

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.
AND SUBSIDIARIES

Consolidated Financial Statements

December 31, 2020 and 2019

(With Independent Auditors' Report Thereon)

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Independent Auditors' Report

Based on a report originally issued in Korean

To the Shareholders and Board of Directors of
Doosan Heavy Industries & Construction Co., Ltd.:

Opinion

We have audited the consolidated financial statements of Doosan Heavy Industries & Construction Co., Ltd. and its subsidiaries ("the Group"), which comprise the consolidated statements of financial position as of December 31, 2020 and 2019, the consolidated statements of loss and other comprehensive loss, changes in equity and cash flows for the years then ended, and notes, comprising significant accounting policies and other explanatory information.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2020 and 2019, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with Korean International Financial Reporting Standards ("K-IFRS").

Basis for Opinion

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

Emphasis of Matter

Without qualifying our opinion, we draw attention to following:

As stated in Note 39 to the consolidated financial statements, Doosan Heavy Industries & Construction Co., Ltd. ("the Company") is pursuing financial structure improvement plans such as restructuring of human resources and capital expansion to respond to financial difficulties. In particular, in order to overcome liquidity risks, the Company has entered into an agreement to implement the financial structure improvement plan with Korea Development Bank and Korea EXIM Bank, and is in the process of rationalizing its business and selling the Company's major subsidiaries according to the agreement. If a disruption occurs in the Company's financial structure improvement plan, the financial position and business performance may change significantly depending on the impact.

Key Audit Matters

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

1) Recognition of revenue such as using the input method

As described in the Note 2 to the consolidated financial statements, the Group recognizes its revenue when the control of products and services is transferred to the customers. Therefore, the Group estimates percentage-of-completion of performance obligation satisfied over time by using the input method and recognizes revenue over time depending on the progress. For performance obligations satisfied at a point of time, the Group recognizes revenue when the product is delivered to and accepted by the customer.

As the amount of revenue recognized over time using the input method depends on the measured percentage-of-completion, management's judgment is involved in determining the method of measuring progress, estimating total contract cost and changes in construction. In addition, there is an inherent risk in revenue such as overstatement of unit sales price and manipulation of revenue through fictitious customers as revenue is one of the major performance indicators of the Group. Therefore, as there is a risk of overstatement of revenue due to an error in judgment or intent, we have identified the recognition of revenue as a key audit matter.

Following audit procedures were performed regarding the revenue recognized using the input method.

- Evaluation and testing of internal controls related to the determination and modification of estimated total contract cost
- Evaluation and testing of internal controls related to changes in contract terms
- Evaluation and testing of internal controls related to product sales
- Evaluation and testing of internal controls related to aggregation and allocation of project costs
- Evaluation and testing of internal controls related to purchasing, production, inventory, and logistics of the Group affecting the input costs
- Evaluation and testing of internal controls related to calculation of liquidated damages
- Evaluation and testing of internal controls related to calculation of provisions for construction losses
- For major projects completed during the current year, performed retrospective review by comparing the actual cost incurred during the current year and construction cost estimated at the end of the prior year
- Inquiries and inspection of documents for projects with significant changes in estimated total contract cost
- Comparison of estimated total contract cost with those of other similar projects
- Inquiries and analytical review of changes in the percentage-of-completion for each reporting period
- For major projects, inquiries and inspection of documents if there were significant differences between the progress rate in the respective monthly progress reports received from customers and the percentage-of-completion calculated based on cost
- For selected samples, inspecting related documents to test the existence of cost of goods manufactured (including material costs, outsourced construction costs and other expenses) incurred during the current year and to test whether it attributed to appropriate project and period.
- Testing journal entries of cost transferred between projects to understand the reason of transfer and whether appropriate approval was obtained
- For the selected samples, performed site visits for on-going construction sites and sites which have equipment under construction
- Recalculation of the percentage-of-completion independently for each project
- For selected samples, inspection of documents (change order, official letter and others) to test changes in contract price
- Examined the contractual delivery date with the expected delivery date as of year-end. For those which the contractual delivery date has passed, inquired of the basis, performed analytical review and agreed to underlying documents
- Assessing the appropriateness of the estimation of liquidated damages at the end of current period

- For the selected samples of sales transactions, inspecting related documents to test whether it agrees with the substance of recorded sales transactions which incurred during the current year
- Assessing whether revenue is recognized in appropriate period by inspecting delivery acceptance notes signed by customers and bill of lading documents for selected samples of sales transactions
- For the selected samples, recalculation of the foreign currency translation of contract amount denominated in foreign currency
- Retrospective review and recalculation of provisions for construction losses by project

2) Recoverability of due from customers for contract work

As described in the Note 2 to the consolidated financial statements, the Group calculates expected credit losses ("ECLs") based on the expected life of the ECLs and evaluates the recoverability of due from customers for contract work.

In calculating ECLs, management's judgment is involved due to uncertainty over the collection of due from customers for contract work from delayed payment of the owner, changes in conditions or claims incurred. Therefore, we identified the assessment of the recoverability of due from customers for contract work as a key audit matter, given there are risks of overstatement of due from customers for contract work due to error or bias in judgment.

Following audit procedures were performed regarding assessment of the recoverability of due from customers for contract work.

- Evaluation and testing of internal controls related to the assessment of recoverability of due from customers for contract work
- Inquiries and inspection of documents to assess payment terms, delivery time, and other obligations of contracts for the due from customer for contract work which increased significantly
- Inquiries of long-term due from customers for contract work and inspection of documents to evaluate the reasonableness of the cause
- Assessed the current status of billing, collection and disposal of due from customers for contract work for each major projects
- For the projects with bad debt allowance reserved over trade receivables assessed whether an allowance is reserved for unbilled accounts receivable and inspected documents
- Reviewing legal opinion provided by external counsels

3) Impairment of goodwill

As described in the Note 2 to the consolidated financial statements, the Group conducts an annual impairment test for goodwill and compares the carrying amount of investment in subsidiaries with the recoverable amount which is measured as the value in use using discounted cash flow projection or calculated as the fair value less costs to sell using market value approach to determine whether it is impaired or not.

In calculating the recoverable amount, significant management's judgment is involved in estimating long-term sales growth rate, discount rates and selected as a similar company and so on. Therefore, we identified the impairment for goodwill as a key audit matter as certain key assumptions on which management has based cash flow projections such as growth rate and discount rates are included, are subject to management bias.

Following audit procedures were performed regarding impairment of goodwill.

- Evaluation and testing of internal controls related to impairment test for goodwill

- Inquiries and assessment of valuation model used by the Group
- Understanding future cash flows and agreeing whether the estimated future cash flows corresponds to business plan approved by the Group's management
- Testing the appropriateness of major assumptions (discount rate, growth rate) of the valuation model by comparing to benchmark of peer industry and past financial information of cash generating unit (by using our internal valuation specialists)
- Evaluation of the sensitivity analysis results of the discount rate and permanent growth rate presented by the Group to assess the impact of changes in major assumptions on the impairment assessment (by using our internal valuation specialists)
- Testing the appropriateness of use of the market value approach by considering the business and financial characteristics of similar companies selected (by using our internal valuation specialists)

4) Assessment of provision for warranty

As described in the Note 2 to the consolidated financial statements, Doosan Infracore Co., Ltd. and its subsidiaries ("DI") segment of the Group provides customers with free warranty for a certain period of time after the sale of the product, and reserves a provision for warranty by estimating the expected warranty expenses.

The performance obligation of the warranty is determined by the nature and scope of the free warranty provided by DI and various assumptions, including the warranty period and estimated warranty expense to incur in the future. Therefore, we identified the assessment of provision for warranty as a key audit matter as certain key assumptions on which management has based on involves significant judgment of management.

Following audit procedures were performed regarding assessment of provision for warranty.

- Understanding of the accounting policy related recognition of provision for warranty and testing of internal controls
- Testing the accuracy of underlying data of major accounting estimates used by management
- Comparison and analysis of the basis of key assumptions used by management in measuring provision for warranty with actual past performance
- Independent recalculation of the balance of provision for warranty as of current year end

Other Matter

The procedures and practices utilized in the Republic of Korea to audit such consolidated financial statements may differ from those generally accepted and applied in other countries.

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

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

In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

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



Auditors' Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' 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 consolidated 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 consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, then we are required to draw attention in our auditors' report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the Group audit. We remain solely responsible for our audit opinion.



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

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

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

The engagement partner on the audit resulting in this independent auditors' report is Hyun Joong Kim.

KPMG Samjong Accounting Corp.

Seoul, Korea
March 18, 2021

This report is effective as of March 18, 2021, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that the above audit report has not been updated to reflect the impact of such subsequent events or circumstances, if any.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Consolidated Statements of Financial Position
As of December 31, 2020 and 2019

<i>(In won)</i>	Note	2020	2019
Assets			
Cash and cash equivalents	4,5,10,33	₩ 2,336,795,020,568	1,441,280,687,215
Short-term financial instruments	4,5,10,33	316,762,603,159	268,320,160,761
Short-term investments in securities	4,6,10	268,262,018,463	79,279,692,390
Trade receivables, net	4,7,10,25,34	2,036,954,321,016	2,092,822,360,607
Due from customers for contract work, net	7,25	1,764,133,275,013	1,761,026,139,486
Other receivables, net	4,7,10,34	236,838,070,204	470,874,496,975
Prepayments, net	7,25	452,091,457,840	466,574,020,089
Prepaid expenses		94,593,137,930	121,764,332,600
Short-term loans, net	4,7,10,34	149,986,369,488	85,498,883,370
Derivative financial assets	4,9,10	58,352,499,895	35,066,050,494
Firm commitment assets	9	5,900,766,998	25,785,207,028
Inventories, net	8,25,33	1,958,721,611,748	2,201,708,429,106
Non-current assets held for sale	12	11,495,049,364	-
Other current assets, net	4,7,10,14	255,909,668,705	301,607,276,508
Total current assets		9,946,795,870,391	9,351,607,736,629
Long-term financial instruments	4,5,10	23,367,497,135	2,548,786,446
Long-term investments in securities	4,6,10,33	926,508,778,964	201,487,575,568
Investments in associates and joint ventures	11,33	162,973,738,141	155,757,265,633
Due from customers for contract work, net	7,25	102,739,503,644	102,739,503,644
Long-term loans, net	4,7,10,34	230,048,605,914	706,816,256,036
Property, plant and equipment, net	12,14,33	6,157,806,963,024	5,921,531,734,148
Intangible assets, net	13	6,900,287,804,408	7,031,885,767,946
Investment properties, net	15	81,937,006,635	498,211,016,067
Derivative financial assets	4,9,10	37,748,633,632	17,011,219,245
Firm commitment assets	9	9,818,569,590	18,149,165,186
Guarantee deposits, net	4,7,10	488,311,023,811	348,345,632,651
Deferred tax assets	30	442,532,656,942	401,285,168,759
Other non-current assets, net	4,7,10,14	56,297,638,873	51,872,353,221
Total non-current assets		15,620,378,420,713	15,457,641,444,550
Total assets		₩ 25,567,174,291,104	24,809,249,181,179

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Consolidated Statements of Financial Position, Continued
As of December 31, 2020 and 2019

(In won)	Note	2020	2019
Liabilities			
Trade payables	4,10,34	₩ 2,194,328,819,387	2,532,417,863,903
Short-term borrowings	4,10,16,32,33,34,35	5,368,579,020,551	3,767,270,248,235
Asset-backed borrowings	4,10,16,32,33,35	59,550,657,597	381,573,986,887
Other payables	4,10,34	492,438,703,598	537,794,374,950
Advanced received	25	96,754,115,588	87,362,541,801
Due to customers for contract work	25	1,666,079,090,537	1,461,856,470,698
Withholdings		32,641,867,115	40,505,367,389
Accrued expenses	4,10	645,041,631,439	664,011,536,281
Income tax payable	30	38,710,823,579	30,974,465,576
Current portion of long-term debt	4,10,16,32,33,35	1,590,801,459,636	3,265,484,739,353
Derivative financial liabilities	9,10	61,603,742,869	73,076,096,327
Firm commitment liabilities	9	17,401,805,083	11,024,583,351
Provisions	18,25,32	508,536,449,621	390,543,375,151
Current lease liabilities	4,10,14,35	66,465,579,213	80,788,294,005
Other current liabilities	4,10	231,614,380,403	448,538,017,113
Total current liabilities		13,070,548,146,216	13,773,221,961,020
Bonds	4,10,16,32,33,35	1,800,160,199,498	846,834,779,773
Long-term borrowings	4,10,16,32,33,35	1,183,035,254,754	1,697,982,898,672
Long-term asset-backed borrowings	4,10,16,33,35	49,102,652,561	292,290,321,272
Long-term other payables	4,10	14,928,812,333	14,995,488,666
Defined benefit liabilities, net	17	721,424,677,702	674,264,222,128
Deposits received	4,10	309,091,438,251	270,661,690,028
Derivative financial liabilities	9,10	70,772,172,508	57,061,984,079
Firm commitment liabilities	9	24,633,647,381	13,228,719,317
Deferred tax liabilities	30	334,221,214,442	331,502,786,410
Provisions	18,25,32	370,469,192,358	322,995,953,618
Non-current lease liabilities	4,10,14,35	171,864,529,234	175,749,643,381
Other non-current liabilities	4,10	340,425,672,881	136,465,747,992
Total non-current liabilities		5,390,129,463,903	4,834,034,235,336
Total liabilities		18,460,677,610,119	18,607,256,196,356
Equity			
Capital stock	19	1,937,707,325,000	1,075,255,425,000
Capital surplus	19,20	2,662,214,482,750	1,762,628,456,797
Other components of equity	21	47,907,323,727	48,935,313,897
Accumulated other comprehensive income	9,10,12,22	587,157,416,427	649,530,462,196
Accumulated Deficit	23	(2,046,600,548,095)	(974,213,089,079)
Equity attributable to owners of the controlling company		3,188,385,999,809	2,562,136,568,811
Non-controlling interests	1	3,918,110,681,176	3,639,856,416,012
Total equity		7,106,496,680,985	6,201,992,984,823
Total liabilities and equity		₩ 25,567,174,291,104	24,809,249,181,179

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Consolidated Statements of Loss
For the years ended December 31, 2020 and 2019

(In won)	Note	2020	2019
Continuing operations			
Sales	24,25,34 ₩	15,132,406,695,625	15,659,674,141,321
Cost of sales	8,26,34	13,077,134,435,560	12,983,530,802,944
Gross profit		2,055,272,260,065	2,676,143,338,377
Selling and administrative expenses	10,26,27,34	1,901,181,059,831	1,599,256,528,424
Operating profit	24	154,091,200,234	1,076,886,809,953
Finance income and expenses		(571,859,075,984)	(580,363,368,069)
Finance income	10,28	610,498,857,853	489,339,227,001
Finance expenses	10,28	1,182,357,933,837	1,069,702,595,070
Other non-operating income and expenses		(429,792,986,081)	(386,989,678,057)
Other non-operating income	10,29	128,842,128,553	48,530,356,091
Other non-operating expenses	10,29	558,635,114,634	435,520,034,148
Share of loss of equity method investees	11	(16,348,029,221)	(14,344,113,107)
Profit (loss) before income tax		(863,908,891,052)	95,189,650,720
Income tax expense (benefit)	30	(25,463,118,206)	210,151,845,119
Loss from continuing operations		(838,445,772,846)	(114,962,194,399)
Discontinued operations			
Profit from discontinued operations, net of tax	36	-	10,595,042,993
Loss for the period	24 ₩	(838,445,772,846)	(104,367,151,406)
Loss attributable to:			
Owners of the Company	₩	(1,069,666,921,022)	(395,296,012,245)
Non-controlling interests	1	231,221,148,176	290,928,860,839
Earnings (loss) per share			
Basic earnings (loss) per share	31 ₩	(4,279)	(2,620)
Continuing operations		(4,279)	(2,694)
Discontinued operations		-	74
Diluted earnings (loss) per share	31	(4,279)	(2,620)
Continuing operations		(4,279)	(2,694)
Discontinued operations		-	74

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Consolidated Statements of Comprehensive Loss
For the years ended December 31, 2020 and 2019

<i>(In won)</i>	Note	2020	2019
Loss for the period	₩	(838,445,772,846)	(104,367,151,406)
Other comprehensive income (loss)		(146,709,878,308)	87,280,095,231
Items that will not be reclassified			
to profit or loss		(45,164,958,464)	(21,357,608,196)
Remeasurements of the defined benefit liabilities	17,30	(41,930,254,474)	(57,124,825,627)
Loss on change in fair value of fair value through other comprehensive income ("FVOCI") financial assets	6,10,30	(3,397,942)	(9,130,535,326)
Gain (loss) on revaluation of assets	12,30	(3,231,306,048)	44,897,752,757
Items that are or may be reclassified subsequently to profit or loss		(101,544,919,844)	108,637,703,427
Effective portion of changes in fair value of cash flow hedges	9,10,30	(10,020,296,668)	8,436,040,037
Equity adjustments in equity method investees	11	672,147,102	(10,320,598)
Gain (loss) on translation of foreign operations		(92,196,770,278)	100,211,983,988
Total comprehensive loss for the period	₩	<u>(985,155,651,154)</u>	<u>(17,087,056,175)</u>
Total comprehensive loss attributable to:			
Owners of the Company	₩	(1,148,942,071,827)	(392,325,987,389)
Non-controlling interests		163,786,420,673	375,238,931,214

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Consolidated Statements of Changes in Equity
For the years ended December 31, 2020 and 2019

(In won)		Capital stock	Capital surplus	Other components of equity	Accumulated other comprehensive income	Accumulated deficit	Non-controlling interests	Total
Balance at January 1, 2019	₩	650,255,065,000	1,678,913,750,186	(55,947,752,410)	680,535,131,925	(148,908,617,065)	3,413,581,982,804	6,218,429,560,440
Adjustment on initial application of K-IFRS No. 1116 and 1028		-	-	-	-	(31,805,902,802)	(7,629,208,953)	(39,435,111,755)
Adjusted balance at January 1, 2019		650,255,065,000	1,678,913,750,186	(55,947,752,410)	680,535,131,925	(180,714,519,867)	3,405,952,773,851	6,178,994,448,685
Total comprehensive income (loss):								
Profit (loss) for the period		-	-	-	-	(395,296,012,245)	290,928,660,839	(104,367,151,406)
Remeasurements of defined benefit liabilities		-	-	-	-	(26,332,690,322)	(30,792,135,305)	(57,124,825,627)
Loss on change in fair value of FVOCI financial assets		-	-	-	(9,130,535,326)	-	-	(9,130,535,326)
Effective portion of changes in fair value of cash flow hedges		-	-	-	8,655,939,374	-	(219,899,337)	8,436,040,037
Equity adjustments in equity method investees		-	-	-	(9,945,893)	(105,401)	(269,304)	(10,320,598)
Gain on translation of foreign operations		-	-	-	11,059,408,887	-	89,152,575,101	100,211,983,988
Gain (loss) on revaluation of assets		-	-	-	(41,579,536,771)	60,307,490,308	26,169,799,220	44,897,752,757
Subtotal		-	-	-	(31,004,669,729)	(361,321,317,660)	375,238,931,214	(17,087,056,175)
Transactions with owners of the Company:								
Issuance of shares		425,000,000,000	37,362,955,728	-	-	-	-	462,362,955,728
Repayment of redeemable convertible preferred stock		-	11,859,342,286	85,639,596,240	-	(415,843,156,678)	-	(318,344,218,152)
Dividends		-	-	-	-	(14,390,062,723)	-	(14,390,062,723)
Stock option		-	1,990,828,335	(1,990,828,335)	-	-	-	-
Exercise of stock warrants		360,000	965,042	-	-	-	-	1,325,042
Issuance of shares of subsidiaries		-	56,890,926,817	-	-	-	(42,697,290,543)	14,193,636,274
Dividends of subsidiaries		-	-	-	-	-	(61,866,047,310)	(61,866,047,310)
Stock option of subsidiaries		-	133,193,412	(133,193,412)	-	-	-	-
Exercise of stock warrants of subsidiaries		-	(3,019,734)	-	-	-	22,351,237	19,331,503
Changes in scope of consolidation		-	-	-	-	-	(38,349,841,679)	(38,349,841,679)
Others		-	(24,520,485,275)	21,367,491,814	-	(1,944,032,151)	1,555,539,242	(3,541,486,370)
Balance at December 31, 2019	₩	1,075,255,425,000	1,762,628,456,797	48,935,313,897	649,530,462,196	(974,213,089,079)	3,639,856,416,012	6,201,992,984,823

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Consolidated Statements of Changes in Equity, Continued
For the years ended December 31, 2020 and 2019

(In won)	Capital stock	Capital surplus	Other components of equity	Accumulated other comprehensive income	Accumulated deficit	Non-controlling interests	Total
Balance at January 1, 2020	₩ 1,075,255,425,000	1,762,628,456,797	48,935,313,897	649,530,462,196	(974,213,089,079)	3,639,856,416,012	6,201,992,984,823
Total comprehensive income							
(loss):							
Profit (loss) for the period	-	-	-	-	(1,069,666,921,022)	231,221,148,176	(838,445,772,846)
Remeasurements of defined benefit liabilities	-	-	-	-	(31,143,741,675)	(10,786,512,799)	(41,930,254,474)
Loss on change in fair value of FVOCI financial assets	-	-	-	(3,397,942)	-	-	(3,397,942)
Effective portion of changes in fair value of cash flow hedges	-	-	-	(12,039,366,671)	-	2,019,070,003	(10,020,296,668)
Equity adjustments in equity method investees	-	-	-	673,413,215	(343,417)	(922,696)	672,147,102
Loss on translation of foreign operations	-	-	-	(33,530,408,267)	-	(58,666,362,011)	(92,196,770,278)
Gain (loss) on revaluation of assets	-	-	-	(31,654,853,146)	28,423,547,098	-	(3,231,306,048)
Subtotal	-	-	-	(76,554,612,811)	(1,072,387,459,016)	163,786,420,673	(985,155,651,154)
Transactions with owners of the Company:							
Issuance of shares	827,990,875,000	607,570,209,908	-	-	-	-	1,435,561,084,908
Stock option	-	827,401,364	(827,401,364)	-	-	-	-
Exercise of stock warrants	5,735,000	12,900,393	-	-	-	-	18,635,393
Stock Exchange	34,455,290,000	(87,122,659,194)	(16,409,250)	-	-	45,361,057,616	(7,322,720,828)
Issuance of shares of subsidiaries	-	(42,362,757,714)	-	-	-	86,241,832,214	43,879,074,500
Dividends of subsidiaries	-	-	-	-	-	(30,163,749,600)	(30,163,749,600)
Stock option of subsidiaries	-	184,179,556	(184,179,556)	-	-	-	-
Exercise of stock warrants of subsidiaries	-	(34,721,468,852)	-	-	-	84,465,818,983	49,744,350,131
Issuance of convertible bonds of subsidiaries	-	-	-	-	-	835,806,976	835,806,976
Changes in scope of consolidation	-	-	-	14,181,567,042	-	(72,272,921,698)	(58,091,354,656)
Others (See Note 20)	-	455,198,220,492	-	-	-	-	455,198,220,492
Balance at December 31, 2020	₩ 1,937,707,325,000	2,662,214,482,750	47,907,323,727	587,157,416,427	(2,046,600,548,095)	3,918,110,681,176	7,106,496,680,985

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES

Consolidated Statements of Cash Flows

For the years ended December 31, 2020 and 2019

(In won)

	Note	2020	2019
Cash flows from operating activities			
Cash generated from operations:	35 ₩	796,745,530,423	1,031,213,931,567
Loss for the period		(838,445,772,846)	(104,367,151,406)
Adjustments		1,974,417,215,258	1,941,459,055,749
Changes in operating assets and liabilities		(339,225,911,989)	(805,877,972,776)
Interest received		39,196,722,713	41,306,217,133
Interest paid		(415,041,541,521)	(446,725,761,394)
Dividends received		1,123,058,402	1,325,542,753
Income tax paid		(126,800,069,217)	(193,440,221,009)
Net cash from operating activities		295,223,700,800	433,679,709,050
Cash flows from investing activities			
Cash inflows from investing activities:			
Decrease in short-term financial instruments		175,221,755,320	208,736,213,869
Proceeds from disposal of short-term investments in securities		28,545,686,029	19,462,935,481
Collection of short-term loans		286,251,740,356	31,716,806,560
Decrease in long-term financial instruments		29,745,896,685	18,138,956,195
Proceeds from disposal of long-term investments in securities		5,634,215,928	23,993,375,220
Collection of long-term loans		656,986,706,878	289,314,179,416
Proceeds from disposal of investments in associates		-	1,583,765,000
Proceeds from disposal of investments in subsidiaries		40,852,098,466	24,052,573,921
Proceeds from disposal of property, plant and equipment		12,418,943,621	158,421,189,421
Proceeds from disposal of intangible assets		10,341,854,969	4,171,598,941
Proceeds from disposal of investments properties		53,367,500	-
Collection of lease receivables		2,130,535,534	3,964,205,660
Cash inflow due to changes in the scope of consolidation		60,687,143,427	-
Subtotal		1,308,869,944,713	783,555,799,684
Cash outflows for investing activities:			
Increase in short-term financial instruments		(224,374,044,873)	(84,111,790,349)
Acquisition of short-term investments in securities		(218,545,148,244)	(65,715,048,943)
Increase in short-term loans		(413,759,248,228)	(50,176,628,577)
Increase in long-term financial instruments		(52,242,481,434)	(15,317,962,712)
Acquisition of long-term investments in securities		(63,786,177,796)	(39,060,956,934)
Increase in long-term loans		(337,095,008,749)	(321,767,263,984)
Acquisition of investments in associates and joint ventures		(13,289,035,002)	(12,912,750,000)
Acquisition of property, plant and equipment		(262,954,987,025)	(377,389,228,462)
Acquisition of intangible assets		(239,972,434,732)	(385,396,995,198)
Acquisition of investment properties		(280,896,640)	(992,815,000)
Others		(8,547,418,990)	(10,386,782,752)
Subtotal		(1,834,846,881,713)	(1,363,228,222,911)
Net cash used in investing activities	₩	(525,976,937,000)	(579,672,423,227)

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Consolidated Statements of Cash Flows, Continued
For the years ended December 31, 2020 and 2019

(In won)

	Note	2020	2019
Cash flows from financing activities			
Cash inflows from financing activities			
Increase in short-term borrowings, net	₩	1,803,462,947,016	910,964,629,135
Proceeds from asset-backed borrowings		937,513,952,782	1,957,800,000,000
Proceeds from long term asset-backed borrowings		-	325,818,311,839
Issuance of bonds		1,457,919,299,190	899,204,755,526
Proceeds from long-term borrowings		563,576,990,765	848,880,483,945
Paid in capital		1,212,523,393,400	471,750,000,000
Exercise of stock warrants		5,554,700	923,157
Increase of issuance of shares of subsidiaries		43,879,074,500	14,194,322,104
Exercise of stock warrants of subsidiaries		49,540,236,110	4,427,010
Subtotal		<u>6,068,421,448,463</u>	<u>5,428,617,852,716</u>
Cash outflows for financing activities			
Repayment of current portion of long-term debt		(3,132,301,392,568)	(2,133,369,883,863)
Repayment of asset-backed borrowings		(1,221,014,269,493)	(2,188,655,209,184)
Repayment of long-term borrowings		(344,832,398,835)	(1,141,828,603,716)
Repayment of lease liabilities		(87,175,065,896)	(91,304,765,981)
Acquisition of treasury stock		(16,409,250)	-
Expense of common stock issuance		(15,645,359,727)	(9,387,044,272)
Additional acquisition of subsidiaries		(11,093,317,240)	-
Payment of dividends		-	(14,390,062,723)
Payment of dividends of subsidiaries		(30,163,749,600)	(61,866,047,310)
Repayment of redeemable convertible preference shares		-	(318,344,218,152)
Subtotal		<u>(4,842,241,962,609)</u>	<u>(5,959,145,835,201)</u>
Net cash provided by (used in) financing activities		<u>1,226,179,485,854</u>	<u>(530,527,982,485)</u>
Effect of movements in exchange rates on cash held		<u>(99,911,916,301)</u>	<u>42,472,690,559</u>
Net increase (decrease) in cash and cash equivalents		<u>895,514,333,353</u>	<u>(634,048,006,103)</u>
Cash and cash equivalents at January 1		<u>1,441,280,687,215</u>	<u>2,075,328,693,318</u>
Cash and cash equivalents at December 31	₩	<u><u>2,336,795,020,568</u></u>	<u><u>1,441,280,687,215</u></u>

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December 31, 2020 and 2019

1. Reporting entity

(1) The controlling company

Doosan Heavy Industries & Construction Co., Ltd. (the "Company") was incorporated on September 20, 1962, with its headquarters in Changwon, Korea. Since its incorporation, the Company has grown to become one of the leading global manufacturers of advanced power generation equipment. The Company engages in manufacturing of a range of power generation equipment including boilers, turbines and generators. It also engages in engineering, procurement and construction of thermal power plants. And the Company engages in general construction, seawater desalination and etc.

