



LG CNS CO., LTD.

SEPARATE FINANCIAL STATEMENTS
AS OF AND FOR THE YEARS ENDED
DECEMBER 31, 2018 AND 2017

ATTACHMENT: INDEPENDENT AUDITORS' REPORT

INDEPENDENT AUDITORS' REPORT

English Translation of Independent Auditors' Report Originally Issued in Korean on March 14, 2019

**To the Shareholders and the Board of Directors of
LG CNS Co., Ltd.:**

Report on the Separate Financial Statements

Our Opinion

We have audited the accompanying separate financial statements of LG CNS Co., Ltd. (the "Company"), which comprise the separate statements of financial position as of December 31, 2018 and 2017, respectively, and the separate statements of income, separate statements of comprehensive income, separate statements of changes in shareholders' equity and separate statements of cash flows, all expressed in Korean won, for the years then ended, and a summary of significant accounting policies and other explanatory information.

In our opinion, the separate financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and its financial performance and its cash flows for the years then ended in accordance with Korean International Financial Reporting Standards ("K-IFRSs").

Basis for Audit Opinion

We conducted our audits in accordance with the Korean Standards on Auditing ("KSAs"). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audits of the Separate Financial Statements section of our report. We are independent of the Company in accordance with the ethical requirements, including those related to independence, that are relevant to our audits of the separate financial statements in the Republic of Korea as required by prevailing audit regulations. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key Audit Matters

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

(The key audit matters) Change in estimating total contract cost

As described in Note 19 (5) to the separate financial statements, changes in estimation of the total contract cost for contracts that recognize revenue over time using the cost-based input method affect profit or loss of current and future periods, contract assets and contract liabilities. In addition, as explained in Note 3 to the separate financial statements, the total contract cost is estimated on the basis of future expectations, such as labor cost, material cost, project duration, and so on.

Estimates of total contract costs require expertise in engineering design and therefore the risk that changes in total contract costs with the project progresses will not be reflected in a timely manner. Thus, we identified changes in estimated total contract cost as a key audit matter, taking into account the impact of changes in estimated total contract cost on current and future profit and loss.

The major audit procedures we have conducted in relation to the changes in estimated total contract cost are as follows:

- Understanding and evaluation of design and implementation of internal control relevant to accuracy and cut off of estimated total contract cost
- Retrospective test of changes in estimated total contract cost of ongoing projects at the end of current period
- Test of accuracy and cut off of estimated total contract cost which was changed during the current period
- Test of the subsequent event related to estimated total contract cost, which is in progress at the end of current period

Responsibilities of Management and Those Charged with Governance for the Separate Financial Statements

Management is responsible for the preparation of the accompanying separate financial statements in accordance with K-IFRSs, and for such internal control as they determine is necessary to enable the preparation of separate financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the separate financial statements, management of the Company is responsible for assessing the Company'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 Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance's responsibilities include overseeing the Company's financial reporting process.

Auditor's Responsibilities for the Audits of the Separate Financial Statements

Our objectives are to obtain reasonable assurance about whether the separate 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 KSAs 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 separate financial statements.

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

- Identify and assess the risks of material misstatement of the separate financial statements, 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 Company'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 the 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 Company'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 separate 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 Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the separate financial statements, including the disclosures, and whether the separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance of the Company 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 audits.



March 14, 2019

Notice to Readers

This report is effective as of March 14, 2019, the auditors' report date. Certain subsequent events or circumstances may have occurred between the auditors' report date and the time the auditors' report is read. Such events or circumstances could significantly affect the separate financial statements and may result in modifications to the auditors' report.

LG CNS CO., LTD. (the “Company”)

SEPARATE FINANCIAL STATEMENTS

AS OF AND FOR THE YEARS ENDED

DECEMBER 31, 2018 AND 2017

The accompanying separate financial statements, including all footnote disclosures, were prepared by, and are the responsibility of, the Company.

Kim Young Shub.

Chief Executive Officer

LG CNS CO., LTD.

Headquarters: (Address) LG science park E13, 71 Magokjungang 8 ro, gangseo-gu, Seoul, Korea
(Telephone) +82-2-2099-0114

LG CNS CO., LTD.
SEPARATE STATEMENTS OF FINANCIAL POSITION
AS OF DECEMBER 31, 2018 AND 2017

	Korean won	
	Year ended December 31, 2018	Year ended December 31, 2017
	(In thousands)	
<u>ASSETS</u>		
CURRENT ASSETS:		
Cash and cash equivalents (Notes 5, 6 and 34)	₩ 392,006,720	₩ 180,326,415
Financial institution deposits (Notes 5, 31 and 34)	12,500,000	22,500,000
Financial assets at FVTPL (Notes 5 and 34)	1,030	-
Current derivative assets (Notes 5 and 34)	928,051	1,715,664
Trade receivables, net (Notes 5, 7, 30 and 34)	780,754,088	650,013,420
Other receivables, net (Notes 5, 7, 30, 32 and 34)	29,967,498	36,670,333
Inventories, net (Note 8)	46,702,191	35,342,860
Other assets (Notes 9, 19 and 30)	165,574,269	137,427,501
Total current assets	1,428,433,847	1,063,996,193
NON-CURRENT ASSETS:		
Financial assets at FVTPL (Notes 5, 31 and 34)	7,935,198	-
Financial assets at FVTOCI (Notes 5 and 34)	4,336,045	-
AFS financial assets (Notes 5 and 34)	-	23,699,573
Long-term trade receivables, net (Notes 5, 7, 30 and 34)	11,881,990	13,206,467
Long-term other receivables, net (Notes 5, 7, 30 and 34)	4,502,318	2,762,993
Property, plant and equipment, net (Note 10)	639,011,525	642,520,187
Investment property (Note 11)	19,889,938	24,794,936
Intangible assets (Note 12)	51,296,577	45,900,868
Investments in subsidiaries (Note 13)	48,648,389	113,554,064
Investments in associates and joint ventures (Note 14)	32,286,673	39,649,339
Deferred tax assets, net (Note 29)	45,461,850	41,068,947
Other non-current assets (Notes 9 and 30)	2,583,627	2,715,636
Total non-current assets	867,834,130	949,873,010
TOTAL ASSETS	₩ 2,296,267,977	₩ 2,013,869,203

(Continued)

LG CNS CO., LTD.
SEPARATE STATEMENTS OF FINANCIAL POSITION (CONTINUED)
AS OF DECEMBER 31, 2018 AND 2017

	Korean won	
	Year ended December 31, 2018	Year ended December 31, 2017
	(In thousands)	
<u>LIABILITIES AND SHAREHOLDERS' EQUITY</u>		
CURRENT LIABILITIES:		
Derivative liabilities (Notes 5 and 34)	₩ 180,750	₩ 1,835,613
Trade payables (Notes 5, 30 and 34)	356,537,879	310,283,177
Other payables (Notes 5, 30 and 34)	123,227,388	145,792,434
Current portion of long-term borrowings (Notes 5, 15 and 34)	-	149,948,723
Current tax liabilities (Note 29)	20,641,927	15,357,050
Current provisions (Note 16)	50,581,253	49,460,780
Other liabilities (Notes 18 and 19)	150,982,203	119,405,871
Total current liabilities	702,151,400	792,083,648
NON-CURRENT LIABILITIES:		
Other payables (Notes 5, 30 and 34)	1,052,873	1,834,064
Long-term borrowings (Notes 5, 15 and 34)	518,863,575	299,176,114
Provisions (Note 16)	2,037,565	1,875,911
Retirement benefit obligation (Note 17)	43,425	2,850,457
Other liabilities (Note 18)	8,419,052	7,431,890
Total non-current liabilities	530,416,490	313,168,436
TOTAL LIABILITIES	1,232,567,890	1,105,252,084
SHAREHOLDERS' EQUITY:		
Issued capital (Note 20)	47,198,411	47,198,411
Capital surplus (Notes 20 and 21)	138,026,095	59,521,055
Accumulated other comprehensive income (loss) (Note 22)	(14,610,405)	185,807
Retained earnings (Note 23)	893,085,986	801,711,846
TOTAL SHAREHOLDERS' EQUITY	1,063,700,087	908,617,119
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	₩ 2,296,267,977	₩ 2,013,869,203

(Concluded)

See notes

LG CNS CO., LTD.
SEPARATE STATEMENTS OF INCOME
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	Korean won	
	Year ended December 31, 2018	Year ended December 31, 2017
	(In thousands)	
Revenue (Notes 4, 24 and 30)	₩ 2,828,574,073	₩ 2,388,651,947
Cost of sales (Notes 24, 25 and 30)	(2,458,728,479)	(2,059,355,653)
Gross profit	369,845,594	329,296,294
Selling and administrative expenses (Notes 24, 25, 30 and 32)	(206,219,971)	(153,495,981)
Operating income	163,625,623	175,800,313
Financial income (Note 26)	20,486,740	17,746,293
Financial expenses (Note 26)	(14,789,269)	(20,016,381)
Other non-operating income (Note 27)	14,794,244	31,132,997
Other non-operating expenses (Note 27)	(35,188,394)	(37,870,684)
Profit before income tax expense	148,928,944	166,792,538
Income tax expense from continuing operations (Note 29)	(44,363,797)	(60,083,291)
Income from continuing operations	104,565,147	106,709,247
Income (loss) from discontinued operations (Note 35)	-	(18,769,319)
Profit for the year	₩ 104,565,147	₩ 87,939,928

See notes

LG CNS CO., LTD.
SEPARATE STATEMENTS OF COMPREHENSIVE INCOME
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	Korean won	
	Year ended December 31, 2018	Year ended December 31, 2017
	(In thousands)	
Profit for the year	₩ 104,565,147	₩ 87,939,928
Other comprehensive income (loss):		
Items that will not be reclassified subsequently to profit or loss		
Remeasurements of the net defined benefit liability	(110,363)	655,755
Net loss on Financial assets measured at FVTOCI	(9,565,412)	-
	<u>(9,675,775)</u>	<u>655,755</u>
Items that may be reclassified subsequently to profit or loss		
Net loss on AFS financial assets	-	(93,397)
Valuation gain of derivative instruments for cash flow hedges	-	173,083
	<u>-</u>	<u>79,686</u>
Total comprehensive income for the year	<u>₩ 94,889,372</u>	<u>₩ 88,675,369</u>

See notes

LG CNS CO., LTD.
SEPARATE STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	Korean won				
	Accumulated other				
	Issued capital	Capital surplus	comprehensive income (loss)	Retained earnings	Total
	(In thousands)				
Balance at January 1, 2017	₩ 47,198,411	₩ 59,521,055	₩ 106,121	₩ 727,503,726	₩ 834,329,313
Profit(loss) for the year	-	-	-	87,939,928	87,939,928
Net loss on AFS financial assets	-	-	(93,397)	-	(93,397)
Valuation losses of derivative instruments for cash flow hedges	-	-	173,083	-	173,083
Remeasurements of the net defined benefit liability	-	-	-	655,755	655,755
Annual dividends	-	-	-	(14,387,563)	(14,387,563)
Balance at December 31, 2017	<u>₩ 47,198,411</u>	<u>₩ 59,521,055</u>	<u>₩ 185,807</u>	<u>₩ 801,711,846</u>	<u>₩ 908,617,119</u>
Balance at January 1, 2018	₩ 47,198,411	₩ 59,521,055	₩ 185,807	₩801,711,846	₩908,617,119
Effect of accounting policy change (Notes 2)	-	-	(5,230,800)	5,230,800	-
Balance at January 1, 2018 – Restated	47,198,411	59,521,055	(5,044,993)	806,942,646	908,617,119
Profit(loss) for the year	-	-	-	104,565,147	104,565,147
Fair value loss on investments in equity instruments designated as at FVTOCI	-	-	(9,565,412)	-	(9,565,412)
Remeasurements of the net defined benefit liability	-	-	-	(110,363)	(110,363)
Increase (decrease) due to business combination	-	78,505,040	-	-	78,505,040
Annual dividends	-	-	-	(18,311,444)	(14,387,563)
Balance at December 31, 2018	<u>₩ 47,198,411</u>	<u>₩ 138,026,095</u>	<u>₩ (14,610,405)</u>	<u>₩ 893,085,986</u>	<u>₩ 1,067,623,968</u>

See notes

LG CNS CO., LTD.
SEPARATE STATEMENTS OF CASH FLOWS
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	Korean won	
	Year ended December 31, 2018	Year ended December 31, 2017
	(In thousands)	
CASH FLOWS FROM OPERATING ACTIVITIES:		
Profit for the year	₩ 104,565,147	₩ 87,939,928
Addition of expenses not involving cash outflows:		
Salaries and wages	1,110,449	558,838
Retirement benefits	3,919,547	2,249,337
Depreciation	65,280,180	67,179,868
Amortization of intangible assets	8,012,378	7,547,647
Bad debt expenses	4,084,093	8,363,029
Accrual of provision	27,349,900	34,239,904
Other operating expenses	1,661,983	2,693,465
Loss on foreign currency translation	1,886,207	7,147,171
Loss on disposal of property, plant and equipment	13,713	763,054
Impairment loss of on property, plant and equipment	-	16,787,017
Loss on disposal of intangible assets	23,204	779,117
Impairment loss of intangible assets	100,000	1,785,138
Loss on transactions of derivatives	13,332,913	10,596,982
Loss on valuation of derivatives	5,423,750	1,835,613
Interest expenses	13,357,775	10,159,897
Loss on disposal of AFS financial assets	-	127
Loss on disposals of FVTPL financial assets	7	-
Impairment loss on AFS financial assets	-	4,292,996
Loss on disposal of investments in subsidiaries	168,908	-
Impairment loss on investments in subsidiaries	1,162,525	1,019,589
Impairment loss on investments in associates	7,362,667	4,479,295
Income tax expense	44,363,797	49,865,093
Other non-operating expenses	-	3,999,507
	<u>198,613,996</u>	<u>236,342,684</u>
Deduction of items not involving cash inflows:		
Reversal of loss on valuation of inventories	-	408,708
Gain on valuation of FVTPL financial assets	95,324	-
Allowance for bad debt	-	459,293
Reversal of allowance for other bad debt	505,881	
Reversal of provision	5,513,573	2,793,011
Gain on foreign currency translation	420,358	3,231,519
Gain on disposal of property, plant and equipment	387,596	740,157
Gain on disposal of intangible assets	216,911	-
Gain on transactions of derivatives	7,084,843	14,436,120
Gain on valuation of derivatives	928,051	1,715,664
Interest income	7,359,730	3,564,099
Dividend income	11,916,305	14,128,597
Gain on disposals of investments in associates	143,062	1,877,570
	<u>(34,571,634)</u>	<u>(43,354,738)</u>

(Continued)

LG CNS CO., LTD.
SEPARATE STATEMENTS OF CASH FLOWS (CONTINUED)
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	Korean won	
	Year ended December 31, 2018	Year ended December 31, 2017
	(In thousands)	
Movements in working capital:		
Trade receivables	₩ (92,961,676)	₩ (107,153,475)
Other receivables	(3,486,788)	12,757,468
Other current assets	(26,965,384)	24,921,988
Inventories	(2,684,683)	(22,258,913)
Non-current trade receivables	(1,926,433)	(11,135,403)
Other non-current assets	(38,969)	(352,502)
Trade payables	16,582,942	6,446,457
Other payables	20,566,698	(1,413,006)
Other current liabilities	30,088,520	(44,437,353)
Current provisions	(17,770,528)	(18,594,704)
Retirement benefit obligation	(6,476,003)	(25,332)
Other non-current liabilities	(535,150)	(518,800)
Other operating assets and liabilities	(932,030)	1,587,266
	<u>(86,539,484)</u>	<u>(160,176,309)</u>
Interest income received	6,747,831	2,352,552
Dividend income received	11,916,305	13,889,842
Interest expense paid	(11,580,906)	(8,646,757)
Income taxes paid	(37,451,663)	(42,540,348)
Net cash provided by operating activities	<u>151,699,592</u>	<u>85,806,854</u>
CASH FLOWS FROM INVESTING ACTIVITIES:		
Cash inflows from investing activities:		
Settlement of derivative instruments	7,084,843	14,436,120
Decrease in financial institution deposits	40,050,000	-
Decrease in other receivables	15,659,675	4,729,050
Disposal of financial assets measured at FVTOCI	724,641	-
Disposal of AFS financial assets	-	344,368
Decrease in other non-current receivables	5,012	158,503
Disposal of investments in subsidiaries	2,391,790	26,278,977
Disposal of property, plant and equipment	22,964,474	2,257,580
Disposal of intangible assets	222,460	1,175,140
Business combination	136,861,042	-
Increase in other non-current payables	824,107	-
	<u>226,788,044</u>	<u>49,379,738</u>
Cash outflows for investing activities:		
Increase in financial institution deposits	-	16,000,000
Settlement of derivative instruments	13,452,862	12,601,266
Increase in other receivables	1,391,898	8,130,295
Acquisition of FVTOCI financial equity instruments	1,767,359	-
Acquisition of AFS financial assets	-	5,645,747
Increase in long-term other receivables	1,739,974	671,643
(Continued)		

LG CNS CO., LTD.
SEPARATE STATEMENTS OF CASH FLOWS (CONTINUED)
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	Korean won	
	Year ended December 31, 2018	Year ended December 31, 2017
	(In thousands)	
Acquisition of investments in subsidiaries	₩ 531,358	₩ 233,340
Acquisition of property, plant and equipment	124,776,509	109,431,785
Acquisition of intangible assets	14,090,906	10,755,771
Decrease in long-term other receivables	28,627	-
	<u>(157,779,493)</u>	<u>(163,469,847)</u>
Net cash used in investing activities	69,008,551	(114,090,109)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Cash inflows from financing activities:		
Issuance of debentures	199,283,352	149,365,460
	<u>199,283,352</u>	<u>149,365,460</u>
Cash outflows for financing activities:		
Redemption of short-term borrowings	-	2,227,617
Redemption of current position of long-term borrowings	190,000,000	50,000,000
Redemption of debentures	-	100,000,000
Settlement of derivative instruments	-	248,630
Payment of dividends	18,311,190	14,387,374
	<u>(208,311,190)</u>	<u>(166,863,621)</u>
Net cash provided by financing activities	(9,027,838)	(17,498,161)
Net increase (decrease) in cash and cash equivalents	<u>211,680,305</u>	<u>(45,781,416)</u>
Cash and cash equivalents at beginning of year	180,326,415	226,311,871
Effects of exchange rate changes on the balance of cash held in foreign currencies	-	(204,040)
Cash and cash equivalents at end of year	<u>₩ 392,006,720</u>	<u>₩ 180,326,415</u>

(Concluded)

See notes

LG CNS CO., LTD.
NOTES TO SEPARATE FINANCIAL STATEMENTS
AS OF AND FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

1. GENERAL:

LG CNS Co., Ltd. (the “Company”) was incorporated in 1987 under the laws of the Republic of Korea to engage in the business of system integration, software design and development, providing information-processing services and leasing computer hardware. It was organized under a joint venture agreement among LG Engineering Co., Ltd., E.D.S. World Corporation (Far East) and others.

As of December 31, 2018, the issued capital is ₩47,198 million, and the Company’s shareholders are LG Corp. (84.95%) and others.

2. STANDARDS AFFECTING PRESENTATION, DISCLOSURE AND SIGNIFICANT ACCOUNTING POLICIES:

(1) Basis of preparing separate financial statements

The Company has adopted the Korean International Financial Reporting Standards (“K-IFRSs”) and these separate financial statements of the Company are in accordance with K-IFRS 1027 (Consolidated and Separate Financial Statements), presented by an investor with joint control or significant influence, in which the investments are accounted for on the basis of cost method, K-IFRS 1039 ‘Financial instruments’ or K-IFRS 1028 - *Investment in Associates and Joint Ventures*.

The significant accounting policies under K-IFRSs followed by the Company in the preparation of its separate financial statements are summarized below. The accounting policies are applied consistently to the separate financial statements for the current period and the comparative period.

The accompanying separate financial statements have been created based on a historical cost basis, with the exception of certain non-current assets and financial assets measured at revalued amount and fair value at the end of each reporting period as explained in the accounting policy below. Historical cost is commonly measured in fair value of cost to acquire the asset.

Fair value is the price that will be paid when the asset is sold or the liability is transferred in a normal transaction between market participants at the measurement date, whether the price is directly observable or whether it is valued using valuation techniques. In estimating the fair value of an asset or liability, we consider the nature of the asset or liability that the market participant considers when determining the cost of the asset or liability at the measurement date. Fair value for measurement and disclosure purposes in these separate financial statements is determined on such a basis, except for share-based payment transactions that are within the scope of K-IFRS 1102 Share-based Payment, leasing transactions that are within the scope of K-IFRS 1017 Leases, and measurements that have some similarities to fair value, but are not fair value, such as net realizable value in K-IFRS 1002 Inventories or value in use in K-IFRS 1036 Impairment of Assets in accordance with the principles described above will be determined.

1) Newly adopted and revised standards, their interpretations and thereby changes in accounting policies being effective for the financial year beginning January 1, 2018, are as follows:

- K-IFRS 1109 – Financial Instruments (Enactment)

The Company has applied K-IFRS 1109 Financial Instruments and the related consequential amendments to other IFRS Standards that are effective for an annual period that begins on or after January 1, 2018. K-IFRS 1109 introduced new requirements for:

- 1) The classification and measurement of financial assets and financial liabilities;
- 2) Impairment of financial assets; and
- 3) General hedge accounting.

Additionally, the Company adopted consequential amendments to K-IFRS 1107 Financial Instruments: Disclosures that were applied to the disclosures for 2018.

At the date of initial application, the Company elected not to restate prior periods, and hence, the Company did not restate comparative financial statements in accordance with K-IFRS 1109.

Details of these new requirements as well as their impact on the Company's separate financial statements are described below.

(a) Classification and measurement of financial assets

All recognized financial assets that are within the scope of K-IFRS 1109 are required to be measured subsequently at amortized cost or fair value on the basis of the entity's business model for managing the financial assets and the contractual cash flow characteristics of the financial assets.

- Debt instruments that are held within a business model whose objective is to collect the contractual cash flows, and that have contractual cash flows that are solely payments of principal and interest ("SPPI") on the principal amount outstanding, are measured subsequently at amortized cost;
- Debt instruments that are held within a business model, whose objective is both to collect the contractual cash flows and to sell the debt instruments, and that have contractual cash flows that are SPPI on the principal amount outstanding, are measured subsequently at fair value through other comprehensive income ("FVTOCI");
- All other debt instruments and equity investments are measured subsequently at fair value through profit or loss ("FVTPL").

Despite the foregoing, the Company may make the following irrevocable election / designation at initial recognition of a financial asset:

- The Company may irrevocably elect to present subsequent changes in fair value of an equity investment that is neither held for trading nor contingent consideration recognized by an acquirer in a business combination in other comprehensive income; and
- The Company may irrevocably designate a debt investment that meets the amortized cost or FVTOCI criteria as measured at FVTPL if doing so eliminates or significantly reduces an accounting mismatch.

In the current year, the Company has not designated any debt investments that meet the amortized cost or FVTOCI criteria as measured at FVTPL.

When a debt investment measured at FVTOCI is derecognized, the cumulative gain or loss previously recognized in other comprehensive income is reclassified from equity to profit or loss as a reclassification adjustment. When an equity investment designated as measured at FVTOCI is derecognized, the cumulative gain or loss previously recognized in other comprehensive income is subsequently transferred to retained earnings.

Debt instruments that are measured subsequently at amortized cost or at FVTOCI are subject to impairment. See (b) below.

The directors of the Company reviewed and assessed the Company's existing financial assets as of January 1, 2018, based on the facts and circumstances that existed at that date and concluded that the initial application of K-IFRS 1109 has had the following impact on the Company's financial assets as regards their classification and measurement:

- The Company's investments in redeemable notes were classified as available-for-sale (AFS) financial assets under K-IFRS 1039 Financial Instruments: Recognition and Measurement. The notes have been reclassified as financial assets measured at amortized cost because they are held within a business model, whose objective is to collect the contractual cash flows and they have contractual cash flows that are SPPI on the principal amount outstanding;

- The Company's investment in corporate bonds that were classified as AFS financial assets under K-IFRS 1039 have been classified as financial assets at FVTOCI because they are held within a business model, whose objective is both to collect contractual cash flows and to sell the bonds, and they have contractual cash flows that are SPPI on principal outstanding. The change in the fair value on these redeemable notes continues to accumulate in the investment revaluation reserve until they are derecognized or reclassified;
- The Company's investments in equity instruments (neither held for trading nor a contingent consideration arising from a business combination) that were previously classified as AFS financial assets and were measured at fair value at each reporting date under K-IFRS 1109 have been designated as at FVTOCI. The change in fair value on these equity instruments continues to be accumulated in the investment revaluation reserve;
- There is no change in the measurement of the Company's investments in equity instruments that are held for trading; those instruments were and continue to be measured at FVTPL
- Financial assets classified as held-to-maturity and loans and receivables under K-IFRS 1039 that were measured at amortized cost continue to be measured at amortized cost under K-IFRS 1109, as they are held within a business model to collect contractual cash flows and these cash flows consist solely of payments of principal and interest on the principal amount outstanding.

Financial assets classified as financial assets at FVTPL under K-IFRS 1039 continue to be measured at FVTPL.

None of the other reclassifications of financial assets have had any impact on the Company's financial position, profit or loss, other comprehensive income or total comprehensive income in the current year.

(b) Impairment of financial assets

In relation to the impairment of financial assets, K-IFRS 1109 requires an expected credit loss ("ECL") model as opposed to an incurred credit loss model under K-IFRS 1039. The ECL model requires the Company to account for ECLs and changes in those ECLs at each reporting date to reflect changes in credit risk since initial recognition of the financial assets. In other words, it is no longer necessary for a credit event to have occurred before credit losses are recognized.

Specifically, K-IFRS 1109 requires the Company to recognize a loss allowance for ECLs on:

- (1) Debt investments measured subsequently at amortized cost or at FVTOCI,
- (2) Lease receivables,
- (3) Accounts receivable and contract assets,
- (4) Financial guarantee contracts to which the impairment requirements of K-IFRS 1109 apply.

In particular, K-IFRS 1109 requires the Company to measure the loss allowance for a financial instrument at an amount equal to the lifetime ECLs if the credit risk on that financial instrument has increased significantly since initial recognition, or if the financial instrument is a purchased or originated credit-impaired financial asset. However, if the credit risk on a financial instrument has not increased significantly since initial recognition (except for a purchased or originated credit-impaired financial asset), the Company is required to measure the loss allowance for that financial instrument at an amount equal to 12 months ECL. K-IFRS 1109 also requires a simplified approach for measuring the loss allowance at an amount equal to lifetime ECL for accounts receivable and contract assets and lease receivables in certain circumstances. Accordingly, the Company applied the simplified approach to measure the loss allowance for accounts receivables, deposits and loans.

