 15. These provisions are estimated based on past experience.

(4) Fair value of financial instruments

The fair value of financial instruments that are not traded in an active market is determined by using valuation techniques. The Group uses its judgment to select a variety of methods and make assumptions that are mainly based on market conditions existing at the end of each reporting period (Note 3.3).

(5) Impairment of financial assets

The provision for impairment for financial assets are based on assumptions about risk of default and expected loss rates. The Group uses judgement in making these assumptions and selecting the inputs to the impairment calculation based on the Group's past history, existing market conditions as well as forward looking estimates at the end of each reporting period (Note 3.1.(2)).

(6) Net defined benefit liability

The present value of net defined benefit liability depends on a number of factors that are determined on an actuarial basis using a number of assumptions including the discount rate (Note 16).

**5. Financial Instruments by Category**

Categorizations of financial instruments as at December 31, 2018 and 2017, are as follows:

*(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	
<b>Financial assets</b>				

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

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 current financial assets	-	-	-	-
Other non-current financial assets	-	16,077	77,273	93,350
<b>Total</b>	<b>6,955,721</b>	<b>16,077</b>	<b>471,797</b>	<b>7,443,595</b>

(in millions of Korean won)

<b>December 31, 2018</b>				
<b>Financial liabilities</b>	<b>Financial liabilities at fair value through profit or loss</b>	<b>Financial liabilities at amortized cost</b>	<b>Other financial liabilities<sup>1</sup></b>	<b>Total</b>
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
Other current liabilities (dividends payable)	-	-	-	-
Other current financial liabilities	-	-	18,477	18,477
Other 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
<b>Total</b>	<b>30,384</b>	<b>10,020,332</b>	<b>46,721</b>	<b>10,097,437</b>

(in millions of Korean won)

<b>December 31, 2017</b>				
<b>Financial assets</b>	<b>Loans and receivables</b>	<b>Financial assets at fair value through profit or loss</b>	<b>Available-for-sale financial assets</b>	<b>Total</b>
Cash and cash equivalents	2,249,341	-	-	2,249,341
Trade receivables	4,448,669	-	-	4,448,669
Other receivables	770,776	-	-	770,776
Other non-current receivables	126,429	-	-	126,429
Other non-current financial assets	-	-	23,782	23,782
<b>Total</b>	<b>7,595,215</b>	<b>-</b>	<b>23,782</b>	<b>7,618,997</b>

(in millions of Korean won)

<b>December 31, 2017</b>				
<b>Financial liabilities</b>	<b>Financial liabilities at fair value through profit or loss</b>	<b>Financial liabilities at amortized cost</b>	<b>Other financial liabilities<sup>1</sup></b>	<b>Total</b>
Trade payables	-	2,014,779	-	2,014,779

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Other payables	-	1,847,222	-	1,847,222
Borrowings (current)	-	1,443,683	7,641	1,451,324
Other non-current payables	-	8,646	-	8,646
Borrowings (non-current)	-	1,566,258	27,367	1,593,625
<b>Total</b>	-	<b>6,880,588</b>	<b>35,008</b>	<b>6,915,596</b>

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

Net gains or losses on each category of financial instruments for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
<b>Dividend income</b>		
Financial assets at fair value through other comprehensive income	123	-
Available-for-sale financial assets	-	331
<b>Interest income</b>		
Financial assets at fair value through other comprehensive income	-	5
Financial assets at amortized cost	47,837	30,211
<b>Interest expense</b>		
Derivative instruments	-	-
Financial liabilities at amortized cost	(155,404)	(100,028)
Other financial liabilities	(1,014)	(6,930)
<b>Gain (loss) on valuation</b>		
Financial assets at fair value through profit or loss	73	-
Financial assets at fair value through other comprehensive income	(5,737)	(4,328)
Derivative instruments	(15,721)	-
<b>Loss on redemption of debentures</b>		
Financial liabilities at amortized cost	(13)	-
<b>Gain (loss) on disposal</b>		
Financial assets at fair value through profit or loss	-	-
Derivative instruments	-	170
Financial assets at fair value through other comprehensive income	(1,542)	-
<b>Gain (loss) on foreign currency translation</b>		
Financial assets at amortized cost	(30,452)	(85,697)
Financial liabilities at amortized cost	(40,031)	74,329
Other financial liabilities	(527)	-
<b>Gain (loss) on foreign currency transaction</b>		
Financial assets at amortized cost	139,819	(225,897)
Financial liabilities at amortized cost	(138,131)	112,045

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Other financial liabilities	(212)	64,653
-----------------------------	-------	--------

**6. Cash and Cash Equivalents**

Details of cash and cash equivalents as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Bank deposits and cash on hand	872,337	598,712
Deposits held by financial institutions and others	1,641,365	1,650,629
<b>Total</b>	<b>2,513,702</b>	<b>2,249,341</b>

As at December 31, 2018, cash and cash equivalents include ₩4,607 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 December 31, 2018 and 2017, are as follows:

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

<i>(in millions of Korean won)</i>	<b>December 31, 2017</b>		
	<b>Gross amount</b>	<b>Provision for impairment</b>	<b>Carrying amount</b>
Trade receivables <sup>1</sup>	4,456,221	(7,552)	4,448,669
Other current receivables	771,735	(959)	770,776
Other non-current receivables <sup>2</sup>	126,429	-	126,429
<b>Total</b>	<b>5,354,385</b>	<b>(8,511)</b>	<b>5,345,874</b>

<sup>1</sup> As at December 31, 2018 and 2017, trade receivables transferred to financial institutions have been accounted for as a collateralized borrowing and financial assets not fully derecognized are as follows (Note 14):

	<b>Loans and receivables</b>	
	<b>(trade receivables collateralized borrowings)</b>	
<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Carrying amount of transferred assets	-	2,504
Carrying amount of related liabilities	-	(2,504)

<sup>2</sup> As at December 31, 2018, ₩931 million of other non-current receivables represents deposits

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

which are restricted from withdrawal in connection with maintaining checking accounts (2017: ₩550 million).

Details of other receivables as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
<b>Current</b>		
Non-trade receivables	242,740	187,314
Deposits held by financial institutions <sup>1</sup>	42,902	529,701
Accrued income	3,533	5,126
Guarantee deposits provided	36,918	48,635
	326,093	770,776
<b>Non-current</b>		
Non-trade receivables	7,030	4,246
Deposits held by financial institutions <sup>2</sup>	64,331	64,308
Loans	312	291
Guarantee deposits provided	57,578	57,584
	129,251	126,429
<b>Total</b>	455,344	897,205

<sup>1</sup> As at December 31, 2018, ₩300 million (2017: ₩1,338 million) is pledged as a collateral for borrowings and others.

<sup>2</sup> As at December 31, 2018, ₩63,400 million (2017: ₩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 December 31, 2018 and 2017, is as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>		<b>December 31, 2017</b>	
	<b>Trade receivables</b>	<b>Other receivables</b>	<b>Trade receivables</b>	<b>Other receivables</b>
<b>Receivables not past due</b>	4,115,060	445,357	4,302,204	834,882
<b>Past due but not impaired</b>				
Up to 3 months	247,287	6,850	148,043	59,070
Between 3-6 months	5,631	1,907	311	2,078
Over 6 months	15,570	1,847	554	1,175
	268,488	10,604	148,908	62,323
<b>Impaired receivables</b>	5,561	2,109	5,109	959
	4,389,109	458,070	4,456,221	898,164



**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Movements on the provision for impairment of trade and other receivables for the years ended December 31, 2018 and 2017, are as follows:

(in millions of Korean won)

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

(in millions of Korean won)

	2017			
	Trade receivables		Other receivables	
	Current	Non-current	Current	Non-current
<b>Beginning balance</b>	12,219	-	385	990
Business combination (Note 34)	2,018	-	-	-
Additions	-	-	795	-
Write-off	(644)	-	(221)	(990)
Reversals	(4,464)	-	-	-
Exchange differences	(1,577)	-	-	-
<b>Ending balance</b>	<b>7,552</b>	<b>-</b>	<b>959</b>	<b>-</b>

As at December 31, 2018 and 2017, 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 ₩579,770 million at December 31, 2018, 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 and liabilities as at December 31, 2018 and December 31, 2017, are as follows:

(in millions of Korean won)

	December 31, 2018	December 31, 2017
<b>Other financial assets</b>		
Financial assets at fair value through other comprehensive income (non-current)	77,273	-
Financial assets at fair value through profit or loss (non-current)	16,077	-
Available-for-sale financial assets	-	23,782

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

	93,350	23,782
<b>Other financial liabilities</b>		
Financial liabilities at fair value through other comprehensive income (current)	18,477	-
Derivative instruments (non-current)	30,384	-
	<u>48,861</u>	<u>-</u>

Changes in other financial assets for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
<b>Beginning balance</b>	23,782	23,448
Business combination (Note 34)	-	2,652
Acquisitions / Transfer	89,240	3,001
Disposals	(14,009)	(195)
Impairment	-	(209)
Loss on valuation (before income tax effects) through other comprehensive income	(7,566)	(5,550)
Gain on valuation (before income tax effects) through profit or loss	73	-
Less: current portion	-	-
Exchange differences	1,830	635
<b>Ending balance</b>	<u>93,350</u>	<u>23,782</u>

**9. Inventories**

Details of inventories as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>		
	<b>Gross Amount</b>	<b>Valuation allowance</b>	<b>Carrying amount</b>
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
<b>Total</b>	<u>4,434,473</u>	<u>(145,010)</u>	<u>4,289,463</u>

<i>(in millions of Korean won)</i>	<b>December 31, 2017</b>		
	<b>Gross Amount</b>	<b>Valuation allowance</b>	<b>Carrying amount</b>
Merchandise	141,567	(3,320)	138,247
Finished / Semi-finished products	1,956,436	(95,369)	1,861,067
Work-in-process	9,852	-	9,852
Raw materials	897,227	(14,459)	882,768
Supplies	136,251	-	136,251
Materials-in-transit	324,269	-	324,269
<b>Total</b>	<u>3,465,602</u>	<u>(113,148)</u>	<u>3,352,454</u>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

During the year, the cost of inventories recognized as expense and included in 'cost of sales' amounted to ₩17,684,967 million (2017: ₩15,436,415 million).