The Company was listed on the Korea Exchange on October 25, 2000 and its major stockholder as of December 31, 2020 is Doosan Corp. (holding 41.95% equity ownership).

(2) Consolidated subsidiaries

Details of consolidated subsidiaries as of December 31, 2020 and 2019 are as follows:

Company	Key operating activities	Location	Ownership(%)(*1)		Closing date(*2)
			2020	2019	
Doosan Heavy Industries Vietnam Co., Ltd.(*8)	Manufacturing of machinery & equipment	Vietnam	100.00	100.00	December 31
Doosan HF Controls Corp.	Manufacturing	USA	100.00	100.00	"
Doosan HF Controls Asia Co., Ltd.	Manufacturing	Korea	100.00	100.00	"
PT. Doosan Heavy Industries Indonesia(*8)	Manufacturing	Indonesia	83.64	55.00	"
Doosan Heavy Industries Malaysia Sdn. Bhd.	Dormant	Malaysia	100.00	100.00	"
Doosan Heavy Industries Japan Corp.	Sales	Japan	100.00	100.00	"
S.C. Doosan IMGB S.A.("IMGB")(*10)	Manufacturing	Romania	-	99.92	"
Doosan Enpure Ltd.	Engineering & Services	UK	100.00	100.00	"
Doosan Power Systems India Private Ltd.("DPSI")(*8)	Engineering & Services	India	100.00	100.00	March 31
Doosan Heavy Industries Muscat LLC	Manufacturing	Oman	70.00	70.00	December 31
Doosan Power Systems Arabia Company Limited	Manufacturing & Services	Saudi Arabia	51.00	51.00	"
Azul Torre Construction Corporation(*3)	Manufacturing	Philippines	40.00	40.00	"
Doosan Heavy Industries America Holdings Inc.	Holdings Company	USA	100.00	100.00	"
Doosan Heavy Industries America LLC	Sales	USA	100.00	100.00	"
Doosan ATS America, LLC	Engineering & Services	USA	100.00	100.00	"
Doosan Power Service America, LLC	Engineering & Services	USA	100.00	100.00	"
Doosan Turbomachinery Services Holding, Inc.	Holdings Company	USA	95.90	95.90	"
Doosan Turbomachinery Services Inc.	Manufacturing	USA	100.00	100.00	"
Doosan GridTech Inc.(*8)	Software & System engineering	USA	100.00	100.00	"
Doosan GridTech LLC	Software & System engineering	USA	100.00	100.00	"
Doosan GridTech CA LLC	Software & System engineering	USA	100.00	100.00	"
Doosan GridTech EPC LLC	Software & System engineering	USA	100.00	100.00	"
Doosan GridTech C&I LLC	Software & System engineering	USA	100.00	100.00	"
Continuity Energy LLC	Software & System engineering	USA	100.00	100.00	"
Doosan Skoda Power s.r.o	Manufacturing	Czech	100.00	100.00	"

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December 31, 2020 and 2019

Company	Key operating activities	Location	Ownership(%)(*1)		Closing date(*2)
			2020	2019	
Skoda Power Private Ltd.	Engineering	India	100.00	100.00	March 31
Doosan Power Systems Pension Trustee Company Ltd.	Professional services	UK	100.00	100.00	December 31
Doosan Power Systems Overseas Investments Ltd.	Holdings Company	UK	100.00	100.00	"
Doosan Babcock Ltd.	Engineering & Services	UK	100.00	100.00	"
Doosan Power Systems Europe Limited GmbH	Engineering & Services	Germany	100.00	100.00	"
Doosan Power Systems Americas LLC	Engineering & Services, Sales	USA	100.00	100.00	"
Doosan Lentjes UK Limited(*9)	Dormant	UK	-	100.00	"
Doosan Lentjes GmbH	Engineering & Services	Germany	100.00	100.00	"
Doosan Power Systems S.A.("DPS S.A.")	Holdings Company	Luxem-bourg	100.00	100.00	"
Doosan Babcock Energy Technologies (Shanghai) Ltd.(*9)	Engineering & Services	China	-	100.00	"
Doosan Babcock Energy Services (Overseas) Ltd.	Engineering & Services	UK	100.00	100.00	"
Doosan Babcock Energy Polska S.A.	Engineering & Services	Poland	98.91	98.91	"
Doosan Babcock Energy Germany GmbH	Engineering & Services	Germany	100.00	100.00	"
Doosan Lentjes Czech s.r.o	Professional services	Czech	100.00	100.00	"
Doosan Power Systems (Scotland) Ltd. Partnership	Real estate	UK	100.00	100.00	"
Doosan Babcock General Maintenance Services LLC(*3)	Professional services	UAE	49.00	49.00	"
Osung Power O&M Co., Ltd.	Engineering & Services	Korea	100.00	100.00	"
Doosan Mecatec Co., Ltd. and subsidiaries(*7,11)	Manufacturing	Korea, etc	100.00	-	"
KDPP 3 rd Co., Ltd.(*4,6)	Asset Securitization	Korea	-	-	"
KDPP 5 th Co., Ltd.(*4)	Asset Securitization	Korea	-	-	"
U-best 5 th Co., Ltd.(*4)	Asset Securitization	Korea	-	-	"
Doosan Cuvex Co., Ltd. ("Cuvex")	Operation of resort and golf club	Korea	56.60	64.97	"
Doosan Infracore Co., Ltd. ("DI") and subsidiaries(*5)	Manufacturing of machinery & equipment	Korea, etc	34.97	36.27	"
Doosan Engineering & Construction Co., Ltd. ("DEC") and subsidiaries(*8,11)	Construction and manufacturing	Korea	100.00	89.03	"

(*1) The ownership percentage represents the ownership interest held by the Company (the parent) in each respective subsidiary, except Cuvex of which 21.11%, 30.56%, 4.93% of equity interest are owned by the Company, DI and Doosan Bobcat Korea Co., Ltd. respectively, and Doosan Turbomachinery Services Inc. of which 100% of equity interest is owned by Doosan Turbomachinery Services Holding, Inc.. Overall, the Company and its subsidiaries ("the Group") has an effective ownership interest of 32.68% of Cuvex and 95.90% of Doosan Turbomachinery Services Inc..

(*2) Where the reporting date of subsidiaries is not consistent with that of the Company based on local laws, adjustments have been made to conform to the Company's reporting date for preparation of consolidated financial statements.

(*3) Although the Company's ownership interest in the investee is less than 50%, it is classified as a consolidated subsidiary since the Group is considered to have the majority voting rights in the board of directors, and others.

(*4) The Group assessed that it has control over the special purpose entity as the entity's activities are substantively governed by the Group.

(*5) Although the Company's ownership interest in the investee is less than 50%, the Company assessed that it has control over the investee based on its holdings relative to the size and dispersion of ownership interests held by other equity holders and the voting patterns in previous shareholders' meetings.

(*6) Control was lost due to borrowings repayment in 2020.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December 31, 2020 and 2019

(*7) Newly acquired in 2020.

(*8) Additionally acquired in 2020.

(*9) Liquidated in 2020.

(*10) Disposed in 2020.

(*11) Doosan Heavy Industries Vietnam Haiphong Co., Ltd. and Value Works Co., Ltd., which were subsidiaries of DEC were split in 2020. Doosan Heavy Industries Vietnam Haiphong Co., Ltd. was incorporated as a subsidiary of Doosan Mecatec Co., Ltd., and Value Works Co., Ltd. was merged with Doosan Mecatec Co., Ltd.

(3) Summary financial information of major subsidiaries

Summarized financial information of subsidiaries as of and for the year ended December 31, 2020 is as follows:

(In millions of won)

Company	Assets	Liabilities	Sales	Net profit (loss)	Total comprehensive income (loss)
Doosan Heavy Industries Vietnam Co., Ltd. ₩	464,543	274,632	509,155	82,384	82,384
Doosan HF Controls Corp.	23,222	4,609	5,467	(2,085)	(2,085)
PT. Doosan Heavy Industries Indonesia	32,208	97,500	4,389	220	220
Doosan Heavy Industries Japan Corp.	14,836	11,341	2,040	68	68
Doosan Enpure Ltd.	33,140	32,705	43,040	(2,905)	(2,905)
DPSI	662,058	699,383	363,956	(331,405)	(326,229)
Doosan Heavy Industries Muscat LLC	24,718	39,828	29,908	(11,514)	(11,514)
Doosan Power Systems Aribia Company Limited	22,916	16,887	11,938	(231)	(231)
Doosan Heavy Industries America Holdings Inc.	187,874	80,036	-	9,726	9,726
Doosan Turbomachinery Services Inc.	52,661	34,464	51,104	985	985
Doosan Heavy Industries America LLC	15,546	8,477	1,963	375	375
Doosan GridTech Inc.	14,514	16,122	7,605	(9,161)	(9,161)
Doosan Skoda Power s.r.o	450,649	84,011	183,144	19,855	20,283
Doosan Babcock Ltd.	1,139,881	473,560	403,538	9,370	(6,490)
Doosan Power Systems Europe Limited GmbH	59,061	212,456	-	(32,347)	(32,347)
Doosan Lentjes GmbH	101,611	87,184	35,549	(8,795)	(39,451)
DPS S.A.	1,293,334	830,782	-	33,605	4,174
Doosan Babcock Energy Polska S.A.	28,972	21,331	34,111	(348)	(348)
Doosan Power Systems (Scotland) Ltd. Partnership	34,422	3,937	-	1,772	1,772
Doosan Babcock General Maintenance Services LLC	16,644	61,999	18,235	(4,874)	(3,118)
Doosan Mecatec Co., Ltd. and subsidiaries	609,515	351,295	317,538	6,032	7,299
Cuvex	307,707	106,780	69,373	4,153	4,280
DI and subsidiaries	12,026,886	7,537,888	7,934,105	285,074	200,310
DEC and subsidiaries	1,550,362	1,253,762	1,828,661	(165,066)	(168,049)

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December 31, 2020 and 2019

(4) Changes in the scope of consolidation

Changes in the scope of consolidation during the year ended December 31, 2020 are as follows:

Company	Description	Reason
DS Munsuro 1 st Co., Ltd.	Newly included in consolidation	New borrowing
Doosan Mecatec Co., Ltd.	Newly included in consolidation	Acquisition
Valuegrowth Co., Ltd.	Newly included in consolidation	Establishment of new corporation
Bild Up 1 st Co., Ltd.	Newly included in consolidation	New borrowing
KJDS 1 st Co., Ltd.	Newly included in consolidation/ Excluded from consolidation	New borrowing/ Repayment of borrowings
Jayonstar Co., Ltd.	Newly included in consolidation	New borrowing
Doosan Infracore Hunan Corp.	Newly included in consolidation	Establishment of new corporation
Doosan Infracore Beijing Corp.	Newly included in consolidation	Establishment of new corporation
Ecube Solution Co., Ltd.	Newly included in consolidation	Establishment of new corporation
Jonsindongbaek Co., Ltd.	Newly included in consolidation	New borrowing
Doosan Infracore Europe B.V.	Excluded from consolidation	Merger
KDPP 3 rd Co., Ltd.	Excluded from consolidation	Repayment of borrowings
Doosan Lentjes UK Limited	Excluded from consolidation	Liquidation
Doosan Babcock Energy Technologies (Shanghai) Ltd.	Excluded from consolidation	Liquidation
IMGB	Excluded from consolidation	Disposal
Valueworks Co., Ltd	Excluded from consolidation	Merger
Pinetreecity 1 st Co., Ltd.	Excluded from consolidation	Repayment of borrowings
JONSTAR Co., Ltd.	Excluded from consolidation	Repayment of borrowings

(5) Significant non-controlling interests

Financial information of subsidiaries attributable to significant non-controlling interests as of December 31, 2020 is as follows:

(In millions of won)

Company		Net profit attributable to non-controlling interests	Cumulative non-controlling interests	Dividends allocated to non-controlling interests
DI and subsidiaries	₩	231,739	3,786,256	(29,444)
Cuvex		2,813	140,477	(720)

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December 31, 2020 and 2019

(6) Cash flow information for subsidiaries with significant non-controlling interests

Cash flow information for subsidiaries with significant non-controlling interests for the year ended December 31, 2020 is as follows:

(In millions of won)

		2020	
		DI and subsidiaries	Cuvex
I.	Net cash flows from operating activities	₩ 1,050,847	8,205
II.	Net cash flows from investing activities	(503,165)	(80,488)
III.	Net cash flows from financing activities	428,938	77,345
IV.	Effect of movements in exchange rates on cash held	(69,334)	(1)
V.	Net increase in cash and cash equivalents	907,286	5,061
VI.	Cash and cash equivalents as at January 1	756,173	991
VII.	Cash and cash equivalents as at December 31	₩ 1,663,459	6,052

2. Significant accounting policies and basis of preparation

(1) Basis of consolidated financial statements

The Group has prepared the consolidated financial statements in accordance with the K-IFRS.

The significant accounting principles as applied in the consolidated financial statements correspond to those pertaining to the annual consolidated financial statements for the year ended December 31, 2020, except for the effects associated with the introduction of the Standard or Interpretation as described below.

The accompanying consolidated financial statements have been prepared on the historical cost basis, except for certain properties/non-current assets and financial instruments that are measured at fair values, as explained in the accounting policies below. Historical cost is based on the fair values of the consideration given in exchange for assets.

The principal accounting policies are set out below.

1) The Group has applied the amendments to the following standards with January 1, 2020 as the date of initial application

- K-IFRS No. 1103 'Business Combinations' : Definition of a business
- K-IFRS No. 1001 'Presentation of Financial Statements' : Definition of a materiality
- K-IFRS No. 1109 'Financial Instruments' : Hedge accounting interest rate index reformation
- A review of the Conceptual Framework for Financial Reporting : The principles of the definition, recognition and derecognition of assets and liabilities

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

- COVID-19 Related Rent Concessions (K-IFRS No. 1116 'Lease')
- Proceeds before Intended Use (K-IFRS No. 1016 'Property, Plant and Equipment')
- Reference to the Conceptual Framework (K-IFRS No. 1103 'Business Combinations')

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES

Notes to the Consolidated Financial Statements

For the years ended December 31, 2020 and 2019

The Group anticipates that the application of the enactment and amendments will not have a significant impact on the Group's consolidated financial statements.

(2) Basis of consolidation

The consolidated financial statements comprise the financial statements of the Company and its subsidiaries as at December 31, 2020. Control is achieved when the Group is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee. Specifically, the Group controls an investee if and only if the Group has:

- power over the investee (i.e. existing rights that give it the current ability to direct the relevant activities of the investee);
- exposure or rights to variable returns from its involvement with the investee; and
- the ability to use its power over the investee to affect its returns.

When the Group has less than a majority of the voting or similar rights of an investee, the Group considers all relevant facts and circumstances in assessing whether it has power over an investee, including:

- the contractual arrangement with the other vote holders of the investee;
- rights arising from other contractual arrangements; and
- the Group's voting rights and potential voting rights.

The Group re-assesses whether or not it controls an investee if facts and circumstances indicate that there are changes to one or more of the three elements of control. Consolidation of a subsidiary begins when the Group obtains control over the subsidiary and ceases when the Group loses control of the subsidiary. Assets, liabilities, income and expenses of a subsidiary acquired or disposed of during the year are included in the statement of profit or loss and the statement of comprehensive income from the date the Group gains control until the date the Group ceases to control the subsidiary.

Profit or loss and each component of other comprehensive income (OCI) or loss are attributed to the equity holders of the parent of the Group and to the non-controlling interests, even if this results in the non-controlling interests having a deficit balance. When necessary, adjustments are made to the financial statements of subsidiaries to bring their accounting policies into line with the Group's accounting policies. All intra-group assets and liabilities, equity, income, expenses and cash flows relating to transactions between members of the Group are eliminated in full on consolidation.

A change in the ownership interest of a subsidiary, without a loss of control, is accounted for as an equity transaction. If the Group loses control over a subsidiary, the Group:

- derecognizes the assets (including goodwill) and liabilities of the subsidiary;
- derecognizes the carrying amount of any non-controlling interests;
- derecognizes the cumulative translation differences recorded in equity;
- recognizes the fair value of the consideration received;
- recognizes the fair value of any investment retained;
- recognizes any surplus or deficit in profit or loss; and
- reclassifies the parent's share of components previously recognized in OCI to profit or loss or retained earnings, as appropriate, as would be required if the Group had directly disposed of the related assets or liabilities.

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(3) Investments in associates and joint ventures

An associate is an entity over which the Group has significant influence and is neither a subsidiary nor an investment in a joint venture. The Group generally holds, directly or indirectly through subsidiaries, between 20% and 50% of the voting power of the entity. A joint venture is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint venture. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control.

The Group's investments in its associate and joint venture accounted for using the equity method. Under the equity method, the investment in an associate or a joint venture is initially recognized at cost. Goodwill relating to the associate or joint venture is included in the carrying amount of the investment and is neither amortized nor individually tested for impairment.

After acquisition, the Group's share of the profit or loss and other comprehensive income or loss of the associates and jointly controlled entities are recognized as profit or loss and other comprehensive income or loss and the Group's share of the changes in retained earnings of the associates and joint ventures are recognized as retained earnings. When the Group's share of losses of an associates and joint ventures exceeds the Group's interest in those entities (which includes any long-term interests that, in substance, form part of the Group's net investment in the associate), the Group discontinues recognizing its share of further losses.

Additional losses are recognized only to the extent that the Group has incurred legal or constructive obligations or made payments on behalf of the associates and joint ventures.

Unrealized gains from transactions between the Group and its associates and joint ventures are eliminated up to the interests in those entities. Unrealized losses are also eliminated unless evidence of impairment in assets transferred is provided.

When necessary, the Group may revise associates' and joint ventures' financial statements, to apply consistent accounting policies as the Group, prior to applying the equity method of accounting for its investments in the associates and joint ventures.

For overseas investees whose financial statements are prepared in foreign currencies, the equity method of accounting is applied after assets and liabilities are translated in accordance with the accounting treatments for the translation of the financial statements of overseas' subsidiaries for consolidated financial statements. The Group's proportionate share of the difference between assets net of liabilities and equity after translating into Korean Won is accounted for as "increase (decrease) in equity adjustments in equity method investments" included in accumulated other comprehensive income (loss).

(4) Foreign currency translation

1) Functional currency and presentation currency

The Group's financial statements are presented in the currency of the primary economic environment in which it operates (its functional currency). The functional currency of the Group and the presentation currency for the consolidated financial statements of the Group are Korean won.

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2) Transactions and balances

Transactions in currencies other than the entity's functional currency are recognized at the rates of exchange prevailing at the dates of the transactions. Foreign currency gain (loss) from settlements of foreign currency transactions or translation of monetary items denominated in foreign currencies are recognized in profit or loss whereas the gain (loss) from qualified cash flow hedge and net investment hedge for foreign operations is deferred as an equity item.

3) Group companies

For the purpose of presenting consolidated financial statements, ①the assets and liabilities of the Group's foreign operations with different functional currencies are translated into presentation currency of the Group using exchange rates prevailing at the end of the reporting period. ②Income and expense items are translated using the average exchange rates for the period, unless exchange rates fluctuated significantly during that period, in which case the exchange rates at the dates of the transactions are used. ③Exchange differences, if any, are recognized in other comprehensive income or loss and accumulated in equity (attributed to non-controlling interests as appropriate).

Exchange differences from the net investment in the foreign operation, and borrowings and other foreign currency instruments designated as hedging instrument for the net investment in the foreign operation are recognized in other comprehensive income or loss. On the disposal of a foreign operation resulting in loss of control, all of the accumulated exchange differences in respect of that operation are reclassified to profit or loss. Goodwill and fair value adjustments arising from the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated at the closing rate.

(5) Cash and cash equivalents

Cash and cash equivalents include cash on hand, demand deposits, short-term, highly liquid investments with maturities (or date of redemption) of three months or less upon acquisition. Bank overdraft is classified as short-term borrowings on the consolidated statements of financial position.

(6) Non-derivative financial assets

1) Initial recognition and measurement

Trade and other receivables, and debt investment are initially recognized when they are originated. Other financial assets and financial liabilities are recognized when the Group becomes a party to the contractual provisions of the instruments.

A financial asset and financial liability (unless it is a trade receivable - trade without a significant financing component that is initially measured at the transaction price) are initially measured at fair value plus, for an item not at fair value through profit or loss ("FVTPL"), transaction costs that are directly attributable to its acquisition.

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2) Classification and subsequent measurement

On initial recognition, a financial asset is classified as measured at: amortized cost; FVOCI - debt investment; FVOCI - equity investment; or FVTPL. The classification of financial assets is generally based on the business model in which a financial asset is managed and its contractual cash flow characteristics. In case of changing its business model, all affected financial asset are reclassified on the first day of the first reporting period after the change in the business model.

A financial asset is measured at amortized cost if it meets both of the following conditions and is not designated as at FVTPL:

- it is held within a business model whose objective is to hold assets to collect contractual cash flow; and
- its contractual terms give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

A debt investment is measured at FVOCI if it meets both of the following conditions and is not designated as at FVTPL:

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

On initial recognition of an equity investment that is not held for trading, the Group may irrevocably elect to present subsequent changes in the investment's fair value in other comprehensive income. This election is made on an investment-by-investment basis and irrevocable election can be made at initial recognition.

All financial assets not classified as measured at amortized cost or FVOCI as described above are measured at FVTPL. This includes all derivative financial assets. On initial recognition, the Group may irrevocably designate a financial asset that otherwise meets the requirements to be measured at amortized cost or at FVOCI as at FVTPL if doing so eliminates or significantly reduces an accounting mismatch that would otherwise arise.

The Group makes an assessment of the objective of the business model in which, financial assets is held at a portfolio level because this best reflects the way the business is managed, and information is provided to management. The information considered includes:

- the stated policies and objectives for the portfolio and the operation of those policies in practice;
- how the performance of the business model and the financial assets held within that business model are evaluated and reported to the entity's key management personnel;
- the risks that affect the performance of the business model (and the financial assets held within that business model) and, in particular, the way in which those risks are managed;
- how managers of the business are compensated (e.g. whether the compensation is based on the fair value of the assets managed or on the contractual cash flows collected); and
- the frequency, volume and timing of sales of financial assets in prior periods, the reason for those sales and expectation about future sales activity for financial asset.

Transfers of financial assets to third parties in transactions that do not qualify for derecognition are not considered sales for this purpose, consistent with the Group's continuing recognition of the assets.

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For the purposes of this assessment, 'principal' is defined as the fair value of the financial assets on initial recognition. 'Interest' is defined as consideration for the time value of money and for the credit risk associated with the principal amount outstanding during a particular period of time and for other basic lending risks and costs (e.g. liquidity risk and administrative costs), as well as a profit margin.

In assessing whether the contractual cash flows are solely payments of principal and interest, the Group considers the contractual terms of the instrument. This includes assessing whether the financial asset contains a contractual term that could change the timing or amount of contractual cash flows such that it would not meet this condition. In making this assessment, the Group considers:

- contingent events that would change the amount or timing of cash flows;
- terms that may adjust the contractual coupon rate, including variable-rate features;
- prepayment and extension features; and
- terms that limit the Group's claim to cash flows from specified assets (e.g. non-recourse features).

A prepayment feature is consistent with the solely payments of principal and interest criterion if the prepayment amount substantially represents unpaid amounts of principal and interest on the principal amount outstanding, which may include reasonable additional compensation for early termination of the contract. Additionally, for a financial asset acquired at a discount or premium to its contractual par value, a feature that permits or requires prepayment at an amount that substantially represents the contractual par value plus accrued (but unpaid) contractual interest (which may also include reasonable additional compensation for early termination) is treated as consistent with this criterion if the fair value of the prepayment feature is insignificant at initial recognition.