The Company has assessed whether there has been a significant increase in credit risk since initial recognition of financial instruments that remain recognized on the date of initial application of K-IFRS 1109 (i.e., January 1, 2018), the directors have assessed the credit risk of the respective financial instruments on the date of their initial recognition. In accordance with K-IFRS 1109, the Company recognizes an ECL of a financial instrument by setting a provision for loss when the credit rating of a customer falls sharply and there is no significant impact on the recognition of loss provisions.

As of January 1, 2018, differences in between the ending provision for impairment in accordance with K-IFRS 1039 and the provision in accordance with K-IFRS 1037 (for the financial guarantee contracts) to the opening loss allowance determined in accordance with K-IFRS 1109 are disclosed in each relevant annotation.

The consequential amendments to K-IFRS 1107 have also resulted in more extensive disclosures about the Company's exposure to credit risk in the separate financial statements (Note 7, 19 and 34).

(c) Classification and measurement of financial liabilities

A significant change introduced by K-IFRS 1109 in the classification and measurement of financial liabilities relates to the accounting for changes in the fair value of a financial liability designated as at FVTPL attributable to changes in the credit risk of the issuer.

Specifically, K-IFRS 1109 requires that the changes in the fair value of the financial liability that is attributable to changes in the credit risk of that liability be presented in other comprehensive income, unless the recognition of the effects of changes in the liability's credit risk in other comprehensive income would create or enlarge an accounting mismatch in profit or loss. Changes in fair value attributable to a financial liability's credit risk are not subsequently reclassified to profit or loss, but are instead transferred to retained earnings when the financial liability is derecognized. Previously, under K-IFRS 1039, the entire amount of the change in the fair value of the financial liability designated as at FVTPL was presented in profit or loss.

The application of K-IFRS 1109 has had no impact on the classification and measurement of the Company's financial liabilities.

In Note (e), the details of the change in classification according to the application of K-IFRS 1109 are described.

(d) General hedge accounting

The new general hedge accounting requirements retain the three types of hedge accounting. However, greater flexibility has been introduced to the types of transactions eligible for hedge accounting, specifically broadening the types of instruments that qualify for hedging instruments and the types of risk components of non-financial items that are eligible for hedge accounting. In addition, the effectiveness test has been replaced with the principle of an 'economic relationship.' Retrospective assessment of hedge effectiveness is also no longer required. Enhanced disclosure requirements about the Company's risk management activities have also been introduced.

In accordance with K-IFRS 1109's transition provisions for hedge accounting, the Company has applied the K-IFRS 1109 hedge accounting requirements prospectively from the date of initial application on January 1, 2018. The Company's qualifying hedging relationships in place as of January 1, 2018, also qualify for hedge accounting in accordance with K-IFRS 1109 and were therefore regarded as continuing hedging relationships. No rebalancing of any of the hedging relationships was necessary on January 1, 2018. As the critical terms of the hedging instruments match those of their corresponding hedged items, all hedging relationships continue to be effective under K-IFRS 1109's effectiveness assessment requirements. The Company has also not designated any hedging relationships under K-IFRS 1109 that would not have met the qualifying hedge accounting criteria under K-IFRS 1039.

K-IFRS 1109 requires hedging gains and losses to be recognized as an adjustment to the initial carrying amount of non-financial hedged items (basis adjustment). In addition, transfers from the hedging reserve to the initial carrying amount of the hedged item are not reclassification adjustments under K-IFRS 1001 Presentation of Financial Statements, and hence, they do not affect other comprehensive income. Hedging gains and losses subject to basis adjustments are categorized as amounts that will not be subsequently reclassified to profit or loss in other comprehensive income. This is consistent with the Company's practice prior to the adoption of K-IFRS 1109.

Consistent with prior periods, when a forward contract is used in a cash flow hedge or fair value hedge relationship, the Company has designated the change in fair value of the entire forward contract, i.e. including the forward element, as the hedging instrument.

(e) Disclosures in relation to the initial application of K-IFRS 1109

The additional loss allowance on the initial application of K-IFRS 1109 is due to a change in the measurement of loss allowance related to each financial asset. No financial assets or financial liabilities designated as financial assets at FVTPL in accordance with K-IFRS 1039 are subject to reclassification and there are no financial assets or financial liabilities that the Company elected to reclassify as it applies K-IFRS 1109.

The table below shows information related to financial assets and financial liabilities that have been reclassified as a result of transition to K-IFRS 1109 and K-IFRS 1039 (Unit: Korean won in thousands):

Title	Classification		Book value	
	K-IFRS 1039	K-IFRS 1109	K-IFRS 1039	K-IFRS 1109
Marketable equity securities (*1)	AFS financial assets	Financial assets measured at FVTOCI	₩ 1,944,773	₩ 1,944,773
Unmarketable equity securities (*1)	AFS financial assets	Financial assets measured at FVTOCI	17,709,211	17,709,211
Investment (*2)	AFS financial assets	Financial assets measured at FVTPL	4,045,589	4,045,589
Trading derivative assets	Financial assets at FVTPL	Financial assets measured at FVTPL	1,715,664	1,715,664
Financial institution deposits	Loans and receivables	Financial liabilities measured at amortized cost	22,500,000	22,500,000
Account and other receivables	Loans and receivables	Financial liabilities measured at amortized cost	702,653,213	702,653,213
Derivative liabilities for trading purposes	Financial liabilities at FVTPL	Financial liabilities measured at FVTPL	1,835,613	1,835,613
Account and other payables	Financial liabilities measured at amortized cost	Financial liabilities measured at amortized cost	457,909,675	457,909,675
Borrowings and Bonds	Financial liabilities measured at amortized cost	Financial liabilities measured at amortized cost	449,124,837	449,124,837

(*1) Among AFS financial assets as of December 31, 2017, marketable equity securities and unmarketable equity securities were designated as financial assets measured at FVTOCI by applying the irrevocable election at the date of initial application.

(*2) It was classified as unmarketable equity securities of AFS financial assets on December 31, 2017, but were classified as financial assets measured at FVTPL under K-IFRS 1109.

- K-IFRS 1115 – Revenue from Contracts with Customers (Enactment)

In the current year, the Company has applied K-IFRS 1115 Revenue from Contracts with Customers, which is effective for an annual period that begins on or after January 1, 2018. K-IFRS 1115 introduced a five-step approach to revenue recognition. Far more prescriptive guidance has been added in K-IFRS 1115 to deal with specific scenarios. Details of the new requirements as well as the accounting policy the Company applied are noted in (5) Revenue recognition and their impact on the Company's separate financial statements are described below.

The Company has applied K-IFRS 1115 in accordance with the fully retrospective transitional approach using the expedient in K-IFRS 1115, allowing both non-disclosure of the amount of the transaction price allocated to the remaining performance obligations and an explanation of when it expects to recognize that amount as revenue for all reporting periods presented before the date of initial application, i.e., January 1, 2018. Furthermore, as a practical expedient, the Company elects to retrospectively restate only contracts that are not completed at the date of initial application. For contracts that were modified before the initial application date, the Company does not retrospectively restate the contract for those contract modifications.

- K-IFRS 1102—Share-based Payment (Amendment)

The amendments include: 1) when measuring the fair value of share-based payment, the effects of vesting and non-vesting conditions on the measurement of cash-settled share-based payment should be consistent with the measurement of equity-settled share-based payment; 2) share-based payment transaction in which the Company settles the share-based payment arrangement net by withholding a specified portion of the equity instruments per statutory tax withholding requirements would be classified as equity settled in its entirety (it otherwise would be classified as equity settled without the net settlement feature); and 3) when a cash-settled share-based payment changes to an equity-settled share-based payment because of modifications of the terms and conditions, the original liability recognized is derecognized and the equity-settled share-based payment is recognized at the modification-date fair value. Any difference between the carrying amount of the liability at the modification date and the amount recognized in equity at the same date would be recognized in profit and loss immediately. The application of K-IFRS 1102 has not had a significant impact on the financial position and/or financial performance of the Company.

- K-IFRS 1040 – Investment Property (Revised)

This amendment assesses whether real estate meets (or fails to meet) the definition of an investment property and replaces it with investment property (or from investment property) where observable evidence supports that a change in use that has occurred is clear. The amendment also provides evidence that there is a change in the use of the circumstances other than those listed in K-IFRS 1040 and that the use of the property under construction can be changed (not limited to assets). There is no significant impact on the financial position and/or financial performance of the Company.

- Annual Improvements to K-IFRS Standards 2014-2016 Cycle

This amendment includes certain amendments to K-IFRS 1101 'First-time adoption of K-IFRSs and K-IFRS 1028, Investments in associates and joint ventures. In accordance with K-IFRS 1028, a venture capital investment organization or a similar entity may elect each of its associates and joint ventures individually as a profit or loss or fair value measurement and make it clear that you need to do it when you first recognize an investment. In addition, when the equity method is applied to associates and joint ventures, which are not investment companies, they are permitted to apply the fair value measurement applied to subsidiaries as they are, and it is clear that you can choose for each.

Since the Company does not adopt K-IFRSs for the first time and is not a venture capital investment organization, we believe that the amendment will have no impact on the separate financial statements. In addition, the Company does not have any interest in affiliates or joint ventures that are investment companies.

- K-IFRS 2122—Foreign Currency Transactions and Advance Consideration (Enactment)

This interpretation is the first time an entity recognizes an asset, cost or revenue (or a portion thereof), eliminating the non-monetary assets or non-monetary liabilities incurred. It deals with how to determine the trading date to determine the applicable exchange rate.

The interpretation stipulates that the transaction date is the first day of recognizing non-monetary assets or non-monetary liabilities, either as a prepayment of a consideration or as an auction. The interpretation states that if the advance payment or the athlete's auction is made several times, the transaction date for each advance payment or the athlete's auction is determined separately.

As the Company has already accounted for prepayments in foreign currencies or the consideration given to them by the Company in a manner consistent with the interpretation, it is expected that the interpretation will not affect the Company's separate financial statements.

The effect of changes in accounting policies on the separate financial statements due to new standards and interpretations is as follows:

	January 1, 2018		
	Before	Adjustment	After
ASSETS	₩ 951,611	₩ (2,454)	₩ 949,157
CURRENT ASSETS:	32,797	8,860	41,657
Other receivables (*1)	100,345	(100,345)	-
Due from customers for contract work (*1)	-	89,032	89,032
Contract assets(*1)	849,542	-	849,542
NON-CURRENT ASSETS:	21,196	(21,196)	-
AFS financial assets	-	3,618	3,618
Financial assets at FVTPL	-	17,578	17,578
Financial assets at FVTOCI	1,801,153	(2,454)	1,798,699
TOTAL ASSETS	32,797	8,860	41,657
LIABILITIES			
CURRENT LIABILITIES	708,419	(2,454)	705,965
Due to customers for contract work (*1)	35,520	(35,520)	-
Contract liabilities(*1)	-	34,745	34,745
Other provisions(*1)	29,952	(1,678)	28,274
TOTAL LIABILITIES	988,509	(2,454)	986,055
SHAREHOLDERS' EQUITY:			
Issued capital	42,213	-	42,213
Capital surplus	53,234	-	53,234
Accumulated other comprehensive income (loss) (*2)	166	(4,678)	(4,512)
Retained earnings (*2)	717,031	4,678	721,709
TOTAL SHAREHOLDERS' EQUITY	812,644	-	812,644

(*1) Changes in the separate financial statement presentation of the provision for contract loss and provision for damages accrued at due from(to) customers for contract work due to introduction of K-IFRS 1115 (see Note 2).

(*2) Changes in the separate financial statement presentation of financial assets classified as AFS financial assets to financial assets measured at FVTPL due to introduction of K-IFRS 1109.

The effect of changes in accounting policy on each item of equity as of the initial application date is as follows
(Unit: Korean won in thousands):

	Accumulated other comprehensive income	Retained earnings
December 31, 2017 (amount reported)	₩ 185,807	₩ 801,711,846
First application of K-IFRS 1109	-	-
Effects of classification and measurement	(5,230,800)	5,230,800
January 1, 2018 (first application date)	(5,044,993)	806,942,646

2) New and revised K-IFRSs in issue, but not yet effective

- K-IFRS 1116—Leases (Enactment)

a) General impact of application of K-IFRS 1116 Leases

K-IFRS 1116 provides a comprehensive model for the identification of lease arrangements and their treatments in the separate financial statements for both lessors and lessees. K-IFRS 1116 will supersede the current lease guidance, including K-IFRS 1017 Leases and the related interpretations, when it becomes effective for accounting periods beginning on or after January 1, 2019.

The lessees have an option to choose between the full retrospective application for each reporting date and modified retrospective application at the initial application date.

The Company plans to apply modified retrospective approach as of January 1, 2019, in accordance with K-IFRS 1116. Therefore, the cumulative effect of applying K-IFRS 1116 will be adjusted in the retained earnings (or, where appropriate, other components of equity) at the date of initial application, and the comparative separate financial statements will not be restated.

The lessee and lessor must account for each lease element of the lease separate from the non-lease element ("non-lease element") in a lease contract. The lessee is required to recognize lease assets and liabilities that represent the right to use the underlying assets and the obligation to pay the lease payments. However, in case of short-term lease and small-value-based lease, the exemption provisions of the standard may be selected. In addition, the lessee is not required to separate the lease element from the non-lease element in accordance with the simplified approach, and can account for each lease element and related non-lease element as one lease element.

In contrast to lessee accounting, K-IFRS 1116 does not substantially carry forward the lessor accounting requirements in K-IFRS 1017.

b) Impact of the new definition of a lease

The Company will make use of the practical expedient available on transition to K-IFRS 1116 to not reassess whether a contract is, or contains, a lease. Accordingly, the definition of a lease in accordance with K-IFRS 1117 will continue to apply to those leases entered or modified before January 1, 2019.

The Company will apply the definition of a lease and related guidance set out in K-IFRS 1116 to all lease contracts entered into or modified on or after January 1, 2019 (whether it is a lessor or a lessee in the lease contract).

The change in definition of a lease mainly relates to the concept of control. K-IFRS 1116 distinguishes between leases and service contracts on the basis of whether the use of an identified asset is controlled by the customer. Control is considered to exist if the customer has:

- the right to obtain substantially all of the economic benefits from the use of an identified asset and
- the right to direct the use of that asset.

The Company has shown that the new definition in K-IFRS 1116 will not change significantly the scope of contracts that meet the definition of a lease for the Company.

c) Impact on lessee accounting

Operating leases

K-IFRS 1116 will change how the Company accounts for leases previously classified as operating leases under K-IFRS 1017, which were off-balance sheet. On initial application of K-IFRS 1116, for all leases (except as short-term leases and leases of low-value assets), the Company will:

- a) recognize right-of-use assets and lease liabilities in the separate statements of financial position, initially measured at the present value of the future lease payments;
- b) recognize depreciation of right-of-use assets and interest on lease liabilities in the separate statements of comprehensive income; and
- c) separate the total amount of cash paid into a principal portion (presented within financing activities) and interest (presented within operating activities) in the separate statements of cash flows.

Under K-IFRS 1116, right-of-use assets will be tested for impairment in accordance with K-IFRS 1036 Impairment of Assets. This will replace the previous requirement to recognize a provision for onerous lease contracts.

For short-term leases (lease term of 12 months or less) and leases of low-value assets (such as personal computers and office furniture), the Company will opt to recognize a lease expense on a straight-line basis as permitted by K-IFRS 1116.

Based on our preliminary assessment as of December 31, 2018, the Company expects to increase the amount of license assets amounting to ₩ 64,818 million and lease liabilities amounting to ₩ 61,395 million related to the lease contracts, excluding short-term lease and small basic lease. Provisions for losses incurred under K-IFRS 1017 are eliminated and there is no lease incentive liability previously recognized in respect of operating leases.

Finance leases

The main difference between K-IFRS 1116 and K-IFRS 1017 with respect to assets formerly held under a finance lease is the measurement of the residual value guarantees provided by the lessee to the lessor. K-IFRS 1116 requires that the Company recognize as part of its lease liability only the amount expected to be payable under a residual value guarantee, rather than the maximum amount guaranteed as required by K-IFRS 1017. On initial application, the Company will present equipment previously included in property, plant and equipment within the line item for right-of-use assets and the lease liability, previously presented within borrowing, will be presented in a separate line for lease liabilities.

Based on an analysis of the Company's finance leases as at December 31, 2018, on the basis of the facts and circumstances that exist at that date, the directors of the Company have assessed that the impact of this change will not have an impact on the amounts recognized in the Company's separate financial statements.

d) Impact on Lessor Accounting

Under K-IFRS 1116, a lessor continues to classify leases as either finance leases or operating leases and account for those two types of leases differently. However, K-IFRS 1116 has changed and expanded the disclosures required, in particular regarding how a lessor manages the risks arising from its residual interest in leased assets.

Under K-IFRS 1116, an intermediate lessor accounts for the head lease and the sublease as two separate contracts. The intermediate lessor is required to classify the sublease as a finance or operating lease by reference to the right-of-use asset arising from the head lease (and not by reference to the underlying asset as was the case under K-IFRS 1017).

Because of this change, the Company will reclassify certain of its sublease agreements as finance leases. As required by K-IFRS 1109, an allowance for ECLs will be recognized on the finance lease receivables. The leased assets will be derecognized and finance lease receivables will be recognized. This change in accounting will change the timing of recognition of the related revenue (recognized in finance income).

- K-IFRS 1109 – Prepayment Features with Negative Compensation (Amendment)

The amendments to K-IFRS 1109 clarify that for the purpose of assessing whether a prepayment feature meets the SPPI condition, the party exercising the option may pay or receive reasonable compensation for the prepayment irrespective of the reason for prepayment. In other words, prepayment features with negative compensation do not automatically fail an SPPI test. The amendment applies to annual periods beginning on or after January 1, 2019, with earlier application permitted.

- K-IFRS 1028 – Long-term Interests in Associates and Joint Ventures (Amendment)

The amendment clarifies that K-IFRS 1109, including its impairment requirements, applies to long-term interests. Furthermore, in applying K-IFRS 1109 to long-term interests, an entity does not take into account adjustments to their carrying amount required by K-IFRS 1028 (i.e., adjustments to the carrying amount of long-term interests arising from the allocation of losses of the investee or assessment of impairment in accordance with K-IFRS 1028). The amendments apply retrospectively to annual reporting periods beginning on or after January 1, 2019. Earlier application is permitted.

- Annual Improvements to K-IFRS Standards 2015–2017 Cycle

The annual improvements include amendments to four standards, i.e., K-IFRS 1012 Income Taxes, K-IFRS 1023 Borrowing Costs, K-IFRS 1103 Business Combinations and K-IFRS 1111 Joint Arrangements.

1. K-IFRS 1012 Income Taxes
The amendments clarify that an entity should recognize the income tax consequences of dividends in profit or loss, other comprehensive income or equity according to where the entity originally recognized the transactions that generated the distributable profits.
2. K-IFRS 1023 Borrowing Costs
The amendments clarify that if any specific borrowing remains outstanding after the related asset is ready for its intended use or sale, the specific borrowing becomes part of the funds that an entity borrows generally when calculating the capitalization rate on general borrowings.
3. K-IFRS 1103 Business Combinations
The amendments to K-IFRS 1103 clarify that when an entity obtains control of a business that is a joint operation, the entity applies the requirements for a business combination achieved in stages, including remeasuring its previously held interest (“PHI”) in the joint operation at fair value. The PHI to be remeasured includes any unrecognized assets, liabilities and goodwill related to the joint operation.
4. K-IFRS 1111 Joint Arrangements
The amendments to K-IFRS 1111 clarify that when a party that participates in, but does not have joint control of, a joint operation that is a business obtains joint control of such a joint operation, the entity does not remeasure its PHI in the joint operation.

All the amendments are effective for annual periods beginning on or after January 1, 2019, and generally require prospective application. Earlier application is permitted.

- K-IFRS 1019 Employee Benefits Plan Amendment, Curtailment or Settlement (Amendment)

The amendments clarify that the past service cost (or the gain or loss on settlement) is calculated by measuring the defined benefit liability (asset) using updated assumptions and comparing benefits offered and plan assets before and after the plan amendment (or curtailment or settlement), but ignoring the effect of the asset ceiling (that may arise when the defined benefit plan is in a surplus position). K-IFRS 1019 is now clear that the change in the effect of the asset ceiling that may result from the plan amendment (or curtailment or settlement) is determined in the second step and is recognized in the normal manner in other comprehensive income.

The paragraphs that relate to measuring the current service cost and the net interest on the net defined benefit liability (asset) have also been amended. The Company will now be required to use the updated assumptions from this remeasurement to determine current service cost and net interest for the remainder of the reporting period after the change to the plan. In the case of the net interest, the amendments make it clear that for the period post plan amendment, the net interest is calculated by multiplying the net defined benefit liability (asset) as remeasured under paragraph 99 with the discount rate used in the remeasurement (also taking into account the effect of contributions and benefit payments on the net defined benefit liability (asset)).

The amendments are applied prospectively. They apply only to plan amendments, curtailments or settlements that occur on or after the beginning of the annual period in which the amendments to K-IFRS 1019 are first applied. The amendments to K-IFRS 1019 must be applied to annual periods beginning on or after January 1, 2019, but they can be applied earlier if an entity elects to do so.

- K-IFRS 1115 Revenue from Contracts with Customers (Amendment)

This amendment relates to prevent the revision of the meaning of ‘contract’ referred in K-IFRS 1115 paragraph 129.1 to ‘individual contract’ in relation to ‘additional disclosure of contracts based on contract costs incurred to date’ so that, even if application of K-IFRS 1115 is adopted, the range of disclosure has not been reduced. In addition, K-IFRS 1115 does not distinguish the types of contracts for the service contracts that did not qualify for the application of K-IFRS 1011 in paragraph 45.1 can be qualified in K-IFRS 1115 paragraph 129.1 and it is to clarify that the range of the contracts subject to making disclosure in accordance with paragraph 129.1 can be expanded compared to the previous standard. This amendment is effective for annual periods beginning on or after January 1, 2019, and earlier application is permitted.

- K-IFRS 2123 Interpretation Uncertainty over Income Tax Treatments (Enactment)

K-IFRS 2123 interpretation sets out how to determine the accounting tax position when there is uncertainty over income tax treatments. The interpretation requires an entity to:

1. determine whether uncertain tax positions are assessed separately or as a Company and
2. assess whether it is probable that a tax authority will accept an uncertain tax treatment used, or proposed to be used, by an entity in its income tax filings:
 - A. If yes, the entity should determine its accounting tax position consistently with the tax treatment used, or planned to be used, in its income tax filings.
 - B. If no, the entity should reflect the effect of uncertainty in determining its accounting tax position.

The interpretation is effective for annual periods beginning on or after January 1, 2019. The Company can apply the interpretation with either full retrospective application or modified retrospective application without restatement of comparatives retrospectively or prospectively.

The directors of the Company do not anticipate that the application of the amendments in the future will have an impact on the Company’s separate financial statements.

(2) Business combination

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

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

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

Goodwill is measured as the excess of the sum of a) the consideration transferred, b) the amount of any non-controlling interests in the acquiree and c) the fair value of the acquirer’s previously held equity interest in the acquiree (if any) over the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed. If, after reassessment, the net of the acquisition-date amounts of the identifiable assets acquired and liabilities assumed exceed the sum of a) the consideration transferred, b) the amount of any non-controlling interests in the acquiree and c) the fair value of the acquirer’s PHI in the acquiree (if any), the excess is recognized immediately in profit or loss as a bargain purchase gain.

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

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

When a business combination is achieved in stages, the Company's previously held equity interest in the acquiree is remeasured to fair value at the acquisition date (i.e., the date when the Company obtains control) and the resulting gain or loss, if any, is recognized in profit or loss (or, where appropriate, other comprehensive income). Amounts arising from interests in the acquiree prior to the acquisition date that have previously been recognized in other comprehensive income are reclassified as profit or loss where such treatment would be appropriate if that interest was disposed of.

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

(3) Investments in subsidiary, associates and joint ventures

The Company applied the cost method when evaluating the investment on subsidiaries, associates and joint ventures in accordance with K-IFRS 1027, *Consolidated and Separate Financial Statements*. On the other hand, the dividend income from the subsidiaries, associates and joint ventures is recognized in profit or loss when the right to receive the payment is confirmed.

(4) Goodwill

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

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

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

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

(5) Revenue recognition

The Company recognizes revenue from sales of goods, service and construction contracts

1) Sale of goods

The Company recognizes revenue from sale of goods when significant risks and rewards from ownership of goods have been transferred and it retains neither continuing managerial involvement to the degree usually associated with ownership nor effective control over the goods. Therefore, the Company recognizes revenue for the manufactured goods at acceptance and merchandises at delivery. Revenue is recognized by estimating the total amount of returns expected monthly by using the expected return period and the return rate, and based on past experience, in case of a return condition transaction with a low importance of the amount, the entire amount of the sale is recognized as revenue.

At the point of sale, a refund liability and a corresponding adjustment to revenue is recognized for those products expected to be returned. At the same time, the Company has a right to recover the product when customers exercise their right of return and consequently recognizes a right to returned goods asset and a corresponding adjustment to cost of sales; previously, these effects were recognized as warranty provisions.

2) Rendering of service

The Company recognizes revenue from rendering of service using percentage-of-completion method when the outcome of the transaction can be estimated reliably, stage of completion at reporting date can be measured reliably and the costs incurred and the cost to complete the transaction can be measured reliably.

3) Construction contracts

The project that are developed to suit the customer's characteristics are recognized as revenue over time because the assets the Company has created do not have an alternative use to themselves, and they have the right to enforceable payment for performance completed. Therefore, revenue from construction contracts is recognized over time on a cost based input method (i.e., based on the proportion of contract costs incurred for work performed to date relative to the estimated total contract costs). The directors consider that this input method is an appropriate measure of the progress towards complete satisfaction of these performance obligations under K-IFRS 1115.

Where the outcome of a construction contract can be estimated reliably, revenue and costs are recognized by reference to the stage of completion of the contract activity at the end of the reporting period, measured based on the proportion of contract costs incurred for work performed to date relative to the estimated total contract costs, except where this would not be representative of the stage of completion. Variations in contract work, claims and incentive payments are included to the extent that the amount can be measured reliably, and its receipt is considered probable.

Where the outcome of a construction contract cannot be estimated reliably, contract revenue is recognized to the extent of contract costs incurred that are probable to be recovered. Contract costs are recognized as expenses in the period in which they are incurred.

When it is probable that total contract costs will exceed total contract revenue, the expected loss is recognized as an expense immediately.

The amount added from the recognized profit to the accumulated accrued costs exceeding the amount claimed for progress is classified as contract assets, and the amount claimed for progress exceeding the amount added from the recognized profit to the accumulated accrued costs is classified as contract liabilities. Amounts received before the related work is performed are included in the separate statements of financial position, as a liability, as advances received. Amounts billed for work performed, but not yet paid by the customer are included in the separate statements of financial position under trade and other receivables.

(6) Leases

Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

1) The Company as lessor

Amounts due from lessees under finance leases are recognized as receivables at the amount of the Company's net investment in the leases. Finance lease interest income is allocated to accounting periods so as to reflect an effective interest rate on the Company's net investment outstanding in respect of the leases. Rental income from operating leases is recognized on a straight-line basis over the term of the relevant lease. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognized on a straight-line basis over the lease term.