**10. Investments in Associates and Joint Ventures**

Changes in investments in associates and joint ventures for the years ended December 31, 2018 and 2017, are as follows:

(in millions of Korean won)

	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. <sup>1</sup>	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. <sup>2</sup>	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. <sup>3</sup>	-	1,503	-	(118)	(4)	18	1,399
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO., LTD. <sup>4</sup>	-	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>(27,090)</u>	<u>266,124</u>

(in millions of Korean won)

	2017								
	Beginning balance	Business combination	Acquisitions / transfer	Dividends	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income of associates and joint ventures	Changes in ownership of associates	Others	Ending balance
LG VINA Chemical Co., Ltd.	3,874	-	-	(846)	753	(454)	-	-	3,327
HL Greenpower Co., Ltd.	16,927	-	-	-	3,010	-	-	303	20,240
LG Holdings (HK) Ltd.	74,843	-	-	-	4,281	(8,596)	-	(19,499)	51,029
TECHWIN Co., Ltd.	7,214	-	-	-	794	-	-	-	8,008
SEETEC Co., Ltd.	148,333	-	-	(10,000)	8,408	-	-	-	146,741
LG Chem BRASIL INTERMEDIACAO DE NEGOCIOS DO SETOR QUIMICO	579	-	-	-	-	-	-	-	579

# LG Chem, Ltd. and Subsidiaries

## Notes to the Consolidated Financial Statements

### December 31, 2018 and 2017

LTDA.									
LG Chem Malaysia SDN.BHD	150	-	-	-	-	-	-	-	150
LG Fuel Cell Systems Inc.	8,908	-	24,527	-	(10,191)	(587)	7,680	(3)	30,334
FJ Composite Materials Co., Ltd.	-	-	3,015	-	(259)	(87)	-	-	2,669
WUXI CL New Energy Technology Ltd.	-	-	1,178	-	(176)	-	-	-	1,002
LG Life Sciences Poland Ltd.	-	17	-	-	-	-	-	-	17
	<u>260,828</u>	<u>17</u>	<u>28,720</u>	<u>(10,846)</u>	<u>6,620</u>	<u>(9,724)</u>	<u>7,680</u>	<u>(19,199)</u>	<u>264,096</u>

<sup>1</sup> During the year, the Parent Company acquired additional shares of LG VINA Chemical Co.,Ltd. for ₩1,767 million.

<sup>2</sup> During the year, the Parent Company additionally acquired shares of LG Fuel Cell System Inc. in the amount of ₩5,036 million, and then impaired the whole carrying value of the investment amounting to ₩26,498 million.

<sup>3</sup> During the year, the Group newly acquired 29.54% shares of Combustion Synthesis Co., Ltd. for ₩1,503 million.

<sup>4</sup> During the year, the Group newly acquired 49% shares of HUAJIN NEW ENERGY MATERIALS(QUZHOU)CO., LTD. for ₩26,128 million.

## 11. Property, Plant and Equipment

Changes in property, plant and equipment for the years ended December 31, 2018 and 2017, are as follows:

	2018										
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Construction in-progress	Machinery in-transit	Total
<b>Beginning balance</b>	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
<b>Ending balance</b>	<u>1,620,153</u>	<u>3,187,757</u>	<u>827,775</u>	<u>4,691,884</u>	<u>12,865</u>	<u>471,130</u>	<u>149,599</u>	<u>115,901</u>	<u>2,588,018</u>	<u>174,116</u>	<u>13,839,198</u>
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)

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

(in millions of  
Korean won)

	2017										
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Others	Construction -in-progress	Machinery -in-transit	Total
<b>Beginning balance</b>	1,470,226	2,181,396	651,061	4,288,509	8,594	384,777	95,905	100,360	473,111	26,194	9,680,133
Cost	1,507,15										
Accumulated depreciation	4	2,796,650	1,145,962	12,656,297	41,183	1,005,567	323,646	238,906	484,950	26,194	20,226,509
Accumulated impairment	-	(575,932)	(479,210)	(8,305,213)	(32,439)	(611,202)	(225,767)	(138,098)	-	-	(10,367,861)
	<u>(36,928)</u>	<u>(39,322)</u>	<u>(15,691)</u>	<u>(62,575)</u>	<u>(150)</u>	<u>(9,588)</u>	<u>(1,974)</u>	<u>(448)</u>	<u>(11,839)</u>	<u>-</u>	<u>(178,515)</u>
Business combination (Note 34)	62,738	81,497	6,590	109,011	197	8,256	2,918	-	164,722	57,392	493,321
Acquisitions/ Transfer	38,594	607,656	51,272	955,563	9,761	180,809	45,578	41,658	2,535,725	133,175	4599,791
Disposals/ Transfer	(2,972)	(9,888)	(787)	(53,527)	(49)	(31,254)	(1,242)	-	(1,820,436)	(74,475)	(1,994,630)
Exchange differences	(291)	(28,426)	(5,133)	(77,319)	(121)	(6,971)	(1,821)	-	(2,854)	-	(122,936)
Depreciation	-	(75,093)	(46,529)	(955,324)	(4,691)	(125,354)	(35,001)	(66,915)	-	-	(1,308,907)
Impairment	-	(1,390)	(3,039)	(98,125)	(39)	(6,142)	(652)	(1,704)	(32,391)	-	(143,482)
Reversal of impairment	-	6,836	1,194	3,721	2	797	91	-	-	-	12,641
Transfer to assets held for sale (Note 35)	-	-	-	(3,036)	-	(1,396)	(17)	-	-	-	(4,449)
<b>Ending balance</b>	<u>1,568,295</u>	<u>2,762,588</u>	<u>654,629</u>	<u>4,169,473</u>	<u>13,654</u>	<u>403,522</u>	<u>105,759</u>	<u>73,399</u>	<u>1,317,877</u>	<u>142,286</u>	<u>11,211,482</u>
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)

During the year, the Group capitalized ₩20,905 million of borrowing costs (2017: ₩7,081 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 2.24% (2017: 2.44%).

Line items including depreciation in the consolidated statements of profit or loss for the years ended December 31, 2018 and 2017, are as follows:

(in millions of Korean won)	2018	2017
Cost of sales	1,257,245	1,206,469
Selling and administrative expenses	117,200	98,825
Others	4,876	3,613
<b>Total</b>	<u>1,379,321</u>	<u>1,308,907</u>

Details of machinery and construction-in-progress classified as a finance lease as at December 31, 2018 and December 31, 2017, are as follows:

(in millions of Korean won)	December 31, 2018		December 31, 2017
	Machinery	Machinery	Construction-in-progress
Cost- capitalized finance leases	45,025	43,274	1,275

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Accumulated depreciation	(17,660)	(12,952)	-
<b>Net book amount</b>	<b>27,365</b>	<b>30,322</b>	<b>1,275</b>

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

The Group reviews annually whether there is any indication that an asset may be impaired. During 2018, the Company recognized impairment loss of ₩38,322 million relating to the property and equipments held by Basic materials & Chemicals segment and others, which are not expected to contribute to the generation of future economic benefits due to the changes in the usage pattern of the assets.

During 2017, certain equipment in LED Encap business, a CGU in IT & Electronic materials and Advanced materials segment, was tested for reversal of impairment as the future economic performance of OLED material division was estimated to exceed the previous expectation due to a transfer of LED Encap business to OLED material compound process.

The amount of impairment loss (reversal) recognized as other non-operating (income) expense and key assumptions used for calculation of value in use for the year ended December 31, 2017, are as follows:

(in millions of Korean won)

	2017	
	Glass Substrate <sup>1</sup>	LED Encap
<b>Impaired amount</b>		
Property, plant and equipment	124,138	(11,320)
Intangible assets	2,345	(6)
<b>Key assumptions</b>		
Pre-tax discount rate	Not applicable	12.3%
Growth rate for subsequent years exceeding five years	Not applicable	-

<sup>1</sup> The recoverable amount is calculated based on fair value less cost of disposal and it is a nonrecurring fair value measured by an observable transaction price. It is categorized as level 2 of the fair value hierarchy.

During 2017, the Group decided to dispose of certain of non-current assets and recognized the difference between the fair value and the carrying amount as impairment losses (Note 35).

## 12. Intangible Assets

Changes in intangible assets for the years ended December 31, 2018 and 2017, are as follows:

(in millions of Korean won)

	2018					
	Development costs	Industrial property rights	Goodwill	Memberships	Others	Total
<b>Beginning balance</b>	192,046	371,381	925,593	50,806	283,329	1,823,155
Business combination (Note 34)	-	4	76,466	-	63,234	139,704
Separate acquisitions/ Transfer	83,049	63,008	-	702	34,750	181,509
Additions – internal	16,065	-	-	-	-	16,065

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

development						
Disposals/ Transfer	(15,149)	(69)	-	(623)	(23,150)	(38,991)
Exchange differences	(115)	1,433	4,391	-	(120)	5,589
Amortization	(42,276)	(30,475)	-	-	(35,197)	(107,948)
Impairment	(12,760)	-	-	-	(85)	(12,845)
<b>Ending balance</b>	<b>220,860</b>	<b>405,282</b>	<b>1,006,450</b>	<b>50,885</b>	<b>322,761</b>	<b>2,006,238</b>

(in millions of Korean won)

	2017					
	Development costs	Industrial property rights	Goodwill	Memberships	Others	Total
<b>Beginning balance</b>	102,853	344,882	252,253	52,793	79,363	832,144
Business combination (Note 34)	53,913	12,770	686,229	3,723	203,144	959,779
Separate acquisitions/ Transfer	66,432	47,005	-	1,538	34,921	149,896
Additions – internal development	20,843	-	-	-	-	20,843
Disposals/ Transfer	(8,066)	(55)	-	(6,080)	(308)	(14,509)
Exchange differences	(1,107)	(1,985)	(12,889)	(35)	(349)	(16,365)
Amortization	(33,764)	(30,010)	-	-	(32,944)	(96,718)
Impairment	(9,064)	(868)	-	(1,133)	(498)	(11,563)
Reversal of impairment	6	-	-	-	-	6
Transfer to assets held for sale (Note 35)	-	(358)	-	-	-	(358)
<b>Ending balance</b>	<b>192,046</b>	<b>371,381</b>	<b>925,593</b>	<b>50,806</b>	<b>283,329</b>	<b>1,823,155</b>

Line items including amortization of intangible assets for the years ended December 31, 2018 and 2017, as follows:

(in millions of Korean won)

	2018	2017
Cost of sales	23,375	24,106
Selling and administrative expenses	84,573	72,612
<b>Total</b>	<b>107,948</b>	<b>96,718</b>

The Group recognized total research and development costs of ₩1,007,831 million (2017: ₩870,128 million) as expenses.