The following accounting policies apply to subsequent measurements of financial assets.

Classification	Subsequent measurement
Financial assets at FVTPL	These assets are subsequently measured at fair value. Net gains and losses, including any interest or dividend income, are recognized in profit or loss.
Financial assets at amortized cost	These assets are subsequently measured at amortized cost using the effective Interest method. The amortized cost is reduced by impairment losses. Interest income, foreign exchange gains and losses and impairment are recognized in profit or loss. Any gain or loss on derecognition is recognized in profit or loss.
Debt investments at FVOCI	These assets are subsequently measured at fair value. Interest income calculated using the effective interest method, foreign exchange gains and losses and impairment are recognized in profit or loss. Other net gains and losses are recognized in OCI. On derecognition, gains and losses accumulated in OCI are reclassified to profit or loss.
Equity investments at FVOCI	These assets are subsequently measured at fair value. Dividends are recognized as income in profit or loss unless the dividend clearly represents a recovery of part of the cost of the investment. Other net gains and losses are recognized in OCI and are never reclassified to profit or loss.

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3) De-recognition

The Group derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred or in which the Group neither transfers nor retains substantially all of the risks and rewards of ownership and it does not retain control of the financial asset.

The Group enters into transactions whereby it transfers assets recognized in its statement of financial position but retain either all or substantially all of the risks and rewards of the transferred assets. In these cases, the transferred assets are not derecognized.

4) Offsetting between financial assets and financial liabilities

Financial assets and financial liabilities are offset and the net amount is presented in the consolidated statement of financial position only when the Group currently has a legally enforceable right to offset the recognized amounts, and there is the intention to settle on a net basis or to realize the asset and settle the liability simultaneously.

(7) Impairment of financial assets

1) Recognition of impairment on financial assets

The Group recognizes loss allowances for expected credit losses ("ECLs") on:

- financial assets measured at amortized costs;
- debt securities measured at FVOCI; and
- contract assets defined by K-IFRS No. 1115.

The Group's impairment losses are likely to be recognized a lifetime ECLs based on the extent of increase in credit risk since inception except for below asset to be recognized loss allowances measured on 12-month.

- credit risk of debt instruments is low at the end of reporting date
- credit risk has not increased significantly since the initial recognition of debt investment (lifetime ECLs: ECLs that resulted from all possible default events over the expected life of a financial instrument)

The Group adopted an accounting policy to recognize loss allowances at an amount equal to lifetime ECLs for trade receivables and contract assets.

In assessing whether the credit risk on a financial instrument has increased significantly since initial recognition and estimating expected credit loss. The Group 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.

Lifetime ECLs are resulted from all possible default events over the expected life of a financial instrument. And 12-month ECLs are resulted from possible default events within the 12 months (or a shorter period if the expected life of the instrument is less than 12 months) after the reporting date.

The longest period to consider when measuring ECLs is the longest term for which the Group is exposed to credit risk.

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2) Measurement of expected credit loss

ECLs are a probability-weighted estimate of credit losses. Credit losses are measured as the present value of all cash shortfalls (i.e. the difference between the cash flows due to the entity in accordance with the contract and the cash flows that the Group expects to receive). ECLs are discounted at the effective interest rate of financial instrument.

3) Credit-impaired financial instrument

A debt instrument carried at amortized cost and FVOCI is assessed at the end of each reporting period to determine whether there is objective evidence that it is impaired. A financial asset is impaired if objective evidence indicates that the loss event had a negative effect on the estimated future cash flows of that asset that can be estimated reliably.

Objective evidence that a financial asset is impaired includes:

- significant financial difficulty of the issuer or borrower;
- a breach of contract, such as default or delinquency in interest or principal payments;
- the lender, for economic or legal reasons relating to the borrower's financial difficulty, granting to the borrower a concession that the lender would not otherwise consider;
- it becomes probable that the borrower will enter bankruptcy or other financial reorganization; or
- the disappearance of an active market for that financial asset because of financial difficulties.

4) Presentation of credit loss allowance on financial position

For loss allowance on financial assets measured at amortized cost is deducted from the carrying amount of the respective assets, while loss allowance on debt instruments at FVOCI is recognized in OCI.

5) De-recognition

The Group derecognizes a financial asset when it has no reasonable expectations of recovering the contractual cash flows on a financial asset in its entirety or a portion thereof. The Group assess whether there are reasonable expectations of recovering the contractual cash flows from customers and individually assess the timing and amount of write-off. The Group does not expect that such write-off will be recovered but they may be subject to collection activity according to the Group's past due collection process.

(8) Trade receivables

Trade receivables are amounts owed by customer for products and services provided in the ordinary course of business. Receivables expected to be collected within one year are classified as current assets. Otherwise, they are classified as non-current assets. Trade receivables are initially measured at fair value except that the they do not contain a significant financing component in accordance with K-IFRS No. 1115 'Revenue from contracts with customers' and are presented as net of allowance for doubtful accounts, estimated on an individual basis based on past bad debt experience.

(9) Inventories

Inventories are stated at the lower of cost and net realizable value. Cost of inventories includes fixed and variable manufacturing overhead costs which are systematically allocated to inventories by appropriate methods based on each category of inventory. The cost of inventories is determined by the specific identification method for finished goods, work-in-process, and materials in transit, and gross average method for all other inventories.

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The Group periodically reviews changes in net realizable value of inventories (current replacement cost for raw materials) due to damage, obsolescence, decline in selling prices and others and recognizes loss on inventory valuation. Loss on inventory valuation is charged to cost of sales when it is ordinary and to other non-operating expense when it is extraordinary. When the circumstances that previously caused inventories to be written down below cost no longer exist and the new market value of inventories subsequently recovers, the valuation loss is reversed to the extent of the original valuation loss and the reversal is deducted from cost of sales.

(10) Property, plant and equipment

Property, plant and equipment is stated at cost less subsequent accumulated depreciation and accumulated impairment losses. When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment. The cost of an item of property, plant and equipment includes expenditure that is directly attributable to the acquisition of the asset including the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

Subsequent costs incurred to replace part of previously recognized item of property, plant and equipment are added to the carrying amount of an asset, or recognized as a separate asset, if it is probable that future economic benefits associated with the assets will flow into the Group and the cost of an asset can be measured reliably. The carrying amount of what was replaced is derecognized. Routine maintenance and repairs are expensed as incurred.

Depreciation of property, plant and equipment is calculated to the cost of each asset less residual value using the straight-line method over the estimated useful lives of the assets as follows:

	Useful lives
Buildings	8~50 years
Structures	5~40 years
Machinery	2~20 years
Others	2~15 years
Right-of-use asset	Lease term

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

The Group reviews the depreciation method, 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 an accounting estimate.

When there is indicator for impairment, and the carrying amount of property, plant and equipment is higher than the recoverable amount, the carrying amount is adjusted to the recoverable amount and the difference is recognized as an impairment loss. Meanwhile, when the recoverable amount subsequently exceeds the carrying amount of the impaired asset, the excess is recorded as a reversal of impairment loss to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation, if no impairment loss had been recognized. Upon derecognition of a property, plant and equipment, the difference between the net disposals proceed and carrying amount of the item is recognized in other non-operating income (expense).

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A revaluation surplus is recorded in OCI and credited to the asset revaluation reserve in equity. However, to the extent that it reverses a revaluation deficit of the same asset previously recognized in profit or loss, the increase is recognized in profit and loss. A revaluation deficit is recognized in the statement of profit or loss, except to the extent that it offsets an existing surplus on the same asset recognized in the asset revaluation reserve.

(11) Intangible assets

Intangible assets are initially measured at cost and are carried at cost less accumulated amortization and accumulated impairment losses. Subsequent expenditure on an intangible asset is capitalized only when it is probable that the expected future economic benefits that are attributable to the asset will increase.

Intangible assets other than goodwill and intangibles with indefinite useful lives are amortized on a straight-line basis over their estimated useful lives from the date that they are available for use. The estimated useful lives of the intangible assets are as follows:

	Useful lives
Industrial property rights	5~10 years
Development costs	3~20 years
Others	2~20 years

Goodwill acquired in business combination is the consideration paid in excess of the fair value of the group's interest in the identifiable net assets of the subsidiary acquired at the acquisition date, and the goodwill resulting from the acquisition of the subsidiary is included in the intangible asset. The goodwill is not amortized, is annually tested for impairment and is the cost less accumulated impairment losses. Reversal of an impairment losses for goodwill would be prohibited. The goodwill is distributed to the cash-generating unit for the purpose of impairment testing, and the distribution is made to the identified cash-generating unit or group of cash-generating units that are expected to benefit from the business combination in which the goodwill occurs, and it is determined by the sales segment.

Expenditures relating to development activities are capitalized when the result of the development is for the development of new products or substantial improvement of functions of existing products; there is technical and commercial feasibility of completing the development; and the Group has the ability to measure reliably the expenditure attributable to the development. Capitalized development cost include expenditure on materials, salaries, wages and other employment-related costs of personnel directly engaged in generating assets and related overhead cost which is systematically allocated. Capitalized development costs are presented at the acquisition cost less accumulated amortization and accumulated impairment losses. Capitalized development costs are amortized using the straight-line method over the estimated useful life and amortization expenses are included in cost of goods manufactured and amortization in selling and administrative expenses. The expenditure on research and development which does not meet conditions noted above is recognized as an expense when it is incurred.

The estimated useful life and amortization method for intangible assets with finite useful lives are reviewed at the end of each reporting period and for the assets which have been assessed as having indefinite useful life, that assessment is revisited each period, with the effect of any changes in estimate being accounted for as a change in accounting estimate.

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However, useful lives of certain trademarks and memberships, which are determined to be indefinite since there is no foreseeable limit to the period over which the assets are expected to generate net cash inflows for the Group, are not amortized but tested for impairment once a year.

(12) Investment property

Investment properties are properties held to earn rentals and/or for capital appreciation. Investment properties are measured initially at cost, including transaction costs. Subsequent to initial recognition, the book value of investment property is presented at the cost less accumulated depreciation and accumulated impairment. Subsequent costs are included in the asset's carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits arising from the asset will flow in and the cost can be measured reliably. The carrying amount of the portion replaced by subsequent expenditure is derecognized. Meanwhile, costs incurred in connection with routine repairs and maintenance are recognized in profit or loss as incurred.

While land is not depreciated, building is depreciated using the straight-line method over the useful lives between 8 and 50 years.

The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for as a change in accounting estimate.

(13) 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, are added to the cost of those assets, until such time as the assets are substantially ready for their intended use.

(14) Impairment of non-financial assets

Assets with indefinite useful lives such as goodwill are not amortized but tested for impairment annually. Assets which are amortized or depreciated are tested for impairment to determine whether events and circumstances indicating those assets have suffered impairment exist. Impairment loss is the excess of the carrying amount over recoverable amount.

Recoverable amount is the higher of fair value less costs to sell and value in use. When it is not possible to estimate the recoverable amount of an individual asset, the Group estimates the recoverable amount of the cash-generating unit to which the asset belongs. When 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. Except for goodwill, all non-financial assets that have incurred impairment are tested for reversal of impairment at the end of each reporting period.

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(15) Non-derivative financial liabilities

The Group classifies non-derivative financial liabilities into financial liabilities at FVTPL or other financial liabilities in accordance with the substance of the contractual arrangement and the definitions of financial liabilities. The Group recognizes financial liabilities in the consolidated statement of financial position when the Group becomes a party to the contractual provisions of the financial liability.

1) Financial liabilities at FVTPL

Financial liabilities at FVTPL include financial liabilities held for trading or designated as such upon initial recognition. Subsequent to initial recognition, financial liabilities at FVTPL are measured at fair value, and changes therein are recognized in profit or loss. Upon initial recognition, any directly attributable transaction costs are recognized in profit or loss as incurred.

2) Financial liabilities at amortized cost

Non-derivative financial liabilities other than financial liabilities at FVTPL are classified as financial liabilities at amortized cost. At the date of initial recognition, financial liabilities at amortized cost are measured at fair value less any directly attributable transaction costs. Subsequent to initial recognition, financial liabilities at amortized cost are measured at amortized cost using the effective interest rate method.

3) Derecognition of financial liability

The Group derecognizes financial liability when its contractual obligations are discharged, cancelled or expired. The Group also derecognizes a financial liability, when its terms are modified and the cash flows of the modified liability are substantially different, in which case a new financial liability based on the modified terms is recognized a fair value. On derecognition of a financial liability, the difference between the carrying amount extinguished and the consideration paid (including any non-cash assets transferred or liabilities assumed) is recognized in profit or loss.

(16) Borrowings

Borrowings are measured initially at fair value, net of transaction costs and subsequently at amortized cost using the effective interest methods, with interest expense being recognized on an effective yield basis. The difference between the amount received and the redemption amount is amortized using the effective interest method and recognized in profit or loss. Borrowings are classified as non-current liabilities when the Group has an unconditional right to defer settlement of the liability for at least twelve months after the end of the reporting period. Otherwise, borrowings are classified as current liabilities.

(17) Compound financial instrument

Compound financial instruments issued by the Group are classified as a financial liability or an equity instrument in accordance with the substance of the contractual arrangement. The conversion right of convertible bonds and stock warranties embedded in compound financial instrument issued by the Group which can, at the option of the holder, be converted into a fixed number of equity instruments in the Group, is classified as equity.

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The liability component of a convertible bonds and bonds with stock warranties is recognized at the fair value of a similar liability on initial recognition and be measured at amortized cost by applying the effective interest methods until it is extinguished. The equity component is measured by deducting the fair value of the liability component from the fair value of the compound financial instrument as a whole on initial recognition. Any tax effect is also reflected, and such instrument is not subsequently remeasured.

The conversion right that is an embedded derivative is recognized at the market value of a similar derivative or at the fair value derived from an appropriate valuation model. Subsequent changes in fair value of the conversion right are recognized in profit or loss.

(18) Financial guarantee contracts

The Group has financial guarantee contract liabilities, which are obligations to pay specific amounts for indemnifying creditors' loss on insolvency of specific debtors according to initial or revised contract provisions of liabilities on the payment date. Financial guarantee contract liabilities are initially measured at their fair value less the direct transaction cost relating to the issuance. Subsequently, financial guarantee contract liabilities are measured at the higher of the amount of the loss allowance determined in accordance with K-IFRS No. 1109 'Financial instruments', and the amount initially recognized less the cumulative amortizations recognized in accordance with the K-IFRS No. 1115.

(19) Employee benefits liability

The Group operates various types of benefit plans, and generally makes contributions calculated based on periodic actuarial calculations to separately administered funds such as qualifying insurance companies or trust funds.

A defined contribution plan is a post-employment benefit plan, under which the Group pays fixed contribution to a separately administered fund. The Group does not assume any legal or constructive obligation to pay the additional contribution even if the fund does not hold sufficient assets to pay benefits, relating to employee's service in the current and prior periods, in full. The contribution is recognized as pension benefit at the date of payment.

If the contribution already paid exceeds the contribution due for services rendered prior to the end of the reporting period, the Group recognizes such excess as an asset (prepaid expense) to the extent that the prepayment will lead to a reduction in future payments or a cash refund.

Defined benefit plans are post-employment benefit plans other than defined contribution plans. Generally, under the defined benefit plan, amounts to be paid as retirement benefits are determined by reference to a formula usually based on employees' earnings, years of service, ages and other considerations. The retirement benefit obligation recognized in the consolidated statements of financial position represents the present value of the defined benefit obligation, less fair value of plan assets and adjustment for unrecognized past service cost.

The defined benefit obligation is calculated by an independent actuary using the projected unit credit method. The present value of the defined benefit obligation is denominated in the same currency in which the benefits are expected to be paid, and calculated at the discount rate which is the yield at the reporting date on high quality corporate bonds that have maturity dates approximating the terms of the Group's obligation.

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Actuarial gain or loss from changes in actuarial assumptions or differences between actuarial assumptions and actual results is recognized in other comprehensive income or loss, which is immediately reflected in retained earnings. Past service cost is directly recognized in profit or loss in the period the plan amendment or curtailment occurs.

(20) Provision

Provisions are recognized when the Group has a present obligation (legal or constructive) as a result of a past event, it is probable that the Group will be required to settle the obligation, and a reliable estimate can be made of the amount of the obligation. A provision is measured using the present value of the cash flows estimated to settle the present obligation when the effect of the time value of money is material. 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. The increase in provision due to passage of time is recognized as interest expense. If the existence of an obligation to transfer economic benefit is no longer probable, the related provision is reversed during the period.

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. In this case, any income arising from the third party reimbursement is netted off against the related expense to be recognized in the consolidated statements of profit or loss from the recognition of provisions.

(21) Leases

The Group determines whether the contract is a lease or includes a lease at the time of the agreement. If the contract requires a transfer of control over the use of the identified asset for a certain period of time in exchange for consideration, the contract will either be a lease or include a lease. When determining whether a contract transfers control of the use of the identified asset, the Group uses the definition of a lease in K-IFRS No. 1116.

1) Lessee

At the commencement or effective date of the contract that includes the lease element, the Group allocates the consideration of the contract to each lease element based on its relative stand-alone price. However, the Group applies a practical expedient that does not separate the non-less component for a real estate lease and accounts for the non-less component related to the lease element as a single lease element.

The Group recognizes right-of-use assets and lease liabilities at the commencement date of the lease. Right-of-use assets are initially measured at cost, and the costs shall comprise the amount of the initial measurement of the lease liability, the initial direct costs incurred by the lessee, any lease payments made at or before the commencement date (less any lease incentives received) and an estimate of costs to be incurred by the lessee in dismantling and removing the underlying asset, or restoring the underlying asset or the site on which it is located.

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Right-of-use assets are subsequently depreciated on a straight-line basis from the commencement of the lease to the end of the lease term. However, if the ownership of the license asset is transferred at the end of the lease term or the exercise price of the purchase option is reflected in the cost of the license asset, the right-of-use assets shall be depreciated until the end of the useful life of the underlying asset on the same basis as the depreciation of the property, plant and equipment. Also, right-of-use assets may be adjusted as a result of a reduction in impairment losses or a remeasurement of lease liabilities.

Lease liabilities are initially measured at the present value of the lease payments not paid as of the commencement of the lease. Lease is discounted at the intrinsic interest rate of the lease, but if the intrinsic interest rate is not readily calculated, the lease is discounted at the Group's incremental borrowing rate. Generally, the Group uses the incremental borrowing rate as the discount rate. Lease liabilities are amortized in accordance with the effective interest method. When remeasurement of a lease liability, the relevant right-of-use asset is adjusted and the remeasurement amount is recognized in profit or loss if the carrying amount of the right-of-use asset is reduced to nil.

Lease payments included in the measurement of the lease liability comprise the following:

- fixed payments, including in-substance fixed payments
- variable lease payments that depend on an index or a rate, initially measured using the index or rate as at the commencement date;
- amounts expected to be payable under a residual value guarantee; and
- the exercise price under a purchase option that the Company is reasonably certain to exercise, lease payments in an optional renewal period if the Company is reasonably certain to exercise an extension option, and penalties for early termination of a unless the Company is reasonably certain not to terminate early.

As practical expedient, the Group does not recognize right-of-use assets and lease liabilities for short-term leases with a lease term of less than 12 months and low-value assets. The Group shall recognize the lease charges relating to these leases as expenses in accordance with the straight-line method over the lease term.

2) Lessor

The accounting policies applied during comparative periods by the Group as a lessor are not different from those in K-IFRS No. 1116. As a lessor, the Group determines whether the lease is a finance lease or an operating lease at the inception of the lease. To classify each lease, the Group generally determines whether the lease transfers most of the risks and rewards of ownership of the underlying asset. If most of the risks and rewards of ownership of the underlying asset are transferred to the lessee, the lease is classified as a finance lease, otherwise the lease is classified as an operating lease.

(22) Derivative financial instruments and hedge accounting

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 generally recognized as profit or loss when it is incurred.

However, the effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges is recognized in other comprehensive income or loss. The gain or loss relating to the ineffective portion is recognized immediately in profit or loss.

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1) Hedge accounting

The Group operates fair value hedges to avoid the risk of fair value change, which is incurred from specific risk on assets, liabilities and firm contracts, and cash flow hedges to avoid the risk of future cash flow change, which is incurred from specific risk on expecting contracts. At the inception of the hedge relationship, the Group 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 Group assesses whether there is an economic relationship between the hedged item and the hedging instrument.

a) Fair value hedges

Changes in the fair value of derivatives that are designated and qualified as fair value hedges (or gain or loss on foreign currency translation, when a financial instrument, not derivative is designated as the hedging instrument) are recognized in profit or loss immediately, together with any changes in the fair value of the hedged asset or liability that are attributable to the hedged risk.

b) Cash flow hedges

The effective portion of change in the fair value of derivatives that are designated and qualify as cash flow hedges for decreasing risk incurred from change of future cash flow on forecast transaction is recognized in other comprehensive income or loss. Amounts previously recognized in other comprehensive income or loss and accumulated in equity are reclassified to profit or loss in the periods when the hedged item is recognized in profit or loss, or is reflected in the carrying amount of the associated asset or liability when the forecasted transaction occurs. Even when hedge accounting is discontinued due to the expiration, termination or exercise of hedging instrument, subsequent accounting treatment of amounts recognized in other comprehensive income or loss and accumulated in equity is the same. However, when hedge accounting is discontinued due to forecast transaction being no longer expected to occur, the gain or loss accumulated in equity is recognized immediately in profit or loss.

2) Separable embedded derivatives

Embedded derivatives are separated from the host contract and accounted for separately only if the following criteria has been met: (a) the economic characteristics and risks of the host contract and the embedded derivatives are not clearly and closely related to a separate instrument with the same terms as the embedded derivative that would meet the definition of a derivative, and (b) the hybrid (combined) securities is not measured at fair value through profit or loss. Changes in the fair value of separable embedded derivatives are recognized immediately in profit or loss.

3) Other derivative financial instruments

Derivative financial instruments other than the effective portion of derivative financial instruments that are designated as the hedging instruments are measured at fair value. Gain or loss arising from changes in fair value is recognized in profit or loss.

(23) Dividend

Dividend payable is recognized as liability when declaration of the dividend is approved in the shareholders' meeting.

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(24) Issued capital

Common stocks are classified as equity, and the incremental costs directly arising from capital transactions, net of tax are deducted from equity. Preferred stocks are classified as equity only if the preferred stocks are not redeemable or redeemable solely upon the Group's decision, or the distribution of dividends is solely upon the Group's decision. Once a general meeting of shareholders meeting approves dividends, the Group recognizes the dividend liability accordingly.

Own equity instruments that are reacquired (treasury shares) are recognized at cost and deducted from equity. No gain or loss is recognized in profit or loss on the purchase, sale, issue or cancellation of the Group's own equity instruments.

(25) Share-based payments

The Group measures the cost of share options granted to employees by reference to the estimated fair value at the date at which they are granted. The share-based payment expenses are recognized on a straight-line basis over the vesting period reflecting expected forfeiture rate. The Group determines the fair value of share option using the Black-Scholes option pricing model.

(26) Revenue from contracts with customers

1) Identify performance obligations

The Group is mainly engaged in the businesses of power generation facilities, industrial facilities, manufacturing of casting and forging products and comprehensive construction business. The Group identifies separate performance obligations in the contracts and determines whether each of the performance obligations is satisfied at a point of time or over time under K-IFRS No. 1115.

The Group identified as a separate performance obligation if the customer benefits from the good or service on its own or together with other readily available resources and the entity's promise to transfer the good or service separately is identifiable from other promises in the contract. In addition, the transaction price is allocated to each performance obligation in proportion to its stand-alone selling price and if the stand-alone selling price is not directly observable then the entity estimates the amount by using a suitable method.

2) Variable consideration (Right of return/ refund account & Consideration payable to a customer)

Under K-IFRS No. 1115, the Group estimated an amount of variable consideration depending on 'the expected value' that the Group expects to better predict the amount of consideration to which it will be entitled. Prior to adoption of K-IFRS No. 1115, the Group recognized return provision based on net gross profit pursuant to K-IFRS No. 1037 'Provisions, Contingent Liabilities and Contingent Assets'. Upon adoption of K-IFRS No. 1115, the Group recognized the estimated gross amount of contract liability (refund liability) when customers returned product and recognized contract asset (right of return) when customers exercised return rights.

Also, consideration payable to a customer includes cash amounts that the Group pays, or expects to pay, to the customer (or to other parties that purchase the entity's goods or services from the customer). Consideration payable to the customer also includes credit or other items that can be applied against amounts owed to an entity (or to other parties that purchase the entity's goods or services from the customer).

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In accordance with K-IFRS No. 1115, the Group shall account for consideration payable to a customer as a reduction of the transaction price and, therefore, of revenue unless the payment to the customer is in exchange for a distinct good or service that the customer transfers to the Group.

3) Contract cost capitalization

The Group capitalized costs incurred for obtaining construction contract. These costs for obtaining contract include costs that would not have been incurred if the contract were not entered into. In addition, under K-IFRS No. 1115, expenses which do not qualify for asset recognition are recognized as an expense when incurred. Accordingly, upon transitioning to K-IFRS No. 1115, the Group has excluded such expenditures when calculating the percentage-of-completion to recognize revenue from construction contracts.

4) Significant financing component

Under K-IFRS No. 1115, in determining the transaction price, if the timing of payments agreed to by the parties to the contract (either explicitly or implicitly) provides the customer or the Group with a significant benefit of financing the transfer of goods or services to the customer, the Group recognizes revenue at an amount that reflects the price that a customer would have paid for the promised goods or services if the customer had paid cash for those goods or services when (or as) they transfer to the customer (i.e. the cash selling price).

5) Obligations to perform over period of time

The Group manufactures and sells specialized power machinery which are built based on customer's orders designating the design elements and the manufacturing process generally takes one to three years. The Group recognizes revenue over time measuring the progress towards complete satisfaction of the performance obligation, only when the asset in its completed state has no alternative use to the Group and there is an enforceable right to payment for performance completed to date.