2) The Company as lessee

Assets held under finance leases are initially recognized as assets and liability of the Company at their fair value at the inception of the lease or, if lower, at the present value of the minimum lease payments.

Minimum lease payments are apportioned between the finance charge and the reduction of the outstanding liability. The finance charge is allocated to each period during the lease term so as to produce a constant periodic rate of interest on the remaining balance of the liability. The financial charge, except for the case that it is capitalized as part of the cost of that asset according to the Company's accounting for borrowing costs, is immediately expensed in the period in which it is incurred. Contingent rents are charged as expenses in the periods in which they are incurred.

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

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

(7) Foreign currency translation

In preparation of the Company's separate financial statements, any transaction that occurred in currency other than its functional currency will be recorded in translated amount using the exchange rate of the transaction. At the end of the reporting period, all monetary assets and liabilities will be translated using the exchange rate at the end of the reporting date. Meanwhile, non-monetary assets and liabilities measured at fair value will be retranslated using the exchange rate on the day of fair value evaluation, whereas non-monetary assets and liabilities measured at historical cost will not be translated.

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

- exchange differences on foreign currency borrowings relating to assets under construction for future productive use, which are included in the cost of those assets when they are regarded as an adjustment to interest costs on those foreign currency borrowings, and
- exchange differences on transactions entered into in order to hedge certain foreign currency risks.

(8) Borrowing costs

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

If borrowings are borrowed at variable interest rates to acquire qualifying assets and the borrowings are subject to qualifying cash flow hedges of interest rate risk, the effective portion of the derivative is recognized in other comprehensive income and reclassified to profit or loss when qualifying assets affect the profit or loss. If borrowings are borrowed at fixed interest rates to acquire qualifying assets and the borrowings are subject to fair value hedges of interest rate risk, capitalized borrowing costs reflect the interest rate to be hedged.

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

(9) Government grants

Government grants are recognized when criteria for government grants are complied with and receipt is reasonably assured. If government grants are awarded for acquisition and construction of tangible assets, it is recognized by deducting the grant amount from the asset and is depreciated using a systematic and reasonable method over the useful life of the asset.

Other government grants are recognized as revenue using a systematic standard to match the cost it is intended to reimburse. Government grants that reimburse losses incurred in the prior period or government grants awarded without further costs incurred are recognized in profit or loss of the period in which the rights to that grant arise.

Government grants to cover the cost of training employees are recognized in profit or loss over the period required to respond to the related costs and are deducted from related costs. Government grants relating to the acquisition of property, plant and equipment are recognized in profit or loss over their useful lives, net of the carrying amount of the asset.

(10) Retirement benefit costs and termination benefits

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

For defined retirement benefit plans, the cost of providing benefits is determined using the projected unit credit method, with actuarial valuations being carried out at the end of each reporting period. Remeasurement, comprising actuarial gains and losses, the effect of the changes to the asset ceiling (if applicable) and the return on plan assets (excluding interest), is reflected immediately in the separate statements of financial position, with a charge or credit recognized in other comprehensive income in the period in which they occur. Remeasurement recognized in other comprehensive income is reflected immediately in retained earnings and will not be reclassified to profit or loss. Income is not reclassified. Past service cost is recognized in profit or loss when the plan amendment or curtailment occurs, or when the Company recognizes related restructuring costs or termination benefits, if earlier.

Net interest is calculated by applying a discount rate to the net defined benefit liability or asset. Defined benefit costs are split into three categories as follows:

- Service costs, which includes current service cost, past service cost and gains and losses on curtailments and settlements.
- Net interest expense or income.
- Remeasurements.

Net interest expense or income is recognized within finance costs, and the remeasurement component in other comprehensive income. Curtailment gains and losses are accounted for as past service costs.

The retirement benefit obligation recognized in the separate statements of financial position represents the actual deficit or surplus in the Company's defined benefit plans. Any surplus resulting from this calculation is limited to the present value of any economic benefits available in the form of refunds from the plans or reductions in future contributions to the plans.

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

(11) Current tax payable and deferred tax

Income tax expense consists of current tax and deferred tax.

1) Current tax payable

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

A provision is recognized for those matters for which the tax determination is uncertain, but it is considered probable that there will be a future outflow of funds to a tax authority. The provisions are measured at the best estimate of the amount expected to become payable. The assessment is based on the judgement of tax professionals within the Company, supported by previous experience in respect of such activities and, in certain cases, based on specialist independent tax advice.

2) Deferred tax

Deferred tax is the tax expected to be payable or recoverable on differences between the carrying amounts of assets and liabilities in the separate financial statements and the corresponding tax bases used in the computation of taxable profit, and is accounted for using the liability method. Deferred tax liabilities are generally recognized for all taxable temporary differences. Deferred tax assets are generally recognized for all deductible temporary differences to the extent it is probable that taxable profits will be available against which those deductible temporary differences can be utilized. Such deferred tax assets and liabilities are not recognized if the temporary difference arises from goodwill or from the initial recognition (other than in a business combination) of other assets and liabilities in a transaction that affects neither the taxable profit nor the accounting profit.

The Company recognizes a deferred tax liability for all taxable temporary differences associated with investments in subsidiaries, branches and associates and interests in joint arrangements, except to the extent that the Company 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. A deferred tax asset for all deductible temporary differences arising from above-mentioned investments is recognized to the extent, and only to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized. The carrying amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent it is no longer probable that sufficient taxable profits will be available to allow all or part of the asset to be recovered.

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

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

For the purpose of measuring deferred tax liabilities and deferred tax assets for investment properties that are measured using the fair value model, the carrying amounts of such properties are presumed to be recovered entirely through sale, unless the presumption is rebutted. The presumption is rebutted when the investment property is depreciable and is held within a business model whose objective is to consume substantially all of the economic benefits embodied in the investment properties over time, rather than through sale.

3) Recognition of current tax payable and deferred tax

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

(12) Property, plant and equipment

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

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

The Company does not depreciate land and some tangible assets, and depreciation is computed using the straight-line method based on the estimated useful lives of the assets as follows:

	<u>Estimated useful lives (years)</u>
Buildings	25–40
Structures	40
Machinery	4
Vehicles	4–10
Tools and equipment	4
Furniture and fixtures	3–25
Other property	3–20

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

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

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected to arise from the continued use of the assets. Any gain or loss arising from the disposal or retirement of an item of property, plant and equipment is determined as the difference between sales proceeds and the carrying amount of the asset and is recognized in profit or loss.

(13) Investment property

Investment property held to earn rentals and/or for capital appreciation (including property under construction for such purposes) is measured initially at its cost, including transaction costs. Subsequent to initial recognition, investment property is measured at acquisition cost, less accumulated depreciation and accumulated impairment losses.

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

Among the investment properties, land is not depreciated. However, investment properties other than land are depreciated more than 25 to 40 years of their useful lives using the straight-line method.

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

(14) Intangible assets

1) Intangible assets acquired separately

Intangible assets with finite useful lives that are acquired separately are carried at cost, less accumulated amortization and accumulated impairment losses. Amortization is recognized on a straight-line basis over their estimated useful lives. Intangible assets acquired separately compose of development costs, industrial property, software, membership, etc. They are amortized using the straight-line method more than 5 to 10 years, with no residual value.

In relation to intangible assets with definite useful lives, the estimated useful life and amortization method are reviewed at the end of each annual reporting period, with the effect of any changes in estimate being accounted for as change in accounting estimates.

2) Internally generated intangible assets - research and development expenditure

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

An internally generated intangible asset arising from development (or from the development phase of an internal project) is recognized if, and only if, all of the following have been demonstrated:

- The technical feasibility of completing the intangible asset so that it will be available for use or sale.
- The intention to complete the intangible asset and use or sell it.
- The ability to use or sell the intangible asset.
- How the intangible asset will generate probable future economic benefits.
- The availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset.
- The ability to measure reliably the expenditure attributable to the intangible asset during its development.

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

Subsequent to initial recognition, internally generated intangible assets are reported at cost, less accumulated amortization and accumulated impairment losses, on the same basis as intangible assets that are acquired separately.

3) Intangible assets acquired in a business combination

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

4) Derecognition of intangible assets

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

5) Patents and trademarks

Patents and trademarks are measured initially at purchase cost and are amortized on a straight-line basis over their estimated useful lives.

(15) Impairment of tangible and intangible assets other than goodwill

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

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

Recoverable amount is the higher of fair value, less costs to sell, or value in use. In assessing value in use, the estimated future cash flows are discounted to their present value using a pretax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset (or a cash-generating unit) is estimated to be less than its carrying amount, the carrying amount of the asset (or the cash-generating unit) is reduced to its recoverable amount. An impairment loss is recognized immediately in profit or loss, unless the relevant asset is carried at a revalued amount, in which case the impairment loss is treated as a revaluation decrease. Where an impairment loss subsequently reverses, the carrying amount of the asset (or a cash-generating unit) is increased to the revised estimate of its recoverable amount so that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset (or the cash-generating unit) in prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

(16) Inventories

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

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

(17) Provisions

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

The amount recognized as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. When a provision is measured using the cash flows estimated to settle the present obligation, its carrying amount is the present value of those cash flows (where the effect of the time value of money is material).

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

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

1) Onerous contracts

Present obligations arising under onerous contracts are recognized and measured as provisions. An onerous contract is considered to exist where the Company has a contract under which the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received from the contract.

2) Restructuring

A restructuring provision is recognized when the Company has developed a detailed formal plan for the restructuring and has raised a valid expectation in those affected that it will carry out the restructuring by starting to implement the plan or announcing its main features to those affected by it. The measurement of a restructuring provision includes only the direct expenditures arising from the restructuring, which are those amounts that are both necessarily entailed by the restructuring and not associated with the ongoing activities of the entity.

3) Warranties

Provisions for the expected cost of warranty obligations under local sale of goods legislation are recognized at the date of sale of the relevant products, at the directors' best estimate of the expenditure required to settle the Company's obligation.

4) Contingent liabilities acquired in a business combination

Contingent liabilities acquired in a business combination are initially measured at fair value at the acquisition date. At the end of subsequent reporting periods, such contingent liabilities are measured at the higher of the amount that would be recognized in accordance with K-IFRS 1037 or the amount recognized initially, less cumulative amount of income recognized in accordance with the principles of K-IFRS 1115.

(18) Financial instruments

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

(19) Financial assets

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

All recognized financial assets are measured subsequently in their entirety at either amortized cost or fair value, depending on the classification of the financial assets.

1) Classification of financial assets

Debt instruments that meet the following conditions are measured subsequently at amortized cost:

- The financial asset is held within a business model whose objective is to hold financial assets in order to collect contractual cash flows.
- The contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

Debt instruments that meet the following conditions are measured subsequently at FVTOCI:

- The financial asset is held within a business model whose objective is achieved by both collecting contractual cash flows and selling the financial assets.
- The contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

By default, all other financial assets are measured subsequently at FVTPL.

Despite the foregoing, the Company may make the following irrevocable election / designation at initial recognition of a financial asset:

- The Company may irrevocably elect to present subsequent changes in fair value of an equity investment in other comprehensive income if certain criteria are met (see (1-3) below).
- The Company may irrevocably designate a debt investment that meets the amortized cost or FVTOCI criteria as measured at FVTPL if doing so eliminates or significantly reduces an accounting mismatch (see (1-4) below).

1-1) Amortized cost and effective interest method

The effective interest method is a method of calculating the amortized cost of a debt instrument and allocating interest income over the relevant period. For financial assets other than purchased or originated credit-impaired financial assets (i.e., assets that are credit impaired on initial recognition), the effective interest rate is the rate that exactly discounts estimated future cash receipts (including all fees and points paid or received that form an integral part of the effective interest rate, transaction costs and other premiums or discounts), excluding ECLs, through the expected life of the debt instrument, or, where appropriate, a shorter period, to the gross carrying amount of the debt instrument on initial recognition. For purchased or originated credit-impaired financial assets, a credit-adjusted effective interest rate is calculated by discounting the estimated future cash flows, including ECLs, to the amortized cost of the debt instrument on initial recognition.

The amortized cost of a financial asset is the amount at which the financial asset is measured at initial recognition, minus the principal repayments, plus the cumulative amortization using the effective interest method of any difference between that initial amount and the maturity amount, adjusted for any loss allowance. The gross carrying amount of a financial asset is the amortized cost of a financial asset before adjusting for any loss allowance.

Interest income is recognized using the effective interest method for debt instruments measured subsequently at amortized cost and at FVTOCI. For financial assets other than purchased or originated credit-impaired financial assets, interest income is calculated by applying the effective interest rate to the gross carrying amount of a financial asset, except for financial assets that have subsequently become credit impaired (see below). For financial assets that have subsequently become credit impaired, interest income is recognized by applying the effective interest rate to the amortized cost of the financial asset. If, in subsequent reporting periods, the credit risk

on the credit-impaired financial instrument improves so that the financial asset is no longer credit impaired, interest income is recognized by applying the effective interest rate to the gross carrying amount of the financial asset.

For purchased or originated credit-impaired financial assets, the Company recognizes interest income by applying the credit-adjusted effective interest rate to the amortized cost of the financial asset from initial recognition. The calculation does not revert to the gross basis even if the credit risk of the financial asset subsequently improves so that the financial asset is no longer credit impaired.

Interest income is recognized in profit or loss and is included in the "finance income - interest income" line item (see Note 26).

1-2) Debt instruments classified as at FVTOCI

The corporate bonds held by the Company are classified as at FVTOCI. Fair value is determined in the manner described in Note 34. The corporate bonds are initially measured at fair value, plus transaction costs. Subsequently, changes in the carrying amount of these corporate bonds as a result of foreign exchange gains and losses, impairment gains or losses and interest income calculated using the effective interest method are recognized in profit or loss. The amounts that are recognized in profit or loss are the same as the amounts that would have been recognized in profit or loss if these corporate bonds had been measured at amortized cost. All other changes in the carrying amount of these corporate bonds are recognized in other comprehensive income and accumulated under the heading of investments revaluation reserve. When these corporate bonds are derecognized, the cumulative gains or losses previously recognized in other comprehensive income are reclassified to profit or loss.

1-3) Equity instruments designated as at FVTOCI

On initial recognition, the Company may make an irrevocable election (on an instrument-by-instrument basis) to designate investments in equity instruments as at FVTOCI. Designation at FVTOCI is not permitted if the equity investment is held for trading or if it is contingent consideration recognized by an acquirer in a business combination.

A financial asset is held for trading if:

- It has been acquired principally for the purpose of selling it in the near term
- On initial recognition, it is part of a portfolio of identified financial instruments that the Company manages together and has evidence of a recent actual pattern of short-term profit taking
- It is a derivative (except for a derivative that is a financial guarantee contract or a designated and effective hedging instrument).

Investments in equity instruments at FVTOCI are initially measured at fair value plus transaction costs. Subsequently, they are measured at fair value with gains and losses arising from changes in fair value recognized in other comprehensive income and accumulated in the investments' revaluation reserve. The cumulative gain or loss is not reclassified to profit or loss on disposal of the equity investments, instead, it is transferred to retained earnings.

Dividends on these investments in equity instruments are recognized in profit or loss in accordance with K-IFRS 1109, unless the dividends clearly represent a recovery of part of the cost of the investment. Dividends are included in the 'operating income' line item (Note 26) in profit or loss.

1-4) Financial assets at FVTPL

Financial assets that do not meet the criteria for being measured at amortized cost or FVTOCI are measured at FVTPL. Specifically:

- Investments in equity instruments are classified as at FVTPL, unless the Company designates an equity investment that is neither held for trading nor a contingent consideration arising from a business combination as at FVTOCI on initial recognition (see (1-3) above).

- Debt instruments that do not meet the amortized cost criteria or the FVTOCI criteria (see (1-1) and (1-2) above) are classified as at FVTPL. In addition, debt instruments that meet either the amortized cost criteria or the FVTOCI criteria may be designated as at FVTPL upon initial recognition if such designation eliminates or significantly reduces a measurement or recognition inconsistency (so called ‘accounting mismatch’) that would arise from measuring assets or liabilities or recognizing the gains and losses on them on different bases. The Company has not designated any debt instruments as at FVTPL.

Financial assets at FVTPL are measured at fair value at the end of each reporting period, with any fair value gains or losses recognized in profit or loss to the extent they are not part of a designated hedging relationship (see hedge accounting policy). The net gain or loss recognized in profit or loss includes any dividend earned on the financial asset and is included in the ‘operating income’ line item (Note 27). Meanwhile, interest income on financial assets at FVTPL is included in ‘financial income - other’ (Note 34). Fair value is determined in the manner described in Note 26.

2) Foreign exchange gains and losses

The carrying amount of financial assets that are denominated in a foreign currency is determined in that foreign currency and translated at the spot rate at the end of each reporting period. Specifically;

- For financial assets measured at amortized cost that are not part of a designated hedging relationship, exchange differences are recognized in profit or loss in the ‘other gains and losses’ line item (Note 27).
- For debt instruments measured at FVTOCI that are not part of a designated hedging relationship, exchange differences on the amortized cost of the debt instrument are recognized in profit or loss in the ‘other gains and losses’ line item (Note 27). Other exchange differences are recognized in other comprehensive income in the investments’ revaluation reserve.
- For financial assets measured at FVTPL that are not part of a designated hedging relationship, exchange differences are recognized in profit or loss in the ‘other gains and losses’ line item (Note 27).
- For equity instruments measured at FVTOCI, exchange differences are recognized in other comprehensive income in the investments’ revaluation reserve.

3) Impairment of financial assets

The Company recognizes a loss allowance for ECLs on investments in debt instruments that are measured at amortized cost or at FVTOCI, lease receivables, trade receivables and contract assets, as well as on financial guarantee contracts. The amount of ECLs is updated at each reporting date to reflect changes in credit risk since initial recognition of the respective financial instrument.

The Company always recognizes lifetime ECL for trade receivables, contract assets and lease receivables. The ECLs on these financial assets are estimated using a provision matrix based on the Company’s historical credit loss experience, adjusted for factors that are specific to the debtors, general economic conditions and an assessment of both the current as well as the forecast direction of conditions at the reporting date, including time value of money where appropriate.

For all other financial instruments, the Company recognizes lifetime ECL when there has been a significant increase in credit risk since initial recognition. However, if the credit risk on the financial instrument has not increased significantly since initial recognition, the Company measures the loss allowance for that financial instrument at an amount equal to 12-month ECL.

Lifetime ECL represents the ECLs that will result from all possible default events over the expected life of a financial instrument. In contrast, 12-month ECL represents the portion of lifetime ECL that is expected to result from default events on a financial instrument that are possible within 12 months after the reporting date.

3-1) Significant increase in credit risk

In assessing whether the credit risk on a financial instrument has increased significantly since initial recognition, the Company compares the risk of a default occurring on the financial instrument at the reporting date with the risk of a default occurring on the financial instrument at the date of initial recognition. In making this assessment, the Company considers both quantitative and qualitative information that is reasonable and supportable, including

historical experience and forward-looking information that is available without undue cost or effort. Forward-looking information considered includes the future prospects of the industries in which the Company's debtors operate, obtained from economic expert reports, financial analysts, governmental bodies, relevant think-tanks and other similar organizations, as well as consideration of various external sources of actual and forecast economic information that relate to the Company's core operations.

In particular, the following information is taken into account when assessing whether credit risk has increased significantly since initial recognition:

- An actual or expected significant deterioration in the financial instrument's external (if available) or internal credit rating
- Significant deterioration in external market indicators of credit risk for a particular financial instrument, e.g., a significant increase in the credit spread, the credit default swap prices for the debtor, or the length of time or the extent to which the fair value of a financial asset has been less than its amortized cost
- An actual or expected significant deterioration in the operating results of the debtor
- Significant increases in credit risk on other financial instruments of the same debtor
- An actual or expected significant adverse change in the regulatory, economic, or technological environment of the debtor that results in a significant decrease in the debtor's ability to meet its debt obligations

Irrespective of the outcome of the assessment above, the Company presumes that the credit risk on a financial asset has increased significantly since initial recognition when contractual payments are more than 30 days past due, unless the Company has reasonable and supportable information that demonstrates otherwise.

Despite the aforementioned, the Company assumes that the credit risk on a financial instrument has not increased significantly since initial recognition if the financial instrument is determined to have low credit risk at the reporting date. A financial instrument is determined to have low credit risk if:

- (1) The financial instrument has a low risk of default.
- (2) The debtor has a strong capacity to meet its contractual cash flow obligations in the near term.
- (3) Adverse changes in economic and business conditions in the longer term may, but will not necessarily, reduce the ability of the borrower to fulfil its contractual cash flow obligations.

The Company considers a financial asset to have low credit risk when the asset has external credit rating of 'investment grade' in accordance with the globally understood definition or if an external rating is not available, the asset has an internal rating of 'performing.' Performing means that the counterparty has a strong financial position and there are no past-due amounts.

For financial guarantee contracts, the date that the Company becomes a party to the irrevocable commitment is considered to be the date of initial recognition for the purposes of assessing the financial instrument for impairment. In assessing whether there has been a significant increase in the credit risk since initial recognition of a financial guarantee contract, the Company considers the changes in the risk that the specified debtor will default on the contract.

The Company regularly monitors the effectiveness of the criteria used to identify whether there has been a significant increase in credit risk and revises them as appropriate to ensure that the criteria are capable of identifying significant increase in credit risk before the amount becomes past due.

3-2) Definition of default

The Company considers the following as constituting an event of default for internal credit risk management purposes as historical experience indicates that the financial assets that meet either of the following criteria are generally not recoverable:

- When there is a breach of financial covenants by the debtor
- Information developed internally or obtained from external sources indicates that the debtor is unlikely to pay its creditors, including the Company, in full (without taking into account any collateral held by the Company)

Irrespective of the analysis above, the Company considers that default has occurred when a financial asset is more than 90 days past due, unless the Company has reasonable and supportable information to demonstrate that a more lagging default criterion is more appropriate.

3-3) Credit-impaired financial assets

A financial asset is credit impaired when one or more events that have a detrimental impact on the estimated future cash flows of that financial asset have occurred. Evidence that a financial asset is credit impaired includes observable data about the following events:

- (a) Significant financial difficulty of the issuer or the borrower
- (b) A breach of contract, such as a default or a past-due event (see (3-2) above)
- (c) The lender(s) of the borrower, for economic or contractual reasons related to the borrower's financial difficulty, having granted to the borrower a concession(s) that the lender(s) would not otherwise consider
- (d) It is becoming probable that the borrower will enter bankruptcy or other financial reorganization
- (e) The disappearance of an active market for that financial asset because of financial difficulties

3-4) Write-off policy

The Company writes off a financial asset when there is information indicating that the debtor is in severe financial difficulty and there is no realistic prospect of recovery, e.g., when the debtor has been placed under liquidation or has entered into bankruptcy proceedings, or in the case of trade receivables, when the amounts are over two years past due, whichever occurs sooner. Financial assets written off may still be subject to enforcement activities under the Company's recovery procedures, taking into account legal advice where appropriate. Any recoveries made are recognized in profit or loss.

3-5) Measurement and recognition of ECLs

The measurement of ECLs is a function of the probability of default, loss given default (i.e., the magnitude of the loss if there is a default) and the exposure at default. The assessment of the probability of default and loss given default is based on historical data adjusted by forward-looking information as described above. As for the exposure at default, for financial assets, this is represented by the assets' gross carrying amount at the reporting date; for financial guarantee contracts, the exposure includes the amount drawn down as at the reporting date, together with any additional amounts expected to be drawn down in the future by default date determined based on historical trend, the Company's understanding of the specific future financing needs of the debtors, and other relevant forward-looking information.

For financial assets, the ECL is estimated as the difference between all contractual cash flows that are due to the Company in accordance with the contract and all the cash flows that the Company expects to receive, discounted at the original effective interest rate. For a lease receivable, the cash flows used for determining the ECLs are consistent with the cash flows used in measuring the lease receivable in accordance with K-IFRS 1017 Leases. For a financial guarantee contract, as the Company is required to make payments only in the event of a default by the debtor in accordance with the terms of the instrument that is guaranteed, the expected loss allowance is the expected payment to reimburse the holder for a credit loss that it incurs, less any amounts that the Company expects to receive from the holder, the debtor or any other party.

If the Company has measured the loss allowance for a financial instrument at an amount equal to lifetime ECL in the previous reporting period but determines at the current reporting date that the conditions for lifetime ECL are no longer met, the Company measures the loss allowance at an amount equal to 12-month ECL at the current reporting date, except for assets for which simplified approach was used.

The Company recognizes an impairment gain or loss in profit or loss for all financial instruments with a corresponding adjustment to their carrying amount through a loss allowance account, except for investments in debt instruments that are measured at FVTOCI, for which the loss allowance is recognized in other comprehensive income and accumulated in the investments' revaluation reserve, and does not reduce the carrying amount of the financial asset in the separate statements of financial position.

4) Derecognition of financial assets

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

On derecognition of a financial asset measured at amortized cost, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss. In addition, on derecognition of an investment in a debt instrument classified as at FVTOCI, the cumulative gain or loss previously accumulated in the investments' revaluation reserve is reclassified to profit or loss. In contrast, on derecognition of an investment in equity instrument which the Company has elected on initial recognition to measure at FVTOCI, the cumulative gain or loss previously accumulated in the investments' revaluation reserve is not reclassified to profit or loss, but is transferred to retained earnings.

(20) Financial liabilities and equity instruments

1) Classification as debt or equity

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

2) Equity instruments

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

Repurchase of the Company's own equity instruments is recognized and deducted directly from equity. No gain or loss is recognized in profit or loss on the purchase, sale, issue or cancellation of the Company's own equity instruments.

3) Financial liabilities

All financial liabilities are measured subsequently at amortized cost using the effective interest method or at FVTPL.

However, financial liabilities that arise when a transfer of a financial asset does not qualify for derecognition or when the continuing involvement approach applies, and financial guarantee contracts issued by the Company, are measured in accordance with the specific accounting policies set out below.

4) Financial liabilities at FVTPL

Financial liabilities are classified as at FVTPL when the financial liability is (i) contingent consideration of an acquirer in a business combination, (ii) held for trading or (iii) it is designated as at FVTPL.

A financial liability is classified as held for trading if:

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

A financial liability other than a financial liability held for trading or contingent consideration of an acquirer in a business combination may be designated as at FVTPL upon initial recognition if:

- Such designation eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise
- The financial liability forms part of a group of financial assets or financial liabilities or both, which is managed and its performance is evaluated on a fair value basis, in accordance with the Company's documented risk management or investment strategy, and information about the grouping is provided internally on that basis
- It forms part of a contract containing one or more embedded derivatives, and K-IFRS 1109 permits the entire combined contract to be designated as at FVTPL

Financial liabilities at FVTPL are measured at fair value, with any gains or losses arising on changes in fair value recognized in profit or loss to the extent that they are not part of a designated hedging relationship (see hedge accounting policy). The net gain or loss recognized in profit or loss incorporates any interest paid on the financial liability and is included in the 'other gains and losses' line item (see note 27) in profit or loss.