Changes in greenhouse gas emission permits for the years ended December 31, 2018 and 2017, are as follows:

(in thousands of tons and millions of Korean won)

	December 31, 2018					
	2017		2018		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
<b>Beginning balance</b>	7,520	18,635	6,648	-	14,168	18,635
Allocation with nil consideration	160	-	897	-	1,057	-
Additional purchases	481	11,826	-	-	481	11,826
Business combination	-	-	-	-	-	-

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Borrowings/Carry forwards between years	(358)	(7,359)	358	7,359	-	-
Surrendered to the government	(7,803)	(23,102)	-	-	(7,803)	(23,102)
<b>Ending balance</b>	<b>-</b>	<b>-</b>	<b>7,903</b>	<b>7,359</b>	<b>7,903</b>	<b>7,359</b>

<i>(in thousands of tons and millions of Korean won)</i>	December 31, 2017					
	2016		2017		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
<b>Beginning balance</b>	6,191	-	6,475	-	12,666	-
Allocation with nil consideration	350	-	799	-	1,149	-
Additional purchases	250	5,133	873	18,635	1,123	23,768
Business combination	62	-	58	-	120	-
Borrowings/Carry forwards between years	685	-	(685)	-	-	-
Surrendered to the government	(7,538)	(5,133)	-	-	(7,538)	(5,133)
<b>Ending balance</b>	<b>-</b>	<b>-</b>	<b>7,520</b>	<b>18,635</b>	<b>7,520</b>	<b>18,635</b>

Goodwill is allocated to the Group's CGUs identified for each operating segment. The carrying amounts of goodwill allocation by CGUs as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	December 31, 2018						
	Acquisition of NanoH2O Co., Ltd.	Acquisition of FarmHannong Co., Ltd.	Acquisition of LG Life Sciences, Ltd.	Acquisition of Uniseal, Inc.	Acquisition of Ugimag Korea Co., Ltd.	Others	Total
<b>Basic materials &amp; Chemicals</b>							
NCC	-	-	-	-	-	2,639	2,639
ABS	-	-	-	-	-	15,725	15,725
PO	-	-	-	-	-	1,054	1,054
PVC	-	-	-	-	-	808	808
Acrylic	-	-	-	-	-	25,572	25,572
Plasticizer	-	-	-	-	-	53	53
BPA	-	-	-	-	-	467	467
Others	-	-	-	-	11,615	1,350	12,965
<b>IT &amp; Electronic materials and Advanced materials</b>							
RO	105,117	-	-	-	-	-	105,117
PSAA	-	-	-	-	-	4,112	4,112
Rechargeable Battery Materials	-	-	-	64,851	-	-	64,851
<b>Life Sciences</b>							
Life sciences	-	-	686,229	-	-	-	686,229
<b>Common and others</b>							
FarmHannong Co., Ltd.	-	86,858	-	-	-	-	86,858



**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

<b>Total</b>	105,117	86,858	686,229	64,851	11,615	51,780	1,006,450
--------------	---------	--------	---------	--------	--------	--------	-----------

(in millions of  
Korean won)

	December 31, 2017					Total
	Acquisition of LG NanoH2O, Inc.	Acquisition of FarmHannong Co.,Ltd.	Merger of LG Life Sciences, Ltd.	Others		
<b>Basic materials &amp; Chemicals</b>						
NCC	-	-	-	2,639		2,639
ABS	-	-	-	15,725		15,725
PO	-	-	-	1,054		1,054
PVC	-	-	-	808		808
Acrylic	-	-	-	25,572		25,572
Plasticizer	-	-	-	53		53
BPA	-	-	-	467		467
Others	-	-	-	1,350		1,350
<b>IT &amp; Electronic materials and Advanced materials</b>						
RO	100,726	-	-	-		100,726
PSAA	-	-	-	4,112		4,112
<b>Life Sciences</b>						
Life sciences	-	-	686,229	-		686,229
<b>Common and others</b>						
FarmHannong Co.,Ltd.	-	86,858	-	-		86,858
<b>Total</b>	<b>100,726</b>	<b>86,858</b>	<b>686,229</b>	<b>51,780</b>		<b>925,593</b>

The recoverable amounts of CGUs have been determined based on value-in-use or fair value less cost of disposal calculations. Value-in-use calculations use pre-tax cash flow projections based on financial budgets approved by management covering a five-year period. Fair value less cost of disposal reflects expectation of future business and usage pattern of assets from the perspective of market participants. Management determined the estimated pre-tax cash flow based on past performance and its expectations of market development. Discount rates applied by the management are the pre-tax discount rates reflecting specific risks relating to the relevant operating segments.

During 2018, key assumptions used for calculation of value in use and fair value less cost of disposal are as follows:

(in millions of Korean won)

	2018	
	Pre-tax discount rate	Growth rate for subsequent years after five years
Acquisition of LG Petrochemical Co., Ltd.	10.8%	0.0%
Acquisition of SAP business	10.5%	0.0%
Acquisition of NanoH2O, Inc	5.2%	3.0%
Acquisition of FarmHannong	10.5%	1.0%
Acquisition of PSAA business	9.9%	0.0%
Merger of LG Life Sciences	10.8%	3.0%
Acquisition LG Chem(HUIZHOU) Petrochemical Co., Ltd	10.9%	0.0%

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

The results of the sensitivity analysis for the fair value less cost of disposal calculation of Life Sciences CGU are as follows:

<i>(in millions of Korean won)</i>	<b>0.5% Increase</b>	<b>0.5% Decrease</b>
<b>Discount rate</b>		
Increase(decrease) in fair value	(145,672)	171,911
<b>Growth rate</b>		
Increase(decrease) in fair value	116,573	(98,805)

Had the discount rate been 0.5% higher than the management's estimate, the Group should have recognized impairment loss of ₩22,296 million from the carrying value of goodwill.

The results of the sensitivity analysis for the value in use calculation of RO filter CGU are as follows:

<i>(in millions of Korean won)</i>	<b>0.5% Increase</b>	<b>0.5% Decrease</b>
<b>Discount rate</b>		
Increase(decrease) in value in use	(59,502)	107,270
<b>Growth rate</b>		
Increase(decrease) in value in use	100,134	(55,472)

Had the discount rate been 0.5% higher than the management's estimate, the Group should have recognized impairment loss of ₩33,166 million from the carrying value of goodwill. Also, had the discount rate been 0.5% lower than the management's estimate, the Group should have recognized impairment loss of ₩29,136 million from the carrying value of goodwill.

**13. Other Current and Non-Current Assets**

Details of other current and non-current assets as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
<b>Current</b>		
Prepayments to suppliers and prepaid expenses	138,502	129,387
Prepaid value added tax	373,187	225,790
Others	61,771	21,637
<b>Total</b>	<b>573,460</b>	<b>376,814</b>
<b>Non-current</b>		
Long-term prepayments and long-term prepaid expenses	112,223	104,072
Others	157	91
<b>Total</b>	<b>112,380</b>	<b>104,163</b>

**14. Borrowings**

Borrowings as at December 31, 2018 and 2017, consist of:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
------------------------------------	--------------------------	--------------------------

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

<b>Current</b>		
Short-term borrowings	1,254,142	957,868
Current portion of long-term borrowings of bank loans	304,004	318,441
Current-portion of debentures	49,992	169,878
Finance lease liabilities	5,008	5,137
	<u>1,613,146</u>	<u>1,451,324</u>
<b>Non-current</b>		
Long-term borrowings	981,858	518,955
Debentures	2,702,907	1,047,303
Finance lease liabilities	23,236	27,367
	<u>3,708,001</u>	<u>1,593,625</u>
<b>Total</b>	<u>5,321,147</u>	<u>3,044,949</u>

Details of short-term borrowings as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>Bank</b>	<b>Latest maturity date</b>	<b>Interest rate(%) as at December 31, 2018</b>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Notes discounted <sup>1</sup> (Negotiable notes)	-	-	-	-	2,504
Bank loans	Nonghyup Bank, others	Dec. 15, 2019	2.49 and others	1,254,142	955,364
<b>Total</b>				<u>1,254,142</u>	<u>957,868</u>

<sup>1</sup> As at December 31, 2018, trade receivables transferred to financial institutions but not derecognized are accounted for as collateralized borrowing transaction (Note 7).

Details of long-term borrowings as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>Bank</b>	<b>December 31, 2018</b>			
		<b>Annual interest rate (%)</b>	<b>Amount in Korean won</b>	<b>Current</b>	<b>Non-current</b>
<b>Borrowings in Korean won</b>	KEB Hana Bank <sup>1</sup>	1.75	353	353	-
	KDB	1Y + 1.45 ~ 1.99	8,508	-	8,508
<b>Borrowings in foreign currencies</b>	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

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

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
<b>Total</b>		<b>1,285,862</b>	<b>304,004</b>	<b>981,858</b>

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

<i>(in millions of Korean won)</i>		December 31, 2017			
		Bank	Annual interest rate (%)	Amount in Korean won	Current
<b>Borrowings in Korean won</b>	KEB Hana Bank <sup>1</sup>	1.75	706	353	353
<b>Borrowings in foreign currencies</b>	Sumitomo Mitsui Banking Corporation	Libor + 1.05	53,463	5,346	48,117
	Standard Chartered Bank	Libor + 1.60	25,095	-	25,095
	Construction Bank of China	PBOC × 0.90	27,791	3,770	24,021
	Communications Bank of China	PBOC	12,896	1,841	11,055
	Agricultural Bank of China	USD: Libor + 0.80 CNY: PBOC × 0.90	51,637	9,496	42,141
	Bank of America	Libor + 0.90~1.50	69,579	32,080	37,499
	Bank of China	Libor + 0.95	34,246	5,775	28,471
	BNP PARIBAS	EUR: EURIBOR + 0.99 PLN: WIBOR + 0.55	19,151	-	19,151
	CNOOC Finance	PBOC × 0.90	71,515	16,365	55,150
	HSBC	Libor + 1.00~1.05	236,320	198,894	37,426
	JP Morgan	Libor + 0.85~1.05	42,765	42,765	-

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Mizuho Banking Corporation	Libor + 1.02	42,773	-	42,773
CITI	EURIBOR + 0.90	38,298	-	38,298
United Overseas Bank	Libor + 1.55	15,255	152	15,103
Hangseng	Libor + 1.00	32,077	1,604	30,473
INC	EURIBOR + 0.83	63,829	-	63,829
<b>Total</b>		<b>837,396</b>	<b>318,441</b>	<b>518,955</b>

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

Details of debentures as at December 31, 2018 and 2017, are as follows:

		December 31, 2018				
		Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non-current
<b>48<sup>th</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	3.77	2019.02.21	50,000	50,000	-
<b>50-1<sup>st</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	1.95	2020.05.19	120,000	-	120,000
<b>50-2<sup>nd</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	2.28	2022.05.19	400,000	-	400,000
<b>50-3<sup>rd</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	2.53	2024.05.19	280,000	-	280,000
<b>51-1<sup>st</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	2.56	2021.02.20	190,000	-	190,000
<b>51-2<sup>nd</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	2.88	2023.02.20	240,000	-	240,000
<b>51-3<sup>rd</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	3.07	2025.02.20	270,000	-	270,000
<b>51-4<sup>th</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	3.29	2028.02.20	300,000	-	300,000
<b>1-1<sup>st</sup> USD Overseas Convertible bonds<sup>1</sup></b>	Credit Suisse	-	2021.04.16	245,982	-	245,982
<b>1-2<sup>nd</sup> EUR Overseas Convertible bonds<sup>2</sup></b>	Credit Suisse	-	2021.04.16	403,191	-	403,191
<b>Debentures in Korean won (non-guaranteed)</b>	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)
<b>Total</b>				<b>2,752,899</b>	<b>49,992</b>	<b>2,702,907</b>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

<sup>1</sup> Details of 1-1<sup>st</sup> USD overseas convertible bonds are as follows:

	<b>Details</b>
<b>Aggregate principal amount</b>	USD 220,000,000
<b>Issue price</b>	USD 220,000,000
<b>Coupon rate (%)</b>	0.00
<b>Issue date</b>	April 16, 2018
<b>Maturity date</b>	April 16, 2021
<b>Redemption</b>	- 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.
<b>Underlying shares</b>	509,606 registered ordinary shares (treasury shares)
<b>Conversion price (Korean won/shares)</b>	460,000
<b>Conversion period</b>	From May 27, 2018 to April 06, 2021
<b>Call option by the issuer</b>	- 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.
<b>Call option by bondholders</b>	- 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

<sup>2</sup> Details of 1-2<sup>nd</sup> EUR overseas convertible bonds are as follows:

	<b>Details</b>
<b>Aggregate principal amount</b>	EUR 315,200,000
<b>Issue price</b>	EUR 315,200,000
<b>Coupon rate (%)</b>	0.00
<b>Issue date</b>	April 16, 2018
<b>Maturity date</b>	April 16, 2021
<b>Redemption</b>	- 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.
<b>Underlying shares</b>	775,128 registered ordinary shares (treasury shares)
<b>Conversion price (Korean won/shares)</b>	533,600
<b>Conversion period</b>	From May 27, 2018 to April 06, 2021
<b>Call option by the issuer</b>	- 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.
<b>Call option by bondholders</b>	- 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

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

(in millions of Korean won)

		December 31, 2017				
	Financial institution	Annual interest rate (%)	Latest maturity date	Amount in Korean won	Current	Non- current
<b>47<sup>th</sup> Debenture (non-guaranteed/private)</b>	Government Employees Pension Service and others	3.20	2018.04.30	30,000	30,000	-
<b>48<sup>th</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	3.77	2019.02.21	50,000	-	50,000
<b>49<sup>th</sup> Debenture (non-guaranteed/private)</b>	KB Asset Management Co., Ltd and others	2.82	2018.12.12	100,000	100,000	-
<b>50-1<sup>st</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	1.95	2020.05.19	120,000	-	120,000
<b>50-2<sup>nd</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	2.28	2022.05.19	400,000	-	400,000
<b>50-3<sup>rd</sup> Debenture (non-guaranteed/public)</b>	NH Investment & Securities Co., Ltd. and others	2.53	2024.05.19	280,000	-	280,000
<b>Debentures in Korean won (collateralized)<sup>1</sup></b>	IBK Securities Co., Ltd. and others	4.70	2018.03.05	40,000	40,000	
<b>Debentures in Korean won (non-guaranteed)</b>	NH Investment & Securities Co., Ltd. and others	1.93	2020.02.16	100,000	-	100,000
	NH Investment & Securities Co., Ltd. and others	2.26	2022.02.16	100,000	-	100,000
Less: discount on debentures				(2,819)	(122)	(2,697)
<b>Total</b>				<u>1,217,181</u>	<u>169,878</u>	<u>1,047,303</u>

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

Details of finance lease liabilities as at December 31, 2018 and December 31, 2017, are as follows:

(in millions of Korean won)

		December 31, 2018			
Leaser	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
<b>Total</b>			<u>28,244</u>	<u>5,008</u>	<u>23,236</u>

(in millions of Korean won)

		December 31, 2017			
Leaser	Annual interest rate (%)	Latest maturity date	Total amount	Current	Non-current
Hyundai Oil Bank and others	3.12~4.13	2024.12.31	32,504	5,137	27,367
<b>Total</b>			<u>32,504</u>	<u>5,137</u>	<u>27,367</u>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

The present value of finance lease liabilities as at December 31, 2018 and December 31, 2017, is as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>			<b>December 31, 2017</b>		
	<b>Minimum lease payments</b>	<b>Future finance costs</b>	<b>Present value</b>	<b>Minimum lease payments</b>	<b>Future finance costs</b>	<b>Present value</b>
Within 1 year	5,177	169	5,008	5,253	116	5,137
Between 1-5 years	21,065	2,014	19,051	20,710	2,006	18,704
Over 5 years	5,000	815	4,185	10,532	1,869	8,663

**15. Provisions**

Changes in provisions for other liabilities and charges for the years ended December 31, 2018 and 2017, are as follows:

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

<i>(in millions of Korean won)</i>	<b>December 31, 2017</b>				
	<b>Warranty<sup>1</sup></b>	<b>Greenhouse gas emission<sup>2</sup></b>	<b>Legal claims<sup>3</sup></b>	<b>Restoration<sup>4</sup></b>	<b>Total</b>
<b>Beginning balance</b>	51,838	27,801	10,102	95,774	185,515
Business combination	5,994	59	-	-	6,053
Additions	94,603	342	72,787	1,641	169,373
Used	<u>(59,773)</u>	<u>(5,133)</u>	<u>(62,260)</u>	<u>(7,359)</u>	<u>(134,525)</u>
<b>Ending balance</b>	92,662	23,069	20,629	90,056	226,416
Less : current portion	<u>(19,521)</u>	<u>(23,069)</u>	-	<u>(20,350)</u>	<u>(62,940)</u>
<b>Total</b>	<u>73,141</u>	<u>-</u>	<u>20,629</u>	<u>69,706</u>	<u>163,476</u>

<sup>1</sup>Warranty provisions have been accrued for the estimated warranty costs to be incurred due to quality control, exchange, refunds with regard to products based on historical experience.

<sup>2</sup>Greenhouse gas emission provisions have been accrued for estimated expenditures to be obligated for any excess emission. The estimated emission for the year ended December 31, 2018, amounts to 7,834 thousand tons (2017: 7,707 thousand tons).

<sup>3</sup>Lawsuit provisions have been accrued for certain pending cases.

<sup>4</sup>As at December 31, 2018, restoration provisions have been accrued for the estimated expenses to restore land pollutions and others.



**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**16. Net Defined Benefit Liabilities**

Details of net defined benefit liabilities recognized in the statements of financial position as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Present value of defined benefit obligations <sup>1</sup>	1,167,524	1,049,511
Fair value of plan assets	(939,980)	(868,830)
<b>Liabilities in the consolidated statement of financial position</b>	<b>227,544</b>	<b>180,681</b>

<sup>1</sup> The present value of retirement benefit obligations is net of existing contributions to the National Pension Plan of ₩837 million as at December 31, 2018 (2017: ₩862 million).

The amounts recognized in the consolidated statements of profit or loss for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Current service cost <sup>1</sup>	145,176	136,529
Past service cost	812	656
Interest cost	5,846	2,968
<b>Total, included in employee benefit expenses</b>	<b>151,834</b>	<b>140,153</b>

<sup>1</sup> The above amounts excluded ₩1,096 million (2017: ₩826 million) of expenses capitalized to construction in progress and development costs.

Post-employment benefits recognized for defined contribution plan for the year ended December 31, 2018, amounted to ₩5,511 million (2017: ₩3,400 million).

Post-employment benefits recognized in the consolidated statements of profit or loss for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Cost of sales	104,952	96,570
Selling and administrative expenses	52,393	46,983
<b>Total</b>	<b>157,345</b>	<b>143,553</b>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Movements in the present value of defined benefit obligations for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
<b>Beginning balance</b>	1,049,511	885,259
Business combination (Note 34)	2,461	69,693
Transfer in	12,012	7,452
Transfer out	(8,412)	(2,278)
Current service cost	146,272	137,355
Past service cost	812	656
Interest expense	32,609	26,572
Remeasurements:		
Actuarial loss from change in demographic assumptions	2,553	4,100
Actuarial loss (gain) from change in financial assumptions	62,476	(41,917)
Actuarial loss from experience adjustments	2,139	30,059
Others	(91)	1,060
Exchange differences	(666)	(437)
Payments from plans	(134,152)	(68,018)
Changes in consolidation scope	-	(45)
<b>Ending balance</b>	<u>1,167,524</u>	<u>1,049,511</u>

Movements in the fair value of plan assets for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
<b>Beginning balance</b>	868,830	793,087
Business combination (Note 34)	-	57,771
Transfer in	1,546	-
Transfer out	(628)	(504)
Interest income	26,763	23,604
Remeasurements:		
Return on plan assets (excluding amounts included in interest income)	(8,942)	(7,398)
Contributions:		
Employers	155,567	59,288
Payments from plans	(102,229)	(56,106)
Administrative costs	(927)	(912)
<b>Ending balance</b>	<u>939,980</u>	<u>868,830</u>

The actual return on plan assets for the year ended December 31, 2018, was ₩17,821 million (2017: ₩16,206 million).

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

The significant actuarial assumptions as at December 31, 2018 and 2017, are as follows:

	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Discount rate	2.7%~3.5%	3.1%~3.5%
Salary growth rate	2.2%~5.0%	2.2%~5.0%

The sensitivity analysis for changes in key actuarial assumptions as at December 31, 2018, is as follows:

<i>(in millions of Korean won)</i>	<b>Increase by 0.5%</b>	<b>Decrease by 0.5%</b>
Discount rate:		
Increase (decrease) in defined benefit obligations	(63,266)	69,324
Salary growth rate:		
Increase (decrease) in defined benefit obligations	67,614	(62,407)

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 December 31, 2018 and 2017, consist of:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>		<b>December 31, 2017</b>	
	<b>Amount</b>	<b>Composition</b>	<b>Amount</b>	<b>Composition</b>
Insurance contracts with guaranteed yield	922,829	98%	854,368	98%
Equity linked bonds	15,576	1%	11,286	1%
Time deposits	1,575	1%	3,176	1%
	<u>939,980</u>	<u>100%</u>	<u>868,830</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.

As at December 31, 2018, the weighted average duration of defined benefit obligations is 12.06 years.

The Group reviews the funding level on an annual basis and has a policy of eliminating deficit from the fund. Expected contributions to post-employment benefit plans for the year ending December 31, 2019, are ₩445,258 million.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**17. Other Current and Non-Current Liabilities**

Details of other current and non-current liabilities as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
<b>Current</b>		
Advances from customers	128,308	493,595
Withholdings	117,442	91,589
Unearned revenues	13,105	9,842
Accrued expenses	298,458	259,257
<b>Total</b>	<b>557,313</b>	<b>854,283</b>
<b>Non-current</b>		
Long-term accrued expenses	52,359	44,663
Long-term unearned revenues	15,272	14,737
Long-term advanced received	28,788	9,500
	<b>96,419</b>	<b>68,900</b>

**18. Commitments and Contingencies**

(1) As at December 31, 2018, the Parent Company and certain subsidiaries have been guaranteed from the Seoul Guarantee Insurance Company for the execution of contracts and others.

(2) As at December 31, 2018, the Parent Company has provided one blank promissory note to the Korea National Oil Corporation as a collateral in relation to petroleum import surcharges.