6) Measurement of the percentage-of-completion by contract cost incurred

The Group contracts for EPC plant construction contracts and power generating service contracts including purchasing, manufacturing and installing boiler, turbine and others and generally proceeds over a long period of time. The Group recognizes revenue following percentage-of-completion method, judging whether the construction/service contracts are provided over period of time if it meets all of the following conditions:

- the customers simultaneously acquire and consume benefits that the Group provides
- the Group creates or enhances the value of the asset that customers control

However, to represent performance degree faithfully, the Group recognizes the amount equal to the cost of the goods to perform the obligation as revenue if it meets all of the following conditions:

- undistinguished goods when the contract initiate
- expected that the customer can control significantly before the service is provided related to the goods
- the cost of the goods transferred is more significant than the total cost expected to fully perform the obligation
- the Group is provided the goods from the third party
- not significantly involved in the design and production of the goods

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7) Allocating the transaction price to performance obligations

The Group allocates the transaction price to each performance obligation on a relative stand-alone selling price basis. The Group uses adjusted market assessment approach to estimate the stand-alone selling price, however, for certain transactions, 'expected cost plus a margin approach' is used exceptionally.

8) Warranty obligation

The Group generally provide warranty contract with customers pursuant to the local laws and customs. Most of these warranties are assurance type of warranty and accrue provision based on reliable estimate under K-IFRS No. 1037, 'Provisions, Contingent Liabilities and Contingent Assets'.

However, if the Group provides extended warranty that is not assurance type of warranty under non-standardized contract, it is accrued as service type of warranty and separated to performance obligation requiring allocation of transaction price. Revenue is recognized over period of time.

(27) Due from (to) customers for contract work

The due from customers for contract work on assets are the cumulative cost plus the profits (deduction of recognized loss) exceeds the billing amount the amount. The due from customers for contract work on liabilities are the billing amount the amount exceeds the cumulative cost plus the profits (deduction of recognized loss). The amount received before the work is recognized as Advanced received in the consolidated statement of financial position. Any amount previously recognized as a contract asset is reclassified to trade receivables at the point at which it is invoiced to the customer.

(28) Government grants

Government grants are recognized only when there is reasonable assurance that the grant will be received and to comply with the conditions that accompany the grant.

The benefits of government loans at an interest rate lower than the market interest rate are treated as government grants, and the government grants are measured as the difference between the fair value of the government loans calculated based on the market interest rate and the consideration received.

Asset-related government grants are deducted when determining the carrying amount of assets and presented in the statements of financial position. The government grants are recognized in profit or loss over the useful life of the related assets by reducing depreciation expenses.

Revenue-related government grants are recognized as revenue over the period based on a systematic basis in order to respond to expenses intended to be compensated. Government grants received for immediate financial assistance provided to the Company without compensation for expenses or losses already incurred or related costs in the future are recognized in profit or loss during the period in which the right to receive them is incurred.

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(29) Taxes and deferred tax

Income tax expense is composed of current and deferred tax. Current and deferred tax are recognized in profit or loss, except when they relate to items that are recognized in other comprehensive income or loss or directly in equity, in which case, the current and deferred tax are also recognized in other comprehensive income or loss or directly in equity, respectively.

Income tax (current tax) expense is the sum of corporate tax for each fiscal year and tax added to corporate tax under corporate income tax law and other applicable laws. Additional income taxes or tax refunds for the prior periods are included in income tax expense for the current period when recognized.

The Group's liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities in the consolidated financial statements and the corresponding tax bases used in the computation of taxable income. Deferred tax assets and liabilities are not recognized if the temporary difference arises from the initial recognition (other than in a business combination) of other assets and liabilities in a transaction that affects neither the taxable income nor the accounting income.

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 realized, based on tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period.

Deferred tax liabilities are recognized for taxable temporary differences associated with investments in subsidiaries, joint ventures and associates except where the Group is able to control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax assets arising from deductible temporary differences associated with such investments and interests are only recognized to the extent that it is probable that there will be sufficient taxable income against which to utilize the benefits of the temporary differences and they are expected to reverse in the foreseeable future.

The carrying amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable income will be available to allow all or part of the asset to be recovered.

(30) Non-current assets held for sale

Non-current assets and disposal groups are classified as held-for-sale if their carrying amount will be recovered principally through a sale transaction rather than through continuing use. Non-current assets (and disposal groups) classified as held for sale are measured at the lower of their previous carrying amount and fair value less costs to sell and are no longer depreciated or amortized.

If the fair value less costs to sell of the non-current assets held-for-sale (and disposal groups) decrease, impairment loss is recognized immediately in profit or loss. A gain should be recognized for any subsequent increase in fair value less costs to sell of an asset, but not in excess of the cumulative impairment loss previously recognized.

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(31) Operating segments

Operating segments are reported on the same basis as the financial information that is reported to the management of the Group. The management of the Group is responsible for the allocation of resources and assessment of performance for the operating segments.

(32) Greenhouse Gases Emission Right and Emission liability

The Group receives free emission rights as a result of emission trading schemes. The rights are received on an annual basis and, in return, the Group is required to remit rights equal to its actual emissions. The Group has adopted the net liability approach to the emission rights granted. Therefore, a provision is recognized only when actual emissions exceed the emission rights granted and still held.

The emission costs are recognized as other operating costs. Where emission rights are purchased from other parties, they are initially recorded at cost, and treated as a reimbursement right, whereby they are matched to the emission liabilities and subsequently measured at fair value. The changes in fair value are recognized in profit or loss.

3. Significant accounting estimates and assumptions

The estimates and underlying assumptions are reviewed on an ongoing basis. The estimates and underlying assumptions are based on historical experiences and other factors including expectation on possible future events. Actual results may differ from these estimates. The following are critical assumptions and key sources of estimation uncertainty at the end of reporting period, that have a significant risk of causing a material adjustment to the carrying amounts of the Group's assets and liabilities within the next financial year.

(1) Recognition of revenue

The Group recognizes revenue over time using the input method in relation to its performance obligation over time. Revenue is recognized as work progresses in the ratio of actual costs incurred to estimated total costs. Any changes in the early stages of long-term projects in the scope and costs of project implementation in the construction period, and in construction plans may have a significant effect on the amount of revenue recognized.

(2) Impairment of goodwill

Goodwill is tested for impairment annually and when circumstances indicate that the carrying value may be impaired. Recoverable amount of cash generating unit ("CGU") is calculated based on the value in use and fair value, this calculation requires the use of accounting estimates.

(3) Defined benefit liability

The Group operates a defined benefit plan. Defined benefit liability is calculated by annual actuarial valuations as of the reporting date. In order to perform the actuarial valuations, assumptions for discount rates, future salary increases and others are required to be estimated.

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(4) Provisions

Provisions are recognized when the Group has a present obligation (legal or constructive) as a result of a past event, and if it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and if a reliable estimate can be made of the amount of the obligation. In accordance with the relevant laws and practices, the estimated amounts may change to prescribe for additional provisions to be recognized in future periods.

(5) Deferred tax

Recognition and measurement of deferred tax assets and liabilities require judgment of the Group's management. Especially, the recognition of deferred tax asset and the scope of recognition are influenced by assumptions about future circumstances and judgment of management.

(6) Impairment of non-financial assets

The Group is assessing whether there is any indication that an asset may be impaired at the end of each reporting period. The Group estimates the recoverable amount of an asset when such indication exists or when an impairment test for an asset is required each year. Recoverable amount of an asset is the higher of its fair value less costs of disposal and its value in use.

The recoverable amount is determined for individual assets. However, if an asset does not generate cash inflows that are largely independent of those from other assets, the recoverable amount is determined for the CGU to which the asset belongs. The asset is impaired if its carrying amount exceeds its recoverable amount and the carrying amount of the asset is reduced to its recoverable amount.

4. Financial risk management

The Group is exposed to various financial risks, such as market (foreign currency risk and interest rate risk), credit and liquidity, relating to the operations of the Group. The purpose of risk management policy is to minimize potential risks, which could have adverse effect on financial performance.

Financial risk management activities are performed by the treasury department in accordance with the risk management policies. In addition, the Group enters into derivative contracts to hedge against certain risks. The Group is trying to minimize the effect of financial risks by reorganizing financial risk management policy and monitoring financial risks regularly.

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(1) Market risk

1) Foreign currency risk

The Group's exposure to the risk of changes in foreign currency exchange rates relates primarily to the Group's operating activities and net investments in foreign subsidiaries. The Group's objective of foreign currency risk management is to minimize uncertainty and volatility arising from fluctuations in foreign currency exchange rates. Foreign currency risk is managed in accordance to the Group's policy on foreign currencies, and currency trading for speculative purposes is prohibited.

Foreign currency risk is managed by the Group's policy on foreign currencies. The Group's basis for foreign currency management is to reduce income/loss volatility. The Group reduces exposure to foreign currency risk by matching the inflow and the outflow of foreign currencies (natural hedge) and manages foreign currency risk by using currency derivatives, such as currency forwards, for the remaining exposure.

The book value of the Group's monetary assets and liabilities denominated in foreign currencies, which represents the maximum exposure to foreign currency risk as of December 31, 2020 and 2019 are as follows:

		2020					
		USD	EUR	JPY	GBP	Others(*1)	Total
Financial assets	₩	1,422,015	205,508	18,111	151,855	492,148	2,289,637
Financial liabilities		1,267,979	261,932	35,493	36,783	159,713	1,761,900
Net assets (liabilities)	₩	154,036	(56,424)	(17,382)	115,072	332,435	527,737

(*1) Others are assets and liabilities denominated in foreign currencies other than USD, EUR, JPY and GBP.

		2019					
		USD	EUR	JPY	GBP	Others(*1)	Total
Financial assets	₩	1,234,701	348,121	4,463	62,272	489,600	2,139,157
Financial liabilities		1,431,420	496,460	41,495	41,419	130,093	2,140,887
Net assets (liabilities)	₩	(196,719)	(148,339)	(37,032)	20,853	359,507	(1,730)

(*1) Others are assets and liabilities denominated in foreign currencies other than USD, EUR, JPY and GBP.

A sensitivity analysis on the Group's income before tax for the period, assuming a 10% increase and decrease in currency exchange rates, as of December 31, 2020 and 2019 are as follows:

		2020		2019	
		10% increase	10% decrease	10% increase	10% decrease
Income before tax impact	₩	52,774	(52,774)	(173)	173

The above-mentioned sensitivity analysis is based on monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency as of December 31, 2020 and 2019.

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2) Interest rate risk

Interest rate risk is related to borrowings and bank deposits with floating interest rates, and related interest income and expense are exposed to interest rate risk. The Group is exposed to interest rate risk mainly due to its borrowing or deposit with floating interest rates. The purpose of interest rate risk management is to minimize uncertainty and financial expense arising from interest rate fluctuation.

To manage its interest rate risk, the Group minimizes external borrowings using internal funds and reduces borrowings with high interest rates and maintains an appropriate balance between borrowings with floating interest rate and fixed-interest rate and short-term and long-term borrowings. The Group manages its interest rate risk preemptively through regular monitoring and adjustments to the changing domestic and overseas markets conditions and nature of its interest rates.

Floating rate financial assets and liabilities exposed to interest rate risk as of December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>		2020	2019
Financial assets	₩	382,572	302,001
Financial liabilities		2,118,363	3,013,532
Net liabilities	₩	(1,735,791)	(2,711,531)

A sensitivity analysis on the Group's income before tax for the period, assuming a 1% increase and decrease in interest rates, as of December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>		2020		2019	
		1% increase	1% decrease	1% increase	1% decrease
Income before tax impact	₩	(17,358)	17,358	(27,115)	27,115

3) Price risk

The Group is exposed to equity price risks arising from its listed equity investments among financial investments. The Group periodically measures the risk as the fair value or future cash flows of equity investments may fluctuate due to the changes in market prices. Significant investments in the Group's portfolio are individually managed, and acquisition and disposal are approved by the Board of Directors.

(2) Credit risk

The Group is exposed to credit risk that a counterparty will not meet its obligations under a financial instrument or customer contract, leading to a financial loss. Credit risk arises from trade and other receivables, debt instruments, deposits in financial institutions, derivative financial instruments and financial guarantee contracts.

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The Group enters into transactions with customers having met a certain level of credit quality and maintains policies and procedures on financial assets to manage such risks. The credit quality of a new customer is assessed based on publicly announced financial information and the information provided by credit rating agencies. Such assessment is used as a basis for determining a customer's credit limit. Furthermore, collaterals and credit guarantees are obtained as security, if necessary. In addition, the Group periodically reassesses the credit quality of customers by auditing credit limits and adjusts the amount covered by collaterals when deemed necessary. The Group also monitors whether the collection of financial assets have been impaired to take relevant actions.

The carrying amount of financial assets represents the Group's maximum exposure. The maximum exposure to credit risk as of December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020	2019
Cash and cash equivalents	₩	2,336,795	1,441,281
Short-term and long- term financial instruments		340,130	270,869
Trade receivables and other receivables		2,722,029	3,459,688
Deposits		488,311	348,346
Short-term and long- term investment in securities (excluding equity securities)		438,325	196,107
Derivative financial assets		96,101	52,077
Total	₩	<u>6,421,691</u>	<u>5,768,368</u>

In addition to the above, the maximum amount to be paid for the principal debtor related to financial guarantee contract is described in Note 32.

The Group's receivables' aging analysis as of December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020					
		Receivables assessed for impairment individually or on a collective basis					
		Before maturity	0-3 months	3-6 months	6-12 months	More than 12 months	Total
Trade receivables	₩	1,733,072	178,733	76,905	44,736	1,207,472	3,240,918
Loans and other receivables		767,688	234,868	57,831	86,366	1,009,964	2,156,717
Accrued income		22,163	3,891	3,616	7,312	83,276	120,258
Lease receivables		9,419	-	-	-	-	9,419
Total	₩	<u>2,532,342</u>	<u>417,492</u>	<u>138,352</u>	<u>138,414</u>	<u>2,300,712</u>	<u>5,527,312</u>

(In millions of won)

		2019					
		Receivables assessed for impairment individually or on a collective basis					
		Before maturity	0-3 months	3-6 months	6-12 months	More than 12 months	Total
Trade receivables	₩	1,480,525	148,798	24,411	87,449	1,613,272	3,354,455
Loans and other receivables		853,920	262,567	59,077	194,471	1,421,200	2,791,235
Accrued income		17,638	7,861	7,588	16,344	61,098	110,529
Lease receivables		12,035	-	-	-	-	12,035
Total	₩	<u>2,364,118</u>	<u>419,226</u>	<u>91,076</u>	<u>298,264</u>	<u>3,095,570</u>	<u>6,268,254</u>

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ECLs are measured as the present value of all cash shortfalls. If the Group does not have reasonable and supportable information that is available without under cost or effort to measure ECLs on an individual instrument basis, the Group can group financial instruments on the basis of shared credit risk characteristics.

(3) Liquidity risk

The Group is exposed to liquidity risk, which is the risk that it will encounter difficulties in fulfilling the obligations associated with its financial liabilities that are settled by delivering cash or another financial asset.

The Group manages liquidity risk by matching the duration of financial assets and liabilities through estimating future cash flows from its operating, investing and financing activities, and securing moderate levels of liquidity in advance.

A summary of the Group's non-derivative liabilities maturity as of December 31, 2020 and 2019 are as follows:

(In millions of won)

	Book value	2020				
		Nominal cash flows according to contract				
		Total	Less than 1 year	1-2 years	2-5 years	More than 5 years
Principle on financial liabilities(*1)	₩ 14,108,095	14,193,330	10,390,321	1,891,078	1,855,132	56,799
Interest on financial liabilities	-	363,990	222,732	84,224	57,015	19
Total	₩ 14,108,095	14,557,320	10,613,053	1,975,302	1,912,147	56,818

(*1) This includes provision for payment guarantees in the amount of ₩54,855 million.

(In millions of won)

	Book value	2019				
		Nominal cash flows according to contract				
		Total	Less than 1 year	1-2 years	2-5 years	More than 5 years
Principle on financial liabilities(*1)	₩ 14,761,902	14,861,142	11,367,150	1,679,494	1,688,595	125,903
Interest on financial liabilities	-	309,942	213,529	76,302	20,111	-
Total	₩ 14,761,902	15,171,084	11,580,679	1,755,796	1,708,706	125,903

(*1) This includes provision for payment guarantees in the amount of ₩54,855 million.

The contractual amounts of financial liabilities in the above tables are calculated based on non-discounted cash flows (including estimated interest expense) and differ from its book values. Besides the above non-derivative liabilities, the maximum guarantee amounts based on financial guarantee contracts provided by the Group as of December 31, 2020 are described in Note 32.

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(4) Capital risk

The objective of the Group's capital risk management is to secure its ability to provide earnings to its shareholders and interested parties and sustain optimal capital structure to reduce the cost of capital. In order to sustain optimal capital structure, the Group uses a debt-to-equity ratio similar to other entities in the industry. Debt-to-equity ratio is calculated by dividing total liabilities by total equity.

Debt-to-equity ratios as of December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>		2020	2019
Total liabilities	₩	18,460,678	18,607,256
Total equity		7,106,497	6,201,993
Debt-to-equity ratio		259.77%	300.02%

5. Restricted financial assets

Details of restricted financial assets as of December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>		2020	2019	Restrictions
Cash and cash equivalents	₩	79,425	4,412	Collateral for advanced received and others
Short-term financial instruments				National R&D projects(*1), Shared growth fund, Establishment of a pledge right, Price return swap ("PRS") deposit(*2) and others
		213,972	195,243	
Long-term financial instruments		622	659	Deposits for maintenance of checking accounts and others
Total	₩	294,019	200,314	

(*1) The amounts are restricted in use and may only be used for specific national R&D projects.

(*2) This is deposit amount for the PRS contract that had been signed coincidentally with disposal of Doosan Bobcat Inc. shares.

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6. Investments in securities

(1) Investments in securities as of December 31, 2020 and 2019 are summarized as follows:

(In millions of won)

Description		2020	2019
Short-term investments in securities	Financial assets as measured at amortized cost	₩ 98,203	39
	Financial assets as measured at FVOCI	158,701	69,961
	Financial assets as measured at FVTPL	11,358	9,280
	Subtotal	268,262	79,280
Long-term investments in securities(*1)	Financial assets as measured at amortized cost	15,332	3,284
	Financial assets as measured at FVOCI	4,821	4,826
	Financial assets as measured at FVTPL	906,356	193,378
	Subtotal	926,509	201,488
Total		₩ 1,194,771	280,768

(*1) A portion of long-term investments in securities have been pledged as collateral for developers' project financing and others as of December 31, 2020 (See Note 33).

(2) Details of the Group's investments in securities as of December 31, 2020 and 2019 are as follows:

(In millions of won)

Description			2020	2019
Financial assets as measured at amortized cost	Debt securities	Government and corporate bonds and others	<u>₩ 113,535</u>	<u>3,323</u>
Financial assets as measured at FVOCI	Non-marketable equity securities	Al Asilah Desalination Company and others	4,821	4,826
	Debt securities	Asset backed short-term bond	158,701	69,961
	Subtotal		<u>163,522</u>	<u>74,787</u>
Financial assets as measured at FVTPL	Marketable equity securities	Doosan Fuel Cell Co., Ltd. and others(*1)	690,774	9,507
	Non-marketable equity securities	S-Y Highway Co., Ltd. and others	63,262	70,328
	Investment in guarantee cooperative	Construction Guarantee Cooperative and others	133,785	103,615
	Beneficiary certificates	Korea EXIM Bank – Public Carbon Fund and others	29,893	19,208
	Subtotal		<u>917,714</u>	<u>202,658</u>
Total		<u>₩ 1,194,771</u>	<u>280,768</u>	

(*1) Shares of Doosan Fuel Cell Co., Ltd. given free of charge by related parties during the current year are included.

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(3) Changes in financial assets as measured at fair value for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

2020						
	January 1	Acquisition	Disposal	Gain or loss on valuation	Others	December 31
Financial assets as measured at FVOCI	₩ 74,787	118,005	(28,441)	(4)	(825)	163,522
Financial assets as measured at FVTPL	202,658	651,398	(7,256)	67,666	3,248	917,714
Total	₩ 277,445	769,403	(35,697)	67,662	2,423	1,081,236

(In millions of won)

2019						
	January 1	Acquisition	Disposal	Gain or loss on valuation	Others	December 31
Financial assets as measured at FVOCI	₩ 21,718	66,437	-	(12,046)	(1,322)	74,787
Financial assets as measured at FVTPL	189,595	35,107	(18,639)	(2,544)	(861)	202,658
Total	₩ 211,313	101,544	(18,639)	(14,590)	(2,183)	277,445

7. Trade and other receivables

(1) Trade and other receivables as of December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020			2019		
	Gross	Allowance for doubtful accounts	Book value	Gross	Allowance for doubtful accounts	Book value
Current asset:						
Trade receivables	₩ 3,221,422	(1,184,468)	2,036,954	3,334,135	(1,241,313)	2,092,822
Lease receivables	2,267	-	2,267	1,622	-	1,622
Other receivables	439,725	(202,887)	236,838	698,997	(228,123)	470,874
Accrued income	120,258	(73,915)	46,343	110,529	(32,020)	78,509
Short-term loans	310,470	(160,484)	149,986	228,575	(143,076)	85,499
Subtotal	4,094,142	(1,621,754)	2,472,388	4,373,858	(1,644,532)	2,729,326
Non-current asset:						
Long-term trade receivables	5,025	(56)	4,969	4,543	(56)	4,487
Lease receivables	5,796	-	5,796	8,583	-	8,583
Long-term other receivables	12,975	(4,148)	8,827	16,179	(5,703)	10,476
Long-term loans	1,344,376	(1,114,327)	230,049	1,798,974	(1,092,158)	706,816
Subtotal	1,368,172	(1,118,531)	249,641	1,828,279	(1,097,917)	730,362
Total	₩ 5,462,314	(2,740,285)	2,722,029	6,202,137	(2,742,449)	3,459,688

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(2) Changes in allowance for doubtful accounts for the years ended December 31, 2020 and 2019 are summarized as follows:

(In millions of won)

		2020				
		January 1	Provision for (reversal of) allowance	Write-off of uncollectible amounts	Changes in foreign currency translation and others	December 31
Trade and other receivables:						
Trade receivables	₩	1,241,369	21,664	(60,143)	(18,366)	1,184,524
Other receivables		233,826	(52,407)	(50,309)	75,925	207,035
Accrued income		32,020	31,707	(341)	10,529	73,915
Short and long-term loans		1,235,234	197,809	(95,081)	(63,151)	1,274,811
Subtotal		2,742,449	198,773	(205,874)	4,937	2,740,285
Others:						
Due from customers for contract work		63,578	20,876	(772)	(981)	82,701
Deposits		2,672	206	(119)	(6)	2,753
Prepayments		1,499	392	(797)	(33)	1,061
Subtotal		67,749	21,474	(1,688)	(1,020)	86,515
Total	₩	2,810,198	220,247	(207,562)	3,917	2,826,800

(In millions of won)

(In millions of won)		2019				
		January 1	Provision for (reversal of) allowance	Write-off of uncollectible amounts	Changes in foreign currency translation and others	December 31
Trade and other receivables:						
Trade receivables	₩	1,298,821	(6,833)	(43,045)	(7,574)	1,241,369
Other receivables		188,567	52,338	(13,884)	6,805	233,826
Accrued income		32,463	8	(451)	-	32,020
Short and long-term loans		1,233,951	98,995	(57,280)	(40,432)	1,235,234
Subtotal		2,753,802	144,508	(114,660)	(41,201)	2,742,449
Others:						
Due from customers for contract work		57,920	4,032	-	1,626	63,578
Deposits		2,601	28	-	43	2,672
Prepayments		1,292	676	(429)	(40)	1,499
Subtotal		61,813	4,736	(429)	1,629	67,749
Total	₩	2,815,615	149,244	(115,089)	(39,572)	2,810,198

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8. Inventories

Inventories as of December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020			2019		
	Acquisition cost	Valuation allowance	Book value	Acquisition cost	Valuation allowance	Book value
Finished goods	₩ 548,459	(38,505)	509,954	659,701	(33,707)	625,994
Merchandise	236,512	(23,036)	213,476	321,464	(21,754)	299,710
Semi-finished goods	99,577	(514)	99,063	145,155	(281)	144,874
Work-in-process	291,381	(10,795)	280,586	344,717	(14,016)	330,701
Raw materials	589,423	(34,922)	554,501	586,156	(36,415)	549,741
Supplies	22,456	(2,603)	19,853	21,104	(2,631)	18,473
Materials-in-transit	277,359	-	277,359	223,787	-	223,787
Unfinished houses	898	-	898	8,428	-	8,428
Sites	3,032	-	3,032	-	-	-
Total	₩ 2,069,097	(110,375)	1,958,722	2,310,512	(108,804)	2,201,708

As of December 31, 2020, certain inventories have been pledged as collateral for the Group's debts (See Note 33).

Losses on inventory valuation recognized within the cost of sales amounted to ₩2,816 million and ₩18,243 million for the years ended December 31, 2020 and 2019, respectively.

9. Derivatives

(1) Overview of the derivatives of the Group is as follows:

	Category	Summary
Fair value hedge	Forward exchange	Avoiding the risk of exchange rate fluctuations for foreign currency contracts that meet the requirements of the firm commitment
Cash flow hedge	Forward exchange	Avoiding the cash flow risk due to fluctuations in the exchange rate of the expected foreign currency collection and the expected foreign currency expenditure related to the purchasing of foreign materials
	Interest rate swap	Contracts that pay a fixed rate and receives a variable rate on the future interest payment date in order to avoid the risk of cash flow fluctuations due to fluctuations in interest rates
Trading	Forward exchange	Contracts that concluded a forward currency contract to avoid the risk of future cash flow fluctuations, but did not apply hedging accounting

The Group classified derivatives as non-current assets (liabilities) if their remaining maturity exceeds 12 months from the end of the reporting period to the contract maturity date, and current assets (liabilities) if they are within 12 months. When cash flow hedging is applied, the ineffective portion is recognized in profits (losses).