However, for financial liabilities that are designated as at FVTPL, the amount of change in the fair value of the financial liability that is attributable to changes in the credit risk of that liability is recognized in other comprehensive income, unless the recognition of the effects of changes in the liability's credit risk in other comprehensive income would create or enlarge an accounting mismatch in profit or loss. The remaining amount of change in the fair value of liability is recognized in profit or loss. Changes in fair value attributable to a financial liability's credit risk that are recognized in other comprehensive income are not subsequently reclassified to profit or loss; instead, they are transferred to retained earnings upon derecognition of the financial liability.

Gains or losses on financial guarantee contracts issued by the Company that are designated by the Company as at FVTPL are recognized in profit or loss.

Fair value is determined in the manner described in Note 34.

5) Financial liabilities measured subsequently at amortized cost

Financial liabilities that are not (i) contingent consideration of an acquirer in a business combination, (ii) held for trading, or (iii) designated as at FVTPL, are measured subsequently at amortized cost using the effective interest method.

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

6) Financial guarantee contracts

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

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

- The amount of the obligation under the contract, as determined in accordance with K-IFRS 1037
- The amount initially recognized, less cumulative amortization recognized in accordance with the K-IFRS 1018, *Revenue*

7) Foreign exchange gains and losses

For financial liabilities that are denominated in a foreign currency and are measured at amortized cost at the end of each reporting period, the foreign exchange gains and losses are determined based on the amortized cost of the instruments. These foreign exchange gains and losses are recognized in the 'other gains and losses' line item in profit or loss (see Note 27) for financial liabilities that are not part of a designated hedging relationship. For those which are designated as a hedging instrument for a hedge of foreign currency risk, foreign exchange gains and losses are recognized in other comprehensive income and accumulated in a separate component of equity.

The fair value of financial liabilities denominated in a foreign currency is determined in that foreign currency and translated at the spot rate at the end of the reporting period. For financial liabilities that are measured as at FVTPL, the foreign exchange component forms part of the fair value gains or losses and is recognized in profit or loss for financial liabilities that are not part of a designated hedging relationship.

8) Derecognition of financial liabilities

The Company derecognizes financial liabilities when, and only when, the Company's obligations are discharged, cancelled or have expired. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable is recognized in profit or loss.

When the Company exchanges with the existing lender one debt instrument into another one with the substantially different terms, such exchange is accounted for as an extinguishment of the original financial liability and the recognition of a new financial liability. Similarly, the Company accounts for substantial modification of terms of an existing liability or part of it as an extinguishment of the original financial liability and the recognition of a new liability. It is assumed that the terms are substantially different if the discounted present value of the cash flows under the new terms, including any fees paid net of any fees received and discounted using the original effective rate, is at least 10 percent different from the discounted present value of the remaining cash flows of the original financial liability. If the modification is not substantial, the difference between: (1) the carrying amount of the liability before the modification and (2) the present value of the cash flows after modification should be recognized in profit or loss as the modification gain or loss within other gains and losses.

(21) Derivative financial instruments

The Company enters into a variety of derivative financial instruments to manage its exposure to interest rate and foreign exchange rate risks, including foreign exchange forward contracts, options and interest rate swaps.

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

A derivative with a positive fair value is recognized as a financial asset; a derivative with a negative fair value is recognized as a financial liability. Derivatives are not offset in the financial statements unless the Company has both legal right and intention to offset. The impact of the master netting agreements on the Company's financial position is disclosed in Note 34. A derivative is presented as a non-current asset or a non-current liability if the remaining maturity of the instrument is more than 12 months and it is not expected to be realized or settled within 12 months. Other derivatives are presented as current assets or current liabilities.

1) Embedded derivatives

An embedded derivative is a component of a hybrid contract that also includes a non-derivative host — with the effect that some of the cash flows of the combined instrument vary in a way similar to a stand-alone derivative.

Derivatives embedded in hybrid contracts with a financial asset host within the scope of K-IFRS 1109 are not separated. The entire hybrid contract is classified and subsequently measured as either amortized cost or fair value as appropriate.

Derivatives embedded in hybrid contracts with hosts that are not financial assets within the scope of K-IFRS 1109 (e.g., financial liabilities) are treated as separate derivatives when they meet the definition of a derivative, their risks and characteristics are not closely related to those of the host contracts and the host contracts are not measured at FVTPL.

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

2) Hedge accounting

The Company designates certain derivatives as hedging instruments in respect of foreign currency risk and interest rate risk in fair value hedges, cash flow hedges, or hedges of net investments in foreign operations. Hedges of foreign exchange risk on firm commitments are accounted for as cash flow hedges.

At the inception of the hedge relationship, the Company documents the relationship between the hedging instrument and the hedged item, along with its risk management objectives and its strategy for undertaking various hedge transactions. Furthermore, at the inception of the hedge and on an ongoing basis, the Company documents whether the hedging instrument is effective in offsetting changes in fair values or cash flows of the hedged item attributable to the hedged risk, which is when the hedging relationships meet all of the following hedge effectiveness requirements:

- There is an economic relationship between the hedged item and the hedging instrument
- The effect of credit risk does not dominate the value changes that result from that economic relationship
- The hedge ratio of the hedging relationship is the same as that resulting from the quantity of the hedged item that the Company actually hedges and the quantity of the hedging instrument that the Company actually uses to hedge that quantity of hedged item

If a hedging relationship ceases to meet the hedge effectiveness requirement related to the hedge ratio but the risk management objective for that designated hedging relationship remains the same, the Company adjusts the hedge ratio of the hedging relationship (i.e., rebalances the hedge) so that it meets the qualifying criteria again.

The Company designates the full change in the fair value of a forward contract (i.e., including the forward elements) as the hedging instrument for all of its hedging relationships involving forward contracts.

The Company designates only the intrinsic value of option contracts as a hedged item, i.e., excluding the time value of the option. The changes in the fair value of the aligned time value of the option are recognized in other comprehensive income and accumulated in the cost of hedging reserve. If the hedged item is transaction related, the time value is reclassified to profit or loss when the hedged item affects profit or loss. If the hedged item is time-period related, then the amount accumulated in the cost of hedging reserve is reclassified to profit or loss on a rational basis — the Company applies straight-line amortization method. Those reclassified amounts are recognized in profit or loss in the same line as the hedged item. If the hedged item is a non-financial item, then the amount accumulated in the cost of hedging reserve is removed directly from equity and included in the initial carrying amount of the recognized non-financial item. Furthermore, if the Company expects that some or all of the loss accumulated in cost of hedging reserve will not be recovered in the future, that amount is immediately reclassified to profit or loss.

Note 34 sets out details of the fair values of the derivative instruments used for hedging purposes.

Movements in the hedging reserve in equity are detailed in Note 37.

3) Fair value hedges

The fair value change on qualifying hedging instruments is recognized in profit or loss, except when the hedging instrument hedges an equity instrument designated at FVTOCI, in which case, it is recognized in other comprehensive income.

The carrying amount of a hedged item not already measured at fair value is adjusted for the fair value change attributable to the hedged risk with a corresponding entry in profit or loss. For debt instruments measured at FVTOCI, the carrying amount is not adjusted as it is already at fair value, but the hedging gain or loss is recognized in profit or loss instead of other comprehensive income. When the hedged item is an equity instrument designated at FVTOCI, the hedging gain or loss remains in other comprehensive income to match that of the hedging instrument.

Where hedging gains or losses are recognized in profit or loss, they are recognized in the same line as the hedged item.

The Company discontinues hedge accounting only when the hedging relationship (or a part thereof) ceases to meet the qualifying criteria (after rebalancing, if applicable). This includes instances when the hedging instrument expires or is sold, terminated or exercised. The discontinuation is accounted for prospectively. The fair value adjustment to the carrying amount of the hedged item arising from the hedged risk is amortized to profit or loss from that date.

4) Cash flow hedges

The effective portion of changes in the fair value of derivatives and other qualifying hedging instruments that are designated and qualify as cash flow hedges is recognized in other comprehensive income and accumulated under the heading of cash flow hedging reserve, limited to the cumulative change in fair value of the hedged item from inception of the hedge. The gain or loss related to the ineffective portion is recognized immediately in profit or loss and is included in the 'other gains and losses' line item.

Amounts previously recognized in other comprehensive income and accumulated in equity are reclassified to profit or loss in the periods when the hedged item affects profit or loss, in the same line as the recognized hedged item. However, when the hedged forecast transaction results in the recognition of a non-financial asset or a non-financial liability, the gains and losses previously recognized in other comprehensive income and accumulated in equity are removed from equity and included in the initial measurement of the cost of the non-financial asset or non-financial liability. This transfer does not affect other comprehensive income. Furthermore, if the Company expects that some or all of the loss accumulated in the cash flow hedging reserve will not be recovered in the future, that amount is immediately reclassified to profit or loss.

The Company discontinues hedge accounting only when the hedging relationship (or a part thereof) ceases to meet the qualifying criteria (after rebalancing, if applicable). This includes instances when the hedging instrument expires or is sold, terminated or exercised. The discontinuation is accounted for prospectively. Any gain or loss recognized in other comprehensive income and accumulated in cash flow hedge reserve at that time remains in equity and is reclassified to profit or loss when the forecast transaction occurs. When a forecast transaction is no longer expected to occur, the gain or loss accumulated in cash flow hedge reserve is reclassified immediately to profit or loss.

5) Hedges of net investments in foreign operations

Hedges of net investments in foreign operations are accounted for similarly to cash flow hedges. Any gain or loss on the foreign currency forward contracts related to the effective portion of the hedge is recognized in other comprehensive income and accumulated in the foreign currency translation reserve. The gain or loss related to the ineffective portion is recognized immediately in profit or loss and is included in the 'other gains and losses' line item.

Gains and losses on the hedging instrument accumulated in the foreign currency translation reserve are reclassified to profit or loss on the disposal or partial disposal of the foreign operation.

3. **CRITICAL ACCOUNTING JUDGMENTS AND KEY SOURCES OF ESTIMATION UNCERTAINTY:**

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

Estimation and assumptions are continuously reviewed. Effects of changes in accounting estimates are recognized during the period of changes made only in case that those changes affect a corresponding period. Effects of changes are recognized during both current and future periods and, in such case, those changes affect both periods.

(1) Uncertainty on the estimation of the total construction revenue

Total contract revenue is measured based on the contract amount initially agreed upon but can be increased or decreased as the terms of the contract change in the course of performing the contract, so measurement of contract revenue is subject to various uncertainties related to the outcome of future events. The Company includes in the contract revenue when it is likely that the customer will approve a change in the amount of revenue due to a change in the terms of the contract or when the Company is more likely to meet its performance criteria and can measure the amount more reliably.

(2) Estimation of the total construction cost

The amount due from the customer is affected by the percentage of completion, which is estimated by reference to the total cost incurred, and the total contract cost is estimated by reference to the expected future figures, such as the material costs, the labor costs, the contract period, etc. The Company periodically reviews any changes of estimated total contract cost and reflects such changes when it calculates current progress rate at the end of reporting period.

4. **OPERATING SEGMENTS:**

The Company reports segment information based on K-IFRS 1108, *Operating Segments*. The information for the entity level is as follows (Unit: Korean won in thousands):

(1) Sales

Inventory sold or services rendered	December 31, 2018		December 31, 2017	
Merchandise	₩	618,554,336	₩	388,670,132
Service		1,015,176,475		944,963,553
Construction		1,194,843,262		1,055,018,262
Total	₩	2,828,574,073	₩	2,388,651,947

(2) Information about the region.

Our sales are all generated and all of the non-current assets are located within the country (Republic of Korea).

(3) Information on major customers

Customer sales, which account for more than 10% of sales as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	December 31, 2018		December 31, 2017	
LG Electronics Inc. (*)	₩	568,795,020	₩	534,130,872
LG Uplus Co., Ltd. (*)		359,113,610		261,612,655
LG Chem Ltd. (*)		331,705,269		217,273,605

(*) Includes the transaction history of subsidiaries.

5. CLASSIFICATION OF FINANCIAL INSTRUMENTS AND FAIR VALUE:

(1) The carrying amount and the fair value of financial assets and liabilities as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

1) Financial assets

Financial assets	Account	December 31, 2018		December 31, 2017	
		Carrying amount	Fair value	Carrying amount	Fair value
Cash and cash equivalents	Cash and cash equivalents	₩ 392,006,720	₩ 392,006,720	₩180,326,415	₩180,326,415
Financial assets at FVTPL	Derivative assets for trading	928,051	928,051	1,715,664	1,715,664
	Investment (*1)	7,935,198	7,935,198	-	-
	Government bonds	1,030	1,030	-	-
	Subtotal	8,864,279	8,864,279	1,715,664	1,715,664
Financial assets at FVTOCI	Marketable equity securities	1,936,400	1,936,400	1,944,773	1,944,773
	Unmarketable equity securities (*)	2,399,646	2,399,646	21,754,800	21,754,800
	Subtotal	4,336,046	4,336,046	23,699,573	23,699,573
Financial assets at amortized cost	Financial institution deposits	12,500,000	12,500,000	22,500,000	22,500,000
	Trade receivables	792,636,078	792,636,078	663,219,887	663,219,887
	Loans	11,489,414	11,489,414	10,193,096	10,193,096
	Other accounts receivable	16,081,603	16,081,603	11,156,248	11,156,248
	Accrued income	654,819	654,819	174,678	174,678
	Deposits	6,243,980	6,243,980	17,909,304	17,909,304
	Subtotal	839,605,894	839,605,894	725,153,213	725,153,213
	Total	₩1,244,812,939	₩1,244,812,939	₩930,894,865	₩930,894,865

(*1) As explained in Note 2, the equity securities classified as non-marketable at the end of the prior year are classified as financial assets at FVTPL as those are puttable financial instruments in accordance with K-IFRS 1109.

(*2) For equity instruments held for strategic investments other than trading securities, the Company has applied the irrevocable option designated as other comprehensive income - fair value measurement at the date of initial application. Recognizing short-term changes in the fair value of these equity instruments to profit or loss is considered to be inconsistent with the Company's strategy of holding these equity instruments for long-term purposes and realizing potential results over time.

2) Financial liabilities

Financial liabilities	Account	December 31, 2018		December 31, 2017	
		Carrying amount	Fair value	Carrying amount	Fair value
Financial liabilities at FVTPL	Derivative liabilities for trading	₩ 180,750	₩ 180,750	₩ 1,835,613	₩ 1,835,613
Financial liabilities at amortized cost	Trade payables	356,537,879	356,537,879	310,283,177	310,283,177
	Other accounts payable	24,923,401	24,923,401	75,111,832	75,111,832
	Accrued expenses	98,303,238	98,303,238	70,680,108	70,680,108
	Dividend payables	749	749	494	494
	Deposits received	1,052,873	1,052,873	1,834,064	1,834,064
	Long-term borrowings	518,863,575	521,374,578	449,124,837	444,392,477
	Subtotal	999,681,715	1,002,192,718	907,034,512	902,302,152
	Total	₩999,862,465	₩1,002,373,468	₩908,870,125	₩ 904,137,765

6. CASH AND CASH EQUIVALENTS:

Cash and cash equivalents in the separate statements of cash flows are equivalent to cash and cash equivalents in the separate statements of financial position. Details of cash and cash equivalents as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

Description	December 31, 2018	December 31, 2017
Cash on hand	₩ 8,230	₩ 9,757
Bank deposits	391,998,490	180,316,658
Total	₩ 392,006,720	₩ 180,326,415

7. TRADE AND OTHER RECEIVABLES:

(1) Details of trade and other receivables as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

1) December 31, 2018

	Nominal value	Impaired loss	Discount on present value	Total
Trade receivables	₩ 799,843,511	₩ (19,042,799)	₩ (46,624)	₩ 780,754,088
Short-term loans	15,998,259	(4,909,561)	(2,018)	11,086,680
Accounts receivable	16,870,267	(788,664)	-	16,081,603
Accrued income	958,892	(304,073)	-	654,819
Short-term deposit	2,157,081	(9,442)	(3,243)	2,144,396
Subtotal	835,828,010	(25,054,539)	(51,885)	810,721,586
Long-term trade receivables	18,390,153	(6,452,017)	(56,146)	11,881,990
Long-term loan	436,917	-	(34,183)	402,734
Long-term deposit	6,736,872	-	(2,637,288)	4,099,584
Subtotal	25,563,942	(6,452,017)	(2,727,617)	16,384,308
Total	₩ 861,391,952	₩(31,506,556)	₩ (2,779,502)	₩ 827,105,894

2) December 31, 2017

	Nominal value	Impaired loss	Discount on present value	Total
Trade receivables	₩ 662,641,667	₩ (12,510,866)	₩ (117,381)	₩ 650,013,420
Short-term loans	16,668,505	(6,918,415)	(690)	9,749,400
Accounts receivable	18,594,551	(7,438,303)	-	11,156,248
Accrued income	481,874	(307,195)	-	174,679
Short-term deposit	15,698,298	(11,230)	(97,062)	15,590,006
Subtotal	714,084,895	(27,186,009)	(215,133)	686,683,753
Long-term trade receivables	19,274,870	(5,966,846)	(101,557)	13,206,467
Long-term loan	488,333	-	(44,638)	443,695
Long-term deposit	5,038,451	-	(2,719,153)	2,319,298
Subtotal	24,801,654	(5,966,846)	(2,865,348)	15,969,460
Total	₩ 738,886,549	₩ (33,152,855)	₩ (3,080,481)	₩ 702,653,213

- (2) Changes in accumulated impairment losses for the years ended December 31, 2018 and 2017, are as follows
(Unit: Korean won in thousands):

Description	Year ended December 31, 2018		Year ended December 31, 2017	
	Trade receivables	Other receivables	Trade receivables	Other receivables
Beginning balance	₩ 18,477,712	₩ 14,675,143	₩ 10,517,219	₩ 15,136,326
Impairment loss	4,084,093	-	8,363,029	-
Reversal of Impairment loss	-	(505,881)	-	(459,293)
Disposals of accounts receivable	(690,417)	(8,172,522)	(319,033)	-
Changes due to business disposal	3,623,428	-	(83,503)	(1,889)
Others	-	15,000	-	-
Ending balance	₩ 25,494,816	₩ 6,011,740	₩ 18,477,712	₩ 14,675,144

(*1) The provision for loss on trade receivables and other receivables at the end of the period was measured as ECLs for the whole period in accordance with the practical expedient of K-IFRS 1109.

(*2) In the current year, K-IFRS 1109 has been applied prospectively, and reversal of allowance for doubtful accounts were in accordance with IAS 39.

The Company measures the allowance for losses on trade receivables at amounts equivalent to ECLs over the full term. The ECLs on trade receivables are estimated using the provisioning schedule based on the borrower's experience of past defaults. It is adjusted by assessing the factors specific to the borrower and the general economic situation in the industry to which the borrower belongs and the current and the future direction of forecast at the end of the reporting period. There are no changes in estimation techniques or important assumptions during this year.

8. INVENTORIES:

- (1) Inventories as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

Description	December 31, 2018		
	Acquisition cost	Carrying amount	Valuation allowance
Merchandise	₩ 48,204,531	₩ (1,502,340)	₩ 46,702,191
Other inventories	407,846	(407,846)	-
Total	₩ 48,612,377	₩ (1,910,186)	₩ 46,702,191

Description	December 31, 2017		
	Acquisition cost	Carrying amount	Valuation allowance
Merchandise	₩ 36,845,200	₩ (1,502,340)	₩ 35,342,860
Other inventories	-	-	-
Total	₩ 36,845,200	₩ (1,502,340)	₩ 35,342,860

- (2) Details of inventory costs for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	2018	2017
Inventory costs recognized in cost of sales	₩ 895,959,136	₩ 2,059,355,653
Inventory costs recognized in discontinued operations	-	61,439,486
The loss on valuation of inventory, which was included in the cost of sales	-	408,708

9. OTHER ASSETS:

Details of other assets as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	December 31, 2018		December 31, 2017	
	Current	Non-current	Current	Non-current
Advance payments	₩ 12,026,757	₩ 29,686	₩ 11,903,820	₩ 9,531
Prepaid expenses	13,286,024	2,553,941	12,592,448	2,706,105
Prepaid value-added tax	450,171	-	735,157	-
Contract assets	139,768,166	-	-	-
Due from customers for contract work	-	-	112,196,076	-
Other current assets	43,151	-	-	-
	<u>₩ 165,574,269</u>	<u>₩ 2,583,627</u>	<u>₩137,427,501</u>	<u>₩ 2,715,636</u>

10. PROPERTY, PLANT AND EQUIPMENT:

(1) Composition of the Company's property, plant and equipment as of December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

1) December 31, 2018

	Land	Buildings	Structures	Machinery	Vehicles	Tools and equipment	Furniture and fixtures	Construction in progress	Others	Total
Acquisition cost	₩90,661,695	₩493,746,927	₩3,017,875	₩ 44,324	₩ 33,605	₩ 414,896	₩ 85,773,044	₩848,988	₩404,023,877	₩1,078,565,231
Accumulated depreciation	-	(84,128,101)	(206,573)	(21,968)	(18,203)	(317,453)	(46,260,557)	-	(307,407,566)	(438,360,421)
Accumulated impairment loss	-	-	-	-	-	-	-	-	(158,200)	(158,200)
Government subsidies	-	(950,774)	-	-	-	-	-	-	(84,311)	(1,035,085)
Total	<u>₩ 90,661,695</u>	<u>₩408,668,052</u>	<u>₩2,811,302</u>	<u>₩ 22,356</u>	<u>₩ 15,402</u>	<u>₩ 97,443</u>	<u>₩ 39,512,487</u>	<u>₩ 848,988</u>	<u>₩ 96,373,800</u>	<u>₩ 639,011,525</u>

2) December 31, 2017

	Land	Buildings	Structures	Machinery	Vehicles	Tools and equipment	Furniture and fixtures	Construction in progress	Others	Total
Acquisition cost	₩89,237,696	₩308,451,638	₩ 537,078	₩ 44,324	₩ 33,605	₩ 4,708	₩ 88,226,730	₩173,331,828	₩381,852,541	₩1,041,720,148
Accumulated depreciation	-	(68,806,540)	(125,829)	(16,359)	(9,801)	(3,200)	(46,264,889)	-	(282,806,699)	(398,033,317)
Accumulated impairment loss	-	-	-	-	-	-	-	-	(61,250)	(61,250)
Government subsidies	-	(945,194)	-	-	-	-	-	-	(160,200)	(1,105,394)
Total	<u>₩89,237,696</u>	<u>₩238,699,904</u>	<u>₩ 411,249</u>	<u>₩ 27,965</u>	<u>₩ 23,804</u>	<u>₩ 1,508</u>	<u>₩ 41,961,841</u>	<u>₩173,331,828</u>	<u>₩ 98,824,392</u>	<u>₩ 642,520,187</u>

(2) Changes in property, plant and equipment for the years ended December 31, 2018 and 2017, are as follows
(Unit: Korean won in thousands):

1) Year ended December 31, 2018

	Land	Buildings	Structures	Machinery	Vehicles	Tools and equipment	Furniture and fixtures	Construction in progress	Others	Total
Beginning balance	₩89,237,696	₩238,699,904	₩ 411,249	₩ 27,965	₩ 23,804	₩ 1,508	₩ 41,961,841	₩173,331,828	₩ 98,824,392	₩642,520,187
Acquisition	-	32,114,271	-	-	-	-	5,316,598	2,271,968	37,162,434	76,865,271
Disposals	-	-	-	-	-	-	(3,974)	(22,504,568)	(82,049)	(22,590,591)
Depreciation (*)	-	(15,171,558)	(79,825)	(5,609)	(8,402)	(19,067)	(7,393,528)	-	(42,229,719)	(64,907,708)
Transfers	1,423,999	152,878,889	2,479,878	-	-	-	-	(152,250,240)	-	4,532,526
Government subsidies	-	(40,500)	-	-	-	-	-	-	-	(40,500)
Increase (decrease) due to business combination	-	187,046	-	-	-	-	(516,811)	-	284,546	(45,219)
Others	-	-	-	-	-	115,002	148,361	-	2,414,196	2,677,559
Ending balance	₩ 90,661,695	₩408,668,052	₩2,811,302	₩ 22,356	₩ 15,402	₩ 97,443	₩ 39,512,487	₩ 848,988	₩ 96,373,800	₩639,011,525

2) Year ended December 31, 2017

	Land	Buildings	Structures	Machinery	Vehicles	Tools and equipment	Furniture and fixtures	Construction in progress	Others	Total
Beginning balance	₩99,836,167	₩251,044,891	₩ 676,480	₩ 618,042	₩33,405	₩ 6,735,523	₩ 34,749,832	₩ 97,783,844	₩ 117,451,083	₩608,929,267
Acquisition	-	1,158,528	-	-	-	2,221,948	2,537,899	112,612,675	25,920,014	144,451,064
Business combination (*1)	(1,485,063)	(1,789,596)	(11,372)	(568,587)	-	(1,340,055)	(101,331)	-	(268,333)	(5,564,337)
Disposals	-	(10,022,930)	(14,175)	(21,490)	(9,601)	(2,336,107)	(8,174,811)	-	(46,202,575)	(66,781,689)
Depreciation (*2)	(3,588,350)	(7,343,113)	(57,914)	-	-	(5,279,801)	(152,883)	-	(364,956)	(16,787,017)
Impairment loss	(5,525,058)	5,652,124	(181,770)	-	-	-	13,095,799	(37,064,691)	2,303,210	(21,720,386)
Transfers	-	-	-	-	-	-	-	-	(14,051)	(14,051)
Others	-	-	-	-	-	-	7,336	-	-	7,336
Ending balance	₩89,237,696	₩238,699,904	₩ 411,249	₩ 27,965	₩ 23,804	₩ 1,508	₩ 41,961,841	₩173,331,828	₩ 98,824,392	₩642,520,187

(*) Depreciation and impairment amounting to ₩2,833,785 thousand and ₩16,723,287 thousand, respectively were included in profit or loss from discontinued operations.