(3) As at December 31, 2018, 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 Group		Certain Overseas Subsidiaries					
	KRW	USD	KRW	USD	CNY	EUR	INR	THB
Limit of bank overdraft	59,100	-	-	180	1,153	29	-	19
Limit of the letter of credit	32,000	498	-	301	200	2	-	-
Limit of discount of notes from export	-	1,193	-	-	-	-	-	-
Limit of guaranteed payments in other foreign currency	-	135	-	-	-	-	-	-
Limit of loan arrangements	-	-	104,235	2,150	6,957	260	3,200	-

The Group also entered into credit line agreements with other financial institutions relating to trade finance and import/export amounting to ₩20,000 million and US\$ 55 million.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

- (4) As at December 31, 2018, the Parent Company and certain subsidiaries have B2B purchase arrangements with several financial institutions with limit of ₩410,000 million and ₩126,000 million, respectively.
- (5) As at December 31, 2018, 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 December 31, 2018, the Parent Company and certain subsidiaries have been named as a plaintiff in 11 and 20 legal actions, respectively, involving ₩18,907 million and ₩3,194 million in claims, respectively. They have been named as a defendant in 102 and 35 legal actions, respectively, with ₩58,524 million and ₩10,489 million in claims, respectively. The ultimate outcome of these cases cannot be determined at the reporting date.
- (7) The Parent Company has entered into manufacture and production technical contracts with ExxonMobil and others.
- (8) The Parent Company has entered into a license agreement with LG Corp. to use trademarks on the products that the Group manufactures and sells, and on the services the Group provides in relation to its business.
- (9) As at December 31, 2018, the Parent Company has entered into payment guarantee contract of USD 4 million and EUR 6 million with financial institutions to guarantee the warrant of certain installed products. Also, certain subsidiaries have entered into payment guarantee contract of CNY 405 million with financial institutions in relation to custom of imported raw materials.
- (10) As at December 31, 2018 and 2017, assets pledged as collateral for the borrowings are as follows:

*(in millions of Korean won)*

	<b>December 31, 2018</b>			
	<b>Secured amount</b>	<b>Borrowings / Loan</b>	<b>Limit</b>	<b>Secured party</b>
Other receivables	300	Non-current borrowings	353	KEB Hana Bank
Factory	20,880	Non-current borrowings	16,800	KDB
Dormitory	600	Non-current borrowings	1,038	Woori Bank
	<u>21,780</u>		<u>18,191</u>	

*(in millions of Korean won)*

	<b>December 31, 2017</b>			
	<b>Secured amount</b>	<b>Borrowings / Loan</b>	<b>Limit</b>	<b>Secured party</b>
Other receivables	300	Non-current borrowings	705	KEB Hana Bank
Gumi facility, Anseong facility, Genetics institute	52,000	Debentures (Collateralized)	40,000	Creditors
	<u>52,300</u>		<u>40,705</u>	

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

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

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Property, plant and equipment	2,041,834	1,734,663

(12) The Group has entered into operating lease agreements for offices, equipment, ports and others. Most of the agreements will be terminated within a year.

**19. Share Capital**

Changes in share capital and share premium for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won and in shares)</i>	<b>Ordinary shares</b>		<b>Preferred shares</b>		<b>Share premium</b>
	<b>Number of shares</b>	<b>Share capital</b>	<b>Number of shares</b>	<b>Share capital</b>	
January 1, 2017	66,271,100	331,356	7,628,921	38,144	897,424
Share issuance due to business combination	4,321,243	21,606	59,879	300	1,116,614
December 31, 2017	<u>70,592,343</u>	<u>352,962</u>	<u>7,688,800</u>	<u>38,444</u>	<u>2,014,038</u>
December 31, 2018	<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 years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>Number of shares</b>		<b>Carrying amount</b>	<b>Gain on disposal of treasury shares</b>
	<b>Ordinary shares</b>	<b>Preferred shares</b>		
January 1, 2017	359,795	5,519	15,484	13,855
Purchase of treasury shares due to business combination	1,284,891	10,328	337,211	-
Acquisition of fractional shares due to business combination	7,730	520	2,250	-
December 31, 2017	<u>1,652,416</u>	<u>16,367</u>	<u>354,945</u>	<u>13,855</u>
Acquisition of own shares	1	-	-	-
December 31, 2018	<u>1,652,417</u>	<u>16,367</u>	<u>354,945</u>	<u>13,855</u>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**20. Retained Earnings**

Retained earnings as at December 31, 2018 and 2017, consist of:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Legal reserve <sup>1</sup>	329,554	312,894
Discretionary reserve <sup>2</sup>	12,541,819	11,410,610
Retained earnings before appropriation	2,122,879	2,315,746
<b>Total</b>	<u>14,994,252</u>	<u>14,039,250</u>

<sup>1</sup> 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.

<sup>2</sup> 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 December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Treasury shares (Note 19)	(354,945)	(354,945)
Capital transactions within the Group <sup>1</sup>	(19,298)	(7,731)
<b>Total</b>	<u>(374,243)</u>	<u>(362,676)</u>

<sup>1</sup> Includes gain or loss on disposal of investments and investment differences due to changes in equity, net of deferred tax.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**22. Selling and Administrative Expenses**

Selling and administrative expenses for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Wages and salaries	822,676	720,628
Post-employment benefits (Note 16)	52,393	46,983
Employee benefits	157,843	138,599
Travel expense	62,718	53,108
Water & utilities	45,226	38,899
Packaging expense	9,708	6,959
Rental expenses	94,724	84,277
Commission expenses	443,153	355,316
Depreciation (Note 11)	117,200	98,825
Advertising expense	32,486	29,345
Freight expenses	556,816	533,354
Training expense	24,015	18,887
Amortization (Note 12)	84,573	72,612
Sample expense	18,925	19,318
Development costs	186,286	146,645
Others	391,385	271,314
<b>Total</b>	<b>3,100,127</b>	<b>2,635,069</b>

**23. Breakdown of Expenses by Nature**

Cost of sales, and selling and administrative expenses by nature for the years ended December 31, 2018 and 2017, consist of:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Changes in inventories of merchandise, finished goods, semi-finished goods and work in process	(527,872)	(200,811)
Raw materials and consumables used	16,831,855	14,262,336
Purchase of merchandise	1,380,984	1,374,890
Employee benefit expenses (Note 24)	2,425,323	2,028,590
Advertising expenses	34,005	30,675
Freight expenses	598,564	571,075
Commission expenses	731,651	588,551
Depreciation and amortization	1,482,405	1,402,012
Operating lease payments	97,098	86,881
Other expenses	2,882,930	2,625,358
<b>Total</b>	<b>25,936,943</b>	<b>22,769,557</b>



**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**24. Employee Benefit Expenses**

Details of employee benefit expenses for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Salaries	2,042,056	1,662,983
Post-employment benefits – Defined benefit plan (Note 16)	151,834	140,153
Post-employment benefits – Defined contribution plan (Note 16)	5,511	3,400
Others	225,922	222,054
<b>Total</b>	<b>2,425,323</b>	<b>2,028,590</b>

**25. Finance Income and Costs**

Details of finance income and costs for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
<b>Finance income</b>		
Interest income <sup>1</sup>	47,836	30,216
Dividend income	123	331
Gain on foreign exchange	129,136	162,507
Gain on foreign currency translation	30,425	47,210
Gain on valuation of derivative instruments	2,855	-
Gain on disposal of hedging derivatives	-	170
<b>Total</b>	<b>210,375</b>	<b>240,434</b>
<b>Finance costs</b>		
Interest expense <sup>2</sup>	135,513	99,877
Loss on foreign exchange	141,556	205,809
Loss on foreign exchange translations	90,316	14,149
Loss on valuation of derivative instruments	99	-
Loss on redemption of debentures	13	-
<b>Total</b>	<b>367,497</b>	<b>319,835</b>

<sup>1</sup> Details of interest income for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Deposits held by financial institutions	42,137	26,373
Other financial assets	-	5
Other loans and receivables	5,699	3,838
<b>Total</b>	<b>47,836</b>	<b>30,216</b>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

<sup>2</sup> Details of interest expense for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Interest on bank overdraft and borrowings	81,161	72,526
Interest on finance lease liabilities	994	1,517
Interest on debentures	66,646	26,792
Other interest expenses	7,617	6,123
Capitalized interest for qualifying assets	(20,905)	(7,081)
<b>Total</b>	<u>135,513</u>	<u>99,877</u>

**26. Other Non-Operating Income**

Details of other non-operating income for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Gain on foreign exchange	299,997	309,771
Gain on foreign currency translation	26,091	35,687
Gain on disposal of property, plant and equipment	8,409	8,793
Gain on disposal of intangible assets	2	4,869
Reversal of impairment loss on property, plant and equipment (Note 11)	452	12,641
Reversal of impairment loss on intangible assets (Note 12)	-	6
Others	42,242	106,495
<b>Total</b>	<u>377,193</u>	<u>478,262</u>

**27. Other Non-Operating Expenses**

Details of other non-operating expenses for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Loss on foreign exchange	286,101	315,668
Loss on foreign currency translation	37,211	80,115
Loss on disposal of property, plant and equipment	27,915	46,302
Loss on disposal of intangible assets	1,940	2,264
Impairment loss on property, plant and equipment (Note 11)	52,914	143,482
Impairment loss on intangible assets (Note 12)	12,845	11,563
Loss on disposal of investments in joint ventures	-	458
Donations	14,295	34,874
Others	97,958	135,317
<b>Total</b>	<u>531,179</u>	<u>770,043</u>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**28. Tax Expense and Deferred Tax**

Details of income tax expense for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Current tax on profit for the years	517,100	671,931
Adjustments in respect of prior years	(25,288)	(15,135)
Deferred tax - movement in temporary differences	(97,386)	(114,705)
Deferred tax – tax credit carryforwards	(3,502)	3,105
	390,924	545,196
Deferred tax charged directly to equity	8,997	(3,657)
Current tax charged directly to equity	20,814	383
Income tax expense	420,735	541,922

The aggregate current and deferred tax charged directly to equity (other comprehensive income) for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
<b>Current tax</b>		
Remeasurements of net defined benefit liabilities	20,814	383
<b>Deferred tax</b>		
Shares of other comprehensive income of joint ventures	5,081	-
Exchange differences on translation of foreign operations	1,731	(5,183)
Gain on disposal of financial assets at fair value through other comprehensive income	424	-
Gain on valuation of financial assets at fair value through other comprehensive income	1,761	-
Loss on valuation of available-for-sale financial assets	-	1,526
<b>Total</b>	8,997	(3,657)

Movements in deferred tax assets (liabilities) for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>					
	Increase (decrease)					
	Beginning balance	Business combination	Profit (loss) for the year	Other comprehensive income	Exchange differences	Ending balance
Net defined benefit liabilities	274,554	-	42,339	(66)	(150)	316,677
Plan assets	(237,514)	-	(19,282)	-	-	(256,796)
Reserve for research and human resources development	(18,334)	-	18,333	-	-	(1)
Provision for impairment on receivables	677	-	179	-	(15)	841
Property, plant and equipment	83,996	459	(9,138)	(26,818)	121	48,620
Intangible assets	(27,618)	-	(1,759)	-	(72)	(29,449)

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Investments in subsidiaries, associates and joint ventures	(12,011)	-	24,040	(111)	535	12,453
Accrued income	(1,096)	-	667	-	(105)	(534)
Others	138,789	(17,112)	25,625	7,470	(7,241)	147,531
	<u>201,443</u>	<u>(16,653)</u>	<u>81,004</u>	<u>(19,525)</u>	<u>(6,927)</u>	<u>239,342</u>
Exchange differences on translation of foreign operations	(4,501)	-	68	1,731	2	(2,700)
Tax credit carryforwards	15,518	(5,271)	3,502	-	-	13,749
Tax loss carryforwards	26,419	(3,546)	35,848	-	(810)	57,911
Deferred tax assets (liabilities)	<u>238,879</u>	<u>(25,470)</u>	<u>120,422</u>	<u>(17,794)</u>	<u>(7,735)</u>	<u>308,302</u>

(in millions of Korean won)