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(2) Details of valuation of derivatives as of December 31, 2020 and 2019 are as follows:

(In millions of won, in thousands of foreign currency)

2020							
Buy		Sell		Derivative financial assets (liabilities)	Gain (loss) on valuation of derivative financial instruments	Accumulated other comprehensive income (loss)(*1)	Firm commitment assets (liabilities)(*2)
Currency	Amount	Currency	Amount				
Foreign currency forwards:							
KRW	1,988,948	USD	1,775,452 ₩	53,761	73,683	1,724	(22,858)
KRW	296,663	EUR	218,520	1,815	888	(76)	(655)
KRW	132,388	JPY	11,468,220	9,253	2,919	1,000	(3,335)
KRW	50,479	Others		2,513	2,430	62	(1,263)
USD	428,842	KRW	482,949	(15,722)	(15,116)	(10,586)	1,906
EUR	264,230	KRW	357,794	(184)	(1,364)	4,511	44
JPY	14,548,410	KRW	180,952	(24,613)	(2,705)	(6,381)	130
Others		KRW	54,232	(2,337)	(14)	(2,272)	7
GBP and others		EUR and others		(40,768)	1,306	1,703	(328)
Long-term (short-term) borrowing denominated in foreign currencies(*3)							
KRW	-	USD	-	-	-	-	36
Currency rate swap (“CRS”)				(43,774)	-	6,536	-
Interest rate swap (“IRS”)				(832)	-	(832)	-
PRS(*4)				24,613	24,613	-	-
Subtotal				(36,275)	86,640	(4,611)	(26,316)
Tax effect				-	-	1,104	-
Adjustments for consolidation				-	-	8,704	-
Total				₩ (36,275)	86,640	5,197	(26,316)

(*1) In consideration of the amounts adjusted in sales and cost of sales, the effective portion of changes in fair value of cash flow hedges of ₩5,197 million, net of tax, was recognized in accumulated other comprehensive income or loss.

(*2) In consideration of the amounts adjusted in revenue, firm commitment assets of ₩15,719 million and firm commitment liabilities of ₩42,035 million were recognized in the consolidated statements of financial position by applying a fair value hedge accounting.

(*3) The Group designated its short-term and long-term borrowings denominated in foreign currencies as hedging instruments to hedge the fair value change of firm commitments.

(*4) The Group has entered into PRS contract to exchange profits due to changes in stock prices at the same time as the disposal of Doosan Bobcat Inc. stocks.

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2019							
Buy		Sell		Derivative financial assets (liabilities)	Gain (loss) on valuation of derivative financial instruments	Accumulated other comprehensive income (loss)(*1)	Firm commitment assets (liabilities)(*2)
Currency	Amount	Currency	Amount				
Foreign currency forwards:							
KRW	2,098,162	USD	1,866,910 ₩	(43,279)	(34,440)	4,179	25,605
KRW	300,123	EUR	225,276	5,039	1,524	1,310	(720)
KRW	199,713	JPY	18,082,201	3,449	(2,622)	(1,112)	(1,895)
KRW	70,902	Others		(862)	(978)	(64)	424
USD	1,450,610	KRW	1,674,689	11,410	38,493	3,178	(3,497)
EUR	269,516	KRW	364,052	(10,462)	(3,907)	(1,085)	129
JPY	16,838,081	KRW	208,006	(24,110)	(1,527)	(132)	73
Others		KRW	21,007	284	(88)	527	-
GBP and others		EUR and others		(16,922)	(11,345)	570	(618)
Long-term (short-term) borrowing denominated in foreign currencies(*3)							
KRW	-	USD	-	-	-	-	180
Currency rate swap (“CRS”)				12,753	1,588	(1,036)	-
Interest rate swap (“IRS”)				(1,204)	-	(1,204)	-
PRS(*4)				(14,157)	(14,157)	-	-
Subtotal				(78,061)	(27,459)	5,131	19,681
Tax effect				-	-	(1,300)	-
Adjustments for consolidation				-	-	13,406	-
Total				₩ (78,061)	(27,459)	17,237	19,681

(*1) In consideration of the amounts adjusted in sales and cost of sales, the effective portion of changes in fair value of cash flow hedges of ₩17,237 million, net of tax, was recognized in accumulated other comprehensive income or loss.

(*2) In consideration of the amounts adjusted in revenue, firm commitment assets of ₩43,934 million and firm commitment liabilities of ₩24,253 million were recognized in the consolidated statements of financial position by applying a fair value hedge accounting.

(*3) The Group designated its long-term and short-term borrowings denominated in foreign currencies as hedging instruments to hedge the fair value change of firm commitments.

(*4) The Group has entered into PRS contract to exchange profits due to changes in stock prices at the same time as the disposal of Doosan Bobcat Inc. stocks.

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(3) Put option granted for financial investors

DEC, a subsidiary of the Company, participated in SOC projects and development-type projects such as Masan Sewer Pipeline BTL, Sangju Yeongcheon Expressway, Suwon-Gwangmyeong Expressway, and Seoul Munsan Expressway as a member of the construction investment company, and signed a put option contract of ₩12.6 billion in relation to stocks acquired by the financial investors to recruit financial investors. In addition, during 2019, the Company and financial investors, Nuscale Korea and others, acquired preferred shares of NuScale Power LLC. The Company entered into a put option contract that could only be exercised under the conditions of non-compliance, including failure to obtain design certification in relation to the preferred shares (USD 39.8 million) acquired by Nuscale Korea and others.

The Group classifies these option contracts as derivative financial instruments. As of December 31, 2020, there was no recognized gain or loss on valuation of derivatives and assets (liabilities) for changes in the fair value of options.

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10. Financial instruments

(1) Financial assets as of December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020					
		Financial assets as measured at amortized cost	Financial assets as measured at FVOCI	Financial assets as measured at FVTPL	Other financial assets(*1)	Carrying amounts	Fair value
Cash and cash equivalents	₩	2,336,795	-	-	-	2,336,795	2,336,795
Short-term and long-term financial instruments (*2)		340,130	-	-	-	340,130	340,130
Short-term and long-term investment in securities		113,535	163,522	917,714	-	1,194,771	1,194,771
Derivative financial assets		-	-	30,728	65,373	96,101	96,101
Trade and other receivables		2,692,619	29,410	-	-	2,722,029	2,722,029
Deposits		488,311	-	-	-	488,311	488,311
Total	₩	5,971,390	192,932	948,442	65,373	7,178,137	7,178,137

(*1) Other financial assets include derivatives as hedged item.

(*2) Some of short-term financial instruments have been pledged as collateral for borrowings (See Note 33).

(In millions of won)

		2019					
		Financial assets as measured at amortized cost	Financial assets as measured at FVOCI	Financial assets as measured at FVTPL	Other financial assets(*1)	Carrying amounts	Fair value
Cash and cash equivalents	₩	1,441,281	-	-	-	1,441,281	1,441,281
Short-term and long-term financial instruments		270,869	-	-	-	270,869	270,869
Short-term and long-term investment in securities		3,323	74,787	202,658	-	280,768	280,768
Derivative financial assets		-	-	9,547	42,530	52,077	52,077
Trade and other receivables		3,447,438	12,250	-	-	3,459,688	3,459,688
Deposits		348,346	-	-	-	348,346	348,346
Total	₩	5,511,257	87,037	212,205	42,530	5,853,029	5,853,029

(*1) Other financial assets include derivatives as hedged item.

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(2) Financial liabilities as of December 31, 2020 and 2019 are as follows:

(In millions of won)

(In millions of won)

		2020				
		Financial liabilities as measured at amortized cost	Financial liabilities as measured at FVTPL	Other financial liabilities(*1)	Carrying amounts	Fair value
Trade and other payables	₩	2,701,696	-	-	2,701,696	2,701,696
Borrowings and bonds		10,051,229	-	-	10,051,229	10,051,229
Derivative financial liabilities		-	20,260	112,116	132,376	132,376
Financial guarantee liabilities		-	-	24,911	24,911	24,911
Lease liabilities		238,330	-	-	238,330	238,330
Others		1,060,863	-	-	1,060,863	1,060,863
Total	₩	14,052,118	20,260	137,027	14,209,405	14,209,405

(*1) Other financial liabilities include derivatives as hedged item and others.

(In millions of won)

(In millions of won)

	2019				
	Financial liabilities as measured at amortized cost	Financial liabilities as measured at FVTPL	Other financial liabilities(*1)	Carrying amounts	Fair value
Trade and other payables	₩ 3,085,208	-	-	3,085,208	3,085,208
Borrowings and bonds	10,251,437	-	-	10,251,437	10,251,437
Derivative financial liabilities	-	45,863	84,275	130,138	130,138
Financial guarantee liabilities	-	-	13,900	13,900	13,900
Lease liabilities	256,538	-	-	256,538	256,538
Others(*2)	892,870	-	220,000	1,112,870	1,112,870
Total	₩ 14,486,053	45,863	318,175	14,850,091	14,850,091

(*1) Other financial liabilities include derivatives as hedged item and others.

(*2) Others include PF payment guarantees for Club Mow in the amount of ₩220,000 million.

(3) As of December 31, 2020 and 2019, the Group uses the following hierarchy for determining and disclosing the fair value of financial instruments:

Level 1: Quoted (unadjusted) prices in active markets for identical assets or liabilities.

Level 2: Inputs other than quoted prices that are observable for the asset or liability either directly or indirectly.

Level 3: Inputs that are not based on observable market data (unobservable inputs).

The fair value of financial instruments traded in active markets is based on quoted market prices at the dates of the consolidated statements of financial position. These instruments are included in level 1. Instruments included in level 1 primarily comprise listed equity investments classified as trading securities.

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

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If one or more of the significant inputs are not based on observable market data, the instrument is included in level 3.

Specific valuation techniques used to value financial instruments include:

- quoted or dealer price of similar instruments;
- the fair value of forward foreign exchange contracts determined by using forward exchange rates at the reporting date, with the resulting value discounted to present value; and
- other financial techniques such as discounted cash flow analysis.

The level of fair value measurements of financial instruments as of December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020			
		Level 1	Level 2	Level 3	Total
Financial assets measured at fair value:					
Measured at FVOCI	₩	-	188,111	4,821	192,932
Measured at FVTPL		690,774	34,301	223,367	948,442
Others		-	65,373	-	65,373
Total	₩	690,774	287,785	228,188	1,206,747
Financial liabilities measured at fair value:					
Measured at FVTPL	₩	-	20,260	-	20,260
Others		-	112,116	-	112,116
Total	₩	-	132,376	-	132,376

(In millions of won)

		2019			
		Level 1	Level 2	Level 3	Total
Financial assets measured at fair value:					
Measured at FVOCI	₩	-	82,210	4,827	87,037
Measured at FVTPL		9,590	9,547	193,068	212,205
Others		-	42,530	-	42,530
Total	₩	9,590	134,287	197,895	341,772
Financial liabilities measured at fair value:					
Measured at FVTPL	₩	-	45,863	-	45,863
Others		-	84,275	-	84,275
Total	₩	-	130,138	-	130,138

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Assumptions used for the measurement of financial assets at fair value based on level 3 valuation methods as of December 31, 2020 are as follows:

	Valuation methods	Discount rate	Note
Incheon-Gimpo Expressway Co.	Dividend evaluation model	6.67%	Expected dividend cash flow for each financial period
Kyunggi South Road Co., Ltd.	Cash flow discount model	6.61%	Expected cash flow to equity
Daegu South Circulation Road Corporation	Cash flow discount model	6.26%	Expected cash flow to equity
S-Y Expressway Co., Ltd.	Cash flow discount model	6.41%	Expected cash flow to equity
Metropolitan Western Expressway Co., Ltd.	Net asset value assessment	6.00%	Amount available for sale under contract
BLTC and others	Cost method	-	Recent measurement cost
Gyeonggi East-West Beltway Co.	Net asset value assessment	-	Fair value of net asset
Korea EXIM Bank-Public Carbon Fund	Estimated sales price valuation method	-	Expected sales price
Construction Guarantee Cooperative	Estimated sales price valuation method	-	Expected sales price
Machinery Financial Cooperative	Estimated sales price valuation method	-	Expected sales price
Facilities Construction Financial Cooperative	Estimated sales price valuation method	-	Expected sales price
Engineering Guarantee Insurance	Estimated sales price valuation method	-	Expected sales price
Gyeongnam GNTech Creative Economy Innovation Fund	Net asset value assessment	-	Fair value of net asset
Emerald Technology Venture	Estimated sales price valuation method	-	Return rate on investment
Lanco Kondapalli Power Ltd.	Net asset value assessment	-	Fair value of net asset
Electric Contractors' Financial Cooperative and others	Estimated sales price valuation method, etc.	-	Expected sales price, etc.
Information & Communication Financial Cooperative	Estimated sales price valuation method, etc.	-	Expected sales price, etc.
Korea Electric Engineers Association	Estimated sales price valuation method, etc.	-	Expected sales price, etc.
Fire Guarantee	Estimated sales price valuation method, etc.	-	Expected sales price, etc.
Al Asilah Desalination Company	Net asset value assessment	-	Fair value of net asset
NuScale Power LLC	Net asset value assessment	-	Fair value of net asset

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Changes in financial assets included in level 3 of the fair value hierarchy for the years ended December 31, 2020 and 2019 are summarized as follows and there is no transfer between levels of the fair value.

(In millions of won)

		2020					
		January 1	Acquisition	Disposal	Profit (loss) for the year	Other comprehensive income (loss)	December 31
Financial assets as measured at							
FVOCI	₩	4,827	18,439	(18,441)	-	(4)	4,821
Financial assets as measured at							
FVTPL		193,068	48,510	(7,206)	(11,428)	-	223,367
Total	₩	197,895	66,949	(25,647)	(11,428)	(4)	228,188

(In millions of won)

		2019					
		January 1	Acquisition	Disposal	Profit (loss) for the year	Other comprehensive income (loss)	December 31
Financial assets as measured at							
FVOCI	₩	17,986	722	-	-	(12,046)	4,827
Financial assets as measured at							
FVTPL		176,877	34,774	(18,309)	(105)	-	193,068
Total	₩	194,863	35,496	(18,309)	(105)	(12,046)	197,895

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(4) Gain or loss by categories of financial instruments

1) Gain or loss by categories of financial instruments for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)		2020						
		Gain or loss						Other comprehensive income(*2)
Interest income (expense)	Dividend income	Gain or loss on valuation (*1)	Impairment loss on financial instruments	Gain or loss on disposal	Gain or loss on financial guarantee			
Financial assets:								
Measured at								
amortized cost	₩	38,104	-	-	(198,979)	(17,935)	-	
Measured at								
FVOCI		4,829	-	-	-	66	-	
Measured at								
FVTPL		453	1,123	67,666	-	457	-	
Total	₩	43,386	1,123	67,666	(198,979)	(17,412)	-	
Financial liabilities:								
Measured at								
amortized cost	₩	(457,918)	-	-	-	(55,674)	-	
Others		-	-	-	-	-	(14,493)	

(*1) The amounts of gains and losses of foreign exchange and derivatives are excluded.

(*2) The amounts in other comprehensive income or loss exclude deferred tax effect.

(In millions of won)

		2019						
		Gain or loss						
		Interest income (expense)	Dividend income	Gain or loss on valuation (*1)	Impairment loss on financial instruments	Gain or loss on disposal	Gain or loss on financial guarantee	Other comprehensive income(*2)
Financial assets:								
Measured at								
amortized cost	₩	44,205	-	-	(148,568)	(22,010)	-	-
Measured at								
FVOCI		2,530	5	-	-	-	-	(12,046)
Measured at								
FVTPL		9,801	1,336	(2,544)	-	2,921	-	-
Others		460	-	-	-	-	-	-
Total	₩	56,996	1,341	(2,544)	(148,568)	(19,089)	-	(12,046)
Financial liabilities:								
Measured at								
amortized cost	₩	(506,710)	-	-	-	(7,682)	-	-
Others		-	-	-	-	-	(10,106)	

(*1) The amounts of gains and losses of foreign exchange and derivatives are excluded.

(*2) The amounts in other comprehensive income or loss exclude deferred tax effect.

Gains or losses on translation or transaction of foreign currencies arising from foreign currency transactions except for derivative financial instruments have been mostly incurred from financial assets and liabilities measured at amortized cost.

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2) Details of gains and losses on valuation and settlement of derivative financial instruments for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020		
		Gain or loss on valuation	Gain or loss on settlement	Other comprehensive income(*1)
Derivatives measured at FVTPL	₩	21,126	(20,438)	-
Derivatives for fair value hedge		35,267	(3,054)	-
Derivatives for cash flow hedge		30,247	(2,260)	(9,742)
Total	₩	86,640	(25,752)	(9,742)

(*1) The amounts of gains and losses of derivatives are excluded.

(In millions of won)

		2019		
		Gain or loss on valuation	Gain or loss on settlement	Other comprehensive income(*1)
Derivatives measured at FVTPL	₩	22,694	2,088	-
Derivatives for fair value hedge		(54,999)	1,752	-
Derivatives for cash flow hedge		4,845	(4,341)	14,485
Total	₩	(27,460)	(501)	14,485

(*1) The amounts of gains and losses of derivatives are excluded.

Gain or loss by categories of financial instruments for the years ended December 31, 2020 and 2019 include selling and administrative expenses, finance income and expenses, other non-operating income and expenses and other comprehensive income or loss from each financial instrument.

(5) Financial assets and financial liabilities subject to an enforceable master netting arrangement or similar agreement as of December 31, 2020 are as follows:

(In millions of won)

		Eligible for legal right to offset		
		Total assets (liabilities)	Offset amount	Amount after offset
Derivative financial assets	₩	79,580	(19,332)	60,248
Derivative financial liabilities		(59,929)	19,332	(40,597)

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11. Investments in associates and joint ventures

(1) Details of share of investment in associates and joint ventures as of December 31, 2020 and 2019 are as follows:

(In millions of won)

(In millions of won)				Acquisition cost		Book value	
	Countries	Percentage of ownership (%)		2020	2019	2020	2019
Associates:							
The HS-City Expressway(*1)	Korea	27.29	₩	9,578	9,578	3,081	3,806
Samcheok Blue Power Co., Ltd.(*1,2,6)	Korea	9.00		43,568	43,568	38,086	42,961
Daejung Offshore Wind Power Co., Ltd.(*7)	Korea	26.65		3,196	2,827	2,771	2,617
Hychangwon Co., Ltd.(*8,9)	Korea	18.52		3,000	-	2,810	-
ReCarbon, Inc.(*2,5)	USA	16.09		8,151	-	8,052	-
DBC Co., Ltd.(“DBC”)	Korea	49.90		53,216	53,216	52,361	52,830
Shinbundang Railroad Co., Ltd.(*3)	Korea	29.03		62,552	62,552	-	-
Kyunggi Railroad Co., Ltd.(*2,3)	Korea	6.98		7,067	7,067	-	-
Neo Trans Co., Ltd.	Korea	42.86		43	43	21,883	21,810
New Seoul Railroad Co., Ltd.(*2,3)	Korea	13.76		8,794	8,794	6,826	7,219
KIAMCO Kyunggi Railway Investment Private property investment trust(*3,7)	Korea	35.78		28,167	28,072	-	-
Incheon fuel cell Co., Ltd.	Korea	20.00		4,700	4,700	2,999	4,439
Others	USA, etc	-		13,004	5,333	6,936	-
Subtotal				245,036	225,750	145,805	135,682
Joint ventures:							
Doosan Babcock Blackcat W.L.L	Qatar	49.00		243	243	640	-
Haman Industrial Complex Company(*4)	Korea	-		-	3,600	-	-
Tianjin Lovol Doosan Engine Co., Ltd.(*10)	China	50.00		28,163	25,640	16,327	17,787
Others	USA, etc	-		718	1,826	202	2,288
Subtotal				29,124	31,309	17,169	20,075
Total			₩	274,160	257,059	162,974	155,757

(*1) The Group's investments in investee have been pledged as collateral for the company's project financing and contract of completion guarantee (See Note 33).

(*2) Although the Group's ownership interest in the investee is less than 20%, the investee is classified as an associate considering the exercise of voting rights in the board of directors.

(*3) Investments in the investee have been pledged as collateral in connection with project financing (See Note 33).

(*4) Liquidated in 2020.

(*5) The investee was incorporated into investments in associate due to changes in the scope of consolidation in 2020.

(*6) The company name was changed from POSPOWER Co., Ltd. to Samcheok Blue Power Co., Ltd. in 2020.

(*7) Additional acquired in 2020.

(*8) Newly acquired in 2020.

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(*9) The Group's ownership interest in the investee included preferred stocks, and the investee is classified as an associate since the Group hold more than 20% of the stocks with voting rights.

(*10) The Group participated in the issuance of shares of Tianjin Lovol Doosan Engine Co. Ltd. and acquired 50% of the share for ₩2,523 million in 2020.

(2) Changes in investment in associates and joint ventures for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020					
	January 1, 2020	Acquisition (disposal)	Share of profit (loss)	Increase (decrease) in equity of associates	Others	December 31, 2020
Associates:						
The HS-City Expressway	₩ 3,806	-	(850)	-	125	3,081
Samcheok Blue Power Co., Ltd.	42,961	-	(4,873)	(2)	-	38,086
Daejung Offshore Wind Power Co., Ltd.	2,617	369	(215)	-	-	2,771
Hychangwon Co., Ltd.(*1)	-	3,000	(190)	-	-	2,810
ReCarbon, Inc.(*2)	-	-	(956)	857	8,151	8,052
DBC	52,830	-	(468)	(1)	-	52,361
Shinbundang Railroad Co., Ltd.(*3)	-	-	-	-	-	-
Kyunggi Railroad Co., Ltd.(*3)	-	-	-	-	-	-
Neo Trans Co., Ltd.	21,810	-	73	-	-	21,883
New Seoul Railroad Co., Ltd.	7,219	-	(393)	-	-	6,826
KIAMCO Kyunggi Railway Investment Private property investment trust	-	95	(95)	-	-	-
Incheon fuel cell Co., Ltd.	4,439	-	(1,438)	(2)	-	2,999
Others	-	7,670	-	-	(734)	6,936
Subtotal	135,682	11,134	(9,405)	852	7,542	145,805
Joint ventures:						
Doosan Babcock Blackcat W.L.L	-	-	653	-	(13)	640
Haman Industrial Complex Company	-	-	-	-	-	-
Tianjin Lovol Doosan Engine Co., Ltd.	17,787	2,523	(4,217)	-	234	16,327
Others	2,288	(2,223)	358	-	(221)	202
Subtotal	20,075	300	(3,206)	-	-	17,169
Total	₩ 155,757	11,434	(12,611)	852	7,542	162,974

(*1) Share of profit (loss) of equity method investees were calculated as a 50% share on common stock basis.

(*2) The amounts of others are due to changes in the scope of consolidation.

(*3) An additional ₩3,737 million was recognized for share of loss on long-term investment.

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		2019				
		January 1, 2019	Acquisition (disposal)	Share of profit (loss)	Increase (decrease) in equity of associates	December 31, 2019
Associates:						
The HS-City Expressway	₩	4,920	-	(1,211)	-	3,806
POSPower Co., Ltd.		43,448	-	(477)	(10)	42,961
Daejung Offshore Wind Power Co., Ltd.		2,772	-	(155)	-	2,617
DBC		-	-	(386)	-	53,216
Potenit Co., Ltd.		4,779	-	(4,779)	-	-
Shinbundang Railroad Co., Ltd.(*1)		-	-	-	-	-
Kyunggi Railroad Co., Ltd.(*1)		-	-	-	-	-
Neo Trans Co., Ltd.		21,645	-	165	-	21,810
New Seoul Railroad Co., Ltd.		7,144	-	75	-	7,219
KIAMCO Kyunggi Railway Investment Private property investment trust		-	-	-	-	-
Incheon fuel cell Co., Ltd.		4,662	-	(223)	-	4,439
Dongbuk LRT		1,693	(1,665)	(28)	-	-
Subtotal		91,063	(1,665)	(7,019)	(10)	53,313
Joint ventures:						
Doosan Babcock Blackcat W.L.L		-	-	-	-	-
Haman Industrial Complex Company		-	-	-	-	-
Doosan PSI LLC		1,337	-	802	-	2,181
Doosan Infracore Liaoning Machinery Sales Co., Ltd.		292	-	(193)	-	8
Tianjin Lovol Doosan Engine Co., Ltd.		8,235	12,913	(3,139)	-	(222)
Subtotal		9,864	12,913	(2,530)	-	(172)
Total	₩	100,927	11,248	(9,549)	(10)	53,141

(*1) Recognized an additional ₩4,795 million in equity method losses under the amendment to K-IFRS No. 1028.