(3) Government subsidies

Changes in government subsidies for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

1) Year ended December 31, 2018

	Buildings	Others	Total
Beginning balance	₩ 945,194	₩ 160,200	₩ 1,105,394
Occurrence in this year	40,500	-	40,500
Offsetting depreciation	(34,920)	(75,889)	(110,809)
Ending balance	₩ 950,774	₩ 84,311	₩ 1,035,085

2) Year ended December 31, 2017

	Buildings	Furniture and fixtures	Others	Total
Beginning balance	₩ 978,575	₩ 178	₩ 317,346	₩ 1,296,099
Offsetting depreciation	-	-	14,051	14,051
Disposal	(33,381)	(178)	(171,197)	(204,756)
Ending balance	₩ 945,194	₩ -	₩ 160,200	₩ 1,105,394

(4) Composition of disposal for the years ended December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

1) Year ended December 31, 2018

	Furniture and fixtures	Construction in progress	Others	Total
Book value before disposal	3,974	22,504,568	82,049	22,590,591
Disposal amount	25,600	22,504,568	434,306	22,964,474
Gain (loss) on disposal	₩ 21,626	₩ -	₩ 352,257	₩ 373,883

2) Year ended December 31, 2017

	Land	Buildings	Structures	Machinery	Vehicles	Tools and equipment	Furniture and fixtures	Construction in progress	Others	Total
Book value before disposal	₩ 1,485,063	₩ 1,789,596	₩ 11,372	₩ 568,587	₩ -	₩ 1,340,055	₩ 101,331	₩ -	₩ 268,333	₩ 5,564,337
Disposal amount	1,863,394	1,806,351	11,422	31,790	-	1,269,157	50,986	-	508,340	5,541,440
Gain (loss) on disposal	₩ 378,331	₩ 16,755	₩ 50	₩ (536,797)	₩ -	₩ (70,898)	₩ (50,345)	₩ -	₩ 240,007	₩ (22,897)

11. INVESTMENT PROPERTY:

(1) Details of investment property as of December 31, 2018, are as follows (Unit: Korean won in thousands):

	Land	Buildings	Structures	Total
Beginning acquisition cost	₩ 5,081,036	₩ 18,923,776	₩ 166,099	₩ 24,170,911
Accumulated depreciation	-	(4,251,196)	(29,777)	(4,280,973)
Ending balance	₩ 5,081,036	₩ 14,672,580	₩ 136,322	₩ 19,889,938

(2) Changes in investment property for the year ended December 31, 2018, are as follows (Unit: Korean won in thousands):

	Land	Buildings	Structures	Total
Beginning balance	₩ 6,186,167	₩ 18,433,415	₩ 175,354	₩ 24,794,936
Depreciation	-	(369,784)	(2,688)	(372,472)
Transfers	(1,105,131)	(3,391,051)	(36,344)	(4,532,526)
Ending balance	₩ 5,081,036	₩ 14,672,580	₩ 136,322	₩ 19,889,938

(3) Details of investment property as of December 31, 2018, are as follows (Unit: Korean won in thousands):

December 31, 2018				
	Date of revaluation	Land	Buildings and structures	Total
Incheon IT Center (*1)		₩ 3,352,192	₩ 13,678,797	₩ 17,030,989
Sangam DDMC (*2)		₩ 13,461,406	₩ 37,452,199	₩ 50,913,605
Incheon IT Center (*3,4)	2009-01-01	₩ 15,391,110	₩ 9,169,094	₩ 24,560,204
Sangam DDMC (*3,4)	2014-10-01	₩ 260,635,000		₩ 260,635,000

(*1) Includes the value of investment property occupied by the owner (land: ₩2,691,083 thousand and buildings and structures: ₩10,981,107 thousand).

(*2) Includes the value of investment property occupied by the owner (land: ₩9,041,479 thousand and buildings and structures: ₩25,155,119 thousand).

(*3) This is the valuation amount for entire Incheon IT Center and Sangam DDMC. In case of Sangam DDMC, the total value of real estate includes land and buildings and constructions. The appraisal amount distributed as the share of area is ₩78,190,500 thousand.

(*4) Fair value assessment was performed by an independent third party, Nara Appraisal Co., Ltd., which used an average-costing approach and cost approach method of standard appraised value of land and buildings. The changes in fair value between the date of the assessment and the end of the reporting period are not determined significant, and therefore, fair value reassessment was not performed as of December 31, 2018.

12. INTANGIBLE ASSETS:

(1) Composition of the Company's intangible assets as of December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

1) December 31, 2018

	Development costs	Industrial property rights	Computer software and others	Membership	Goodwill	Total
Acquisition cost	₩27,011,862	₩ 1,774,074	₩74,534,674	₩30,611,084	₩ 4,833,374	₩138,765,068
Accumulated depreciation	(17,679,547)	(525,009)	(58,129,260)	-	-	(76,333,816)
Accumulated impairment loss	(2,605,970)	(1,307)	-	(3,642,477)	(4,833,374)	(11,083,128)
Government subsidies	-	-	(51,547)	-	-	(51,547)
Total	₩ 6,726,345	₩ 1,247,758	₩16,353,867	₩26,968,607	₩ -	₩ 51,296,577

2) December 31, 2017

	Development costs	Industrial property rights	Computer software and others	Membership	Goodwill	Construction in progress	Total
Acquisition cost	₩21,830,441	₩ 1,274,992	₩66,968,196	₩27,354,850	₩ 4,833,374	₩7,325,295	₩129,587,148
Accumulated amortization	(17,701,506)	(262,291)	(55,475,516)	-	-	-	(73,439,313)
Accumulated impairment loss	(2,605,971)	(1,307)	-	(2,683,861)	(4,833,374)	-	(10,124,513)
Government subsidies	-	-	(122,454)	-	-	-	(122,454)
Total	₩ 1,522,964	₩ 1,011,394	₩11,370,226	₩24,670,989	₩ -	₩7,325,295	₩ 45,900,868

(2) Changes in intangible assets for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands)

1) For the year ended December 31, 2018

	Development costs	Industrial property rights	Computer software	Membership	Construction in progress	Total
Beginning balance	₩1,522,964	₩1,011,394	₩11,370,226	₩24,670,989	₩ 7,325,295	₩45,900,868
Acquisition	2,000	-	9,745,550	24,528	-	9,772,078
Increase due to internal development	-	-	-	-	698,137	698,137
Disposals	(28,753)	-	(16,740)	-	-	(45,493)
Impairment loss	-	-	-	(100,000)	-	(100,000)
Transfers	8,023,432	-	-	-	(8,023,432)	-
Amortization	(2,793,298)	(201,044)	(5,018,036)	-	-	(8,012,378)
Increase due to merger	-	2,739	256,127	2,373,090	-	2,631,956
Others	-	-	16,740	-	-	16,740
Government subsidies	-	434,669	-	-	-	434,669
Ending balance	₩ 6,726,345	₩ 1,247,758	₩16,353,867	₩26,968,607	₩ -	₩51,296,577

2) For the year ended December 31, 2017

	Development costs	Industrial property rights	Computer software	Membership	Goodwill	Construction in progress	Total
Beginning balance	₩3,720,032	₩2,383,974	₩13,447,645	₩25,506,753	₩ 519,256	₩ 340,095	₩45,917,755
Acquisition	-	1,741	3,374,338	394,492	-	6,985,200	10,755,771
Disposals	(181,479)	(297,525)	(36,734)	(1,230,256)	(519,256)	-	(2,265,250)
Impairment loss (*)	(197,977)	(1,509,594)	(77,567)	-	-	-	(1,785,138)
Amortization (*)	(1,817,612)	(375,865)	(5,354,170)	-	-	-	(7,547,647)
Others	-	808,663	35,314	-	-	-	843,977
Government subsidies	-	-	(18,600)	-	-	-	(18,600)
Ending balance	₩1,522,964	₩1,011,394	₩11,370,226	₩24,670,989	₩ -	₩7,325,295	₩45,900,868

(*) Included in the reclassified amounts as discontinued operations (amortization: ₩8,973 thousand and impairment loss: ₩1,583,753 thousand).

(3) Government subsidies

Changes in government subsidies for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
	Computer software	Computer software
Beginning balance	₩ 122,454	₩ 272,138
Receipt	-	18,600
Offsetting amortization	(54,167)	(168,284)
Disposals	(16,740)	-
Ending balance	₩ 51,547	₩ 122,454

(4) Composition of disposal for the years ended December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

1) Year ended December 31, 2018

	Development costs	Software	Total
Book value before disposal	₩ 28,753	₩ -	₩ 28,753
Disposal amount	221,960	500	222,460
Loss on disposal	₩ 193,207	₩ 500	₩ 193,707

2) Year ended December 31, 2017

	Development costs	Industrial property rights	Software	Membership	Goodwill	Total
Book value before disposal	₩ 181,479	₩ 297,525	₩ 36,734	₩1,230,256	₩ 519,256	₩ 2,265,250
Disposal amount	-	296,174	14,959	1,175,000	-	1,486,133
Loss on disposal	₩ (181,479)	₩ (1,351)	₩ (21,775)	₩ (55,256)	₩ (519,256)	₩ (779,117)

(5) The expenses related to research and development for the years ended December 31, 2018 and 2017, are ₩33,731,258 thousand and ₩16,762,738 thousand, respectively. Those amounts are recognized in selling and administrative expenses.

13. INVESTMENTS IN SUBSIDIARIES:

(1) Composition of the Company's investments in subsidiaries as of December 31, 2018 and 2017, is as follows:

Company	Location of incorporation	Major operation	Closing date	Number of shares owned by the Company	Number of shares issued	Percentage of ownership (%) 2018	Percentage of ownership (%) 2017
LG CNS PHILIPPINES, INC.	Philippines	Services	December 31	298,083	298,083	100.00%	100.00%
LG CNS China Inc. (*1)	China	Services	December 31	-	-	100.00%	100.00%
LG CNS Europe B.V.	Netherlands	Services	December 31	5,000	5,000	100.00%	100.00%
LG CNS America, Inc.	USA	Services	December 31	100	100	100.00%	100.00%
LG CNS India Pvt., Ltd.	India	Services	December 31	15,319,725	15,319,725	100.00%	100.00%
PT LG CNS Indonesia	Indonesia	Services	December 31	20,000	20,000	100.00%	100.00%
Entrue Brasil Servicos de T.I. Ltda.	Brazil	Services	December 31	2,471,000	2,471,000	100.00%	100.00%
UCESS PHILIPPINES, INC.	Philippines	Services	December 31	450,000	450,000	100.00%	100.00%
Biztech Partners Co., Ltd.	South Korea	Services	December 31	12,534,571	13,045,007	96.09%	95.90%
LG N-Sys Co., Ltd. (*2)	South Korea	Product/sale	December 31	-	-	-	100.00%
Korea Elecom	South Korea	Product/sale	December 31	7,870,990	8,380,000	93.93%	93.93%
SBI-LG Systems Co., Ltd. (*3)	Japan	Services	December 31	-	-	-	51.00%
LG CNS COLOMBIA SAS	Colombia	Services	December 31	110,000	110,000	100.00%	100.00%
LG CNS MALAYSIA SDN BHD	Malaysia	Services	December 31	1,500,002	1,500,002	100.00%	100.00%
LG CNS Saudi Arabia LLC	Saudi Arabia	Services	December 31	3,060	6,000	51.00%	51.00%
LG CNS JAPAN Co., Ltd.	Japan	Services	December 31	800	800	100.00%	100.00%
LG CNS UZBEKISTAN, LLC (*4)	UZBEKISTAN	Services	December 31	-	-	51.00%	51.00%
Hangbokmaru Co., Ltd.	South Korea	Services	December 31	140,000	140,000	100.00%	100.00%
LG CNS Vietnam Co., Ltd. (*5)	Vietnam	Services	December 31	-	-	100.00%	100.00%
LG CNS FUND I LLC (*6)	USA	Investment Fund	December 31	-	-	100.00%	-
Sejong Green Power Co., Ltd. (*7)	South Korea	Product/sale	December 31	260,600	1,309,200	19.91%	-

(*1) There are no outstanding shares based on the relevant laws and regulations of local country for an entity formed in China.

(*2) LG N-Sys Co., Ltd. was absorbed by the Company during this year.

(*3) In the current period, it was liquidated.

(*4) There are no outstanding shares based on the relevant laws and regulations of local country for an entity formed in UZBEKISTAN.

(*5) In the current period, it was established and there are no outstanding shares based on the relevant laws and regulations of local country for an entity formed in VIETNAM.

(*6) Although it was established during this year, there are no outstanding shares before payment of investment capital.

(*7) The Company has been classified as a subsidiary as it has been notified of the exercise of the rights to sell shares during the year.

(2) Changes in investments in subsidiaries for the years ended December 31, 2018 and 2017, are as follows
(Unit: Korean won in thousands):

1) For the year ended December 31, 2018

Company	Beginning balance	Acquisition	Disposal	Impairment loss	Increase (decrease) due to merger	Ending balance
LG CNS PHILIPPINES, INC.	₩ -	₩ -	₩ -	₩ -	₩ -	₩ -
LG CNS China Inc.	23,231,647	-	-	-	-	23,231,647
LGCNS Europe B.V.	3,656,950	-	-	-	-	3,656,950
LG CNS America, Inc.	2,883,494	-	-	-	-	2,883,494
LG CNS India Pvt., Ltd.	795,429	-	-	-	-	795,429
PT LG CNS Indonesia	1,220,095	-	-	-	-	1,220,095
Entrue Brasil Servicos de T.I. Ltda.	1,556,532	221,320	-	-	-	1,777,852
UCESS PHILIPPINES, INC.	102,553	-	-	-	-	102,553
Biztech Partners Co., Ltd.	12,069,575	29,288	-	-	-	12,098,863
LG N-Sys Co., Ltd.	61,856,873	-	-	-	(61,856,873)	-
Korea Elecom	-	-	-	-	-	-
SBI-LG Systems Co., Ltd.	2,417,636	-	(2,417,636)	-	-	-
LG CNS COLOMBIA SAS	690,134	-	-	-	-	690,134
LG CNS MALAYSIA SDN BHD	559,250	-	-	-	-	559,250
LG CNS Saudi Arabia LLC	-	-	-	-	-	-
LG CNS JAPAN Co., Ltd.	418,032	-	-	-	-	418,032
LG CNS UZBEKISTAN, LLC	1,162,524	-	-	(1,162,524)	-	-
Hangbokmaru Co., Ltd.	700,000	-	-	-	-	700,000
LG CNS Vietnam Co., Ltd.	233,340	-	-	-	-	233,340
LG CNS FUND I LLC (*)	-	280,750	-	-	-	280,750
Sejong GreenPower Co., LTD	-	-	-	-	-	-
Total	₩113,554,064	₩531,358	₩(2,417,636)	₩(1,162,524)	₩ (61,856,873)	₩48,648,389

(*) Established and acquired during this year; actual capital payment was not made at the end of December 31, 2018.

2) For the year ended December 31, 2017:

Company	Beginning balance	Acquisition	Transfer	Impairment loss	Ending balance
LG CNS PHILIPPINES, INC.	₩ -	₩ -	₩ -	₩ -	₩ -
LG CNS China Inc.	23,231,647	-	-	-	23,231,647
LGCNS Europe B.V.	3,656,950	-	-	-	3,656,950
LG CNS America, Inc.	2,883,494	-	-	-	2,883,494
LG CNS India Pvt., Ltd.	795,429	-	-	-	795,429
PT LG CNS Indonesia	1,220,095	-	-	-	1,220,095
Entrue Brasil Servicos de T.I. Ltda.	1,556,532	-	-	-	1,556,532
UCESS PHILIPPINES, INC.	102,553	-	-	-	102,553
Biztech Partners Co., Ltd. (formerly, known as BNE Partners Co., Ltd. (*5))	6,149,795	-	5,919,780	-	12,069,575
LG N-Sys Co., Ltd.	61,856,873	-	-	-	61,856,873
Korea Elecom	-	-	-	-	-
SBI-LG Systems Co., Ltd.	3,437,225	-	-	(1,019,589)	2,417,636
LG CNS COLOMBIA SAS	690,134	-	-	-	690,134
LG CNS MALAYSIA SDN BHD	559,250	-	-	-	559,250
LG CNS Saudi Arabia LLC	-	-	-	-	-
LG CNS JAPAN Co., Ltd.	418,032	-	-	-	418,032
LG CNS UZBEKISTAN, LLC	1,162,524	-	-	-	1,162,524
Hangbokmaru Co., Ltd.	700,000	-	-	-	700,000
Biztech partners Co., Ltd.	4,042,210	-	(4,042,210)	-	-
LG CNS Vietnam Co., Ltd.	-	233,340	-	-	233,340
Total	₩112,462,743	₩233,340	₩1,877,570	₩(1,019,589)	₩113,554,064

(*) BNE Partners Co., Ltd. merged with Biztech Partners Co., Ltd. as a surviving corporation. The name of the merged corporation is Biztech Partners Co., Ltd.

14. INVESTMENTS IN ASSOCIATES AND JOINT VENTURES:

(1) Composition of the Company's investments in associates and jointly controlled entity as of December 31, 2018 and 2017, is as follows:

Companies	Location of incorporation	Major business activities	Closing date	Number of shares owned by the Company Common stock	Number of issued shares Common stock	Percentage of ownership (%), 2018	Percentage of ownership (%), 2017
Korea Smart Card Co., Ltd.	South Korea	System software development and supply	December 31	3,927,167	11,934,085	32.91	32.91
Songdo U-Life LLC (*1)	South Korea	Health care, integrated wireless environment, integrated smart cards and building management	December 31	5,880	35,880	16.39	16.39
RECAUDO BOGOTA S.A.S.	Colombia	Public system development and service	December 31	2,126	10,630	20.00	20.00
Sejong GreenPower Co., LTD (*2)	South Korea	Energy supply	December 31	-	-	-	19.91
Hellas SmartTicket Societe Anonyme	Greece	Public system development and service	December 31	22,500	75,000	30.00	30.00
Ulleungdo Natural Energy Co., Ltd.	South Korea	New renewable energy supply	December 31	1,600,000	5,360,000	29.85	29.85
Daegu Natural Energy Co., Ltd.	South Korea	Power plant construction	December 31	25,000	100,000	25.00	25.00
KEPCO-LG CNS Mangilao Holdings LLC (*3)	USA	New renewable energy supply	December 31	-	-	-	-
Total							

(*1) The Company has significant influence since contractual right by which the Company is able to appoint one member of board even though the percentage of ownership is less than 20%.

(*2) It has been classified to subsidiary from associate due to notification of the exercise of the right to claim the shares during this year (see Note 13).

(*3) Although it was established during the previous year, there are no outstanding shares since it is before the payment of investment capital.

(2) Changes in investments in associates and jointly controlled entity for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

1) For the year ended December 31, 2018

Company	Beginning balance	Disposal	Ending balance
Korea Smart Card Co., Ltd.	₩ 21,598,660	₩ -	₩ 21,598,660
Songdo U-Life LLC	4,507,299	(3,795,966)	711,333
RECAUDO BOGOTA S.A.S.	2,575,022	-	2,575,022
Hellas SmartTicket Societe Anonyme	2,843,358	-	2,843,358
Ulleungdo Natural Energy Co., Ltd.	8,000,000	(3,441,700)	4,558,300
Daegu Natural Energy Co., Ltd.	125,000	(125,000)	-
Total	₩ 39,649,339	₩ (7,362,666)	₩ 32,286,673

2) For the year ended December 31, 2017

Company	Beginning balance	Disposal	Ending balance
Korea Smart Card Co., Ltd.	₩ 21,598,660	₩ -	₩ 21,598,660
Songdo U-Life LLC	4,507,299	-	4,507,299
RECAUDO BOGOTA S.A.S.	5,751,317	(3,176,295)	2,575,022
Sejong Green Power Co., Ltd.	1,303,000	(1,303,000)	-
Hellas SmartTicket Societe Anonyme	2,843,358	-	2,843,358
Ulleungdo Natural Energy Co., Ltd.	8,000,000	-	8,000,000
Daegu Natural Energy Co., Ltd.	125,000	-	125,000
Total	₩ 44,128,634	₩ (4,479,295)	₩ 39,649,339

15. DEBENTURES AND BORROWINGS:

The Company's long-term borrowings (debentures) as of December 31, 2018 and 2017, consist of the following (Unit: Korean won in thousands):

Type	Maturity date	Annual interest rate (%)	December 31, 2018	December 31, 2017
Unguaranteed public bond	7th public offering	2.96	₩ -	₩ 100,000,000
	9-1th public offering	1.88	-	50,000,000
	9-2th public offering	2.07	100,000,000	100,000,000
	9-3th public offering	2.44	50,000,000	50,000,000
	10-1th public offering	2.10	110,000,000	110,000,000
	10-2th public offering	2.45	40,000,000	40,000,000
	11-1th public offering	2.55	90,000,000	-
	11-2th public offering	2.83	110,000,000	-
	2-2th public offering	2.89	20,000,000	-
Subtotal			520,000,000	450,000,000
Discount on debentures			(1,136,425)	(875,163)
Current portion of debentures			-	(149,948,723)
Total			₩ 518,863,575	₩ 299,176,114

16. PROVISIONS:

(1) Changes in provisions for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

1) For the year ended December 31, 2018

	Beginning balance	Decrease	Reversal	Increase	Increase due to mergers	Others (*2)	Ending balance
Provision for construction (product) warranties	₩ 13,153,230	₩ (9,693,674)	₩ (1,720,364)	₩ 10,875,298	₩642,235	₩ -	₩ 13,256,725
Restoration liabilities (*1)	4,693,911	(2,791,240)	(26,760)	161,654	-	-	2,037,565
Others	33,489,550	(7,191,228)	(3,793,209)	16,474,602	221,323	(1,876,510)	37,324,528
Total	₩ 51,336,691	₩ (19,676,142)	₩ (5,540,333)	₩ 27,511,554	₩863,558	₩ (1,876,510)	₩ 52,618,818

(*1) Increases in valuation of present value for the year ended December 31, 2018, amounting to ₩144,184 thousand are included in increase of provisions.

(*2) This corresponds to a change in the presentation of the separate financial statements of the amount of the contract loss allowance deducted from the previous-term Due from(to) customers for contract work as a result of the introduction of K-IFRS 1115 (see Note 2).

2) For the year ended December 31, 2017

	Beginning balance	Decrease	Reversal	Increase	Others	Ending balance
Provision for construction (product) warranties	₩ 8,028,674	₩ (8,145,145)	₩ (715,158)	₩ 16,224,365	₩ (2,239,506)	₩ 13,153,230
Restoration liabilities (*1)	4,081,035	-	-	612,876	-	4,693,911
Others	31,113,357	(9,434,559)	(1,497,179)	13,307,931	-	33,489,550
Total	₩ 43,223,066	₩ (17,579,704)	₩ (2,212,337)	₩ 30,145,172	₩ (2,239,506)	₩ 51,336,691

(*) Increases in valuation of present value for the year ended December 31, 2017, amounting to ₩612,876 thousand are included in increase of provisions.

(2) Nature of provision and expected timing for outflow of economic benefits (Unit: Korean won in thousands):

	Within 12 months	After 12 months	Total
Provision for construction (product) warranties (*1)	₩ 13,256,725	₩ -	₩ 13,256,725
Restoration liabilities (*2)	-	2,037,565	2,037,565
Others	37,324,528	-	37,324,528
Total	₩ 50,581,253	₩ 2,037,565	₩ 52,618,818

(*1) Estimated provision for construction warranties that would be expected in past service revenue.

(*2) Measured at present value of future restoration estimation costs on leased assets.

(*3) This is the estimated amount of compensation liabilities and provisions related to the hardware and SI construction work.

17. RETIREMENT BENEFIT PLAN:

(1) Defined contribution plan

The Company operates a defined contribution plan for employees. Obligation of the Company is to make payments to third-party funds. The benefits for employees are determined by the payments made to the funds and the investment earnings from the funds. Plan asset is managed by the third party and is segregated from the Company's assets.

The contributions to defined contribution plan for the years ended December 31, 2018 and 2017, are ₩31,405,742 thousand and ₩28,880,668 thousand, respectively. Other accounts payable in relation to defined contribution plans as of December 31, 2018 and 2017, are ₩4,607,472 thousand and ₩2,985,392 thousand, respectively.

(2) Defined benefit plan

The Company operates a defined benefit plan for employees, and according to the plan, employees will be paid their average salary amount of the final three months multiplied by the number of years vested, adjusted for payment rate and other. The valuations of related plan assets and the defined benefit liability are performed by an independent reputable actuary using the projected unit credit method at its present value, relevant current service cost and past service costs.

1) As of December 31, 2018 and 2017, amounts recognized in the separate statements of financial position related to retirement benefit obligation are as follows (Unit: Korean won in thousands):

	December 31, 2018	December 31, 2017
Present value of defined benefit obligation	₩ 15,979,843	₩ 15,263,715
Fair value of plan assets	(15,936,418)	(12,413,258)
Retirement benefit obligation	<u>₩ 43,425</u>	<u>₩ 2,850,457</u>

2) Changes in defined benefit obligation for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Beginning balance	₩ 15,263,715	₩ 15,431,140
Current service cost	2,219,786	1,936,116
Interest cost	405,275	328,664
Actuarial loss (gain)	29,383	(973,020)
Benefits paid	(3,327,357)	(3,245,195)
Transfer to affiliated company	-	1,786,010
Net increase (decrease) in DBO from acquisitions	16,494,083	-
Settlements	(15,105,042)	-
Ending balance	<u>₩ 15,979,843</u>	<u>₩ 15,263,715</u>

- 3) Income and loss related to defined benefit plan for the years ended December 31, 2018 and 2017, are as follows (Korean won in thousands):

Description	Year ended December 31, 2018	Year ended December 31, 2017
Service cost:	₩ 2,219,786	₩ 1,936,116
Current service cost	2,219,786	1,936,116
Net interest on the net defined benefit liability (asset):	77,680	39,086
Interest cost DBO	405,275	328,664
Interest on plan assets	(327,595)	(289,578)
Others	43,906	28,211
Total	₩ 2,341,372	₩ 2,003,413

On the other hand, defined benefit plan gain or loss is allocated to each item as follows (Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Amounts included in the retirement benefits	₩ 1,954,103	₩ 1,929,032
Amounts included in the service fee	43,906	26,799
Amounts included in the cost of production	343,363	18,016
Amounts included in income from discontinued operations	-	29,566
Total	₩ 2,341,372	₩ 2,003,413

- 4) Changes in plan assets for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Beginning balance	₩ 12,413,258	₩ 13,665,442
Expected return on plan assets	327,595	289,578
Actuarial gain (loss)	(116,213)	(107,909)
Transfer to affiliated company	104,400	1,839,553
Other	(43,906)	(28,211)
Benefits paid	(3,231,461)	(3,245,195)
Employer contribution to plan assets	5,264,050	-
Net increase (decrease) in assets from acquisitions	15,268,174	-
Settlements from plan asset	(14,049,479)	-
Ending balance	₩ 15,936,418	₩ 12,413,258

- 5) All of the plan assets are invested in financial instruments that guarantee principal and interest rate as of December 31, 2018 and 2017.

- 6) Actuarial assumptions used as of December 31, 2018 and 2017, are as follows:

Description	December 31, 2018	December 31, 2017
Discount rate (%)	2.27	2.70
Expected rate of salary increase (%)	6.00	6.00

7) The sensitivity analysis of the defined benefit obligation as of December 31, 2018, is as follows (Unit: Korean won in thousands):

Description	Center scenario	+ 1%	- 1%
Change in discount rate	₩ 15,979,843	₩ 15,353,935	₩ 16,652,085
Change in rate of salary increase	15,979,843	16,625,070	15,366,298

(*) The above sensitivity is estimated based on the assumption that all other respective assumptions remain unchanged.