2017

	Increase (decrease)					Ending balance
	Beginning balance	Business combination	Profit (loss) for the year	Other comprehensive income	Exchange differences	
Net defined benefit liabilities	203,259	15,483	55,867	-	(55)	274,554
Plan assets	(191,322)	(13,965)	(32,227)	-	-	(237,514)
Reserve for research and human resources development	(56,467)	-	38,133	-	-	(18,334)
Provision for impairment on receivables	613	-	91	-	(27)	677
Property, plant and equipment	61,408	405	25,739	-	(3,556)	83,996
Intangible assets	(31,122)	-	1,525	-	1,979	(27,618)
Investments in subsidiaries, associates and joint ventures	(8,478)	-	(7,226)	-	3,693	(12,011)
Accrued income	(941)	(3)	(153)	-	1	(1,096)
Others	70,388	(28,714)	79,040	1,526	16,549	138,789
	<u>47,338</u>	<u>(26,794)</u>	<u>160,789</u>	<u>1,526</u>	<u>18,584</u>	<u>201,443</u>
Exchange differences on translation of foreign operations	638	-	-	(5,183)	44	(4,501)
Tax credit carryforwards	10,242	8,123	(3,105)	-	258	15,518
Tax loss carryforwards	71,284	-	(42,427)	-	2,438	26,419
Deferred tax assets (liabilities)	<u>129,502</u>	<u>(18,671)</u>	<u>115,257</u>	<u>(3,657)</u>	<u>16,448</u>	<u>238,879</u>

The reconciliations between income tax expense and accounting profit for the years ended December 31, 2018 and 2017, are as follows:

(in millions of Korean won)

	2018	2017
<b>Profit before income tax expense</b>	<u>1,940,048</u>	<u>2,563,895</u>
<b>Tax at domestic tax rates applicable to profits in the respective countries<sup>1</sup></b>	556,118	630,825
<b>Tax effects of:</b>		
Income not subject to tax	(31,410)	160
Expenses not deductible for tax purposes	18,545	225,091
Unrecognized deferred income tax for temporary differences in the current year	(62,391)	(163,328)
Tax credit	(97,616)	(92,964)
Effects of change in tax rate	308	(16,466)

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Others	37,181	(41,396)
<b>Income tax expense</b>	<b>420,735</b>	<b>541,922</b>
Effective tax rate(income tax expense/ profit before income tax)	21.69%	21.14%

<sup>1</sup> The weighted average applicable tax rate on profit before income tax for the year ended December 31, 2018, is 28.67 % (2017: 24.60%).

Realization of deferred tax assets is dependent on the Group's ability to generate future taxable profits in excess of the profits arising from the reversal of taxable temporary differences, and economic and industry outlooks. Management periodically reviews on these factors.

Details of deductible (taxable) temporary differences unrecognized as deferred tax assets (liabilities) as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>	
Investments in subsidiaries, associates and joint ventures	(113,689)	(464,966)	Permanently re-invested income not distributed as dividend
Investments in subsidiaries, associates and joint ventures	650,872	926,897	No possibility of disposal
Goodwill	(694,422)	(694,422)	
Land	488	-	
Unused tax loss carryforwards	393,911	353,224	Uncertainty of future tax income

The maturity of unused loss is as follows:

<i>(in millions of Korean won)</i>	<b>Less than 1 year</b>	<b>Between 1-2 years</b>	<b>Between 2-5 years</b>	<b>Over 5 years</b>
2018 Tax loss carryforwards	70,730	83,388	59,458	268,961
2017 Tax loss carryforwards	79,864	107,217	59,056	213,710

**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 years ended December 31, 2018 and 2017, is computed as follows:

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**Basic earnings per ordinary share**

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

	<b>2018</b>	<b>2017</b>
Profit attributable to ordinary shares <sup>1</sup>	1,324,787	1,748,829
Weighted average number of ordinary shares outstanding <sup>2</sup>	68,939,926	68,940,266
Basic earnings per ordinary shares (in won)	<u>19,217</u>	<u>25,367</u>

**Basic earnings per preferred share**

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

	<b>2018</b>	<b>2017</b>
Profit attributable to preferred shares <sup>1</sup>	147,821	196,451
Weighted average number of preferred shares outstanding <sup>2</sup>	7,672,433	7,672,456
Basic earnings per preferred shares (in won)	<u>19,267</u>	<u>25,605</u>

<sup>1</sup> Profit attributable to ordinary and preferred shares are as follows:

*(in millions of Korean won)*

	<b>2018</b>	<b>2017</b>
<b>Profit attributable to the equity holders of the Parent Company</b>	1,472,608	1,945,280
Ordinary shares dividends (A)	413,640	329,557
Preferred shares dividends (B)	46,418	38,498
<b>Undistributed earnings for the year</b>	1,012,550	1,577,225
Undistributed earnings available for ordinary shares (C)	911,147	1,419,272
Undistributed earnings available for preferred shares (D)	101,403	157,953
<b>Profit for the year attributable to ordinary shares (A+C)</b>	1,324,787	1,748,829
<b>Profit for the year attributable to preferred shares (B+D)</b>	147,821	196,451

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

<sup>2</sup> Weighted average numbers of shares are calculated as follows:

Ordinary shares outstanding	2018			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2018. 1. 1 - 2018. 12. 31	68,939,926	365	25,163,072,990
<b>Total</b>				<b>25,163,072,990</b>

Weighted average number of ordinary shares outstanding: 25,163,072,990 / 365 = 68,939,926 shares

Preferred shares outstanding	2018			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2018. 1. 1 - 2018. 12. 31	7,672,433	365	2,800,438,045
<b>Total</b>				<b>2,800,438,045</b>

Weighted average number of preferred shares outstanding: 2,800,438,045 / 365 = 7,672,433 shares

Ordinary shares outstanding	2017			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2017. 1. 1 - 2017. 12. 31	65,911,305	365	24,057,626,325
Share issuance due to a business combination	2017. 1. 1 - 2017. 12. 31	4,321,243	365	1,577,253,695
Purchase of treasury shares	2017. 1. 1 - 2017. 12. 31	(1,284,891)	365	(468,985,215)
Purchase of treasury shares	2017. 1. 17 - 2017. 12. 31	(7,730)	349	(2,697,770)
<b>Total</b>				<b>25,163,197,035</b>

Weighted average number of ordinary shares outstanding: 25,163,197,035 / 365 = 68,940,266 shares

Preferred shares outstanding	2017			
	Period	Number of shares	Number of days	Number of shares x days
Beginning balance	2017. 1. 1 - 2017. 12. 31	7,623,402	365	2,782,541,730
Share issuance due to a business combination	2017. 1. 1 - 2017. 12. 31	59,879	365	21,855,835
Purchase of treasury shares	2017. 1. 1 - 2017. 12. 31	(10,328)	365	(3,769,720)
Purchase of treasury shares	2017. 1. 17 - 2017. 12. 31	(520)	349	(181,480)
<b>Total</b>				<b>2,800,446,365</b>

Weighted average number of preferred shares outstanding: 2,800,446,365 / 365 = 7,672,456 shares

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

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.

<i>(in millions of Korean won and in number of shares)</i>	<b>2018</b>
<b>Diluted earnings per ordinary shares</b>	
Profit for the year attributable to the ordinary shares	1,324,787
Gain and loss on convertible bonds	6,444
Profit used in calculating diluted earnings per share	1,331,231
Weighted average number of ordinary shares outstanding	68,939,926
Adjustments for calculation of diluted earnings per share:	
Assumed conversion of convertible bonds	915,153
Weighted average number of ordinary shares and potential ordinary shares used as the denominator in calculating diluted earnings per share	69,855,079
Diluted earnings per share attributable to the ordinary shares (in won)	19,057

<i>(in millions of Korean won and in number of shares)</i>	<b>2018</b>
<b>Diluted earnings per preferred shares</b>	
Profit for the year attributable to preferred shares	147,821
Gain and loss on convertible bonds	(1,224)
Profit used in calculating diluted earnings per share	146,597
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)	19,107



**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**30. Dividends**

Details of dividends of the Parent Company as at December 31, 2018 and 2017, are as follows:

	<b>December 31, 2018</b>	<b>December 31, 2017</b>
Number of shares entitled to dividends: shares issued and outstanding (par value per share: ₩5,000)		
Ordinary shares	68,939,926	68,939,927
Preferred shares	7,672,433	7,672,433
Dividend per share ( <i>in Korean won, %</i> )		
Ordinary shares: cash	6,000 (120%)	6,000 (120%)
Preferred shares: cash	6,050 (121%)	6,050 (121%)
Cash dividends to distribute ( <i>in millions of Korean won</i> )		
Ordinary shares	413,640	413,640
Preferred shares	46,418	46,418
	<u>460,058</u>	<u>460,058</u>

Dividend payout ratios of the Parent Company for the years ended December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Dividends (A)	460,058	460,058
Profit attributable to equity holders of the Parent Company (B)	1,472,608	1,945,280
Dividend payout ratio (A/B)	<u>31.24%</u>	<u>23.65%</u>

Dividend yield ratios of the Parent Company for the years ended December 31, 2018 and 2017, are as follows:

<i>(in Korean won)</i>	<b>2018</b>		<b>2017</b>	
	<b>Ordinary shares</b>	<b>Preferred Shares</b>	<b>Ordinary shares</b>	<b>Preferred Shares</b>
Dividend per share (A)	6,000	6,050	6,000	6,050
Market value at the end of year (B) <sup>1</sup>	353,250	198,125	393,625	245,375
Dividend yield ratio (A/B)	<u>1.70%</u>	<u>3.05%</u>	<u>1.52%</u>	<u>2.47%</u>

<sup>1</sup> Average price in the stock market during the week preceding the two business days before the record date of the shareholders' list for the general meeting of shareholders related to above dividends.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**31. Related Party Transactions**

As at December 31, 2018 and 2017, LG Corp. is an entity exercising a significant influence over the Group, which owns 33.34% of the Parent Company's ordinary shares.