(3) The condensed financial information of the investees as of and for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020				
		Total assets	Total liabilities	Sales	Profit (loss)	Total comprehensive income (loss)
The HS-City Expressway	₩	163,254	151,963	11,320	(3,114)	(3,114)
Samcheok Blue Power Co., Ltd.		1,169,343	700,267	-	(5,994)	(5,994)
Daejung Offshore Wind Power Co., Ltd.		6,282	1,634	-	(824)	(824)
Hychangwon Co., Ltd.		24,537	3	-	(378)	(378)
ReCarbon, Inc.		14,899	6,530	483	(5,848)	(5,848)
DBC		542,068	439,762	-	(938)	(938)
Shinbundang Railroad Co., Ltd.		807,389	999,987	76,427	(56,434)	(56,434)
Kyunggi Railroad Co., Ltd.		613,198	746,790	36,379	(44,024)	(44,024)
Neo Trans Co., Ltd.		68,937	17,879	96,394	171	171
New Seoul Railroad Co., Ltd.		281,548	231,948	-	(2,862)	(2,862)

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	2020				
	Total assets	Total liabilities	Sales	Profit (loss)	Total comprehensive income (loss)
KIAMCO Kyunggi Railway Investment Private property investment trust	78,718	16	-	4	4
Incheon fuel cell Co., Ltd.	192,213	170,976	-	(949)	(949)
Doosan Babcock Blackcat W.L.L	7,183	5,904	36,828	2,913	2,913
Tianjin Lovol Doosan Engine Co., Ltd.	44,048	6,957	-	(8,435)	(8,435)
Doosan Infracore Liaoning Machinery Sales Co., Ltd.	2,537	1,613	24,731	223	223

(In millions of won)

	2019				
	Total assets	Total liabilities	Sales	Profit (loss)	Total comprehensive income (loss)
The HS-City Expressway ₩	172,125	157,720	10,387	974	(4,657)
POSPOWER Co., Ltd.	707,051	199,846	-	(5,294)	(5,294)
Daejung Offshore Wind Power Co., Ltd.	6,181	1,450	-	(617)	(617)
DBC	322,297	219,050	-	(814)	(814)
Potenit Co., Ltd.	6,041	11,380	1,565	(2,243)	(2,243)
Shinbundang Railroad Co., Ltd.	838,864	975,027	103,015	(25,043)	(25,043)
Kyunggi Railroad Co., Ltd.	643,509	733,172	45,556	(33,580)	(33,580)
Neo Trans Co., Ltd.	68,267	17,381	94,406	385	385
New Seoul Railroad Co., Ltd.	205,457	152,996	-	(2,595)	(2,595)
KIAMCO Kyunggi Railway Investment Private property investment trust	78,705	16	-	4	4
Incheon fuel cell Co., Ltd.	22,669	475	-	(1,004)	(1,004)
Doosan Babcock Blackcat W.L.L	813	1,559	10,183	(608)	(608)
Doosan PSI LLC	9,924	5,561	19,412	1,605	1,605
Doosan Infracore Liaoning Machinery Sales Co., Ltd.	1,807	1,205	14,864	(449)	(449)
Tianjin Lovol Doosan Engine Co., Ltd.	41,629	1,007	-	(6,278)	(6,278)

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(4) The following table provides a reconciliation of the summarized financial information of the associates and joint ventures to the carrying amount of its interest in the associates and joint ventures:

(In millions of won)

				2020				
Company	Net asset (a)	Equity ownership (%) (b)	Equity interest in the investee (axb)	Adjustment amount			Book value	
				Difference	Internal transaction	Others		
Associates:								
The HS-City Expressway	₩ 11,291	27.29	3,081	-	-	-	3,081	
Samcheok Blue Power Co., Ltd.	469,076	9.00	42,217	8,360	(4,334)	(8,157)	38,086	
Daejung Offshore Wind Power Co., Ltd.	4,648	26.65	1,239	1,532	-	-	2,771	
Hychangwon Co., Ltd.	5,622	18.52	2,811	-	(1)	-	2,810	
ReCarbon, Inc.	8,369	16.09	1,347	6,560	-	145	8,052	
DBC	102,306	49.90	51,051	701	-	609	52,361	
Shinbundang Railroad Co., Ltd.	(192,598)	29.03	(55,911)	-	-	55,911	-	
Kyunggi Railroad Co., Ltd.	(133,592)	6.98	(9,328)	-	-	9,328	-	
Neo Trans Co., Ltd.	51,058	42.86	21,883	-	-	-	21,883	
New Seoul Railroad Co., Ltd.	49,600	13.76	6,826	-	-	-	6,826	
KIAMCO Kyunggi Railway Investment Private property investment trust	78,702	35.78	28,162	-	-	(28,162)	-	
Incheon fuel cell Co., Ltd.	21,237	20.00	4,247	-	(1,248)	-	2,999	
Subtotal	475,719		97,625	17,153	(5,583)	29,674	138,869	
Joint ventures:								
Doosan Babcock Blackcat W.L.L	1,279	49.00	627	-	-	13	640	
Tianjin Lovol Doosan Engine Co., Ltd.	37,091	50.00	18,546	-	(2,219)	-	16,327	
Doosan Infracore Liaoning Machinery Sales Co., Ltd.	924	43.00	397	-	(195)	-	202	
Subtotal	39,294		19,570	-	(2,414)	13	17,169	
Total	₩ 515,013		117,195	17,153	(7,997)	29,687	156,038	

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(In millions of won)

Company(*1)	2019						
	Net asset (a)	Equity ownership (%) (b)	Equity interest in the investee (axb)	Adjustment amount			Book value
				Difference	Internal transaction	Others	
Associates:							
The HS-City Expressway	₩ 14,405	27.29	3,931	-	-	(125)	3,806
POSPower Co., Ltd.	507,205	9.00	45,648	8,360	-	(11,047)	42,961
Daejung Offshore Wind Power Co., Ltd.	4,731	25.00	1,183	1,434	-	-	2,617
DBC	103,247	49.90	51,520	701	-	609	52,830
Potenit Co., Ltd.	(5,339)	27.80	(1,485)	5,641	-	(4,156)	-
Shinbundang Railroad Co., Ltd.	(136,163)	29.03	(39,528)	-	-	39,528	-
Kyunggi Railroad Co., Ltd.	(89,663)	6.99	(6,267)	-	-	6,267	-
Neo Trans Co., Ltd.	50,886	42.86	21,810	-	-	-	21,810
New Seoul Railroad Co., Ltd.	52,461	13.76	7,219	-	-	-	7,219
KIAMCO Kyunggi Railway Investment Private property investment trust	78,689	35.70	28,092	-	-	(28,092)	-
Incheon fuel cell Co., Ltd.	22,194	20.00	4,439	-	-	-	4,439
Dongbuk LRT	-	-	-	-	-	-	-
Subtotal	602,653		116,562	16,136	-	2,984	135,682
Joint ventures:							
Doosan Babcock Blackcat W.L.L	(746)	49.00	(365)	-	-	365	-
Doosan PSI LLC	4,363	50.00	2,181	-	-	-	2,181
Doosan Infracore Liaoning Machinery Sales Co., Ltd.	602	43.00	259	-	(152)	-	107
Tianjin Lovol Doosan Engine Co., Ltd.	40,622	50.00	20,312	-	(2,525)	-	17,787
Subtotal	44,841		22,387	-	(2,677)	365	20,075
Total	₩ 647,494		138,949	16,136	(2,677)	3,349	155,757

(*1) Adjustments on Haman Industrial Complex Company were not included as the company discontinued recognizing its share of further losses.

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12. Property, plant and equipment

(1) Changes in property, plant and equipment for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)	2020							
		Land	Buildings and structures	Machinery	Others	Construction in progress	Right-of- use assets	Total
As of January 1, 2020	₩	3,605,567	962,399	745,750	145,616	232,631	229,569	5,921,532
Acquisition/ capital expenditure		978	19,426	120,545	48,605	65,366	82,059	336,979
Transfer(*1,2)		361,209	52,794	50,899	259	(98,440)	(2,887)	363,834
Disposals(*3)		(483)	(6,318)	(3,229)	(1,097)	(904)	(7,283)	(19,314)
Depreciation		-	(69,155)	(172,762)	(48,508)	-	(92,368)	(382,793)
Impairment		-	-	26	-	(36,123)	-	(36,097)
Revaluation		19,123	-	-	-	-	-	19,123
Changes in the scope of consolidation(*4)		(41,014)	15,964	8,451	993	93	210	(15,303)
Changes in foreign currency translation and others		(808)	(10,501)	(13,014)	(1,707)	(4,221)	97	(30,154)
As of December 31, 2020	₩	<u>3,944,572</u>	<u>964,609</u>	<u>736,666</u>	<u>144,161</u>	<u>158,402</u>	<u>209,397</u>	<u>6,157,807</u>
- Acquisition cost	₩	2,381,355	2,002,920	2,861,836	711,832	194,509	336,961	8,489,413
- Accumulated depreciation and impairment		(5,932)	(1,038,311)	(2,125,170)	(567,671)	(36,107)	(127,564)	(3,900,755)
- Revaluation surplus		1,569,149	-	-	-	-	-	1,569,149

(*1) Includes amounts reclassified as property, plant and equipment from investment property in 2020 (See Note 15).

(*2) As of December 31, 2020, includes buildings and others (₩11,495 million) classified as non-current assets held for sale.

(*3) Includes the amount due to the contract cancelation of the right-of-use assets (See Note 14).

(*4) Includes the land classified as non-current assets held for sale and sold in 2020.

As of December 31, 2020, certain property, plant and equipment have been pledged as collateral for borrowings and others (See Note 33).

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	2019						
	Land	Buildings and structures	Machinery	Others	Construction in progress	Right-of-use assets	Total
As of January 1, 2019	₩ 4,223,399	1,042,510	731,014	138,695	278,869	-	6,414,487
Adjustment of changes in K-IFRS(*1)	-	-	-	-	-	257,660	257,660
Acquisition/ capital expenditure	41,773	34,449	53,469	53,973	195,978	58,266	437,908
Transfer(*2)	(388,345)	(16,490)	122,332	4,070	(156,676)	15	(435,094)
Disposals(*3, 4)	(148,490)	(3,548)	(2,631)	(3,300)	(29,539)	(191)	(187,699)
Depreciation	-	(64,296)	(164,177)	(48,768)	-	(91,126)	(368,367)
Impairment	2,173	(42,558)	-	(258)	(254)	-	(40,897)
Revaluation	50,974	-	-	-	-	-	50,974
Changes in the scope of consolidation	(177,529)	-	-	-	(58,036)	-	(235,565)
Changes in foreign currency translation and others	1,612	12,332	5,743	1,204	2,289	4,945	28,125
As of December 31, 2019	₩ 3,605,567	962,399	745,750	145,616	232,631	229,569	5,921,532
- Acquisition cost	₩ 2,054,122	1,966,882	2,802,832	698,755	232,881	320,477	8,075,949
- Accumulated depreciation and impairment	(12,299)	(1,004,483)	(2,057,082)	(553,139)	(250)	(90,908)	(3,718,161)
- Revaluation surplus	1,563,744	-	-	-	-	-	1,563,744

(*1) Right-of-use asset from the adoption of K-IFRS No. 1116 is classified as property, plant and equipment (See Note 14).

(*2) Part of the land and buildings were reclassified as investment property in 2019 (See Note 15).

(*3) Includes the amount due to the contract cancelation of the right-of-use assets (See Note 14).

(*4) Includes the land classified as non-current assets held for sale and sold in 2019.

(2) Capitalized borrowing costs for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020	2019
Capitalized borrowing costs	₩ 2,117	3,290
Interest rate of borrowing costs	3.40%~3.97%	3.69%~4.20%

(3) Details of depreciation on property, plant and equipment for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020	2019
Cost of sales	₩ 295,028	290,281
Selling and administrative expenses	67,346	58,559
Research and development costs and others	20,419	19,525
Profit for the year from discontinued operation	-	2
Total	₩ 382,793	368,367

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(4) Revaluation of land

The Group accounts for land using revaluation model; and if the land were accounted for using cost model, the carrying amount of land would have been ₩2,375,423 million and ₩2,041,823 million as of December 31, 2020 and 2019, respectively. As of December 31, 2020, there is no significant difference compared to the fair value of land measured as of December 31, 2019.

13. Intangible assets

(1) Changes in intangible assets for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020				Total
		Goodwill	Industrial property rights	Development costs	Other intangible assets	
As of January 1, 2020	₩	4,482,002	1,154,687	1,191,602	203,595	7,031,886
Increase		-	3,963	238,670	24,490	267,123
Internal development		-	-	238,670	-	238,670
Individual acquisition		-	3,963	-	24,490	28,453
Decrease		-	(2,169)	(121,262)	(68,783)	(192,214)
Amortization		-	(2,169)	(121,262)	(58,949)	(182,380)
Disposal		-	-	-	(9,834)	(9,834)
Transfer to other assets		-	1,362	(17,829)	41,696	25,229
Transfer to other expenses		-	-	(456)	-	(456)
Changes in the scope of consolidation		21,096	-	-	16,029	37,125
Changes in foreign currency translation and others		(68,421)	(32,661)	(6,039)	(2,930)	(110,051)
Impairment loss		-	-	(156,559)	(1,795)	(158,354)
As of December 31, 2020	₩	<u>4,434,677</u>	<u>1,125,182</u>	<u>1,128,127</u>	<u>212,302</u>	<u>6,900,288</u>

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		2019				Total
		Goodwill	Industrial property rights	Development costs	Other intangible assets	
As of January 1, 2019	₩	4,354,753	1,092,402	1,036,129	199,832	6,683,116
Increase		23,806	32,680	316,915	37,219	410,620
Internal development		-	-	316,915	-	316,915
Individual acquisition		23,806	32,680	-	37,219	93,705
Decrease		(3,741)	(1,119)	(122,204)	(54,365)	(181,429)
Amortization		-	(1,119)	(121,728)	(53,216)	(176,063)
Disposal		(3,741)	-	(476)	(1,149)	(5,366)
Transfer to other assets		-	635	(28,427)	21,192	(6,600)
Transfer to other expenses		-	-	(4,029)	-	(4,029)
Changes in foreign currency translation		107,184	30,089	4,034	1,959	143,266
Impairment loss		-	-	(10,816)	(2,242)	(13,058)
As of December 31, 2019	₩	4,482,002	1,154,687	1,191,602	203,595	7,031,886

The carrying amounts of intangible assets with indefinite useful lives including goodwill and others as of December 31, 2020 and 2019 amounted to ₩5,591,182 million and ₩5,680,978 million, respectively.

(2) Research and development expenses expensed as incurred for the years ended December 31, 2020 and 2019 amounted to ₩239,611 million and ₩238,030 million, respectively.

(3) Capitalized borrowing costs for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020	2019
Capitalized borrowing costs	₩	26,696	24,547
Interest rate of borrowing costs		3.40%~3.97%	3.69%~4.20%

(4) Details of amortization of intangible assets for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020	2019
Cost of sales	₩	125,452	126,193
Selling and administrative expenses		56,901	49,728
Research and development expenses		27	142
Total	₩	182,380	176,063

(5) Carrying amount of goodwill allocated to each CGU as of December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020	2019
DHI	₩	690,850	673,395
DI		3,683,778	3,748,558
DEC		60,049	60,049
Total	₩	4,434,677	4,482,002

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The recoverable amount of CGU is determined based on a value in use calculation or fair value less costs to sell, and major assumptions used as of December 31, 2020 are as follows:

	DHI	DI	DEC
Valuation methods	Fair value less costs to sell	Value in use	Fair value less costs to sell
Major assumptions and estimation methods	Estimated at DHI's share price	Forecast growth rate: 1.5% Discount rate: 7.5%~8.5%	Market Value Approach EBITDA X Multiple

A value in use is calculated using pre-tax cash flow projections based on financial budgets approved by senior management covering a five-year period. The management assessed the total profit in the budget based on past performances and market growth forecasts. Cash flows beyond the five-year period are extrapolated using a forecast growth rates, which do not exceed the long-term average growth rate for the industry where the CGU operates in and which are consistent with estimations included in industry reports. The discount rate used is risk adjusted discount rate that reflects relevant risks specific to the related CGU.

Fair value less costs to sell was calculated using a share price or market value approach. Market value approach calculates multiple based on the corporate value of a listed similar company and the amount of EBITDA and multiplying the calculated multiple by the target company's EBITDA to estimate the recoverable amount.

(6) Details of development costs as of December 31, 2020 and 2019 are as follows:

(In millions of won)		2020	
	Description	Book value	Remaining amortization period(*1)
DHI	Large-sized Heavy-Duty Gas Turbine Development for Power Generation	₩ 518,802	-
	Gas Turbine 7F Retrofit	34,275	-
	Mid-sized Gas Turbine Development Phase1 (*2)	861	8.58 years
	Mid-sized Gas Turbine Development Phase2 (*2)	17,835	-
	5.5MW Offshore Wind Power	17,220	-
	8MW Offshore Wind Power	15,728	-
DI	Stage5 Response Engine Development(*2)	12,659	-
	Stage5 Excavator/wheel loader Development(*2)	21,713	-
	Stage5 Response Engine Development(*2)	30,411	3.83~4.92 years
	Electronic generator Engine Development	13,277	4.33 years
	Stage5 Excavator/wheel loader Development(*2)	26,710	3.67~4.42 years
	Loader R Series 8X Development(*2)	7,487	-
	Loader R Series 7X(*2)	23,326	4 years

(*1) Remaining amortization period is disclosed for assets which amortization has been initiated and disclosed as '-' for assets not yet amortized.

(*2) Some of the sub-projects that were amortized among the development costs were separately marked.

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2019

	Description	Book value	Remaining amortization period(*1)
DHI	Highly Efficient Heavy-Duty Gas Turbine Development for Power Generation 500MW Standard TPP	₩ 444,398	-
	IGCC Gasification Plant	54,435	-
	3MW Class III Wind Turbine Generator (Stage2)	46,491	18.58 years
	5.5MW Wind Turbine Generator	18,989	3.67 years
DI	Stage5 Response Engine Development(*2)	15,238	-
	Development for Vehicle Engine	19,991	-
	Development for Gen 6 Loaders	13,253	-
	Development for Electronic Generator Engine	31,028	-
	Stage5 Response Engine Development(*2)	9,567	-
	Development for Big Excavators (DX800)	21,870	4.25~4.75 years
	BHL Project	2,901	2.42 years
		4,889	4.92 years

(*1) Remaining amortization period is disclosed for assets which amortization has been initiated and disclosed as '-' for assets not yet amortized.

(*2) Some of the sub-projects that were amortized among the development costs were separately marked.

(7) Intangible assets for which an impairment loss has been recognized for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

2020

	Description	Acquisition cost	Impairment loss	Accumulated amortization	Book value	Method used to assess recoverability
			Loss			
DHI	Development costs(*1)					
	500MW Standard TPP	₩ 55,931	55,931	55,931	-	Value in use
	IGCC Gasification Plant	47,493	44,197	44,197	3,296	Value in use
	3MW Class III Wind Turbine Generator	25,612	14,293	14,293	11,319	Value in use
	USC CFB Boiler RPM Development	16,894	10,921	10,921	5,973	Value in use
	Others	32,486	24,746	24,746	7,740	Value in use
	Other intangible assets					
	Reclamation license	40,898	10,749	30,149	-	Value in use
	Subtotal	219,314	160,837	180,237	28,328	10,749
DI	Development costs					
	Development for DL06 Engine(*2)	5,202	297	2,615	2,587	Value in use
	Development for DX12 Engine(*2)	13,367	6,174	6,174	119	7,074
	Subtotal	18,569	6,471	8,789	2,706	7,074
Cuvex	Other intangible assets					
	Condo memberships and others	434	5	5	340	89
	Total	₩ 238,317	167,313	189,031	31,374	17,912

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(*1) The related carrying amount recognized an impairment loss, as the value in use decreased due to changes in energy policy, etc.

(*2) The Group has decreased book amount due to a decrease in value in use compared to the estimate at the time of development.

(In millions of won)

(In millions of won)		2019					
Description		Acquisition cost	Impairment loss		Accumulated amortization	Book value	Method used to assess recoverability
			Loss	Accumulated			
DHI	Development costs						
	TM-ICI and other(*1)	₩ 1,507	1,237	1,237	270	-	Value in use
	PCCS and 7 others(*1)	2,442	2,442	2,442	-	-	Value in use
	Others	1,742	1,068	1,742	-	-	Value in use
	Other intangible assets						
	Golf membership and others	5,571	4,759	5,111	-	460	Fair value
	Subtotal	11,262	9,506	10,532	270	460	
DI	Development costs						
	Development for DL06						
	Engine	5,202	763	2,318	2,383	501	Value in use
	Medium Frame GenV and others	135,489	4,824	4,824	130,665	-	Value in use
	Subtotal	140,691	5,587	7,142	133,048	501	
Cuvex	Other intangible assets						
	Condo memberships	73	19	26	47	-	Fair value
	Total	₩ 152,026	15,112	17,700	133,365	961	

(*1) The carrying amount was reduced in full accordance with the development of new nuclear power plants stopped due to the domestic construction stopped and government policy.

(8) Reversal of impairment loss of intangible assets

Reversal of impairment loss of intangible assets for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020		2019	
Description	Assets	Reversal of impairment loss	Method used to assess recoverability	Reversal of impairment loss	Method used to assess recoverability
Other intangible assets	Golf membership	₩ 8,959	Fair value	2,054	Fair value

(9) Items in the consolidated statements of loss that included an impairment loss(reversal)

For the years ended December 31, 2020 and 2019, item in the consolidated statements loss for which the Group recognized an impairment loss(reversal) are as follows:

(In millions of won)

	2020	2019
Other non-operating expenses	₩ 167,313	15,112
Other non-operating income	(8,959)	(2,054)
Net	₩ 158,354	13,058

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14. Lease

(1) Changes in the right-of-use assets for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020				
		Land	Buildings & structures	Machinery	Other tangible assets	Total
As of January 1, 2020	₩	18,503	174,438	4,149	32,479	229,569
Acquisition		1,293	59,017	6,188	15,561	82,059
Contract cancelation		-	(5,757)	-	(1,526)	(7,283)
Depreciation		(1,163)	(61,762)	(5,685)	(23,758)	(92,368)
Transfers(*1)		(2,887)	-	-	-	(2,887)
Changes in the scope of consolidation		-	6	-	204	210
Foreign currency differences and others		156	1,210	(156)	(1,113)	97
As of December 31, 2020	₩	15,902	167,152	4,496	21,847	209,397
- Acquisition cost	₩	17,773	261,331	7,808	50,049	336,961
- Accumulated depreciation		(1,871)	(94,179)	(3,312)	(28,202)	(127,564)

(*1) Reclassified as non-current assets held for sale in 2020.

(In millions of won)

		2019				
		Land	Buildings & structures	Machinery	Other tangible assets	Total
As of January 1, 2019	₩	-	-	-	-	-
Adjustment on initial application of K-IFRS		18,858	178,976	5,275	54,551	257,660
Acquisition		276	36,194	4,791	17,005	58,266
Contract cancelation		-	-	-	(191)	(191)
Depreciation		(996)	(45,436)	(5,976)	(38,718)	(91,126)
Transfers		-	-	-	15	15
Foreign currency differences and others		365	4,704	59	(183)	4,945
As of December 31, 2019	₩	18,503	174,438	4,149	32,479	229,569
- Acquisition cost	₩	19,489	219,815	10,118	71,055	320,477
- Accumulated depreciation		(986)	(45,377)	(5,969)	(38,576)	(90,908)

(2) Changes in the lease liabilities for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020	2019
As of January 1	₩	256,538	-
Adjustment on initial application of K-IFRS		-	288,626
Payment of lease		(102,526)	(107,331)
Acquisition of leased assets		82,011	58,266
Contract cancelation		(7,067)	(499)
Interest expense		15,351	16,026
Changes in the scope of consolidation		213	-
Foreign currency differences and others		(6,190)	1,450
As of December 31	₩	238,330	256,538

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(3) The depreciation of right-of-use assets by type of accounts for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>		2020	2019
Cost of sales	₩	47,380	65,551
Selling and administrative expenses		44,141	25,000
R&D expenses and others		847	575
Total	₩	<u>92,368</u>	<u>91,126</u>

(4) The maturity of lease receivables and liabilities as of December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>		2020			
		Contractual nominal cash flow			
		Total	Less than 1 year	1-2 years	2-5 years
Lease receivables	₩	9,419	2,503	2,999	3,365
Lease liabilities		269,922	70,529	47,923	95,906

<i>(In millions of won)</i>		2019			
		Contractual nominal cash flow			
		Total	Less than 1 year	1-2 years	2-5 years
Lease receivables	₩	12,724	2,134	2,756	6,934
Lease liabilities		296,460	84,640	48,763	90,666

(5) Expenses incurred in short-term leases and low-value asset leases that are not included in the Group's right-of-use assets for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>		2020	2019
Cost of sales	₩	10,578	6,700
Selling and administrative expenses		8,653	13,797
R&D expenses and others		67	372
Total	₩	<u>19,298</u>	<u>20,869</u>

The Group, as an intermediate lessor, recognized a lease income amounted to ₩2,131 million and ₩3,964 million from the sub-lease of right-of-use assets for the years ended December 31, 2020 and 2019, respectively.

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15. Investment properties

Changes in investment properties for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020		
		Land	Buildings	Total
As of January 1	₩	416,671	81,540	498,211
Acquisition/Capital expenditure		-	281	281
Transfers(*1)		(361,209)	(48,122)	(409,331)
Disposal		-	(78)	(78)
Depreciation		-	(3,593)	(3,593)
Impairment		(2,515)	(634)	(3,149)
Others		(262)	(142)	(404)
As of December 31	₩	52,685	29,252	81,937
- Acquisition cost	₩	69,497	43,649	113,146
- Accumulated depreciation and impairment loss		(16,812)	(14,397)	(31,209)

(*1) Reclassified from investment property to property, plant and equipment in 2020 (See Note 12).

(In millions of won)

		2019		
		Land	Buildings	Total
As of January 1	₩	23,830	2,655	26,485
Acquisition/Capital expenditure		993	-	993
Transfers		391,721	57,550	449,271
Depreciation		-	(6,464)	(6,464)
Impairment		-	(57)	(57)
Others		127	27,856	27,983
As of December 31	₩	416,671	81,540	498,211
- Acquisition cost	₩	431,748	121,930	553,678
- Accumulated depreciation and impairment loss		(15,077)	(40,390)	(55,467)

Rental income from investment properties for the years ended December 31, 2020 and 2019 are ₩7,211 million and ₩14,856 million, respectively.

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16. Bonds and borrowings

(1) Borrowings

1) Short-term borrowings as of December 31, 2020 and 2019 are as follows:

(In millions of won)

Type of borrowings	Borrower(*1)	Lender	Annual interest rate (%) as of December 31, 2020	2020(*3)	2019
Denominated in KRW	DHI	Korea Development Bank ("KDB") and others	1.14~5.83	₩ 3,802,627	2,239,206
	DI	Korea EXIM Bank and others	2.55~3.34	516,994	329,082
	DEC	Construction Guarantee Cooperation	1.43	27,039	49,039
Denominated in foreign currencies	DHI	Woori Bank and others	0.13~9.65	608,073	871,686
	DI	KDB and others	0.30~4.89	405,740	251,988
		Disposal of receivables in foreign currency(*2)	-	8,106	10,013
	DEC	Asia Commercial Bank and others	-	-	16,256
		Total		₩ 5,368,579	3,767,270

(*1) Includes the Company's overseas subsidiaries and their consolidated subsidiaries.

(*2) The Group continues to recognize assets that do not meet the requirements for "derecognition of financial assets" in the consolidated financial statements and recognized the related amounts received as short-term borrowings.

(*3) The Group's PP&E and others have been pledged as collateral for the above borrowings (See Note 33).

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2) Long-term borrowings as of December 31, 2020 and 2019 are as follows:

(In millions of won)

Type of borrowings	Borrower(*1)	Lender	Annual interest rate(%) as of December 31, 2020	2020(*2)	2019
Denominated in KRW	DHI	Korea EXIM Bank and others	2.34~4.81	₩ 513,291	538,097
	DI	KDB and others	2.81~4.20	214,000	380,000
	DEC	KDB and others	7.50, CD+2.50	75,000	95,000
	Cuvex	SBI Savings Bank and others	-	-	1,000
Denominated in foreign currencies	DHI	Mashreq Bank and others	2.78~5.19	424,561	634,722
	DI	A number of USA institutional investors, banks and others	2.25~8.00	744,006	1,002,720
	Subtotal			1,970,858	2,651,539
	Less: Current portion of long-term borrowings			(778,732)	(940,844)
	Less: Discount on long-term borrowings			(9,091)	(12,712)
	Total			₩ 1,183,035	1,697,983

(*1) Includes the Company's overseas subsidiaries and their consolidated subsidiaries.