8) Remeasurements related to net defined benefit liability for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

Description	Year ended December 31, 2018	Year ended December 31, 2017
Actuarial gains arising from changes in demographic assumptions	₩ (67,338)	₩ (16,256)
Actuarial gains (losses) arising from changes in financial assumptions	274,526	(1,793,342)
Actuarial losses arising from experience	(169,247)	530,299
Return on plan assets, excluding amounts included in interest income	116,213	107,909
Actuarial losses arising from transfer in/out adjustments	(8,556)	306,279
Total	₩ 145,598	₩ (865,111)

9) Estimated contribution that will be paid in the next fiscal year is as follows (Unit: Korean won in thousands):

	Year ending December 31, 2019
Estimated contributions to plan assets (*)	₩ 2,392,299

(*) The above-estimated contributions to plan assets are estimated based on the assumption that all the other respective assumptions remain unchanged.

18. OTHER LIABILITIES:

Other liabilities as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands)

	December 31, 2018		December 31, 2017	
	Current	Non-current	Current	Non-current
Advance receipts	₩ 35,568,676	₩ -	₩ 32,952,505	₩ -
Withholding value-added tax	31,288,613	-	18,717,116	-
Withholdings	23,603,487	-	27,994,811	-
Unearned income	41,810	-	26,576	-
Contract liabilities	60,479,617	-	-	-
Due to customers for contract work	-	-	39,714,863	-
Other long-term employee liabilities	-	8,419,052	-	7,431,890
Total	₩ 150,982,203	₩ 8,419,052	₩ 119,405,871	₩ 7,431,890

19. CONTRACT ASSETS AND LIABILITIES

- (1) Contract assets as of December 31, 2018, and due from customers for contract work as of December 31, 2017, are as follows (Unit: Korean won in thousands):

	December 31, 2018	December 31, 2017
Construction contracts	₩ 145,958,847	₩ 116,991,991
Deductions: allowance for losses	(6,190,681)	(4,795,915)
Total	₩ 139,768,166	₩ 112,196,076

During this year, there are no changes in estimates or important assumptions applied when assessing the loss allowance for contract assets in a construction contract.

- (2) Changes in ECLs of contractual assets during this year are as follows (Unit: Korean won in thousands):

	December 31, 2018
Beginning balance	₩ 4,795,915
Increase in allowance for loss	1,394,766
Ending balance	₩ 6,190,681

- (3) At the end of this year, the contract liability and the balance of the due to customers for contract work at the end of the previous year are as follows (Unit: Korean won in thousands):

	December 31, 2018	December 31, 2017
Construction contracts	₩ 60,479,617	₩ 39,714,863

The contract liability relating to the construction contract is the balance received from the customer in accordance with the construction contract. This occurs when the amount received under the milestone exceeds the revenue recognized up to that point in accordance with the cost-based input method. There was no significant change in the contractual liability balance during the reporting period.

- (4) The following shows how much of the revenue recognized in the current reporting period relates to carryforward contract liabilities. No revenue related to performance obligations carried out in a prior year is recognized in current reporting period. (Unit: Korean won in thousand):

	December 31, 2018
Construction contracts	₩ 38,619,671

- (5) As of January 1, 2018, when the adoption date of K-IFRS 1115, the following shows changes in estimates of total contractual costs and contractual costs relating to contracts recognized in profit or loss over the period by applying the cost-based input method, the effect of changes in the fair value of derivative financial instruments on profit and loss, contract assets and liabilities in the current and future period:

Type	Change in estimated total contracted amount	Change in estimated total contracted cost	Impact on gain and loss for this year	Impact on gain and loss in the future	Changes in contract assets (contract liabilities)
Construction contract (*1)	₩ 27,818,882	₩ 29,466,341	₩ (4,774,755)	₩ 3,127,296	₩ (4,774,755)

(*1) The Company has only one operating segment in accordance with K-IFRS 1108.

(*2) Contract loss provision liability amounts to ₩1,256,328 thousand for the year ended December 31, 2018.

(6) During the current period, following are the details of major contracts in which the amount of contract is 5% or more of the sales amount of the prior period, as contracts recognized profit using cost-based input method:

	Contract date	Completion period on the contract	Progress rate	Contract assets (liabilities)		Receivables from construction	
				Total	Loss allowance	Total	Loss allowance
LG CNS	2010-11-30	2015-11-30	98%	-	-	1,429,644	-
LG CNS	2016-05-02	2018-08-22	100%	-	-	-	-

20. ISSUED CAPITAL:

Details of issued capital as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

Type of stock	Number of authorized shares	Number of issued shares	Number of shares owned by related party	Par value (Korean won)	Amount of issued capital (*)	Amount of capital surplus
Common stock	400,000,000	87,197,353	76,142,992	₩ 500	₩47,198,411	₩46,625,595

(*) As the Company purchased 7,199,469 shares via tender offer at ₩12,000 per share and had retired them before the prior year, the issued capital and number of issued stocks multiplied by face value are not equal.

21. CAPITAL SURPLUS:

Composition of the Company's capital surplus as of December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

	December 31, 2018		December 31, 2017	
Paid-in capital in excess of par value	₩	46,625,595	₩	46,625,595
Gains on sale of treasury stock		454,597		454,597
Other capital surplus		90,945,903		12,440,863
Total	₩	138,026,095	₩	59,521,055

22. ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS):

(1) Details of accumulated other comprehensive income (loss) as of December 31, 2018 and 2017, are as follows
(Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Gain on AFS financial assets	₩ -	₩ 850,702
Loss on AFS financial assets	-	(664,895)
Loss on valuation of financial assets at FVTOCI	(14,610,405)	-
Ending balance	₩ (14,610,405)	₩ 185,807

Losses / gains on valuation of financial assets measured at FVTOCI related to equity instruments are recognized in the cumulative gain or loss, except for the amount replaced with retained earnings at the time of disposal. Gains and losses related to debt instruments are calculated by adding or deducting the amount reclassified to profit or loss as a result of accumulated depreciation and reversal from cumulative gain or loss.

Equity instruments designated as FVTOCI are not recognized for impairment. Accumulated gains and losses arising from the valuation of those equity instruments are not subsequently reclassified to profit or loss. There is no cumulative gain or loss that has been replaced by retained earnings in relation to these equity instruments during this year.

(2) Changes in capital change in equity method for the years ended December 31, 2018 and 2017, are as follows
(Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Beginning balance-rewrite	₩ 185,807	₩ 106,121
Effect of changes in accounting policy	(5,230,800)	-
Changes in net gain on valuation of AFS financial assets	-	(123,215)
Change in fair value of equity instruments designated as Financial assets at FVTOCI	(12,632,282)	-
Gain (loss) on cash flow hedges	-	228,341
Income tax effect	3,066,870	(25,440)
Ending balance	₩ (14,610,405)	₩ 185,807

23. RETAINED EARNINGS AND DIVIDENDS:

(1) Details of retained earnings as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Retained earnings with limited disposal (*)	₩ 23,599,206	₩ 23,599,206
Retained earnings without limited disposal	869,486,780	778,112,640
Total	₩ 893,085,986	₩ 801,711,846

(*) This reserve may only be used to offset future deficit, if any, or may be transferred to capital stock.

(2) Changes in retained earnings for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Beginning balance	₩ 801,711,846	₩ 727,503,726
Effect of accounting policy change	5,230,800	-
Profit for the year	104,565,147	87,939,928
Dividends (*)	(18,311,444)	(14,387,563)
Actuarial gain (loss)	(145,598)	865,111
Related deferred tax	35,235	(209,356)
Ending balance	₩ 893,085,986	₩ 801,711,846

(*) Details of dividend payments for the years ended December 31, 2018 and 2017, are as follows:

	Year ended December 31, 2018	Year ended December 31, 2017
Number of issued and outstanding shares	87,197,353	87,197,353
Number of dividend shares	87,197,353	87,197,353
Dividend per share (Unit: Korean won)	₩ 210	₩ 165
Total dividends (Unit: Korean won in thousands)	₩ 18,311,444	₩ 14,387,563

(3) Separate statements of appropriations of retained earnings for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands)

	Year ended December 31, 2018	Year ended December 31, 2017
Date of appropriations: March 22, 2019		
UNAPPROPRIATED RETAINED EARNINGS:		
Unappropriated retained earnings carried over from prior year	₩ 739,561,916	₩ 669,277,677
Effect of accounting policy change	5,230,800	-
Profit for the year	104,565,147	87,939,928
Actuarial gains and losses on defined benefit plans	(110,363)	655,755
	849,247,500	757,873,360
TRANSFER FROM VOLUNTARY RESERVES:		
Reserves for research and development	-	-
APPROPRIATIONS:		
Legal reserve	-	-
Dividends	41,854,729	18,311,444
	(41,854,729)	(18,311,444)
UNAPPROPRIATED RETAINED EARNINGS TO BE CARRIED FORWARD TO SUBSEQUENT YEAR	₩ 807,392,771	₩ 739,561,916

24. OPERATING INCOME AND LOSS:

(1) The Company is making profit by transferring goods and services over time or at a point in time in the following key business unit. The classification of key business unit is consistent with the disclosure of revenue by reportable segment in accordance with K-IFRS 1108. (Unit: Korean won in thousands):

		2018	2017
Sales recorded at a point in time			
Sales of merchandise	Equipment supply	₩ 478,275,754	₩ 297,082,651
	Others	140,278,582	91,587,481
Total of sales recorded at a point in time		618,554,336	388,670,132
Sales recorded over time			
Service revenue	Maintenance	1,015,176,475	944,963,553
	Development service	796,471,315	671,984,519
Construction revenue	Revenue from construction contract	398,371,947	383,033,743
Total of sales recorded over time		2,210,019,737	1,999,981,815
Total		₩ 2,828,574,073	₩ 2,388,651,947

(2) Details of operating income for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	2018	2017
Sales of merchandise	₩ 618,554,336	₩ 388,670,132
Service revenue	1,015,176,475	944,963,553
Construction revenue	1,194,843,262	1,055,018,262
REVENUE	2,828,574,073	2,388,651,947
Cost of merchandise	560,392,722	357,386,985
Service cost	881,422,973	805,203,625
Construction cost	1,016,912,784	896,765,043
COST OF GOODS SOLD	(2,458,728,479)	(2,059,355,653)
GROSS MARGIN	369,845,594	329,296,294
Salaries and wages	78,876,494	52,865,487
Severance benefits	7,361,688	5,037,342
Welfare	14,110,588	10,196,192
Depreciation	5,850,663	5,091,291
Amortization of intangible assets	2,450,104	1,423,066
Research and development expenses	33,731,258	16,762,738
Commission	8,496,790	5,203,992
Training expenses	5,399,244	3,724,306
Service contract expenses	14,561,333	9,187,566
Rent expense	3,667,195	4,960,569
Bad debt expenses	4,084,093	8,331,536
Increase in provision	(3,221,958)	(49,123)
Others	30,852,479	30,761,019
SELLING AND ADMINISTRATIVE EXPENSES:	(206,219,971)	(153,495,981)
OPERATING INCOME	₩ 163,625,623	₩ 175,800,313

25. CLASSIFICATION OF EXPENSES BY NATURE:

1) For the year ended December 31, 2018 (Unit: Korean won in thousands):

Account	Changes in inventories	Selling and administrative expenses	Manufacturing cost	Total
Changes in inventories:	₩ (11,359,332)	₩ -	₩ -	₩ (11,359,332)
Merchandise	(11,359,332)	-	-	(11,359,332)
Purchase of goods	907,318,468	-	-	907,318,468
Employee benefits	-	100,560,757	474,246,514	574,807,271
Depreciation and amortization	-	8,300,766	64,991,792	73,292,558
Commission expenses	-	8,496,790	89,270,849	97,767,639
Lease expenses	-	3,667,195	14,779,827	18,447,022
Outsourcing services	-	14,561,333	594,666,879	609,228,212
Other expenses	-	70,633,130	324,813,482	395,446,612
Total	₩ 895,959,136	₩ 206,219,971	₩ 1,562,769,343	₩ 2,664,948,450

2) For the year ended December 31, 2017 (Unit: Korean won in thousands):

Account	Changes in inventories	Selling and administrative expenses	Manufacturing cost	Total
Changes in inventories:	₩ (5,265,931)	₩ -	₩ 529,722,322	₩ 524,456,391
Finished goods	4,246,858	-	-	4,246,858
Work in process	2,781,288	-	-	2,781,288
Merchandise	(15,938,391)	-	373,325,376	357,386,985
Other inventories	3,644,314	-	156,396,946	160,041,260
Raw material used	-	-	-	-
Employee benefits	-	69,853,466	423,780,276	493,633,742
Depreciation and amortization	-	6,514,357	65,370,437	71,884,794
Commission expenses	-	5,203,992	69,514,457	74,718,449
Lease expenses	-	4,960,569	15,121,827	20,082,396
Outsourcing services	-	9,187,566	520,927,343	530,114,909
Other expenses	-	57,776,031	440,184,922	497,960,953
Total	₩ (5,265,931)	₩ 153,495,981	₩ 2,064,621,584	₩ 2,212,851,634

26. FINANCIAL INCOME AND FINANCIAL EXPENSES:

(1) Financial income for the years ended December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

	2018	2017
Interest income	₩ 7,359,730	₩ 3,351,095
Dividend income	11,916,305	14,128,597
Gain on foreign currency transactions	695,023	249,449
Gain on foreign currency translation	420,358	17,152
Gain on valuation of financial assets at FVTPL	95,324	-
Total	₩ 20,486,740	₩ 17,746,293

(2) Interest income included in financial income for the years ended December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

	2018	2017
Interest income by effective interest method		
Financial institution deposits	₩ 5,514,919	₩ 1,986,628
AFS financial assets	-	5
Other loans and receivables	1,844,811	1,364,462
Total	₩ 7,359,730	₩ 3,351,095

(3) Financial expenses for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	2018	2017
Interest expense	₩ 13,357,775	₩ 10,069,996
Loss on foreign currency transactions	317,987	4,562,710
Loss on foreign currency translation	-	841,922
Loss on transactions of derivatives	-	248,630
Loss on disposal of financial assets measured at FVTPL	7	127
Impairment loss on AFS financial assets	-	4,292,996
Financial guarantee cost	1,113,500	-
Total	₩ 14,789,269	₩ 20,016,381

(4) Interest expense included in financial expenses for the years ended December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

	2018	2017
Bank overdrafts and loan interest	₩ 6,847	₩ 327,590
Interest expense on debentures	13,364,731	10,737,204
Other interest expense	454,734	1,137,363
Less: interest expense capitalized (*)	(468,537)	(2,132,161)
Total	₩ 13,357,775	₩ 10,069,996

(*) Capitalization interest rates used for the years ended December 31, 2018 and 2017, are 2.51% and 2.22%, respectively.

27. OTHER NON-OPERATING INCOME AND EXPENSE:

Other non-operating income and expenses for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	2018		2017	
Reversal of other allowances	₩	505,881	₩	459,293
Rental income		1,001,178		838,100
Commission		210,551		319,609
Gains on foreign currency transaction		3,790,275		7,144,619
Gain on foreign currency translation		-		3,197,870
Gain on disposal of tangible assets		387,596		729,056
Gain on transactions of derivatives		216,911		-
Gain on valuation of derivatives		7,084,843		14,364,473
Gain on disposal of investments in associates		928,051		1,671,559
Gain on disposal of investments in subsidiaries		143,062		1,877,570
Miscellaneous gain		345,782		411,685
Others		180,114		119,163
OTHER NON-OPERATING INCOME:	₩	14,794,244	₩	31,132,997
Loss on foreign currency transaction		4,417,570		7,349,853
Loss on foreign currency translation		1,886,203		6,196,771
Loss on disposal of tangible assets		13,713		691,871
Loss on impairment of tangible assets		-		63,731
Loss on disposal of intangible assets		23,204		777,765
Loss on impairment of intangible assets		100,000		201,385
Loss on transaction of derivatives		13,332,913		10,348,352
Loss on valuation of derivatives		5,423,750		1,835,613
Loss on disposal of investments in subsidiaries		168,908		-
Impairment loss on investments in subsidiaries		1,162,524		1,019,589
Impairment loss on investments in associates		7,362,667		4,479,295
Donations and contributions		961,900		2,924,026
Miscellaneous loss		-		4,034
Others		335,042		1,978,399
OTHER NON-OPERATING EXPENSES:	₩	(35,188,394)	₩	(37,870,684)

28. NET GAINS (LOSSES) ON FINANCIAL INSTRUMENT:

Net gains (losses) on each financial instrument for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Financial assets:		
Financial assets at FVTPL	₩ -	₩ 16,036,032
AFS financial assets	-	(4,335,862)
Loans and receivables (*)	-	(16,633,236)
Financial assets at FVTPL	8,115,372	-
Financial assets at FVTOCI	(9,385,837)	-
Financial assets at amortized cost (*)	5,865,806	-
Subtotal	4,595,341	(4,933,066)
Financial liabilities:		
Financial liabilities at FVTPL	-	(12,432,595)
Derivative instruments for hedges	-	173,083
Financial liabilities at amortized cost	-	(8,206,734)
Financial liabilities at FVTPL	(13,513,663)	-
Financial liabilities at amortized cost	(13,525,859)	-
Subtotal	(27,039,522)	(20,466,246)
Total	₩ (22,444,181)	₩ (25,399,312)

(*) Net gain or loss arising from cash and cash equivalents is included.

29. INCOME TAX:

(1) Composition of income tax expense for the years ended December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

	2018	2017
Current income tax payable	₩ 44,856,584	₩ 34,309,692
Adjustment relating to prior income tax expense	(2,087,236)	939,832
Tax expenses related to the variation of temporary difference:	(1,336,615)	14,615,569
Beginning deferred tax assets due to temporary differences	41,068,947	55,919,312
Ending deferred tax assets due to temporary differences	45,461,850	41,068,947
Deferred tax directly reflected in equity	3,056,288	(234,796)
Increase in deferred tax assets due to mergers	2,931,064	-
Income tax expense	₩ 44,363,797	₩ 49,865,093
Continuing operations	44,363,797	60,083,291
Discontinued operations	-	(10,218,198)

(2) Reconciliation between accounting income and income tax expense of the Company for the years ended December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

	2018	2017
Profit before income tax expense from continuing operations	₩ 148,928,945	₩ 166,792,538
Profit before income tax expense from discontinued operations	-	(28,987,517)
Income before income tax expense	₩ 148,928,945	₩ 137,805,021
Tax at the applicable tax rate	35,578,805	32,886,815
Adjustments:	8,784,992	16,978,278
Non-taxable income	(5,789,055)	(1,303,985)
Non-deductible expense	3,711,170	1,338,425
Adjustment relating to prior income tax expense	(5,165,301)	939,832
Effect of tax credit and exemption	(4,993,837)	(3,543,624)
Temporary difference not recognized as deferred tax assets	-	1,225,905
Others	21,022,015	18,321,725
Income tax expense	₩ 44,363,797	₩ 49,865,093

(3) Income tax directly reflected in equity for the years ended December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

	2018	2017
Gain (loss) on valuation of financial assets measured at FVTOCI (or AFS financial assets)	₩ 3,021,053	₩ 29,818
Remeasurement factor on a defined benefit plan	35,235	(209,356)
Derivative instruments for cash flow hedges	-	(55,258)
Total deferred tax directly reflected in equity	₩ 3,056,288	₩ (234,796)

(4) Changes in deferred tax assets (liabilities) for the years ended December 31, 2018 and 2017, are as follows
(Unit: Korean won in thousands):

1) For the year ended December 31, 2018 (Unit: Korean won in thousands):

	Beginning balance	Reflected in income (loss)	Reflected in equity	Merger	Ending balance
Temporary differences:					
Valuation of derivative instruments	₩ 29,028	₩ (209,874)	₩ -	-	₩ (180,846)
Property, plant and equipment	4,477,265	402,785	-	-	4,880,050
Investments in subsidiaries/associates	1,657,674	(1,727,016)	-	-	(69,342)
Intangible assets	1,154,010	(101,915)	-	-	1,052,095
Financial assets at FVTOCI	2,308,973	115,130	3,021,053	-	5,445,156
Accrued expense	6,868,881	241,287	-	-	7,110,168
Provisions	21,974,999	(701,596)	35,235	-	21,308,638
Doubtful receivable	124,716	(3,872)	-	-	120,844
Government subsidies	297,139	(34,174)	-	-	262,965
Others	1,440,393	140,134	-	2,638,172	4,218,699
Carried forward tax credit	735,869	577,554	-	-	1,313,423
Deferred income tax assets	<u>₩ 41,068,947</u>	<u>₩ (1,301,557)</u>	<u>₩ 3,056,288</u>	<u>₩ 2,638,172</u>	<u>₩ 45,461,850</u>

2) For the year ended December 31, 2017 (Unit: Korean won in thousands):

	Beginning balance	Reflected in income (loss)	Reflected in equity	Ending balance
Temporary differences:				
Valuation of derivative instruments	₩ 600,464	₩ (516,178)	₩ (55,258)	₩ 29,028
Property, plant and equipment	4,083,582	393,683	-	4,477,265
Investments in subsidiaries/associates	781,316	876,358	-	1,657,674
Intangible assets	4,502,303	(3,348,293)	-	1,154,010
AFS financial assets	821,570	1,457,585	29,818	2,308,973
Accrued expense	6,217,602	651,279	-	6,868,881
Provisions	21,379,913	804,442	(209,356)	21,974,999
Doubtful receivable	98,863	25,853	-	124,716
Government subsidies	383,874	(86,735)	-	297,139
Reserve for research and human resource development	(484,000)	484,000	-	-
Others	1,543,856	(103,463)	-	1,440,393
Carried forward tax credit	15,989,969	(15,254,100)	-	735,869
Deferred income tax assets	<u>₩ 55,919,312</u>	<u>₩ (14,615,569)</u>	<u>₩ (234,796)</u>	<u>₩ 41,068,947</u>

(5) As of December 31, 2018 and 2017, temporary differences not recognized as deferred tax assets (liabilities) related to investment asset and equity interest are as follows (Unit: Korean won in thousands):

	December 31, 2018	December 31, 2017
Investments in subsidiaries	₩ 27,074,215	₩ 14,076,546
Investments in associates	11,357,267	11,357,267
Total	<u>₩ 38,431,482</u>	<u>₩ 25,433,813</u>

30. RELATED-PARTY TRANSACTIONS:

(1) Details of related parties as of December 31, 2018 and 2017, are as follows:

Year ended December 31, 2018		
Entity controlled by the Company ("Controlled entity")	Subsidiaries and jointly controlled entity of Controlled entity (domestic) (*2)	Subsidiaries and jointly controlled entity of Controlled entity (overseas) (*2)
Parent company and its subsidiaries:		
LG Corporation	S&I Corporation Co., Ltd. and four others (*1,5) LG Management Development Institute LG Sports Ltd.	LG Holdings Japan Co., Ltd. and two others (*1) Serveone (Nanjing) Co., Ltd. and five others (*6)
Subsidiary (*2): LG CNS Co., Ltd.	Biztechpartners Co., Ltd. Korea Elecom Co., Ltd. Haemgbokmaru Co., Ltd. Sejong Green Power Co., Ltd.	LG CNS China Inc. and 14 others
Associates and jointly controlled entity:		
LG CNS Co., Ltd.	Korea Smart Card Co., Ltd. and two others Songdo U-Life LLC and two others Ulleungdo Natural Energy Co., Ltd. Daegu clean energy Co., Ltd.	RECAUDO BOGOTA S.A.S. T-money America, Inc. and two others Hellas SmartTicket Societe Anonyme KEPCO-LG CNS Mangilao Holdings LLC and two others
Associates and jointly controlled entities of parent company:		
LG Electronics Inc.	Hi Plaza Inc. High-M Solutec Co., Ltd. HITeleservice Co., Ltd. New Growth Venture Fund New Growth Venture Fund II Ace R&A Co., Ltd. Hientec Co., Ltd. LG-Hitachi Water Solutions Co., Ltd. LG Innotek Co., Ltd. LG Innoteck Alliance Fund Innowith Co., Ltd. LG Hanuri Co. Ltd. Robostar Co., Ltd. and another Haemgboknuri Co., Ltd. FarmHannong Ugimagkorea Co., Ltd. (*4)	LG Electronics Mexico S.A.DE C.V. and others
LG Chem Ltd.	LG Hausys ENG, Ltd. Greennuri Co. Ltd.	LG Chem America, Inc. and others
LG Hausys, Ltd.	CS Leader Ain Teleservice Medialog Corp. CS ONE Partner WithU	LG Hausys America, Inc. and others
LG Uplus Corp.		Dacom America, Inc.

Year ended December 31, 2018		
Entity controlled by the Company ("Controlled entity")	Subsidiaries and jointly controlled entity of Controlled entity (domestic) (*2)	Subsidiaries and jointly controlled entity of Controlled entity (overseas) (*2)
LG Household & Health Care Ltd.	Coca-Cola Beverage Co. Hankook Beverage Co., Ltd. TheFaceShop Co., Ltd. HTB Co., Ltd. K&I Co., Ltd. CNP COSMETICS CO., LTD. Balkeunnuri Co., Ltd. FMG Co., Ltd. OBM RAP Co., Ltd. LG Farouk Ulleungdo Choosan Water Development Co., Ltd. TAI GUK PHARM Co., Ltd. JS Pharmaceutical Co., Ltd.	Beijing LG Household Chemical Co., Ltd. and others
GIIR Corporation	HS Ad Co., Ltd. L.Best	GIIR America Inc. and another
LG Hitachi Co., Ltd. LG MMA Corp. LG Fuel Cell Systems Inc. Silicon Works Inc. LG International Corp.	LG Fuel Cell Systems (Korea) Inc. Dangjin Tank Terminal Co., Ltd. Pantos Logistics Co., Ltd. Pantos Logistics Pusan Co., Ltd. Helistar Air Co., Ltd. Hanultari Co., Ltd.	Silicon Works Inc. and another LG International (America) Inc. and other Pantos Logistics (CHINA) Co., Ltd. and other
Conglomerate of many companies (*7):		
LG Display Global Dynasty Investment Fund Sal de Vida Korea Co., Ltd. LG TOSTEM BM SEETEC Co., Ltd. MiGenstory Co., Ltd. (*8) Clean Soul Ltd. DACOM Crossing	Nanumnuri Co., Ltd.	LG Display Nanjing Co. Ltd. and others

(*1) Direct shareholding of the relationship between corporate subsidiaries is included.

(*2) Excluded joint venture of affiliates.

(*3) As a result of the acquisition of equity interest in the previous year, it was classified as a related entity of associates of parent company.

(*4) During this year, it was classified as an associate of the parent as an acquisition of an equity interest.

(*5) S&I Corporation (formerly Serveone Co., Ltd.) conducted physical division, which divides Serveone Co., Ltd. during this year and changed its name.

(*6) A new S&I Vietnamese corporation was established during this year.

(*7) These companies are not related parties as defined in paragraph 9 of K-IFRS 1024. However, the companies are designated by the Fair Trade Commission as related parties in accordance with the resolution of the Securities and Futures Commission in accordance with the substantive relationship stipulated in paragraph 10 of K-IFRS 1024.

(*8) The Company name is changed from Genstory Co., Ltd. to MiGenstory Co., Ltd.