Details of associates and other related parties that have sales and other transactions with the Group or have receivables and payables balances as at December 31, 2018 and 2017, 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.	-	S&I corp. Vietnam 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 Siltron Incorporated	-	-	Subsidiary of LG Corp.
LG Management Development Institute	-	-	Subsidiary of LG Corp.
LG Sports Ltd.	-	-	Subsidiary of LG Corp.
LG Holdings Japan	-	-	Subsidiary of LG Corp.
LG MMA Corporation	-	-	Joint venture of LG Corp.
LG Display Co., Ltd.	-	LG Display (China) Co., Ltd. and others	LG Enterprise group <sup>1</sup>
LG Electronics, Inc.	LG Innotek Co., Ltd. and others	Inspur LG Digital Mobile Communications Co., Ltd. and others	LG Enterprise group <sup>1</sup>
LG International Corp.	Pantos Logistics Co., Ltd. and others	LG International (Japan) Ltd. and others	LG Enterprise group <sup>1</sup>
LG Hausys, Ltd.	-	LG Hausys Tianjin Co., Ltd. and others	LG Enterprise group <sup>1</sup>
LG Household & Health Care Ltd.	Coca-Cola Beverage Co.	-	LG Enterprise group <sup>1</sup>
LG Uplus Corp.	-	-	LG Enterprise group <sup>1</sup>
G II R Inc.	HS AD Inc.	-	LG Enterprise group <sup>1</sup>
Silicon Works Co., Ltd.	-	-	LG Enterprise group <sup>1</sup>

<sup>1</sup> 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.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Sales and purchases with related parties for the years ended December 31, 2018 and 2017, are as follows:

(in millions of Korean won)

	<b>2018</b>			
	<b>Sales and others</b>	<b>Purchase and others</b>		
		<b>Purchase of raw materials /merchandises</b>	<b>Acquisition of property, plant and equipment and intangible assets</b>	<b>Others</b>
<b>Entity with a significant influence over the Group</b>				
LG Corp.	10	-	-	69,969
<b>Associates and joint ventures</b>				
SEETEC Co., Ltd.	29,019	133,005	4,665	84,759
TECHWIN Co., Ltd.	-	224	3,383	286
HL Greenpower Co., Ltd.	523,822	-	-	790
Others	26	-	-	2,586
<b>Other related parties</b>				
LG MMA Corporation	114,240	264,957	-	6,743
S&I Corporation and its subsidiaries	15,374	547,144	680,905	257,749
LG CNS Co., Ltd. and its subsidiaries	65,622	2,665	273,639	99,874
Others	6	-	-	14,324
<b>Others</b>				
LG Display Co., Ltd. and its subsidiaries	1,234,012	80	1,564	5
LG Electronics Inc. and its subsidiaries	1,036,834	456,254	1,038,106	96,852
LG International Corp. and its subsidiaries	290,208	541,641	1,699	454,390
LG Hausys, Ltd. and its subsidiaries	209,702	3,312	1,545	7,073
Others	16,242	27,341	2,340	9,409
<b>Total</b>	<b>3,535,117</b>	<b>1,976,623</b>	<b>2,007,846</b>	<b>1,104,809</b>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

(in millions of Korean won)

	<b>2017</b>			
	<b>Sales and others</b>	<b>Purchase and others</b>		
		<b>Purchase of raw materials /merchandises</b>	<b>Acquisition of property, plant and equipment and intangible assets</b>	<b>Others</b>
<b>Entity with a significant influence over the Group</b>				
LG Corp.	11	-	-	62,919
<b>Associates and joint ventures</b>				
SEETEC Co., Ltd.	18,790	116,707	1,199	88,239
TECHWIN Co., Ltd.	-	166	4,225	540
HL Greenpower Co., Ltd.	260,001	-	-	-
Others	28	-	-	2,685
<b>Other related parties</b>				
LG MMA Corporation	84,437	224,231	-	5,356
S&I Corporation and its subsidiaries	14,397	528,579	361,697	368,971
LG CNS Co., Ltd. and its subsidiaries	31,376	2,690	185,926	72,349
Others	8	-	-	12,251
<b>Others</b>				
LG Display Co., Ltd. and its subsidiaries	1,336,880	-	14,750	2,165
LG Electronics Inc. and its subsidiaries	975,117	293,867	486,062	32,062
LG International Corp. and its subsidiaries	300,401	501,885	517	363,143
LG Hausys, Ltd. and its subsidiaries	219,427	7,906	3,289	7,692
Others	21,226	28,246	1,203	9,614
<b>Total</b>	<b>3,262,099</b>	<b>1,704,277</b>	<b>1,058,868</b>	<b>1,027,986</b>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Balances of receivables and payables arising from sales and purchases of goods and services as at December 31, 2018 and 2017, are as follows:

(in millions of Korean won)

	December 31, 2018			
	Receivables <sup>1</sup>			
	Trade receivables and others	Loan receivables	Other receivables	Total
<b>Entity with a significant influence over the Group</b>				
LG Corp.	-	-	11,286	11,286
<b>Associates and joint ventures</b>				
SEETEC Co., Ltd.	4,520	-	300	4,820
TECHWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	89,122	-	-	89,122
Others	-	-	837	837
<b>Other related parties</b>				
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
<b>Others</b>				
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
<b>Total</b>	<b>609,269</b>	<b>-</b>	<b>110,168</b>	<b>719,437</b>

(in millions of Korean won)

	December 31, 2018			
	Payables			
	Trade payables	Borrowings	Other payables	Total
<b>Entity with a significant influence over the Group</b>				
LG Corp.	-	-	5,102	5,102
<b>Associates and joint ventures</b>				
SEETEC Co., Ltd.	17,384	-	10,728	28,112
TECHWIN Co., Ltd.	-	-	871	871
HL Greenpower Co., Ltd.	-	-	225	225
Others	-	-	250	250
<b>Other related parties</b>				
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	167,655
Others	-	-	689	689
<b>Others</b>				
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
<b>Total</b>	<b>191,103</b>	<b>-</b>	<b>1,106,364</b>	<b>1,297,467</b>

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

(in millions of Korean won)

	December 31, 2017			
	Receivables <sup>1</sup>			Total
	Trade receivables and others	Loan receivables	Other receivables	
<b>Entity with a significant influence over the Group</b>				
LG Corp.	-	-	9,183	9,183
<b>Associates and joint ventures</b>				
SEETEC Co., Ltd.	1,752	-	279	2,031
TECHWIN Co., Ltd.	-	-	-	-
HL Greenpower Co., Ltd.	60,726	-	-	60,726
Others	16	-	-	16
<b>Other related parties</b>				
LG MMA Corporation	8,663	-	482	9,145
S&I Corporation and its subsidiaries	2,893	-	27,948	30,841
LG CNS Co., Ltd. and its subsidiaries	20,209	-	-	20,209
Others	-	-	4,873	4,873
<b>Others</b>				
LG Display Co., Ltd. and its subsidiaries	240,427	-	6,057	246,484
LG Electronics Inc. and its subsidiaries	287,566	-	46,116	333,682
LG International Corp. and its subsidiaries	48,332	-	891	49,223
LG Hausys, Ltd. and its subsidiaries	40,089	-	92	40,181
Others	318	-	398	716
<b>Total</b>	<b>710,991</b>	<b>-</b>	<b>96,319</b>	<b>807,310</b>

(in millions of Korean won)

	December 31, 2017			
	Payables			Total
	Trade payables	Borrowings	Other payables	
<b>Entity with a significant influence over the Group</b>				
LG Corp.	-	-	7,897	7,897
<b>Associates and joint ventures</b>				
SEETEC Co., Ltd.	10,698	-	10,759	21,457
TECHWIN Co., Ltd.	-	-	2,195	2,195
HL Greenpower Co., Ltd.	-	-	-	-
Others	-	-	-	-
<b>Other related parties</b>				
LG MMA Corporation	19,140	-	-	19,140
S&I Corporation and its subsidiaries	12,630	-	442,860	455,490
LG CNS Co., Ltd. and its subsidiaries	994	-	116,422	117,416
Others	-	-	557	557
<b>Others</b>				
LG Display Co., Ltd. and its subsidiaries	-	-	8,660	8,660
LG Electronics Inc. and its subsidiaries	114,892	-	127,946	242,838
LG International Corp. and its subsidiaries	35,962	-	40,581	76,543
LG Hausys, Ltd. and its subsidiaries	3,409	-	1,811	5,220
Others	2,151	-	5,779	7,930
<b>Total</b>	<b>199,876</b>	<b>-</b>	<b>765,467</b>	<b>965,343</b>

<sup>1</sup> Trade and other receivables derecognized from the financial statements in accordance with the transfer agreements with financial institutions are not included.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Fund transactions with related parties for the years ended December 31, 2018 and 2017, are as follows:

*(in millions of Korean won)*

	2018		2017	
	Equity contributions in cash (capital reduction)	Loan (Repayment)	Equity contributions in cash (capital reduction)	Loan (Repayments)
<b>Associates and joint ventures</b>				
LG Fuel Cell Systems Inc.	5,036	-	24,527	(9,584)
HUAJIN NEW ENERGY MATERIALS(QUZHOU) CO.,Ltd	26,129	-	-	-
Combustion Synthesis Co., Ltd.	1,503	-	-	-
LG VINA Chemical Co.,Ltd.	1,767	-	-	-
FJ Composite Materials Co.,LTD.	-	-	3,015	-
WUXI CL New Energy Technology Ltd	559	-	1,178	-
LG Holdings (HK) Ltd	-	-	(19,499)	-
<b>Total</b>	<b>34,994</b>	<b>-</b>	<b>9,221</b>	<b>(9,584)</b>

Dividends received from related parties for the years ended December 31, 2018 and 2017, are as follows:

*(in millions of Korean won)*

	2018	2017
<b>Associates and joint ventures</b>		
SEETEC Co., Ltd.	10,000	10,000
LG VINA Chemical Co., Ltd.	810	846
<b>Total</b>	<b>10,810</b>	<b>10,846</b>

Dividends paid to related parties for the years ended December 31, 2018 and 2017, are as follows:

*(in millions of Korean won)*

	2018	2017
<b>Entity with significant influence over the Group</b>		
LG Corp.	141,205	111,097
<b>Total</b>	<b>141,205</b>	<b>111,097</b>

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

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Compensation for key management of the Group for the years ended December 31, 2018 and 2017, consists of:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Short-term employee benefits	63,084	74,125
Post-employment benefits	8,233	6,092
<b>Total</b>	<u>71,317</u>	<u>80,217</u>

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 December 31, 2018.

As at December 31, 2018, there is no payment guarantees provided by the Group for related parties.

**32. Cash Generated from Operations**

Reconciliation between profit before income tax and cash generated from operations for the years ended December 31, 2018 and 2017, is as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
<b>Profit before income tax</b>	1,940,047	2,563,895
<b>Adjustments for:</b>		
Depreciation	1,379,321	1,305,324
Amortization	107,948	96,718
Post-employment benefits	151,834	140,153
Finance income	(114,499)	(111,029)
Finance costs	254,416	197,233
Foreign exchange differences	19,327	(88,652)
Loss on valuation of inventories	31,862	1,401
Gain on disposal of property, plant and equipment	(8,427)	(8,793)
Gain on disposal of intangible assets	(2)	(4,869)
Loss on disposal of property, plant and equipment	27,915	46,302
Loss on disposal of intangible assets	1,940	2,264
Impairment loss on property, plant and equipment	52,914	143,482
Impairment loss on intangible assets	12,845	11,563
Reversal of impairment loss on property, plant and equipment	(452)	(12,641)
Reversal of impairment loss on intangible assets	-	(6)
Gain on disposal of investments in associates and joint ventures	-	(7,680)
Impairment loss on investments in associates and joint ventures	26,344	-
Additions to provisions	277,753	169,373
Other income	(8,877)	(12,806)



**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

Increase in inventories	(958,689)	(395,807)
Decrease (increase) in trade receivables	52,072	(971,452)
Increase in other receivables	(107,321)	(8,865)
Decrease (increase) in other current assets	3,159	(67,956)
Increase in settlement of derivatives	-	(2,114)
Increase in trade payables	165,413	328,348
Increase (decrease) in other payables	(22,436)	419,855
Increase (decrease) in other current liabilities	(82,806)	96,191
Decrease in net defined benefit liabilities	(184,390)	(64,709)
Decrease in provisions	(166,516)	(134,525)
Other cash flows from operations	37,150	86,228
<b>Cash generated from operations</b>	<b>2,887,845</b>	<b>3,716,426</b>