(*2) The Group's PP&E and others have been pledged as collateral for the above borrowings (See Note 33).

(2) Bonds

1) Details of bonds as of December 31, 2020 and 2019 are as follows:

(In millions of won)

	Annual interest rate (%) as of December 31, 2020	2020	2019
Public subscription bonds	1.00~5.88	₩ 1,650,200	1,727,580
Private subscription bonds(*1)	3.50~5.00	591,100	356,080
Convertible bonds	2.81~2.87	33,900	-
Bonds with stock warrants	1.00~4.00	122,800	1,057,185
Subtotal		2,398,000	3,140,845
Add: Redemption premium		19,341	108,674
Less: Exchange rights adjustment		(20,766)	(130,447)
Less: Conversion rights adjustment		(2,985)	-
Less: Current portion of long-term bonds		(575,309)	(2,251,796)
Less: Discount on bonds		(18,121)	(20,441)
Long-term bonds		₩ 1,800,160	846,835

(*1) The Group's PP&E and others have been pledged as collateral for the above bonds (See Note 33).

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2) Convertible bonds

Changes in the carrying amount of convertible bonds for the year ended December 31, 2020 are as follows:

		Issuance / Redemption	Exercise / Amortization	
(In millions of won)	January 1			December 31
Convertible bonds	₩ -	33,900	-	33,900
Redemption premium	-	2,326	-	2,326
Discount on bond	-	(217)	29	(188)
Conversion rights adjustment	-	(3,429)	444	(2,985)
Book value	₩ -	32,580	473	33,053
Consideration for conversion rights (other capital surplus)	₩ -	836	-	836

(a) 65th convertible bonds issued by DI

Issue date	Maturity Date	Coupon rate	YTM	Exercise year	Exercise price (in won)	Face value	Issuance value(*1)	Book value
June 8, 2020	June 8, 2023	2.87%	4.82%	From one year after date of issue to one month before maturity	₩6,291/share	₩2,400 million	₩2,288 million	₩2,333 million

(*1) Discount on debentures is deducted from the face value of debentures.

① Early redemption

The early redemption right is exercisable as a whole or in part against the face value of convertible bonds at the interest payment date after June 8, 2022, 2 years after the date of issuance of bonds.

② Redemption at maturity

June 8, 2023, the maturity date of the bond, 106.2537% of the remaining bond principal is paid off temporarily.

③ Calculation of exercise price

The exercise price is adjusted when there is an increase in paid-in capital through issuance of shares at a price lower than the market price, bonus issue, stock dividends, or capitalization of reserves, before exercising the stock warrants, or when there is an issuance of stock purchase warrants or debt securities with warrants.

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(b) 69th convertible bonds issued by DI

Issue date	Maturity Date	Coupon rate	YTM	Exercise year	Exercise price (in won)	Face value	Issuance value(*1)	Book value
August 3, 2020	August 3, 2023	2.81%	4.96%	From one year after date of issue to one month before maturity	₩7,421/share	₩31,500 million	₩30,292 million	₩30,720 million

(*1) Discount on debentures is deducted from the face value of debentures.

① Early redemption

The early redemption right is exercisable as a whole or in part against the face value of convertible bonds at the interest payment date after August 3, 2022, 2 years after the date of issuance of bonds.

② Redemption at maturity

August 3, 2023, the maturity date of the bond, 106.9085% of the remaining bond principal is paid off temporarily.

③ Calculation of exercise price

The exercise price is adjusted when there is an increase in paid-in capital through issuance of shares at a price lower than the market price, bonus issue, stock dividends, or capitalization of reserves, before exercising the stock warrants, or when there is an issuance of stock purchase warrants or debt securities with warrants

3) Bond with stock warrants

Changes in the carrying amount of bonds with stock warrants for the year ended December 31, 2020 are as follows:

(In millions of won)	January 1	Issuance / Redemption	Exercise / Amortization	December 31
Bond with stock warrants	₩ 1,057,185	(934,175)	(210)	122,800
Redemption premium	108,674	(91,626)	(33)	17,015
Discount on bond	(9,967)	7,201	2,051	(715)
Exchange rights adjustment	(130,447)	86,638	23,043	(20,766)
Book value	₩ 1,025,445	(931,962)	24,851	118,334
Consideration for stock warrants rights (other capital surplus)	₩ 98,638	-	(5,537)	93,101

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(a) 94th bond with stock warrants issued by DEC

Issue date	Maturity Date	Coupon rate	YTM	Exercise year	Exercise price (in won)	Face value	Issuance value(*1)	Book value
May 11, 2018	May 11, 2021	4.00%	7.00%	From one month after date of issue to one month before maturity	₩ 2,070/share	₩ 70,000 million	₩ 67,033 million	₩ 8,033 million

(*1) Discount on debentures is deducted from the face value of debentures.

① Early redemption

The early redemption right is exercisable as a whole or in part against the par value of bond with stock warrants at the interest payment date in 1.5 years after the date of issuance of bonds.

② Redemption at maturity

The coupon rate for the bond is 4.00%. For bonds not converted until maturity, 109.9188% of the principal amount will be paid on May 11, 2021 with a yield to maturity rate of 7.00% compounded quarterly.

③ Calculation of exercise price

The exercise price is adjusted when there is an increase in paid-in capital through issuance of shares at a price lower than the market price, stock dividends, or capitalization of reserves, before exercising the stock warrants, or when there is an issuance of stock purchase warrants or debt securities with warrants.

④ Exercise of stock warrants

As of December 31, 2020, stock warrants were exercised in the amount pertaining to 0.05% of the principal amount of bond with stock warrants and 0.04% of the principal amount was substituted. The number of shares issued as a result of the exercise of the stock warrants were 11,508 shares.

(b) 48th bond with stock warrants issued by the Company

Issue date	Maturity date	Coupon rate	YTM	Exercise year	Exercise price (in won)	Face value	Issuance value(*1)	Book value
May 4, 2017	May 4, 2022	1.00%	2.00%	From one month after date of issue to one month before maturity	₩ 14,900 /share	₩ 500,000 million	₩ 491,546 million	₩ 14,735 million

(*1) Discount on debentures is deducted from the face value of debentures.

① Early redemption

The early redemption right is exercisable as a whole or in part against the par value of bond with stock warrants at the interest payment date in 3 years after the date of issuance of bonds. Meanwhile, according to the exercise of the early redemption right, ~~₩~~484,957 million was repaid on May 4, 2020, and the remaining unexercised portion will be repaid on the maturity date.

② Redemption at maturity

The coupon rate for the bond is 1.00%. For bonds not converted until maturity, 105.2448% of the principal amount will be paid on May 4, 2022 with a yield to maturity rate of 2.00% compounded quarterly.

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③ Calculation of exercise price

The exercise price is adjusted when there is an increase in paid-in capital through issuance of shares at a price lower than the market price, stock dividends, or capitalization of reserves, before exercising the stock warrants, or when there is an issuance of stock purchase warrants or debt securities with warrants.

④ Exercise of stock warrants

As of December 31, 2020, stock warrants were exercised in the amount pertaining to 0.05% of the principal amount of bond with stock warrants and 0.04% of the principal amount was substituted. The number of shares issued as a result of the exercise of the stock warrants were 12,541 shares.

(c) 31th bond with stock warrants issued by DI

Issue date	Maturity date	Coupon rate	YTM	Exercise year	Exercise price (in won)	Face value	Issuance value(*1)	Book value
August 1, 2017	August 1, 2022	2.00%	4.75%	From one month after date of issue to one month before maturity	₩6,430/share	₩500,000 million	₩491,607 million	₩105,941 million

(*1) Discount on debentures is deducted from the face value of debentures.

① Early redemption

The early redemption right is exercisable as a whole or in part against the par value of bond with stock warrants at the interest payment date in 3 years after the date of issuance of bonds. Meanwhile, according to the exercise of the early redemption right, ₩393,821 million was repaid on August 3, 2020, and the remaining unexercised portion will be repaid on the maturity date.

② Redemption at maturity

The coupon rate for the bond is 2.00%. For bonds not converted until maturity, 115.4175% of the principal amount will be paid on August 1, 2022 with a yield to maturity rate of 4.75% compounded quarterly.

③ Calculation of exercise price

The exercise price is adjusted when there is an increase in paid-in capital through issuance of shares at a price lower than the market price, stock dividends, or capitalization of reserves, before exercising the stock warrants, or when there is an issuance of stock purchase warrants of debt securities with warrants.

④ Exercise of stock warrants

As of December 31, 2020, stock warrants were exercised in the amount pertaining to 1.13% of the principal amount of bond with stock warrants and 1.13% of the principal amount was substituted. The number of shares issued as a result of the exercise of the stock warrants were 8,476,311 shares.

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(3) Asset-backed borrowings

The Group transferred revenue from construction contracts to a special purpose vehicle, and the special purpose vehicle issued asset-backed securities backed by transferred assets. As of December 31, 2020 and 2019, the special purpose vehicle is liable on the following asset-backed borrowings:

(a) Short-term asset-backed borrowings

(In millions of won)

Company	Lender	Discount rate (%)		2020(*1)	2019
DEC	Shinyoung Securities and others	4.00~7.70	₩	59,814	382,100
	Less: Discount on long-term borrowings			(263)	(526)
	Total		₩	59,551	381,574

(*1) The Group's PP&E and others have been pledged as collateral for the above asset-backed borrowings (See Note 33).

(b) Long-term asset-backed borrowings

(In millions of won)

Company	Lender	Discount rate (%)		2020(*1)	2019
DHI	KDB and others	4.69~6.00	₩	287,200	369,000
	Less: Current portion of long-term borrowings			(236,759)	(72,845)
	Less: Discount on long-term borrowings			(1,338)	(3,865)
	Total		₩	49,103	292,290

(*1) The Group's equity investments and others have been pledged as collateral for the above asset-backed borrowings (See Note 33).

17. Defined benefit liabilities

The Group operates defined benefit plans, and the cost of providing benefit under the defined benefit plans is determined using the projected unit credit method on actuarial valuation of the present value of its defined benefit obligations.

(1) Details of defined benefit liabilities as of December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020	2019
Present value of defined benefit obligations	₩	2,331,212	2,345,826
Fair value of plan assets(*1)		(1,609,787)	(1,671,562)
Defined benefit liabilities	₩	721,425	674,264

(*1) Include employer contributions of ₩917 million and ₩1,271 million to the National Pension Service as of December 31, 2020 and 2019, respectively.

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(2) Expenses recognized in consolidated statements of loss for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>	2020	2019
Current service cost	₩ 88,719	78,863
Net interest cost	19,641	23,439
Past service cost	1,440	(9,129)
Total	₩ 109,800	93,173

(3) Classification of expenses related to the employee benefit liability for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>	2020	2019
Cost of sales	₩ 73,098	47,688
Selling and administrative expenses	27,973	36,277
Research and development costs	8,729	9,150
Profit from discontinued operations	-	58
Total	₩ 109,800	93,173

(4) Changes in the present value of the defined benefit obligations for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>	2020	2019
As of January 1	₩ 2,345,826	2,144,480
Current service costs	88,719	78,864
Past service costs	1,440	(9,129)
Transfer from related parties	1,286	4,900
Transfer to related parties	(4,415)	(4,521)
Interests	54,455	70,252
Remeasurement gain (loss) in OCI:		
Actuarial changes arising from changes in demographic assumptions	(5,420)	(1,542)
Actuarial changes arising from changes in financial assumptions	187,963	195,813
Others	(1,132)	23,902
Effect of curtailment and settlement	19,357	(11,928)
Contributions by plan participants	3,166	3,119
Benefits paid	(290,252)	(225,829)
Others	(69,781)	77,445
As of December 31	₩ 2,331,212	2,345,826

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(5) Changes in the fair value of plan assets for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>	2020	2019
As of January 1	₩ 1,671,562	1,533,196
Expected return on plan assets	34,814	46,813
Transfer from related parties	693	2,922
Transfer to related parties	(1,353)	(5,523)
Remeasurement gain (loss) in OCI	118,394	143,923
Contributions by plan participants	15,138	14,504
Contributions by employer	34,391	94,122
Benefits paid	(235,152)	(195,506)
Effect of collapse and liquidation	15,064	(11,920)
Others	(43,764)	49,031
As of December 31	₩ 1,609,787	1,671,562

In relation to the defined benefit plans, the reasonable estimates of future employer contributions during the year 2021 amounts to ₩163,843 million. In addition, the actual return on plan assets for the years ended December 31, 2020 and 2019 amounts to ₩153,208 million and ₩190,736 million, respectively.

(6) The principal assumptions used in determining employee benefit obligation as of December 31, 2020 and 2019 are as follows:

	2020	2019
Discount rate	1.00%~7.39%	1.30%~7.39%
Future salary increase rate	0.00%~8.00%	0.08%~8.00%

(7) Components of plan assets as of December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>	2020	2019
Equity investments	₩ 299,523	384,019
Government and corporate bonds	739,407	650,963
Trust funds and others	570,857	636,580
Total	₩ 1,609,787	1,671,562

(8) Details of a sensitivity analysis on the defined benefit obligation for changes in the significant assumptions as of December 31, 2020 are as follows:

<i>(In millions of won)</i>	Amount	Ratio
Discount rate:		
1% increase	₩ (303,803)	(13.03%)
1% decrease	348,156	14.93%
Future salary increases:		
1% increase	₩ 35,641	1.53%
1% decrease	(19,290)	(0.83%)

(9) The weighted average maturity of defined benefit obligations is approximately 13.98 years as of December 31, 2020.

(10) With regard to the defined contribution pension plans, the Group recognized expenses for the years ended December 31, 2020 and 2019 amounting to ₩25,262 million and ₩24,744 million, respectively.

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18. Provision

Changes in significant provisions for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020							
		January 1	Arising during the year	Unused amounts reversed	Utilized	Others(*1)	December 31	Less: Current	Non-current
Provisions for warranties	₩	463,035	163,500	(10,093)	(153,988)	541	462,995	(235,351)	227,644
Provisions for construction losses		11,734	130,784	(7,401)	(224)	(4,943)	129,950	(47,177)	82,773
Others(*2)		238,770	163,406	(24,892)	(26,315)	(64,909)	286,060	(226,008)	60,052
Total	₩	713,539	457,690	(42,386)	(180,527)	(69,311)	879,005	(508,536)	370,469

(*1) Includes gain or loss arising from changes in foreign exchange rates and changes in the scope of consolidation.

(*2) As of December 31, 2020, it includes ₩54,855 million in provisions related to guarantee the return of membership fees and other considerations.

(In millions of won)

		2019							
		January 1	Arising during the year	Unused amounts reversed	Utilized	Others(*1)	December 31	Less: Current	Non-current
Provisions for warranties	₩	395,835	234,246	(10,466)	(161,489)	4,909	463,035	(234,214)	228,821
Provisions for construction losses		15,065	6,191	(10,033)	(23)	534	11,734	(11,734)	-
Others(*2)		10,996	162,534	(51,133)	(17,494)	133,867	238,770	(144,595)	94,175
Total	₩	421,896	402,971	(71,632)	(179,006)	139,310	713,539	(390,543)	322,996

(*1) Includes gain or loss arising from changes in foreign exchange rates.

(*2) As of December 31, 2019, it includes ₩54,855 million in provisions related to guarantee the return of membership fees and ₩39,331 million in provisions related to ordinary wage suits.

The Group estimates expenses required to settle the Group's obligations on product warranties, refunds, maintenance and others based on the level of warranty period, historical experience and other considerations.

19. Capital stock

The Company is authorized to issue 2,000,000,000 shares, with a par value of ₩5,000 per share and the number of ordinary shares issued as of December 31, 2020 and 2019 is 374,637,255 shares and 202,146,875 shares, respectively. The number of shares with limited voting rights under Korean Commercial Code as of December 31, 2020 and 2019 is 14,329 treasury shares and 8,479 treasury shares, respectively. The Company issued 44,102,845 new shares in exchange for Doosan Mecatec Co., Ltd.'s ordinary shares acquired through in-kind investment from Doosan Corp., and the Company issued 6,891,058 new ordinary shares through comprehensive stock exchange with DEC's shareholders. Also, the Company issued 121,495,330 new ordinary shares on December 11, 2020.

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Capital stock and Paid-in capital in excess of par value as of December 31, 2020 and 2019 are as follows:

(In millions of won except for share, In shares)	Number of shares		Capital stock			Paid-in capital in excess of par value		
	Ordinary shares	Preference shares	Ordinary shares	Preference shares(*1)	Total	Ordinary shares	Preference shares	Total
Balance at December 31, 2020	374,637,255	- ₩	1,873,185	64,522	1,937,707	875,460	299,701	1,175,161
Balance at December 31, 2019	202,146,875	- ₩	1,010,733	64,522	1,075,255	265,843	299,701	565,544

(*1) Redeemable convertible preference shares were purchased and retired using voluntary reserves for the year ended December 31, 2019, and there is no reduction in capital stock.

20. Capital surplus

Capital surplus as of December 31, 2020 and 2019 are summarized as follows:

(In millions of won)		2020	2019
Paid-in capital in excess of par value	₩	1,175,161	565,544
Asset revaluation surplus		594,262	594,262
Other capital surplus(*1)		892,791	602,822
Total	₩	2,662,214	1,762,628

(*1) Doosan Fuel Cell Co., Ltd.'s stocks were given free of charge by related parties in 2020, and profits from the free receipts are included in other capital surplus.

21. Other components of equity

(1) Other components of equity as of December 31, 2020 and 2019 are summarized as follows:

(In millions of won)		2020	2019
Treasury stock	₩	(152)	(135)
Stock options		772	1,599
Others		47,287	47,471
Total	₩	47,907	48,935

(2) Treasury stocks as of December 31, 2020 and 2019 are as follows:

(In millions of won except for share, In shares)	2020		2019	
	Number of shares	Amount	Number of shares	Amount
Common shares	14,329	₩ 152	8,479	₩ 135

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(3) Stock option

The Company has granted stock options to its executives. The settlement method for stock options includes issuance of new shares, issuance of treasury shares or cash settlement. The type of settlement method chosen is determined based on the Board of Directors' decision at the time of exercise. These stock options require a vesting condition of a two-year continuous employment from the grant date.

1) The terms and conditions of stock options granted as of December 31, 2020 are summarized as follows:

(In won, In shares)

Grant date	Number of shares to be issued	Exercise period	Exercise price	Estimated fair value as of the grant date
Mar 25, 2011	2,600	Mar 25, 2014 ~ Mar 24, 2021	₩ 65,700	₩ 24,642
Mar 30, 2012	8,400	Mar 30, 2015 ~ Mar 29, 2022	66,800	16,337
Mar 29, 2013	20,400	Mar 29, 2016 ~ Mar 28, 2023	44,900	10,860
Mar 28, 2014	43,900	Mar 28, 2017 ~ Mar 27, 2024	34,550	7,948
	<u>75,300</u>			

2) Change in the stock options for the year ended December 31, 2020 is summarized as follows:

(In shares)

Grant date	Number of shares to be issued			December 31
	January 1	Newly granted	Retired	
Mar 26, 2010	2,300	-	(2,300)	-
Mar 25, 2011	6,900	-	(4,300)	2,600
Mar 30, 2012	20,000	-	(11,600)	8,400
Mar 29, 2013	37,700	-	(17,300)	20,400
Mar 28, 2014	75,300	-	(31,400)	43,900
	<u>142,200</u>	<u>-</u>	<u>(66,900)</u>	<u>75,300</u>

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(In millions of won)

Grant date	Valuation			
	January 1	Newly granted	Retired	December 31
Mar 26, 2010	₩ 94	-	(94)	-
Mar 25, 2011	170	-	(106)	64
Mar 30, 2012	329	-	(192)	137
Mar 29, 2013	408	-	(186)	222
Mar 28, 2014	598	-	(249)	349
	₩ 1,599	-	(827)	772

No compensation expenses are recognized for the years ended December 31, 2020 and 2019 and are expected to be recognized in the future periods.

- 3) The estimated fair value was calculated using the modified fair value method and assumptions applied to this method are summarized as follows:

Grant date	Risk free rate(*1)	Expected exercise period	Expected volatility	Expected dividend yield
Mar 25, 2011	3.66%	3 years	53.12%	10.00%
Mar 30, 2012	3.57%	3 years	38.21%	13.33%
Mar 29, 2013	2.45%	3 years	35.98%	15.00%
Mar 28, 2014	2.88%	3 years	34.72%	15.00%

(*1) Based on a three-year treasury bond yield rate.

22. Accumulated other comprehensive income

- (1) Accumulated other comprehensive income as of December 31, 2020 and 2019 are summarized as follows:

(In millions of won)

	2020	2019
Loss on valuation of FVOCI	₩ (35,099)	(35,079)
Gain on valuation of derivative financial instruments	5,197	17,237
Change in equity of equity method investments	739	66
Gain on revaluation of assets	1,052,418	1,084,073
Loss on translation of foreign operations	(436,098)	(416,767)
Total	₩ 587,157	649,530

- (2) Details of income taxes on OCI items directly reflected in equity as of December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020		
	Balance before tax	Tax effect	Balance after tax
Loss on valuation of FVOCI	₩ (34,316)	(783)	(35,099)
Gain on valuation of derivative financial instruments	(2,293)	7,490	5,197
Change in equity of equity method investments	1,022	(283)	739
Gain on revaluation of assets	1,460,825	(408,407)	1,052,418
Loss on translation of foreign operations	(436,098)	-	(436,098)
Total	₩ 989,140	(401,983)	587,157

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(In millions of won)

		2019		
		Balance before tax	Tax effect	Balance after tax
Loss on valuation of FVOCI	₩	(34,022)	(1,074)	(35,096)
Gain on valuation of derivative financial instruments		10,030	7,207	17,237
Change in equity of equity method investments		160	(94)	66
Gain on revaluation of assets		1,474,697	(390,624)	1,084,073
Loss on translation of foreign operations		(416,750)	-	(416,750)
Total	₩	1,034,115	(384,585)	649,530

23. Accumulated deficit

(1) Accumulated deficit as of December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020	2019
Legal reserve	₩ 138,118	138,118
Voluntary reserve	43,395	180,039
Undisposed accumulated deficit	(2,228,114)	(1,292,370)
Total	₩ (2,046,601)	(974,213)

(2) There are no dividends for the years ended December 31, 2020 and 2019.

24. Segment information

(1) The reportable segments of the Group and major products and services by segments are as follows:

Business segment	Major products and services
DHI	NSSS, BOP, Turbine, Seawater desalination plants and water treatment system, plant, civil engineering, architecture and others
DI	Internal combustion engines, various construction machinery, transport equipment and others
DEC	Apartment building and others
Cuvex	Operation of resort and golf club

(2) Summarized financial information by reportable segments as of and for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020				
		Total Sales	Intercompany sales	External sales	Operating income (loss)	Profit (loss)
DHI	₩	5,518,524	(228,259)	5,290,265	(544,586)	(1,638,024)
DI		7,934,105	(1,946)	7,932,159	658,599	285,074
DEC		1,891,692	(24,560)	1,867,132	37,241	(165,066)
Cuvex		69,373	(26,522)	42,851	3,625	4,153
Subtotal		15,413,694	(281,287)	15,132,407	154,879	(1,513,863)
Consolidation adjustments		(281,287)	281,287	-	(788)	675,417
Total	₩	15,132,407	-	15,132,407	154,091	(838,446)

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(In millions of won)

		2019				
		Sales	Intercompany	External sales	Operating income (loss)	Profit (loss)
DHI	₩	5,950,733	(273,695)	5,677,038	152,138	(589,929)
DI		8,185,840	(1,649)	8,184,191	840,397	395,698
DEC		1,781,925	(25,425)	1,756,500	81,028	(75,166)
Cuvex		68,412	(26,467)	41,945	2,633	934
DBC		-	-	-	(54)	(41)
Subtotal		15,986,910	(327,236)	15,659,674	1,076,142	(268,504)
Attributed to:						
Discontinued operations		-	-	-	54	41
Consolidation adjustments		(327,236)	327,236	-	691	164,096
Total	₩	15,659,674	-	15,659,674	1,076,887	(104,367)

(3) Summarized financial information on assets and liabilities by business segments as of December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020		2019	
		Assets	Liabilities	Assets	Liabilities
DHI	₩	14,543,223	10,066,379	14,374,611	10,023,084
DI		12,026,886	7,537,888	11,338,593	7,071,041
DEC		1,550,362	1,253,762	2,329,566	1,763,226
Cuvex		307,707	106,780	220,792	103,295
Subtotal		28,428,178	18,964,809	28,263,562	18,960,646
Consolidation adjustments		(2,861,004)	(504,131)	(3,454,313)	(353,390)
Total	₩	25,567,174	18,460,678	24,809,249	18,607,256

25. Revenue

(1) Revenue for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020	2019
Revenue from contracts with customers			
Sales of goods	₩	7,954,637	8,313,935
Construction contracts		6,899,390	7,180,889
Others		236,785	181,725
Subtotal		15,090,812	15,676,549
Others			
Rental and others		62,271	74,557
Hedging gains(losses)		(20,676)	(91,432)
Subtotal		41,595	(16,875)
Total	₩	15,132,407	15,659,674

(2) In the following table, revenue for the years ended December 31, 2020 and 2019 are disaggregated by primary geographical market and timing of revenue recognition. The table also includes a reconciliation of the disaggregated revenue with the Group's reportable segments.

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(In millions of won)

		2020				
		DHI	DI	DEC	Cuvex	Total
Primary geographical market						
Domestic	₩	2,438,137	1,647,349	1,775,881	42,851	5,904,218
Americas		195,607	3,441,291	31,540	-	3,668,438
Asia		1,494,772	1,562,895	55,811	-	3,113,478
Middle East		374,170	-	-	-	374,170
Europe		748,245	1,273,471	3,900	-	2,025,616
Others		39,334	7,153	-	-	46,487
Total	₩	5,290,265	7,932,159	1,867,132	42,851	15,132,407
Timing of revenue recognition						
At a point in time	₩	254,929	7,668,832	34,978	42,851	8,001,590
Over time		5,035,336	263,327	1,832,154	-	7,130,817
Total	₩	5,290,265	7,932,159	1,867,132	42,851	15,132,407

(In millions of won)

		2019				
		DHI	DI	DEC	Cuvex	Total
Primary geographical market						
Domestic	₩	2,285,727	1,753,618	1,692,999	41,945	5,774,289
Americas		118,229	3,664,568	-	-	3,782,797
Asia		1,704,954	1,362,664	47,873	-	3,115,491
Middle East		617,228	-	-	-	617,228
Europe		946,880	1,394,750	15,628	-	2,357,258
Others		4,020	8,591	-	-	12,611
Total	₩	5,677,038	8,184,191	1,756,500	41,945	15,659,674
Timing of revenue recognition						
At a point in time	₩	203,504	7,950,664	11,223	41,945	8,207,336
Over time		5,473,534	233,527	1,745,277	-	7,452,338
Total	₩	5,677,038	8,184,191	1,756,500	41,945	15,659,674

(3) Contract balances

The following table provides information about receivables, contract assets and contract liabilities from contracts with customers as of December 31, 2020 and 2019.