Year ended December 31, 2017		
Controlled entity	Subsidiaries and jointly controlled entity of Controlled entity (domestic) (*2)	Subsidiaries and jointly controlled entity of Controlled entity (overseas) (*2)
Parent company and its subsidiaries:		
LG Corporation	Lusem Co., Ltd., and another Serveone Co., Ltd. and four others (*1) LG Management Development Institute LG Sports Ltd.	LG Holdings Japan Co., Ltd. and two others Serveone (Nanjing) Co., Ltd. and four others
Subsidiary (*2): LG CNS Co., Ltd.	LG N-Sys Co., Ltd. Biztechpartners Co., Ltd. Korea Elecom Co., Ltd. Haembokmaru Co., Ltd.	LG CNS China Inc. and 15 others
Associates and jointly controlled entity:		
LG CNS Co., Ltd.	Korea Smart Card Co., Ltd. and three others Songdo U-Life LLC and two others Sejong Green Power Co., Ltd. Ulleungdo Natural Energy Co., Ltd. Daegu clean energy Co., Ltd.	RECAUDO BOGOTA S.A.S. T-money America, Inc. and another Hellas SmarTicket Societe Anonyme KEPCO-LG CNS Mangilao Holdings LLC and two others
Associates and jointly controlled entity of parent company:		
LG Electronics Inc.	Hi Plaza Inc. High-M Solutec Co., Ltd. HITeleservice Co., Ltd. New Growth Venture Fund New Growth Venture Fund II Ace R&A Co., Ltd. Hientec Co., Ltd. LG-Hitachi Water Solutions Co., Ltd. LG Innotek Co., Ltd. LG Innoteck Alliance Fund Innowith Co., Ltd. LG Hanuri Co. Ltd.	LG Electronics Mexico S.A.DE C.V. and others
LG Chem Ltd.	Haemboknuri Co., Ltd. FarmHannong FarmHwaong Co., Ltd. Sarangnuri Co., Ltd.	LG Chem America, Inc. and others
LG Hausys, Ltd. LG Uplus Corp.	LG Hausys ENG, Ltd. CS Leader Ain Teleservice Medialog Corp. CS ONE Partner WithU	LG Hausys America, Inc. and others Dacom America, Inc.
LG Household & Health Care Ltd.	Coca-Cola Beverage Co. TheFaceShop Co., Ltd. Hankook Beverage Co., Ltd.	Beijing LG Household Chemical Co., Ltd. and others

Year ended December 31, 2017		
Controlled entity	Subsidiaries and jointly controlled entity of Controlled entity (domestic) (*2)	Subsidiaries and jointly controlled entity of Controlled entity (overseas) (*2)
	HTB Co., Ltd. CNP COSMETICS CO., LTD. K&I Co., Ltd. Zenisce Co., Ltd. Balkeunnuri. Co., Ltd. OBM RAP Co., Ltd. LG Farouk Ulleungdo Choosan Water Development Co., Ltd. HS Ad Co., Ltd. L.Best	GIIR America Inc. and another
GIIR Corporation		
LG Hitachi Co., Ltd. LG MMA Corp. LG Fuel Cell Systems Inc. Silicon Works Inc. LG International Corp.	LG Fuel Cell Systems (Korea) Inc. Dangjin Tank Terminal Co., Ltd. Pantos Logistics Co., Ltd. Pantos Logistics Pusan Co., Ltd. Helistar Air Co., Ltd.	Silicon Works Inc. and another LG International (America) Inc. and other Pantos Logistics (CHINA) Co., Ltd. and other
Conglomerate of many companies:		
LG Display Global Dynasty Investment Fund Sal de Vida Korea Co., Ltd. LG TOSTEM BM SEETEC Genstory Clean Soul Ltd. DACOM Crossing Jiheung	Nanumnuri Co., Ltd.	LG Display Nanjing Co. Ltd. and others

(*1) Direct shareholding of the relationship between corporate subsidiaries is included.

(*2) Excluded joint venture of affiliates.

(2) Major transactions with the related parties for the years ended December 31, 2018 and 2017, are as follows
(Unit: Korean won in thousands):

2018						
Description	Revenue and others		Purchase of raw material		Acquisitions of property, plant and equipment	Other purchase
Parent company and its subsidiaries:						
LG Corporation	₩	3,540,989	₩	-	₩ -	₩ 13,478,820
S&I Corporation Co., Ltd. (*1,4)		47,885,497		-	12,527,961	21,315,983
Siltron Co., Ltd. (*3)		-		-	-	-
LG Sports Co., Ltd.		1,104,765		-	-	40,261
LG Management Development Institute		6,659,880		-	-	5,066,446
LUSEM Co., Ltd. (*2)		88,768		-	-	-
Subtotal		59,279,899		-	12,527,961	39,901,510
Subsidiaries:						
LG CNS China Inc.		61,636,582		-	-	8,362,871
LG CNS Europe B.V.		20,210,255		-	-	812,711
LG CNS America, Inc.		21,968,000		-	430,243	3,985,648
LG CNS India Pvt., Ltd.		3,981,539		-	-	13,876
PT LG CNS Indonesia		3,170,236		-	-	1,227,465
Entrue Brasil Servicos de T.I. Ltda.		145,955		-	-	-
Biztech Partners Co., Ltd. (formerly known as BNE Partners Co., Ltd. (*5))		448,665		-	666,805	64,564,141
LG N-Sys Co., Ltd. (*2)		1,072,044		-	2,992,568	25,229,799
Korea Elecom		32,460		-	-	-
SBI-LG Systems Co., Ltd.		-		-	-	-
LG CNS COLOMBIA SAS		674,293		-	-	293,808
LG CNS Malaysia SDN Bhd		2,562,049		-	-	2,014,237
LG CNS JAPAN Co., Ltd.		856,998		-	-	-
Collain Healthcare LLC		1,993,616		-	-	885,593
LG CNS UZBEKISTAN, LLC		-		-	-	837,650
Haemgbokmaru Co., Ltd.		14,404		-	-	1,737,889
LG CNS Vietnam Co., Ltd.		14,081,550		-	-	-
Sejong Green Power Co., Ltd. (*7)		1,163,892		-	-	7,934,415
Subtotal		134,012,538		-	4,089,616	117,900,103
Associates:						
Korea Smart Card Co., Ltd. (*1)		26,110,378		-	-	3,210,758
Sejong Green Power Co., Ltd.(*2,7)		4,705,434		-	-	-
Ulleungdo Natural Energy Co., Ltd.		2,804,025		-	-	-
Subtotal		33,619,837		-	-	3,210,758
Top Controlled entity's associates and jointly controlled entity:						
LG Chem Ltd. (*1)		331,705,269		-	857,350	54,697,452
LG Household & Health Care Ltd. (*1)		51,428,281		-	-	4,231,880
LG Hausys, Ltd. (*1)		22,487,082		-	945,000	3,118,209
LG Electronics Inc. (*1)		568,795,020		-	21,542	105,070,153
GIIR Corporation (*1)		4,308,369		-	498,700	785,524

2018

Description	Revenue and others	Purchase of raw material	Acquisitions of property, plant and equipment	Other purchase
LG MMA Corp.	5,472,075	-	-	-
LG Hitachi Co., Ltd.	92,498	-	-	971,426
LG U Plus Co., Ltd. (*1)	359,113,610	-	-	25,404,254
Silicon Works Inc.	7,658,291	-	-	-
LG Fuel Cell Systems Inc.	-	-	-	-
LG Fuel Cell Systems (Korea) Inc.	57,520	-	-	-
LG International Corp. (*1,6)	32,844,187	-	-	1,294,345
Subtotal	1,383,962,202	-	2,322,592	195,573,243
Conglomerate of many companies:				
LG Display	215,368,602	-	-	-
LG TOSTEM BM	29,404	-	-	-
DACOM Crossing Corporation	97,994	-	-	-
SEETEC	-	-	-	-
Subtotal	215,496,000	-	-	-
Total	₩ 1,826,370,476	₩ -	₩ 18,940,169	₩ 356,585,614

2017

Description	Revenue and others	Purchase of raw material	Acquisitions of property, plant and equipment	Other purchase
Parent company and its subsidiaries:				
LG Corporation	₩ 3,469,320	₩ -	₩ -	₩ 12,192,689
S&I Corporation Co., Ltd. (*1,4)	74,170,411	-	54,502,963	15,348,005
Siltron Co., Ltd. (*3)	4,595,475	-	-	-
LG Sports Co., Ltd.	1,491,344	-	-	40,547
LG Management Development Institute	5,235,690	-	-	4,338,013
LUSEM Co., Ltd. (*2)	1,638,486	-	-	-
Subtotal	90,600,726	-	54,502,963	31,919,254
Subsidiaries:				
LG CNS China Inc.	53,643,355	-	-	12,137,114
LG CNS Europe B.V.	20,478,027	-	-	1,151,913
LG CNS America, Inc.	19,441,307	-	-	3,612,289
LG CNS India Pvt., Ltd.	4,490,322	-	-	95,253
PT LG CNS Indonesia	8,246,330	-	-	338,910
Entru Brasil Servicos de T.I. Ltda.	234,971	-	-	-
Biztech Partners Co., Ltd. (formerly known as BNE Partners Co., Ltd. (*5))	546,147	-	751,885	64,017,355
LG N-Sys Co., Ltd. (*2)	9,180,857	-	16,558,060	198,424,448
Korea Elecom	32,460	-	-	1,376,248
SBI-LG Systems Co., Ltd.	238,754	-	-	-
LG CNS COLOMBIA SAS	376,383	-	-	214,958
LG CNS Malaysia SDN Bhd	4,768,640	-	-	1,440,726
LG CNS JAPAN Co., Ltd.	2,001,427	-	-	16,138
Collain Healthcare LLC	1,931,020	-	-	1,370,196
LG CNS UZBEKISTAN, LLC	-	-	-	1,048,508
Haembokmaru Co., Ltd.	15,131	-	-	841,246
LG CNS Vietnam Co., Ltd.	18,879,405	-	-	-

2017

Description	Revenue and others	Purchase of raw material	Acquisitions of property, plant and equipment	Other purchase
Sejong Green Power Co., Ltd. (*7)	-	-	-	-
Subtotal	144,504,536	-	17,309,945	286,085,302
Associates:				
Korea Smart Card Co., Ltd. (*1)	21,695,889	-	-	1,097,090
Sejong Green Power Co., Ltd.	5,722,265	-	-	-
Ulleungdo Natural Energy Co., Ltd.	357,250	-	-	-
Subtotal	27,775,404	-	-	1,097,090
Top Controlled entity's associates and jointly controlled entity:				
LG Chem Ltd. (*1)	217,273,605	-	-	16,028,490
LG Household & Health Care Ltd. (*1)	30,596,862	-	508,902	10,473,510
LG Hausys, Ltd. (*1)	18,481,772	-	-	450,125
LG Electronics Inc. (*1)	534,130,872	135,434	1,084	72,927,908
GIIR Corporation (*1)	4,311,157	-	229,123	619,561
LG MMA Corp.	3,615,347	-	-	-
LG Hitachi Co., Ltd.	131,758	-	-	363,869
LG U Plus Co., Ltd. (*1)	261,612,655	-	579,960	22,519,663
Silicon Works Inc.	2,731,330	-	-	-
LG Fuel Cell Systems Inc.	74,723	-	-	-
LG Fuel Cell Systems (Korea) Inc.	-	-	-	-
LG International Corp. (*1,6)	28,216,228	-	-	1,944,819
Subtotal	1,101,176,309	135,434	1,319,069	125,327,945
Conglomerate of many companies:				
LG Display	205,290,198	-	-	322,965
LG TOSTEM BM	29,748	-	-	-
DACOM Crossing Corporation	-	-	-	-
SEETEC	66,177	-	-	-
Subtotal	205,386,123	-	-	322,965
Total	₩ 1,569,443,038	₩ 135,464	₩ 73,131,977	₩ 444,752,556

(*1) This includes transaction details for subsidiaries.

(*2) During this year, the Company excluded shares held by related parties due to the disposal or liquidation of shares.

(*3) The Company excluded shares held by related parties due to the disposal or liquidation of shares in the previous period.

(*4) S&I Corporation (formerly Serveone Co., Ltd.) conducted physical division, which divides Serwon Co., Ltd. during the current period and changed its name.

(*5) BNE Partners, Inc. (surviving corporation) merged with Biztechpartners Co., Ltd. and changed its name to Biztechpartners Co., Ltd.

(*6) The Company has been classified as an associate due to the acquisition of equity interest in the prior year. The current-period and the prior-term transaction amount includes the transaction amount during the period when the Company was classified as a large enterprise group.

(*7) As a result of additional acquisition of equity interest during the year, it was classified as a subsidiary in the associate.

(3) Outstanding receivables and payables from transactions with related parties as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

Description	December 31, 2018			
	Account receivables and others (*1)	Loans	Account payables and others (*2)	Borrowings
Parent company and its subsidiaries:				
LG Corporation	₩ 5,178,125	₩ -	₩ 421,614	₩ -
S&I Corporation Co., Ltd. (*10)	25,248,504	-	3,339,380	-
LG Sports Co., Ltd.	73,957	-	27	-
LG Management Development Institute	5,942,672	-	321,179	-
LUSEM Co., Ltd.	-	-	-	-
Subtotal	36,443,258	-	4,082,200	-
Subsidiaries:				
LG CNS China Inc.	22,433,809	-	2,038,065	-
LG CNS Europe B.V. (*7)	11,634,792	-	16,787	-
LG CNS America Inc. (*5)	11,449,677	-	100,096	-
LG CNS India Pvt., Ltd.	4,636,711	-	-	-
PT LG CNS Indonesia	2,589,945	-	-	-
Biztech Partners Co., Ltd. (formerly known as BNE Partners Co., Ltd.)	15,236	-	10,374,493	-
LG N-Sys Co., Ltd.	-	-	-	-
LG CNS COLOMBIA SAS	2,142,704	-	-	-
LG System Philippines, Inc. (*4)	71,487	2,470,006	-	-
LG CNS JAPAN Co., Ltd.	253,946	-	-	-
LG CNS Malaysia SDN Bhd	4,146,219	-	434,641	-
Collain Healthcare LLC	-	-	-	-
LG CNS UZBEKISTAN, LLC	645,883	-	254,510	-
Hangbokmaru Co., Ltd.	80	-	37,592	-
LG CNS Vietnam Co., Ltd.	8,617,685	-	44,517	-
Sejong Green Power Co., Ltd. (*9)	11,893,218	-	-	-
Subtotal	80,531,392	2,470,006	13,300,701	-
Associates:				
Korea Smart Card Co., Ltd. (*3)	4,852,222	-	543,323	-
RECAUDO BOGOTA S.A.S. (*8)	17,688,476	-	-	-
Ulleungdo Natural Energy Co., Ltd.	-	-	-	-
Sejong Green Power Co., Ltd.	-	-	-	-
KEPCO-LG CNS Mangilao Holdings LLC	-	7,594,292	-	-
Subtotal	22,540,698	7,594,292	543,323	-
Top Controlled entity's associates and jointly controlled entity:				
LG Chem Ltd. (*3)	142,181,332	-	8,118,231	-
LG Household & Health Care Ltd. (*3)	4,179,629	-	559,222	-
LG Hausys, Ltd. (*3)	2,720,123	-	136,967	-
LG Electronics Inc. (*3,6)	154,591,462	-	19,525,414	-
GIIR Corporation (*3)	1,236,666	-	138,389	-
LG MMA Corp.	952,333	-	-	-
LG Hitachi Co., Ltd.	45,375	-	163,556	-
LG Uplus Corp. (*3)	165,547,025	-	1,057,127	-
Silicon Works Inc.	824,550	-	-	-
LG International (*3)	5,736,310	-	123,877	-
Subtotal	478,014,805	-	29,822,783	-

December 31, 2018				
Description	Account receivables and others (*1)	Loans	Account payables and others (*2)	Borrowings
Conglomerate of many companies:				
LG Display	81,225,444	-	-	-
LG TOSTEM BM	440	-	-	-
Subtotal	81,225,884	-	-	-
Total	₩ 698,756,037	₩ 10,064,298	₩ 47,749,007	₩ -
December 31, 2017				
Description	Account receivables and others (*1)	Loans	Account payables and others (*2)	Borrowings
Parent company and its subsidiaries:				
LG Corporation	₩ 5,518,925	₩ -	₩ 580,247	₩ -
S&I Corporation Co., Ltd. (*10)	48,200,418	-	30,582,557	-
LG Sports Co., Ltd.	69,111	-	-	-
LG Management Development Institute	3,727,906	-	227,070	-
LUSEM Co., Ltd.	64,525	-	-	-
Subtotal	57,580,885	-	31,389,874	-
Subsidiaries:				
LG CNS China Inc.	15,450,186	-	6,646,903	-
LG CNS Europe B.V. (*7)	10,844,116	-	132,972	-
LG CNS America Inc. (*5)	5,877,061	-	386,336	-
LG CNS India Pvt., Ltd.	6,180,982	-	-	-
PT LG CNS Indonesia	2,220,254	-	-	-
Biztech Partners Co., Ltd. (formerly known as BNE Partners Co., Ltd. (*5))	224,225	-	10,286,315	-
LG N-Sys Co., Ltd.	377,522	-	93,032,030	-
LG CNS COLOMBIA SAS	2,776,397	-	-	-
LG System Philippines, Inc. (*4)	68,501	2,366,841	-	-
LG CNS JAPAN Co., Ltd.	359,300	-	-	-
LG CNS Malaysia SDN Bhd	4,734,000	-	-	-
Collain Healthcare LLC	1,847,101	-	310,669	-
LG CNS UZBEKISTAN, LLC	1,480,629	-	261,014	-
Hangbokmaru Co., Ltd.	89	-	6,720	-
LG CNS Vietnam Co., Ltd.	13,518,279	-	-	-
Sejong Green Power Co., Ltd.	-	-	-	-
Subtotal	65,958,642	2,366,841	111,062,959	-
Associates:				
Korea Smart Card Co., Ltd. (*3)	2,006,660	-	164,984	-
RECAUDO BOGOTA S.A.S.	17,110,387	-	-	-
Ulleungdo Natural Energy Co., Ltd.	83,600	-	-	-
Sejong Green Power Co., Ltd.	5,436,959	-	-	-
KEPCO-LG CNS Mangilao Holdings LLC	-	7,277,099	-	-
Subtotal	24,637,606	7,277,099	164,984	-
Top Controlled entity's associates and jointly controlled entity:				
LG Chem Ltd. (*3)	100,604,907	-	15,007,960	-
LG Household & Health Care Ltd. (*3)	3,019,854	-	301,427	-
LG Hausys, Ltd. (*3)	3,127,518	-	40,491	-
LG Electronics Inc. (*3,6)	136,869,907	-	16,291,252	-

December 31, 2017				
Description	Account receivables and others (*1)	Loans	Account payables and others (*2)	Borrowings
GIIR Corporation (*3)	1,213,067	-	250,596	-
LG MMA Corp.	569,327	-	-	-
LG Hitachi Co., Ltd.	12,544	-	205,890	-
LG Uplus Corp. (*3)	85,155,361	-	750,902	-
Silicon Works Inc.	449,299	-	-	-
LG International (*3)	5,535,341	-	439,609	-
Subtotal	336,557,125	-	33,288,127	-
Conglomerate of many companies:				
LG Display	74,633,327	-	-	-
LG TOSTEM BM	2,760	-	-	-
Subtotal	74,636,087	-	-	-
Total	₩ 559,370,345	₩ 9,643,940	₩ 175,905,944	₩ -

(*1) Receivables from related party consist of trade receivables, other receivables and prepaid expenses.

(*2) Payables to related party consist of trade payables, other payables and so on.

(*3) It includes transactions with subsidiaries (including joint ventures).

(*4) Bad debt allowances are recorded at 100% of receivables for the years ended December 31, 2018 and 2017.

(*5) Bad debt allowances are recorded at ₩20,793 thousand and ₩9,760 thousand of receivables for the years ended December 31, 2018 and 2017, respectively.

(*6) Bad debt allowances are recorded at ₩210,006 thousand and ₩123,460 thousand of receivables for the years ended December 31, 2018 and 2017, respectively.

(*7) Bad debt allowances are recorded at ₩1,453 thousand and ₩283 thousand of receivables for the years ended December 31, 2018 and 2017, respectively.

(*8) Bad debt allowances are recorded at ₩6,292,337 thousand and ₩5,807,166 thousand of receivables for the years ended December 31, 2018 and 2017, respectively.

(*9) As a result of the agreement described in Note 30 (7), the Company has set aside ₩ 7,934,415 thousand of liabilities related to the loss compensation agreements as of December 31, 2018.

(*10) During this year, the company was split and changed from Serveone Co., Ltd. to S&I Corporation Co., Ltd., including transaction details for subsidiaries.

(4) Cash transactions with the related parties for the years ended December 31, 2018 and 2017, are as follows

(Unit: Korean won in thousands):

Description	Year ended December 31, 2018				
	Payment in cash (reduction of capital)	Sale of interests	Loans		
			Loans	Payback	
Subsidiaries:					
Entrue Brasil Servicos de T.I. Ltda.	₩ 221,320	₩ -	₩ -	₩ -	-
Top Controlled entity's associates and jointly controlled entity: LG Fuel Cell Systems Inc.	1,191,322	-	-	-	-
Total	₩ 1,412,642	₩ -	₩ -	₩ -	-
Description	Year ended December 31, 2017				
	Payment in cash (reduction of capital)	Sale of interests	Loans		
			Loans	Payback	
Subsidiaries:					
LG CNS Vietnam Co., Ltd.	₩ 233,340	₩ -	₩ -	₩ -	-
LG CNS MALAYSIA SDN BHD	-	-	-	1,807,488	-
subtotal	233,340	-	-	1,807,488	-
Associates:					
KEPCO-LG CNS Mangilao Holdings LLC	-	-	7,609,914	-	-
Top Controlled entity's associates and jointly controlled entity: LG Fuel Cell Systems Inc.	-	-	-	-	-
	5,641,252	-	-	2,271,321	-
Total	₩ 5,874,592	₩ -	₩ 7,609,914	₩ 4,078,809	-

- (5) Details of payment guarantees provided to related parties as of December 31, 2018, are as follows:
(6)

Related party	Guarantees	Limit of guarantees
LG CNS India Pvt., Ltd.	Credit line	INR 65,000,000
LG CNS India Pvt., Ltd.	Credit line	INR 66,000,000
LG CNS India Pvt., Ltd.	Payment guarantees	USD 500,000
PT LG CNS Indonesia	Credit line	USD 1,200,000
PT LG CNS Indonesia	Credit line	USD 500,000
PT LG CNS Indonesia	Credit line	USD 840,000
PT LG CNS Indonesia	Credit line	USD 960,000
PT LG CNS Indonesia	Credit line	USD 500,000
PT LG CNS Indonesia	Payment guarantees	IDR 25,075,673,700
PT LG CNS Indonesia	Payment guarantees	IDR 12,537,836,850
LG CNS America Inc.	Credit line	USD 10,000,000
LG CNS America Inc.	Credit line	USD 5,000,000
LG CNS America Inc.	Payment guarantees	USD 34,999,070
LG CNS COLOMBIA SAS	Credit line	USD 3,000,000
LG CNS COLOMBIA SAS	Credit line	USD 5,500,000
LG CNS COLOMBIA SAS	Credit line	USD 4,500,000
LG CNS Europe B.V.	Credit line	EUR 1,800,000
LG CNS MALAYSIA SDN BHD	Credit line	MYR 7,000,000
LG CNS MALAYSIA SDN BHD	Payment guarantees	USD 451,901
LG CNS MALAYSIA SDN BHD	Payment guarantees	MYR 2,110,000
LG CNS JAPAN Co., Ltd.	Payment guarantees	JPY 356,400,000
LG CNS JAPAN Co., Ltd.	Payment guarantees	JPY 6,000,000
LG CNS JAPAN Co., Ltd.	Payment guarantees	JPY 1,254,566,340
LG CNS JAPAN Co., Ltd.	Credit line	JPY 500,000,000
Hellas SmarTicket Societe Anonyme	Payment guarantees	EUR 28,000,000

- (6) The compensation and benefits for the Company's key management (registered executives, including non-permanent and non-registered executives) who have significant control and responsibility on planning, operating and controlling the activities of the Company for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	Year ended December 31, 2018	Year ended December 31, 2017
Short-term employee benefits	₩ 20,323,450	₩ 15,288,761
Severance benefits	2,004,504	2,003,413
Other long-term employee liabilities	4,478	4,381
Total	₩ 22,332,432	₩ 17,296,555

- (7) Other commitments

In connection with the power sales business of Sejong Green Power Co., Ltd., a subsidiary of the Company, the Company signed an agreement to compensate Sejong Green Power Co., Ltd. for its operational losses under the management operation consignment contract.

31. FUNDING ARRANGEMENTS AND PLEDGING:

(1) Financing agreements (Unit: Korean won in thousands and U.S. dollars):

Category (*1)	Financial institution	Limit of credit
Comprehensive import and export	Woori Bank	USD 5,800,000
Comprehensive import and export	Shinhan Bank	USD 5,000,000
Comprehensive import and export	Hana Bank	USD 35,000,000
Forward exchange	Woori Bank	USD 3,000,000
Forward exchange	Hana Bank	USD 19,100,000
Forward exchange	Shinhan Bank	USD 15,000,000
Forward exchange	HSBC	USD 20,000,000
Forward exchange	JP MORGAN	USD 10,000,000
Forward exchange	Kookmin Bank	USD 20,000,000
Credit line of electronic payment	Woori Bank	₩ 9,600,000
Credit line of electronic payment	Hana Bank	₩ 35,000,000
Credit line of electronic payment	Shinhan Bank	₩ 10,000,000
Credit line of electronic payment	Giyup Bank	₩ 30,000,000
Credit line of electronic payment	NH Bank	₩ 4,000,000
Overdraft	Woori Bank	₩ 5,000,000
Other payment guarantee	Woori Bank	₩ 5,000,000

(*1) Both blanket credit agreement and individual credit agreement are presented.

Payment guarantees provided for the related parties are described in Note 30 (5).

(2) Restricted financial assets as of December 31, 2018, are as follows (Unit: Korean won in millions):

Account	December 31, 2018	December 31, 2017
Financial institution deposits	₩ 12,500,000	₩ 12,500,000
Long-term deposits	9,500	11,000
Total	₩ 12,509,500	₩ 12,511,000

(3) Details of pledging

1) Performance guarantee

The Company provides the following performance guarantees for contracts and warrants to customers by insuring guarantee insurance as of December 31, 2018 (Unit: Korean won in thousands):

	Amounts of guarantees	Insurance company
	₩ 92,095,085	Seoul Guarantee Insurance
Guarantees of contract and warranties, etc.	286,387,350	Korea Software Financial Cooperative
	7,545,848	Engineering Financial Cooperative
	122,488,221	KEB HANA Bank and others
Total	₩ 508,516,504	

2) Collateral

Out of Financial assets at FVTPL, capital stock investments to Korea Software Financial Cooperative and Engineering Financial Cooperative of Korea amounting to ₩1,300 million and ₩779 million, respectively, are provided as collateral in relation to performance guarantee provided by the cooperatives.