Changes in liabilities arising from financial activities for the year ended December 31, 2018, are as follows:

(in millions of Korean won)

	2018							At December 31, 2018
	At January 1, 2018	Cash flows from financing activities	Business combination	Exchange differences	Amortizat- ion (transfer)	Reclassification of current portion	Effect of change in exchange rate	
Short-term borrowings	1,451,324	104,462	13,438	11,928	-	309,768	(277,774)	1,613,146
Long-term borrowings	546,322	576,856	10,470	31,242	-	(309,768)	149,972	1,005,094
Debentures	1,217,181	1,527,153	-	(2,216)	10,782	-	-	2,752,900
Conversion rights	-	33,023	-	(2,639)	-	-	-	30,384
<b>Total</b>	<b>3,214,827</b>	<b>2,241,494</b>	<b>23,908</b>	<b>38,315</b>	<b>10,782</b>	<b>-</b>	<b>(127,802)</b>	<b>5,401,524</b>

The significant non-cash transactions for the years ended December 31, 2018 and 2017, are as follows:

(in millions of Korean won)

	2018	2017
Transfer of construction-in-progress	3,461,294	1,820,436
Transfer of machinery-in-transit	150,003	74,475
Reclassification of long-term borrowings into current maturities	359,723	493,456
Acquisition of an entity by means of the issuance of equity instruments	-	1,138,593

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

---

**33. Segment Information**

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

<b>Segment</b>	<b>Products or services</b>	<b>Major customers</b>
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 <sup>1</sup>	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

<sup>1</sup> Life Sciences segment was disclosed separately as LG Life Sciences, Ltd. was merged into the Parent Group on January 1, 2017.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

The segment information on revenue, profit and loss for the years ended December 31, 2018 and 2017, is as follows:

<i>(in millions of Korean won</i>	2018					
	<b>Basic materials &amp; Chemicals</b>	<b>Energy solutions</b>	<b>IT &amp; Electronic materials and Advanced materials</b>	<b>Life sciences</b>	<b>Common and others<sup>3</sup></b>	<b>Total</b>
Total segment revenue	18,035,923	6,499,381	3,272,653	575,127	606,701	28,989,785
Inter-segment revenue	273,781	465	527,510	3,997	1,020	806,773
Revenue from external customers <sup>1</sup>	17,762,142	6,498,916	2,745,143	571,129	605,683	28,183,013
Operating profit (loss) <sup>2</sup>	2,131,072	209,170	(28,297)	49,547	(115,422)	2,246,070

<i>(in millions of Korean won</i>	2017					
	<b>Basic materials &amp; Chemicals</b>	<b>Energy solutions</b>	<b>IT &amp; Electronic materials and Advanced materials</b>	<b>Life sciences</b>	<b>Common and others<sup>3</sup></b>	<b>Total</b>
Total segment revenue	17,426,895	4,560,554	3,064,983	551,524	608,518	26,212,474
Inter-segment revenue	181,160	8	322,656	3,067	7,569	514,460
Revenue from external customers <sup>1</sup>	17,245,735	4,560,546	2,742,327	548,457	600,949	25,698,014
Operating profit (loss) <sup>2</sup>	2,808,142	28,875	111,443	53,522	(73,525)	2,928,457

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

<sup>2</sup> Management assesses the performance of the operating segments based on a measurement of operating profit of segment.

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

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

The segment information on assets and liabilities as at December 31, 2018 and 2017, is as follows:

<i>(in millions of Korean won</i>	<b>December 31, 2018</b>					
	<b>Basic materials &amp; Chemicals</b>	<b>Energy solutions</b>	<b>IT &amp; Electronic materials and Advanced materials</b>	<b>Life sciences</b>	<b>Common and others<sup>3</sup></b>	<b>Total</b>
Reportable segment asset <sup>1</sup>	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 <sup>1</sup>	3,223,114	4,243,999	902,100	194,420	3,058,376	11,622,009

<i>(in millions of Korean won</i>	<b>December 31, 2017</b>					
	<b>Basic materials &amp; Chemicals</b>	<b>Energy solutions</b>	<b>IT &amp; Electronic materials and Advanced materials</b>	<b>Life sciences</b>	<b>Common and others<sup>3</sup></b>	<b>Total</b>
Reportable segment asset <sup>1</sup>	9,307,132	5,460,448	3,503,330	1,809,248	4,961,063	25,041,221
Investments in associates and joint ventures	4,057	21,242	-	17	238,780	264,096
Reportable segment liability <sup>1</sup>	3,317,393	2,176,990	731,585	427,667	2,049,009	8,702,644

<sup>1</sup> 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 years ended December 31, 2018 and 2017, and as at December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>Sales</b>		<b>Non-current assets<sup>1</sup></b>	
	<b>2018</b>	<b>2017</b>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
	Korea <sup>2</sup>	8,996,392	8,332,634	11,678,654
China	9,256,242	8,755,465	2,542,444	1,887,324
Asia	4,620,136	4,692,790	45,648	31,671
America	1,721,120	1,429,682	533,924	235,481
Europe	3,166,553	2,149,630	1,045,716	262,199
Others	422,570	337,813	-	-
<b>Total</b>	<b>28,183,013</b>	<b>25,698,014</b>	<b>15,846,386</b>	<b>13,035,664</b>

<sup>1</sup> Represents aggregate amount of property, plant and equipment, intangible assets and investment properties.

<sup>2</sup> 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 years ended December 31, 2018 and 2017.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**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 diversification in market such as entering into new industry and others.

Goodwill of ₩64,851 million 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 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>	<b>Amount</b>
Consideration	
Cash and cash equivalents	143,327
Total consideration	143,327
Recognized amounts of identifiable assets acquired and liabilities assumed <sup>1</sup>	
Cash and cash equivalents	456
Trade and other receivables <sup>2</sup>	9,082
Inventories	5,594
Property, plant and equipment	22,475
Intangible assets	63,234
Trade and other payables	(4,932)
Other payables	(183)
Deferred tax liabilities	(17,250)
Fair value of identifiable net assets	78,476
Goodwill	64,851
<b>Total</b>	143,327

<sup>1</sup> Goodwill at December 31, 2018 can be adjusted as the results of the purchase price allocation for the recognition of identifiable assets acquired and liabilities assumed is incomplete.

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

The revenues of ₩15,694 million and profit of ₩737 million for the year ended December 31, 2018 arose after the acquisition date are reflected in the consolidated statements of profit or loss.

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.

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.

Goodwill of ₩11,615 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:

**Amount**

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

*(in millions of Korean won)*

Consideration	
Cash and cash equivalents	23,020
Total consideration	<u>23,020</u>
Recognized amounts of identifiable assets acquired and liabilities assumed <sup>1</sup>	
Cash and cash equivalents	359
Trade and other receivables <sup>2</sup>	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	<u>11,405</u>
Goodwill	<u>11,615</u>
<b>Total</b>	<u><b>23,020</b></u>

<sup>1</sup> Goodwill at December 31, 2018 can be adjusted as the results of the purchase price allocation for the recognition of identifiable assets acquired and liabilities assumed is incomplete.

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

The revenues of ₩4,206 million and profit of ₩2,275 million for the year ended December 31, 2018 arose after the acquisition date are reflected in the consolidated statements of profit or loss.

If all the acquisition has occurred on January 1, 2018, the consolidated revenue and profit for the year ended December 31, 2018, would have been ₩28,246,222 million and ₩1,516,392 million, respectively.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

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

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

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

<i>(in millions of Korean won)</i>	<b>Amount</b>
Consideration	
Equity securities (Ordinary 4,321,243 shares, Preferred 59,879 shares) <sup>1</sup>	1,138,593
Total consideration	<u>1,138,593</u>
Recognized amounts of identifiable assets acquired and liabilities assumed	
Cash and cash equivalents	43,832
Trade and other (non-current) receivables	112,703
Inventories	123,083
Property, plant and equipment	493,321
Intangible assets	273,550
Other assets	8,315
Trade payables	(38,736)
Borrowings	(729,745)
Provisions	(6,053)
Net defined benefit liabilities	(11,922)
Other liabilities	<u>(153,195)</u>
Treasury shares (Ordinary 1,284,891 shares, Preferred 10,328 shares) <sup>1</sup>	337,211
Fair value of identifiable net assets	<u>452,364</u>
Goodwill	<u>686,229</u>
<b>Total</b>	<b><u>1,138,593</u></b>

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

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

The fair value and gross contractual amount for trade and other (non-current) receivables at the acquisition date amount to ₩120,794 million, of which ₩1,985 million was expected to be uncollectible.

The revenues of ₩529,364 million and profit of ₩46,444 million for the year ended December 31, 2017 arose after the acquisition date are reflected in the consolidated statements of profit or loss.

**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**35. Assets Held for Sale**

The Group decided to dispose of Electrolyte business, 2CCL business and others upon 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 held for sale, which were 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 December 31, 2018 and 2017, are as follows:

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
<b>Assets of disposal group</b>		
Property, plant and equipment	2,406	5,486
Investment properties	358	358
Other receivables and others	-	751
<b>Total</b>	<u>2,764</u>	<u>6,595</u>
<b>Liabilities of disposal group</b>		
Other payables and others	-	31
<b>Total</b>	<u>-</u>	<u>31</u>

Assets of the disposal group were measured at fair value immediately before the initial classification of the assets as held for sale and the related other non-operating expenses (income) for the years ended December 31, 2018 and 2017, is as follows:

<i>(in millions of Korean won)</i>	<b>2018</b>	<b>2017</b>
Impairment loss on property, plant and equipment	-	9,061
Impairment loss on intangible assets	-	4
<b>Total</b>	<u>-</u>	<u>9,065</u>



**LG Chem, Ltd. and Subsidiaries**  
**Notes to the Consolidated Financial Statements**  
**December 31, 2018 and 2017**

**36. Assets and Liabilities related to Contracts with Customers**

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

<i>(in millions of Korean won)</i>	<b>December 31, 2018</b>	<b>December 31, 2017</b>
<b>Contract assets</b>		
Total contract assets	4,323	5,998
<b>Contract liabilities</b>		
Advances in relation to revenue from the Group's main business activities	47,265	54,972
Expected services to be transferred	34,823	15,535
Expected customer incentives	10,530	5,319
Unearned revenue	16,781	14,779
Expected refunds	9,139	13,551
Total contract liabilities	118,538	104,156

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.

<i>(in millions of Korean won)</i>	<b>2018</b>
Revenue recognized that was included in the contract liability balance at the beginning of the year	6,223
Unearned revenue	122
Expected services to be transferred	6,101
Revenue recognized from performance obligations satisfied in previous periods	-

**37. Events after the Reporting Period**

On January 15, 2019, the Parent Company requested customers to stop operating Energy Storage Systems (ESS) manufactured by the Company. The Parent Company is obliged to pay compensation to the customers due to their loss of discontinued ESS operation and the Parent Company is in the process of estimation for the accurate compensation amounts.

**38. Approval of Issuance of the Financial Statements**

The consolidated financial statements for the year 2018 were authorized for issue by the Board of Directors on January 29, 2019 and are subject to change with approval of shareholders at their Annual General Meeting.