3) There are no non-financial assets and financial assets pledged as collateral for the year ended December 31, 2018, under review.

32. OPERATING LEASE CONTRACTS:

(1) The Company as lessee

- 1) The Company entered into the operating lease contracts with regard to building, vehicle and office equipment. Payment schedule related to the major operating lease contracts as of December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

December 31, 2018

Lessor	Contents	Within one year	One year– five years	After five years	Total
LG Corp.	Real estate leasing	₩ 5,896,622	₩ 23,586,490	₩ 30,957,268	₩ 60,440,380
Others	Real estate leasing	4,215,829	1,881,760	-	6,097,589
Total		₩ 10,112,451	₩ 25,468,250	₩ 30,957,268	₩ 66,537,969

December 31, 2017

Lessor	Contents	Within one year	One year– five years	After five years	Total
The Federation of Korean Industries	Real estate leasing	₩ 2,967,246	₩ -	₩ -	₩ 2,967,246
LG Corp.	Real estate leasing	5,896,622	23,586,490	37,345,275	66,828,387
Others	Real estate leasing	568,723	89,252	-	657,975
Total		₩ 9,432,591	₩ 23,675,742	₩ 37,345,275	₩ 70,453,608

- 2) The Company's lease payments recognized related to operating lease contracts for the years ended December 31, 2018 and 2017, are ₩ 18,447,022 thousand and ₩ 20,082,396 thousand, respectively.

(2) The Company as lessor

- 1) The Company entered into the building lease contract with LG Uplus Co., Ltd., and five others. Collection schedule related to the major operating lease contracts as of December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

	Lessee	Within one year	One year– five years	Total
December 31, 2018	LG Uplus Co., Ltd.	₩ 98,120	₩ -	₩ 98,120
	Biztechpartners Co., Ltd. and four others	847,051	1,144,857	1,991,908
December 31, 2017	LG Uplus Co., Ltd.	₩ 93,540	₩ 17,360	₩ 110,900
	LG N-Sys Co., Ltd. and five others	1,637,139	5,319,019	6,956,158

- 2) The Company's lease revenues recognized related to operating lease contracts for the years ended December 31, 2018 and 2017, are ₩ 1,001,178 thousand and ₩ 838,100 thousand, respectively.

33. PENDING LITIGATION AND DISPUTES:

Pending litigation and disputes as of December 31, 2018, are as follows (Unit: Korean won in thousands):

	Amount of lawsuit	Plaintiff	Defendant
Claims for unfair joint activities	₩ 48,902,750	Kookmin Bank Co., Ltd.	LG CNS Co., Ltd. and others
Claims for unfair joint activities	13,298,811	Industrial Bank of Korea	LG CNS Co., Ltd. and others
Claims for unfair joint activities	21,313,900	Woori FIS.	LG CNS Co., Ltd. and others
Claims for unfair joint activities	78,755,530	National Agricultural Cooperatives Foundation	LG CNS Co., Ltd.
Claims for unfair joint activities	1,693,134	National Federation of Fisheries Cooperatives	LG CNS Co., Ltd.
Claims for unfair joint activities	200,000	Hana Bank	LG CNS Co., Ltd. and others
Claims for National Defense Network	5,000,000	Republic of Korea	LG CNS Co., Ltd. and others
Litigation with the issue of the amount of compensation of deferment	3,421,163	LG CNS Co., Ltd.	KT CO., LTD.
Litigation of service payment	7,399,894	LG CNS Co., Ltd.	Korea Customs Service
ASAN Hospital service charge	10,000,000	LG CNS Co., Ltd.	ASAN Foundation
Claims for ASAN Hospital	37,933,444	ASAN Foundation	LG CNS Co., Ltd.
Claims for return of unreasonable gain in Majortech Co., Ltd.	317,652	Majortech Co., Ltd. Bankruptcy Trustee	LG CNS Co., Ltd. and others
Claims for denial	194,440	Majortech Co., Ltd. Bankruptcy Trustee	LG CNS Co., Ltd. and others
Acceptance to extension of contract period	50,000	LG CNS Co., Ltd.	Republic of Korea

The final result of the litigation and effect on the separate financial statements cannot be estimated at the end of the reporting period.

34. RISK MANAGEMENT:

(1) Capital risk management

The Company performs capital management to maintain the ability to continuously provide profits to shareholders and interest parties and to maintain optimum capital structure to reduce capital expenses. In order to maintain such optimum structure, the Company may adjust dividend payments, redeem paid-in capital to shareholders, issue stocks to reduce liability or sell assets.

The Company's capital structure consists of net liability, which is borrowings, less cash and cash equivalents and equity. The overall capital risk management policy of the Company is unchanged from prior period. In addition, items managed as capital by the Company as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	December 31, 2018		December 31, 2017	
Total borrowings	₩	518,863,575	₩	449,124,837
Less: cash and cash equivalents		392,006,720		180,326,415
Borrowings, net		126,856,855		268,798,422
Total equity	₩	1,063,700,087	₩	908,617,119
Debt ratio		11.93%		29.58%

(2) Financial risk management

The Company is exposed to various financial risks, such as market (foreign currency, interest rate and price), credit and liquidity, related to financial instruments. The purpose of risk management of the Company is to identify the potential risks to financial performance and reduce, eliminate and evade those risks to a degree acceptable to the Company. The Company makes use of derivative financial instruments to hedge certain risks, such as foreign exchange and interest rate. Overall, financial risk management policy of the Company is the same as in the prior period.

1) Foreign currency risk

The Company is exposed to foreign currency risk as it makes transactions denominated in foreign currencies. The book value of the Company's monetary assets and liabilities denominated in foreign currencies that are not the functional currency as of December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

Currency	December 31, 2018			
	Assets		Liabilities	
USD	₩	137,803,643	₩	12,077,883
EUR		15,895,153		7,183,698
JPY		793,320		-
CNY		539,623		132,563
Others		39,516,820		22,711
Total	₩	194,548,559	₩	19,416,855

Currency	December 31, 2017			
	Assets		Liabilities	
USD	₩	89,079,233	₩	13,021,691
EUR		31,063,390		5,141,880
JPY		559,567		96,302
CNY		645,064		2,955,941
Others		35,250,514		4,694,712
Total	₩	156,597,768	₩	25,910,526

The Company internally assesses the foreign currency risk from changes in exchange rates on a regular basis. The Company's sensitivity to a 10% increase and 10% decrease in the Korean won (functional currency of the Company) against the major foreign currencies as of December 31, 2018 and 2017, is as follows (Unit: Korean won in thousands):

		December 31, 2018	
Currency		10% increase against foreign currency	10% decrease against foreign currency
USD	₩	9,530,013	₩ (9,530,013)
EUR		660,328	(660,328)
JPY		60,134	(60,134)
CNY		30,855	(30,855)
Others		2,993,653	(2,993,653)
Total	₩	13,274,983	₩ (13,274,983)

		December 31, 2017	
Currency		10% increase against foreign currency	10% decrease against foreign currency
USD	₩	5,765,162	₩ (5,765,162)
EUR		1,964,850	(1,964,850)
JPY		35,115	(35,115)
CNY		(175,164)	175,164
Others		2,316,130	(2,316,130)
Total	₩	9,906,093	₩ (9,906,093)

The above sensitivity analysis is conducted for monetary assets and liabilities denominated in foreign currencies other than functional currency as of December 31, 2018.

As of December 31, 2018, the Company entered into cross-forward foreign currency contracts to manage its foreign currency exchange rate risk related to its expected sale and purchase. The evaluation of unsettled currency forward contracts as of December 31, 2018, is as follows (Unit: Korean won in thousands):

	Notional amount	Valuation gain and loss		Fair value	
		Gain	Loss	Assets	Liabilities
Currency forward	₩ 59,196,633	₩ 928,051	₩ 5,423,750	₩ 928,051	₩ 5,423,750

2) Price risk

The Company is exposed to price risks from equity instruments, etc. As of December 31, 2018, fair value of marketable equity instruments is ₩4,336,046 thousand, and when all the other variables are constant and when the price of equity instrument changes by 10%, the effect to equity will be ₩328,672 thousand (effect after tax).

3) Credit risk

Credit risk refers to the risk of financial losses to the Company when the counterparty defaults on the obligations of the contract.

The maximum amount of financial loss to be incurred by the counterparty due to non-fulfillment of obligations in case of collateral or other credit enhancement is equivalent to the carrying amount of each financial asset in the financial statement. The maximum amount we will be required to pay if we are warranted due to the financial guarantees we provide is ₩142,980 million (the financial guarantee limit described in Note 30 (5)).

To minimize credit risk, we use independent external credit rating agencies' information to classify exposure based on the extent of default. If information from credit rating agencies is not available, we use officially available financial information to determine the ratings of key customers and other debtors. Our total exposure and the counterparty's credit rating are constantly reviewed and the total amount of these transactions is evenly distributed among the authorized accounts.

The exposure to credit risk based on book value by major industries, to which the Company's customers belong, is as follows (Unit: Korean won in thousands):

	Manufacturing	Financial service	Other service	Public institutions	Others	Total
Financial assets at FVTPL	₩ -	₩ 928,051	₩ -	₩ -	₩ 7,936,227	₩ 8,864,278
Financial liabilities at amortized cost	559,776,458	225,581,558	21,552,238	29,019,495	3,676,145	839,605,894
Limit of payment guarantee	-	-	142,979,994	-	-	142,979,994
Total	<u>₩ 559,776,458</u>	<u>₩ 226,509,609</u>	<u>₩ 164,532,232</u>	<u>₩ 29,019,495</u>	<u>₩ 11,612,372</u>	<u>₩ 991,450,165</u>

The carrying amount of financial assets at FVTPL is the best indication of the maximum exposure to credit risk. The Company has not provided any collateral for its financial assets other than those stated in Note 31.

4) Liquidity risk

The Company manages liquidity risk by establishing short-, medium- and long-term funding plan and continuously monitoring actual cash outflow and its budget to match the maturity profiles of financial assets and liabilities. Management of the Company believes that financial liability may be redeemed by cash flows arising from operating activities and financial assets.

Maturity analysis of non-derivative financial liabilities according to their remaining maturity as of December 31, 2018, is as follows (Unit: Korean won in thousands):

	Within one year	One year– five years	After five years	Total
Non-interest-bearing financial instruments	₩ 479,765,267	₩ 1,052,873	₩ -	₩ 480,818,140
Variable interest rate financial instrument	-	-	-	-
Fixed interest rate financial instrument	-	520,000,000	-	520,000,000
Limit of payment guarantee	142,979,994	-	-	142,979,994
Total	<u>₩ 622,745,261</u>	<u>₩ 521,052,873</u>	<u>₩ -</u>	<u>₩ 1,143,798,134</u>

(*1) It includes the payment guarantees for foreign subsidiaries (USD 67,950,971, EUR 29,800,000, 2,116,966,340, MYR 9,110,000, INR 131,000,000 or IDR 37,613,510,550) in paragraph 30 (5). Based on the expectation as of December 31, 2018, the Company believes that possibility of payment on guaranteed amount is not higher. However, the expectation could be changed because warrantees may request payment to the Company according to the credit loss on the financial assets held by the warrantees.

The above maturity analysis is based on the book value and the earliest maturity date by which the payments should be made.

Maturity analysis of derivative financial liabilities according to its remaining maturity as of December 31, 2018, is as follows (Unit: Korean won in thousands):

		Within one year	One year– five years	After five years
Derivative assets for trading				
Foreign currency derivatives	Inflows	₩ 207,546,815	₩ -	₩ 207,546,815
(*)	Outflow	(206,799,514)	-	(206,799,514)
Others	Outflow	-	-	-
Total		₩ 747,301	₩ -	₩ 747,301

(*) As the cash flows from the foreign currency derivative contracts are settled gross, the cash flows are disclosed separately.

(3) Estimation of fair value

The fair values of financial instruments (i.e., financial assets measured at FVTPL and financial assets measured at FVTOCI) traded in active markets are determined with reference to quoted market prices. The Company uses the current bid price as the quoted market price for its financial assets.

The fair values of financial instruments not traded on an active market (i.e., over-the-counter derivatives) are determined using a valuation technique. The Company uses various valuation techniques using assumptions based on current market conditions. The fair values of long-term liabilities and financial liabilities available for settlement are determined using prices from observable current market transactions and dealer quotes for similar instruments. When such prices are not available, a discounted cash flow (“DCF”) analysis or other valuation technique is performed to measure their fair values.

The fair values of trade receivable and trade payables are approximated as their carrying value, less impairment loss. The Company estimates the fair values of financial liabilities as the present value of future contractual cash flows, discounted based on current market rates applied to similar financial instruments.

Financial instruments that are measured subsequent to initial recognition at fair value are grouped into Level 1 to Level 3, based on the degree to which the fair value is observable, as described below:

- Level 1: Fair value measurements are derived from quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: Fair value measurements are derived from inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e., as prices) or indirectly (i.e., derived from prices).
- Level 3: Fair value measurements are derived from valuation techniques that include inputs for the asset or liability and are not based on observable market data (unobservable inputs).

- 1) Financial instruments that are measured subsequently to initial recognition at fair value by fair value hierarchy levels as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

		December 31, 2018				
		Book value	Level 1	Level 2	Level 3	Total
Financial assets:						
Financial assets at FVTPL		₩ 8,864,278	₩ -	₩ 928,051	₩ 7,936,227	₩ 8,864,278
Non-designated derivative instrument for trading		928,051	-	928,051	-	928,051
Investment		7,935,198	-	-	7,935,198	7,935,198
Government bonds		1,030	-	-	1,030	1,030
Financial assets at FVTOCI		4,336,046	1,936,400	-	2,399,646	4,336,046
Marketable equity securities		1,936,400	1,936,400	-	-	1,936,400
Non-marketable equity securities		2,399,646	-	-	2,399,646	2,399,646
Total		<u>₩13,200,324</u>	<u>₩ 1,936,400</u>	<u>₩ 928,051</u>	<u>₩10,335,873</u>	<u>₩13,200,324</u>
Financial liabilities:						
Financial liabilities at FVTPL		₩ 180,750	₩ -	₩ 180,750	₩ -	₩ 180,750
Derivative instrument for trading		180,750	-	180,750	-	180,750
Total		<u>₩ 180,750</u>	<u>₩ -</u>	<u>₩ 180,750</u>	<u>₩ -</u>	<u>₩ 180,750</u>
		December 31, 2017				
		Book value	Level 1	Level 2	Level 3	Total
Financial assets:						
Non-designated derivative instrument for trading		₩ 1,715,664	₩ -	₩ 1,715,664	₩ -	₩ 1,715,664
Marketable equity securities		1,944,773	1,944,773	-	-	1,944,773
Non-marketable equity securities		4,045,589	-	-	4,045,589	4,045,589
Total		<u>₩ 7,706,026</u>	<u>₩ 1,944,773</u>	<u>₩ 1,715,664</u>	<u>₩ 4,045,589</u>	<u>₩ 7,706,026</u>
Financial liabilities:						
Derivative instrument for trading		₩1,835,613	₩ -	₩ 1,835,613	₩ -	₩ 1,835,613
Total		<u>₩ 1,835,613</u>	<u>₩ -</u>	<u>₩ 1,835,613</u>	<u>₩ -</u>	<u>₩ 1,835,613</u>

- 2) Valuation method and input variables of financial instruments, which are included in Level 2 of the financial instruments that are measured at fair value in the separate statement of financial position, are as follows (Unit: Korean won in thousands):

	Fair value	Valuation technique	Input factor
Financial assets:			
Derivative instrument for trading	₩ 928,051	DCF	Forward exchange rate
Financial liabilities:			
Derivative instrument for trading	180,750	DCF	Forward exchange rate

3) The levels of the fair value of financial instruments without subsequent measurement at fair value as of December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

		December 31, 2018				
		Book value	Level 1	Level 2	Level 3	Total
Financial assets:						
Financial institution deposits	₩ 12,500,000	₩	-	₩	-	₩ 12,500,000
Trade receivables (*)	792,636,078		-		-	792,636,078
Loans (*)	11,489,414		-		-	11,489,414
Other accounts receivable (*)	16,081,603		-		-	16,081,603
Accrued income (*)	654,819		-		-	654,819
Deposits (*)	6,243,980		-		-	6,243,980
Total	₩ 839,605,894	₩	-	₩	-	₩ 839,605,894
Financial liabilities:						
Trade payables (*)	₩ 356,537,879	₩	-	₩	-	₩ 356,537,879
Other accounts payable (*)	24,923,401		-		-	24,923,401
Accrued expenses (*)	98,303,238		-		-	98,303,238
Dividend payables (*)	749		-		-	749
Deposits received	1,052,873		-	1,052,873	-	1,052,873
Long-term borrowings	518,863,575		-	521,374,578	-	521,374,578
Total	₩ 999,681,715	₩	-	₩ 522,427,451	₩ 479,765,267	₩ 1,002,192,718

(*) Short-term receivables and short-term payment obligations that have been shown as Level 3, the discount effect of which is not important, are measured at the original amount.

		December 31, 2017				
		Book value	Level 1	Level 2	Level 3	Total
Financial assets:						
Financial institution deposits	₩ 22,500,000	₩	-	₩	-	₩ 22,500,000
Trade receivables (*)	663,219,887		-		-	663,219,887
Loans (*)	10,193,096		-		-	10,193,096
Other accounts receivable (*)	11,156,248		-		-	11,156,248
Accrued income (*)	174,678		-		-	174,678
Deposits (*)	17,909,304		-		-	17,909,304
Total	₩ 725,153,213	₩	-	₩	-	₩ 725,153,213
Financial liabilities:						
Trade payables (*)	₩ 310,283,177	₩	-	₩	-	₩ 310,283,177
Other accounts payable (*)	75,111,832		-		-	75,111,832
Accrued expenses (*)	70,680,108		-		-	70,680,108
Dividend payables (*)	494		-		-	494
Deposits received	1,834,064		-	1,834,064	-	1,834,064
Long-term borrowings	449,124,837		-	444,392,477	-	444,392,477
Total	₩ 907,034,512	₩	-	₩ 446,226,541	₩ 456,075,611	₩ 902,302,152

(*) Short-term receivables and short-term payment obligations that have been shown as Level 3, the discount effect of which is not important, are measured at the original amount.

4) Changes in Level 3 financial assets for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

Year ended December 31, 2018								
	Beginning balance	Effects of changes in accounting	Net income (loss)	Comprehensive income	Purchases	Disposals	Increase due to merger	Ending balance
Financial assets:								
Investment	₩ 4,045,589	₩ 3,753,516	₩ 95,324	₩ -	₩ -	₩ -	₩ 40,768	₩7,935,198
Government bonds	-	-	-	-	1,030	-	-	1,030
Non-marketable equity securities	-	13,955,695	-	(13,140,545)	1,766,322	(195,000)	13,174	2,399,646
Total	₩ 4,045,589	₩ 17,709,211	₩ 95,324	₩ (13,140,545)	₩ 1,767,352	₩ (195,000)	₩ 53,942	₩10,335,873

Year ended December 31, 2017								
	Beginning balance	Effects of Changes in Accounting	Net income (loss)	Comprehensive income	Purchases	Disposals	Increase due to merger	Ending balance
Financial assets:								
Investment	₩ 3,953,182	₩ -	₩ -	₩ 92,407	₩ -	₩ -	₩ -	₩4,045,589
Total	₩ 3,953,182	₩ -	₩ -	₩ 92,407	₩ -	₩ -	₩ -	₩4,045,589

Meanwhile, some unmarketable equity securities of financial assets categorized within Level 3 are measured at cost as they do not have a quoted market price in an active market and as their fair value cannot be reliably measured. Total recognized gains and losses in other comprehensive income (loss) are related to equity securities that are currently held, and it will be reflected in the change of unrealized gains on FVTOCI assets (see Note 22).

5) A description of the valuation techniques and the inputs used in the fair value measurement of financial instruments classified as Level 2 and Level 3 is as follows:

- Currency forward and interest rate swap

In principle, the fair value of currency forward was measured based on forward currency rates whose period is coincident with the residual period of the currency forward and that are advertised in the market at the end of the reporting period. If forward currency rates whose period is coincident with the residual period are not advertised in the market, the fair value of currency forward was measured by estimating the forward currency rates whose period is similar to the residual period of the currency forward. The estimation of the forward currency was performed using interpolation to advertised periodical forward currency rates. Discount rates used to measure the fair value of currency forward were determined based on yield curve from yields advertised in the market.

Discount rates and forward currency rates used to measure the fair value of interest rate swaps were determined based on the applicable yield curves derived from interest rates that are advertised in the market at the end of the reporting period. The fair value of interest rate swaps measured on the amount of money discounted at an appropriate discount rate to future cash flows of interest rate swaps was estimated based on the forward currency rate that is obtained by the method described above.

As the input variables that are used to measure the fair value of currency forward and interest rate swaps for the end of the reporting period are derived via the forward exchange rate and the yield curve in the market, the fair values of currency forward and interest rate swap were classified as Level 2 value measurement.

- Corporate bonds

The fair value of corporate bonds was measured using DCF. The discount rates used in DCF were determined based on advertised-in-market swap rates and credit spreads of the bonds whose credit rating and period were similar to those of corporate bonds and cumulative redeemable preference stocks. The discount rates that influence the fair value of corporate bonds and cumulative redeemable preference stocks significantly were classified as Level 2 fair value measurement because they resulted in observable information in the market.

- Unlisted securities and unlisted securities-linked convertible securities

The fair value of non-listed shares and unlisted securities-linked convertible securities, which are measured using a DCF model that is not based on observable market prices or rates, will be used to estimate the future cash flows, such as sales growth, pretax operating profit margin and the weighted-average cost of capital. Capital asset pricing model ("CAPM") was used to calculate the weighted-average cost of capital. The key assumptions of estimation listed above are determined to have a significant impact on the fair value of non-listed shares, and the Company has classified the fair value hierarchy system as Level 3 of the fair value measurement for non-listed shares.

6) A description of the valuation processes in the fair value measurement for Level 2 and Level 3 that the Company is carrying out is as follows:

The Company measures fair value of assets and liabilities for financial reporting purposes and reports the result of fair value measurements to the chief finance officer directly.

Undesirable inputs that are used to estimate Level 3 fair value measurement are derived in a manner that is described below:

- Stock volatilities and stock correlation used in measurement of the financial instruments linked to stocks (e.g., investments in convertible bonds, equity-linked securities and consideration for conversion rights) were measured based on change in stock price during certain period before the reporting period.

- Pretax profit margin and sales growth rate, which are used to measure the fair value of non-listed shares, are estimated based on the average value of pretax operating margin and sales growth rate of comparable-listed companies.

- Weighted-average cost of capital discount rate that is used to measure the fair value of non-listed shares is estimated by the weighted-average, after tax, outside capital cost; capital cost estimates of the share value beta reflected for the purpose of the issuer of the shares; and capital structure based on the equity beta of comparable public companies derived based on the CAPM.

7) There is no significant change in business and economic environment affecting the fair value of the financial assets and liabilities during the current year.

35. DISCONTINUED OPERATIONS:

(1) Disposal of ATM business

The Company entered into a sale agreement for the ATM business. The Company completed the physical division and disposal to buyer during the previous year.

(2) Profits from discontinued operations (Korean won in thousands):

	2017
Sales	₩ 74,931,187
Operating income (loss)	(7,048,964)
Profit before income tax expense	(8,407,897)
Income taxes benefit	(2,963,812)
Profit after income tax expense (A)	(5,444,085)
Gain arising from discontinued operations	
Impairment loss (profit) arising from discontinued operations	(20,579,619)
Income taxes benefit	(7,254,385)
Impairment loss (profit) after income tax expense arising from discontinued operations (B)	(13,325,234)
Profits from discontinued operations (A+B)	(18,769,319)

(3) Cash flows from discontinued operations (Korean won in thousands):

	2017
Net cash flows from operating activities	₩ (18,765,277)
Net cash flows from investing activities	(2,386,719)
Net cash flows from financing activities	-
Net cash flows	(21,151,996)

36. BUSINESS COMBINATION:

(1) The merger of LG N-Sys Co., Ltd.

1) On April 1, 2018, the Company merged with LG N-Sys Co., Ltd., a subsidiary, to enhance management efficiency and maximize shareholder value.

2) The Company measured acquired assets and liabilities at fair value and the difference between the fair value and consideration for merger as increase in capital.

The fair value of identifiable assets and liabilities acquired in business combination as of April 1, 2018, is as follows (Unit: Korean won in thousands):

Description	April 1, 2018
Assets:	
Cash and cash equivalents	₩ 136,861,042
Financial institution deposits	30,050,000
Trade receivables and other receivables	44,737,747
Other assets	4,959,245
Inventories	8,674,649
Property, plant and equipment	2,677,559
Intangible assets	2,631,956
Deferred income tax assets	2,931,064
Total	₩ 233,523,262
Liabilities:	
Trade payables and other payables	₩ 29,838,048
Short-term borrowings	59,952,176
Other payables	1,281,659
Provision	863,558
Severance and retirement benefits	1,225,908
Total	₩ 93,161,349

3) Consideration for merger is only composed of stock (₩61,856,873 thousand). In addition, the difference between the fair value and consideration for merger is recognized as increase in capital amounting to ₩78,505,040 thousand.

37. NON-CASH INVESTING AND FINANCING ACTIVITIES:

(1) Significant non-cash investing and financing activities for the years ended December 31, 2018 and 2017, are as follows (Unit: Korean won in thousands):

	2018	2017
Elimination of accounts receivable	₩ 8,863,939	₩ 207,301
Reclassification of current portion of other receivables	-	14,807,086
Reclassification of other assets to property, plant and equipment account and intangible assets	-	808,663
Reclassification of construction in progress to property, plant and equipment account	160,273,672	37,064,691
Other accounts payable related to acquisition of property, plant and equipment	(51,182,979)	35,019,279
Reclassification between property, plant and equipment and investment properties	(4,515,256)	21,720,386
Other accounts receivable related to disposal of investments in subsidiaries	-	9,461,220
Reclassification of current portion of borrowings	-	149,865,028

(2) Details of changes in liabilities arising from financing activities for the year ended December 31, 2018, are as follows (Unit: Korean won in thousands):

	Beginning	Cash flow	Increase (decrease) due to merger	Non-cash change (changes in fair value)	Ending
Current portion of long-term borrowings	₩ 149,948,723	₩(190,000,000)	₩39,992,345	₩ 58,932	₩ -
Long-term borrowings	299,176,114	199,283,352	19,959,830	444,279	518,863,575
Total	₩ 449,124,837	₩ 9,283,352	₩59,952,175	₩ 503,211	₩518,863,575

38. SUBSEQUENT EVENTS:

(1) The Company acquired 80.09% of the remaining equity of Sejong Green Power Co., Ltd. on January 7, 2019.

39. APPROVAL OF SEPARATE FINANCIAL STATEMENTS:

The separate financial statements are approved by the board of directors on February 7, 2019, and are expected to be finally approved at the shareholders' meeting on March 22, 2019.