(In millions of won)		2020	2019
Receivables, which are included in 'trade and other receivables'	₩	2,340,739	2,310,963
Contract assets		1,866,873	1,866,283
Contract liabilities		2,048,854	1,892,365

The contract assets primarily relate to the Group's rights to consideration for work completed but not billed at the reporting date. The contract assets are transferred to receivables when the rights become unconditional. The contract liabilities primarily relate to the advance consideration received from customers for construction, for which revenue is recognized over time.

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- (4) Changes in transaction price for construction contract allocated to the performance obligations satisfied over time for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020			
	Project name	January 1	Increase (decrease)	Revenue recognized	December 31
DHI	Fadhili CHP and others	₩ 13,886,052	5,163,524	5,026,075	14,023,501
DEC	Bumil integrated district 3 and others	7,614,475	1,283,401	1,847,501	7,050,375
DI	Extended warranty and others	310,869	166,675	263,327	214,217
	Subtotal	21,811,396	6,613,600	7,136,903	21,288,093
	Internal transaction	(73,879)	(6,446)	(6,086)	(74,239)
	Attributed to: Discontinued operations	(9,077)	9,077	-	-
	Total	₩ 21,728,440	6,616,231	7,130,817	21,213,854

(In millions of won)

		2019			
	Project name	January 1	Increase (decrease)	Revenue recognized	December 31
DHI	Fadhili CHP and others	₩ 15,381,173	3,906,871	5,401,992	13,886,052
DEC	Gimhae Centum we've and others	7,703,951	1,659,097	1,748,573	7,614,475
DI	Extended warranty and others	89,110	548,049	326,290	310,869
	Subtotal	23,174,234	6,114,017	7,476,855	21,811,396
	Internal transaction	(419,297)	321,159	(24,259)	(73,879)
	Attributed to: Discontinued operations	(9,240)	(95)	(258)	(9,077)
	Total	₩ 22,745,697	6,435,081	7,452,338	21,728,440

- (5) The Group shall recognize as an asset for the incremental costs of obtaining a contract with a customer that is, agent fee if the Group expects to recover those costs.

(In millions of won)

	2020	2019
Incremental costs of obtaining a contract with a customer recognized an asset	₩ 49,919	52,663
The amount of amortization recognized as cost of sales	26,087	15,264

An asset recognized in accordance with above shall be amortized on a systematic basis that is consistent with the transfer to the customer of the good or services to which the asset relates.

- (6) The Group shall recognize an asset from the costs incurred to fulfill a contract if those costs relate directly to a contract or to an anticipated contract the Group can specifically identify. The Group believes that these costs generate or enhance resources of the Group that will be used in satisfying performance obligations in the future and are expected to be recovered.

(In millions of won)

	2020	2019
Costs incurred to fulfill a contract recognized an asset	₩ 117,924	123,701
The amount of amortization recognized as cost of sales	63,248	79,329

An asset recognized in accordance with above shall be amortized on a systematic basis that is consistent with the transfer to the customer of the good or services to which the asset relates.

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(7) Changes in profit or loss in current and future reporting periods and the book value of due from (to) customers for contracts work (excluding foreign currency translation effect) resulting from changes in total contract revenue and in total estimated contract costs for construction contracts in progress as of December 31, 2020 are as follows:

(In millions of won)

		Provision for	Changes in	Changes in	Effect on	Effect on	Changes in due
		construction loss	total contract	total contract	loss for the	profit (loss) for	from (to)
			revenue	cost	period	the future	customer for
							contract work
DHI	₩	129,689	330,498	1,066,302	(389,789)	(346,015)	(389,789)
DEC		261	90,297	132,849	(59,599)	17,047	(59,599)
Total	₩	129,950	420,795	1,199,151	(449,388)	(328,968)	(449,388)

Impacts on current and future profit were calculated based on total contract revenue and costs which were estimated based on the current circumstances as of December 31, 2020. Those estimations may change in the future.

(8) As of December 31, 2020, details of contracts that the revenue was recognized based on the percentage-of-completion measured by input method, and whose contract revenue is more than 5% of sales of the year ended December 31, 2019 are as follows. There is no contract that the Group decided not to disclose due to the prohibition by related regulations or contracts.

(In millions of won)

				Due from customers for		Trade receivables	
				contract work		(receivables from	
						construction contract)	
	Contract	Due date /	Percentage-of-	Gross	Accumulated	Gross	Allowance
	date	Delivery	completion	amounts	impairment	amounts	for doubtful
		date(*1)	(%)		losses		accounts
Shingori #3,4 NSSS	Aug-28-06	Aug-31-19	100.00	-	-	-	-
Shinhanul #1,2 NSSS	Jul-31-09	Aug-31-21	98.25	-	-	-	-
UAE BNPP #1,2 NSSS	Jun-30-10	Dec-8-21	98.88	-	-	6,190	72
Shingori #5,6 NSSS	Aug-28-14	Jun-30-24	76.86	-	-	2,017	5
UAE BNPP #3,4 NSSS	Jun-30-10	Nov-30-23	98.59	14,757	37	-	-
Qurayyah Add-On	Sep-16-09	May-14-20	99.99	-	-	-	-
Vinh Tan 4 TPP	Feb-26-14	Oct-31-21	99.85	21,105	53	20,958	4,192
Song Hau1	Apr-10-15	Mar-31-22	87.40	23,318	58	-	-
Fadhili CHP	Nov-12-16	May-31-21	98.76	6,954	17	1,103	67
Samcheok #1,2 EPC	Jul-24-18	Apr-30-24	28.97	243,595	609	-	-
Yanbu ph.3 MSF	Dec-4-12	Dec-31-21	98.54	-	-	-	-
Nghi Son 2	Dec-24-14	Jul-10-22	78.23	244,792	483	55,472	50
Jawa #9,10	Mar-20-19	Feb-15-25	1.89	-	-	-	-
Jawaharpur	Dec-22-16	Apr-21-23	63.60	23,480	-	25,434	-
Obra C	Dec-22-16	Jun-20-23	55.81	-	-	6,913	-

(*1) Negotiating to extend contract period with respective contract party or due date/delivery date in contract.

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26. Expenses classified by nature

Expenses (cost of sales, selling and administrative expenses) classified by nature for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>		2020	2019
Changes in inventories	₩	242,986	(310,132)
Purchases of raw materials and goods		7,033,640	7,357,818
Salaries		2,097,130	1,993,942
Depreciation and amortization		568,766	550,894
Others		5,035,793	4,990,265
Total	₩	<u>14,978,315</u>	<u>14,582,787</u>

27. Selling and administrative expenses

Selling and administrative expenses for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>		2020	2019
Salaries	₩	482,711	486,484
Severance and retirement benefits		30,402	22,336
Termination benefits		184,987	17,383
Employee welfare benefits		99,220	98,063
Travel		17,800	47,304
Training		10,897	12,573
Taxes and dues		22,233	21,805
Commissions		219,978	212,878
Sales commission		86,269	71,932
Rents		15,149	22,829
Bad debt expenses (reversal)		42,540	(4,327)
Transportation		7,259	11,689
Depreciation		70,939	62,488
Amortization		56,901	49,728
Research		225,965	219,528
Marketing		12,697	15,668
Advertising		76,692	91,576
Warranty		15,015	18,021
Provision for loss compensation		92,100	-
Others		131,427	121,299
Total	₩	<u>1,901,181</u>	<u>1,599,257</u>

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28. Finance income and expenses

(1) Finance income for the years ended December 31, 2020 and 2019 are summarized as follows:

<i>(In millions of won)</i>		2020	2019
Interest income	₩	43,386	56,996
Dividend income		1,123	1,341
Gain on foreign currency transaction		188,033	129,463
Gain on foreign currency translation		147,895	81,269
Gain on settlement of derivative financial instruments		104,036	71,563
Gain on valuation of derivative financial instruments		115,026	84,819
Gain on valuation of firm commitments		10,454	61,896
Gain on financial guarantee		546	1,992
Total	₩	610,499	489,339

(2) Finance expenses for years ended December 31, 2020 and 2019 are summarized as follows:

<i>(In millions of won)</i>		2020	2019
Interest expenses	₩	457,918	506,710
Loss on foreign currency transaction		221,335	149,490
Loss on foreign currency translation		160,323	121,559
Loss on settlement of derivative financial instruments		129,788	72,064
Loss on valuation of derivative financial instruments		28,386	112,278
Loss on valuation of firm commitments		70,281	23,613
Payment of guarantee fee		58,125	74,002
Loss on redemption of bonds		55,663	7,281
Others		539	2,706
Total	₩	1,182,358	1,069,703

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29. Other non-operating income and expenses

(1) Other non-operating income for the years ended December 31, 2020 and 2019 are summarized as follows:

<i>(In millions of won)</i>		2020	2019
Gain on disposal of property, plant and equipment	₩	2,089	1,981
Gain on disposal of intangible assets		745	81
Reversal of impairment loss on intangible assets		8,959	2,054
Gain on short-term and long-term investment securities evaluation		89,340	8,140
Gain on disposal of long-term financial instruments		1,467	3,115
Commissions income		3,610	5,819
Miscellaneous gain and others		22,632	27,340
Total	₩	128,842	48,530

(2) Other non-operating expenses for the years ended December 31, 2020 and 2019 are summarized as follows:

<i>(In millions of won)</i>		2020	2019
Loss on disposal of trade receivables	₩	17,935	22,010
Loss on disposal of property, plant and equipment		1,701	31,068
Other bad debt expenses		177,707	153,571
Impairment loss of property, plant and equipment		36,097	43,134
Impairment loss of intangible assets		167,313	15,112
Loss on short-term and long-term investment securities evaluation		24,400	10,684
Donations		12,220	12,217
Loss on disposal of investment in subsidiaries		10,792	-
Miscellaneous loss and others		110,470	147,724
Total	₩	558,635	435,520

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30. Income tax expense (benefit)

(1) The component of income tax expense (benefit) for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>	2020	2019
Current income tax expense	₩ 120,371	98,372
Adjustments in respect of current income tax of prior year	14,241	52,061
Tax effect of temporary difference	(38,529)	16,512
Total income tax expense	96,083	166,945
Current income tax related to items recognized in equity during the year	(119,166)	(14,801)
Deferred tax related to items recognized in equity during the year	(1,967)	57,946
Income tax benefit related to discontinued operation	-	(51)
Others	(413)	113
Income tax expense (benefit)	₩ (25,463)	210,152

(2) The component of income tax and deferred tax related to items recognized in equity for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>	2020	2019
Gain (loss) on revaluation of assets	₩ (17,154)	6,687
Gain on valuation of FVOCI	1	2,915
Loss on valuation of derivative financial instruments	(295)	(4,728)
Remeasurements of defined benefit liabilities	9,728	21,840
Others	(113,413)	16,431
Total	₩ (121,133)	43,145

(3) Changes in deferred tax assets (liabilities) for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>	2020		
	January 1	Change	December 31
Provision for retirement and severance benefits	₩ 233,062	(6,949)	226,113
Allowance for doubtful accounts	455,328	27,737	483,065
Property, plant and equipment	23,791	(902)	22,889
Intangible assets	43,327	37,827	81,154
Derivative financial instruments	16,549	(26,532)	(9,983)
Foreign currency denominated assets (liabilities)	10,753	(8,033)	2,720
Gain on revaluation of assets	(671,230)	(13,119)	(684,349)
Others	(41,798)	28,500	(13,298)
Total	₩ 69,782	38,529	108,311

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		2019		
		January 1	Change	December 31
Provision for retirement and severance benefits	₩	225,625	7,437	233,062
Allowance for doubtful accounts		400,547	54,781	455,328
Property, plant and equipment		13,732	10,059	23,791
Intangible assets		50,457	(7,130)	43,327
Derivative financial instruments		8,026	8,523	16,549
Foreign currency denominated assets (liabilities)		3,350	7,403	10,753
Gain on revaluation of assets		(671,266)	36	(671,230)
Others		55,823	(97,621)	(41,798)
Total	₩	86,294	(16,512)	69,782

(4) The amount of deductible temporary differences for which no deferred tax asset is recognized in the statements of financial position as of December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020	2019	
Deductible temporary differences	₩ 3,278,185	2,434,325	Uncertainty of future taxable income
Deferred accumulated deficit (After 2021)	1,928,639	1,601,400	Uncertainty of future taxable income
Deferred tax credit carried forward (Expires between 2025 and 2030)	27,533	26,259	Uncertainty of future taxable income
Total	₩ 5,234,357	4,061,984	

The probability of deferred tax assets being realized depends on the Group's ability to generate taxable income in future years over which temporary differences are expected to reverse depending on the economic situation, industry forecast and other various factors. The Group periodically reviews such matters.

(5) Temporary differences related to investment in subsidiaries, associates and joint ventures which are not recognized as deferred tax asset (liability) as of December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020	2019
Investment in subsidiaries	₩ 1,870,491	725,841
Investment in associates or joint ventures	-	2,057
Total	₩ 1,870,491	727,898

(6) Reconciliation of profit (loss) before income tax at the statutory tax rate to income tax expense at the effective income tax rate of the Group for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020	2019
Profit (loss) before income tax	₩ (863,909)	95,190
Income tax expense (benefit) using the statutory tax rate	(256,599)	65,306
Adjustments:		
Permanent differences	44,923	82,946
Unrecognized deferred tax related to temporary differences	149,178	28,344
Tax credit	(15,988)	(34,821)
Others	53,023	68,377
Income tax expense (benefit)	₩ (25,463)	210,152
Effective tax rate(*1)	-	221%

(*1) Effective tax rate for the year ended December 31, 2020 was not calculated due to loss before income tax.

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31. Loss per share

(1) Basic loss per share

Basic loss per share for the years ended December 31, 2020 and 2019 are as follows:

<i>(In won, except for share)</i>	2020	2019
Loss for the period attributable to equity holders of the parent	₩ (1,069,666,921,022)	(395,296,012,245)
Less: preference shares dividends(*1)	-	51,299,224,178
Loss for the period attributable to ordinary equity holders of the parent	₩ (1,069,666,921,022)	(446,595,236,423)
Loss from continuing operations	₩ (1,069,666,921,022)	(459,311,198,388)
Income from discontinued operations	-	12,715,961,965
Weighted-average number of ordinary shares outstanding	250,006,947 shares	170,467,151 shares
Loss per share:		
Basic loss for the period attributable to ordinary equity holders of the parent	₩ (4,279)	(2,620)
Loss for the period from continuing operations	(4,279)	(2,694)
Earnings for the period from discontinued operations	-	74

(*1) Preference shares dividends for the year ended December 31, 2019, are due to redemption of redeemable convertible preference shares.

Weighted-average number of ordinary shares outstanding for the years ended December 31, 2020 and 2019 are as follows:

<i>(In shares)</i>	2020	2019
Beginning outstanding shares	202,138,396	117,138,324
Acquisition of treasury stock	(4,731)	-
Stocks issuance	47,873,092	53,328,767
Exercise of bonds with stock warrants	190	60
Weighted-average number of ordinary shares outstanding as of December 31	250,006,947	170,467,151

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(2) Diluted earnings (loss) per share

There are no potential common shares with dilutive effect for the years ended December 31, 2020 and 2019. Therefore, diluted earnings (loss) per share are the same as basic earnings (loss) per share.

Details of potential common shares that are potentially dilutive but were not included in the calculation of earnings (loss) per share, as there were no dilutive effects as of December 31, 2020 and 2019 are as follows:

<i>(In shares)</i>	2020	2019
Stock option (Mar 26, 2010)	-	2,300
Stock option (Mar 25, 2011)	2,600	6,900
Stock option (Mar 30, 2012)	8,400	20,000
Stock option (Mar 29, 2013)	20,400	37,700
Stock option (Mar 28, 2014)	43,900	75,300
Bonds with stock warrants	33,530,786	29,217,999
Total	33,606,086	29,360,199

32. Commitments and contingencies

- As of December 31, 2020, 5 blank notes, 31 blank checks have been provided as collateral to relevant financial institutions and others for the Group's debt, guarantees and funds replenishing requirement.
- As of December 31, 2020, the Group has credit lines of borrowings, bank overdraft and others from financial institutions up to ₩9,707,889 million and used ₩7,350,930 million, with unused credit lines amounting to ₩2,356,959 million.

As of December 31, 2020, the Company's borrowings (₩31,429 million) from SC Bank require that the credit ratings of the corporate bonds issued by the Company, evaluated by two or more credit rating agencies to be maintained at BBB or higher respectively. In addition, borrowings (₩64,736 million) from Mashreq Bank require that credit rating evaluated by Korea credit rating agency to be maintained at BBB or higher during the borrowing agreement period, and if major financial indicators (the debt to equity ratio below 3 and interest coverage ratio above 2.2) cannot be maintained, additional investments are required within a certain period. Non-fulfillment of these debt covenants would trigger accelerated repayment of these borrowings, but related financial institutions are suspending the application of the related clauses in consideration of changes in circumstances such as changes in the Company's business environment. Asset-backed borrowings of ₩127,200 million for KDPP 5th Co., Ltd. require that a domestic effective credit rating to be maintained BB+ or higher, and failure to comply is a reason for early payment.

(3) Pending litigations

- As of December 31, 2020, the Group is involved in pending lawsuits as a defendant with total claims against the Group amounting to approximately ₩230.4 billion, and the result is currently unpredictable.
- In 2011, an external investor acquired 20% of interest in Doosan Infracore China Co., Ltd., a subsidiary of DI, for ₩380 billion. According to the shareholders' agreement entered into with DI, both parties have the right to request for the counterparty to jointly sell their respective shares to a third party. In case the external investor requests for such share, principally DI shall jointly sell its share but also has a right to purchase the external investor's shares at the proposed purchase price.

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In November 2015, the external investor claimed for payment of the share purchase price. On February 21, 2018 the Seoul High Court admitted that DI breached its obligation to cooperate with the external investor's sale of its shares and ordered DI to pay the claim amounts of ₩10 billion, out of ₩709.3 billion won claimed by external investors. In January 14, 2021, the Supreme Court accepted the claim of DI that pointed out that there was a mistake in the judgement of court of second instance and the case was remanded to the Seoul High Court (Case No. 2018-Da-223054).

In January 20, 2021, as DI prevailed in the Supreme Court, the pledge that provided 8,288,196 shares in Doosan Bobcat Inc. as collateral was canceled.

- (4) As of December 31, 2020, the Group has entered into 14 technical contracts with Mitsubishi Heavy Industries, Ltd. and others. For the years ended December 31, 2020 and 2019, royalty payments amounted to ₩686 million and ₩651 million, respectively.
- (5) The Group continues to recognize factored financial assets in the consolidated statement of financial position since the Group holds virtually all the risks and rewards of ownership. The Group also recognizes the associated financial liabilities amounting to ₩8,106 million as of December 31, 2020.
- (6) As of December 31, 2020, the Group provides joint and several guarantees amounting to ₩419,704 million for the performance of construction contracts to other construction companies. In addition, the Group provides joint and several guarantees for construction performance to Korea Housing Finance Corporation related to the guarantee for housing sales, which was provided by Korea Housing Finance Corporation to the developers the company provides a conditional debt acquisition agreement (Limit : ₩1,214,100 million) to Gwangmyeong Medical Complex and two other projects if the project fails to fulfill its responsibilities. In addition, in relation to the SOC project, construction investors have an agreement to provide funds for the withdrawal when the agreement is terminated or a purchase is requested from the competent authority and if it is insufficient to repay the loan principal at the purchase price, there is a commitment to provide that funds.
- (7) As of December 31, 2020, payment guarantees by financial institutions amounting to ₩12,378,111 million are provided for the Group in connection with domestic and overseas construction projects and others.
- (8) As of December 31, 2020, the Group provides payment guarantees amounting to ₩1,148,589 million to customers and purchasers of vacant lots for housing sales for the purpose of supporting reconstruction and redevelopment project unions and domestic and overseas sales.
- (9) Payment guarantee for related parties
 - 1) As of December 31, 2020, the Company has provided a guarantee of payment of ₩51,210 million to Employee Stock Ownership Association for Union loan. Also, Doosan Mecatec Co., Ltd., a subsidiary as of December 31, 2020, is receiving a payment guarantee of ₩85,379 million from Doosan Corp. for construction guarantee purposes.

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2) As of December 31, 2020, the Company has entered into borrowing agreements of ₩3,000,000 million and ₩1,546,990 million with the KDB and the Korea EXIM Bank, respectively. In accordance with above borrowing agreements, Doosan Corp., Park Jeong-won and 31 related persons provide stocks of Doosan Corp., Doosan Heavy Industries & Construction Co., Ltd. and others and beneficiary certificates (₩3,600,000 million) and others as collateral.

(10) As of December 31, 2020, details of guarantees provided by the Group for developers' project financing are as follows:

(In millions of won)

Type	Developer	Project name	Lender	Guarantee period	Guarantee limit	Loan balance	Guarantee type
Loan	DEC	Pohang new port	Shinhan Bank and others	Mar 26, 2010~ Dec 31, 2025	₩ 4,062	4,062	Joint surety
Short-term bond	DEC	Cheonan Chengdangdong	BNK Securities	Dec 18, 2020~ Mar 18, 2021	80,000	10,000	"
		Cheonan Chengdangdong	BNK Securities	Dec 28, 2020~ Mar 18, 2021		70,000	"
		Cheonan Chengdangdong	BNK Securities	Dec 28, 2020~ Mar 26, 2021	120,000	100,000	"
		Osong Complex	Shinyoung Securities	Dec 28, 2020~ Mar 26, 2021	50,000	50,000	"
		Yongin Samga	BNK Securities	Dec 15, 2020~ Mar 15, 2021		15,000	"
		Yongin Samga	BNK Securities	Dec 18, 2020~ Mar 15, 2021	90,000	15,000	"
		Yongin Samga	BNK Securities	Dec 24, 2020~ Mar 24, 2021	80,000	80,000	"
		Subtotal			420,000	340,000	
		Total			₩ 424,062	344,062	

(11) Details of consolidated structured entities as of December 31, 2020 are as follows:

(In millions of won)

Entity	Nature of interests in consolidated structured entities or provision of financial support	Liability amount of interests in consolidated structured entities	Maximum exposure to the loss of consolidated structured entities
DEC			
New start DM 7 th Co., Ltd.(*1)	Obligation for financial support including principle, interest, etc ₩	25,000	25,000
DM Best 3 rd Co., Ltd.(*2)	"	12,000	12,000
New start DM 8 th Co., Ltd.(*3)	"	10,000	10,000
Great GM 4 th Co., Ltd.(*4)	"	10,000	10,000
DS Munuro 1 st Co., Ltd.(*5)	"	3,250	3,250
Bild Up 1 st Co., Ltd.(*6)	"	12,000	12,000
Jonsindongbaek Co., Ltd.(*7)	"	30,000	30,000
Doosan E&C 4 th Co., Ltd.(*8)	"	75,000	75,000
The Company			
KDPP 5 th Co., Ltd.(*9)	"	127,200	165,360
U-best 5 th Co., Ltd.(*10)	"	160,000	160,000

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- (*1) New start DM 7th Co., Ltd. was established for the purpose of securitizing future construction receivables from four government-ordered construction project including Hamyang~Changnyeong Highway No.14 (zone 3) project of DEC. It receives funds from issuing ABS bonds to financial institutions. Based on the book value presented in its financial statements, underlying assets amounted to ₩25,000 million as of December 31, 2020.
- (*2) DM Best 3rd Co., Ltd. was established for the purpose of securitizing future construction receivables from two government-ordered construction project including Seoul Metropolitan 2nd ring Expressway Hwado~Yangpyeong zone 2 project of DEC. It receives funds from issuing ABS bonds to financial institutions. Based on the book value presented in its financial statements, underlying assets amounted to ₩12,000 million as of December 31, 2020.
- (*3) New start DM 8th Co., Ltd. was established for the purpose of securitizing future construction receivables from Gyeongju (Sanggu~Hyohyun) national road alternative bypass road and other 2 government-ordered construction project. It receives funds from issuing ABS bonds to financial institutions. Based on the book value presented in its financial statements, underlying assets amounted to ₩10,000 million as of December 31, 2020.
- (*4) Great GM 4th Co., Ltd. was established for the purpose of securitizing future construction receivables from Anyang Samyoung apartment district redevelopment project (Anyang Art Park Doosan We've) and other 1 government-ordered construction projects of DEC. It receives funds from issuing ABS bonds to financial institutions. Based on the book value presented in its financial statements, underlying amounted to ₩10,000 million as of December 31, 2020.
- (*5) DS Munuro 1st Co., Ltd. was established for the purpose of securitizing future construction receivables from Ulsan Munsu-ro Doosan We've the Zenith construction project of DEC. It receives funds from issuing ABS bonds to financial institutions. Based on the book value presented in its financial statements, underlying amounted to ₩3,250 million as of December 31, 2020.
- (*6) Bild Up 1st Co., Ltd. was established for the purpose of securitizing future construction receivables from Sillim~Bongcheon Tunnel Road Construction (zone 1) and other 3 government-ordered construction projects of DEC. It receives funds from issuing ABS bonds to financial institutions. Based on the book value presented in its financial statements, underlying amounted to ₩12,000 million as of December 31, 2020.
- (*7) Jonsindongbaek Co., Ltd. was established for the purpose of securitizing future construction receivables from Namyangju-Hwado new construction Project (Namyangju Doosan We've Tresium) of DEC. It receives funds from issuing ABBs to financial institutions. Based on the book value presented in its financial statements, underlying amounted to ₩30,000 million as of December 31, 2020.
- (*8) Doosan E&C 4th Co., Ltd. was established for the purpose of securitizing future construction receivables from Saemangeum-Jeonju 8 zone and other 3 government-ordered construction projects of DEC and of borrowing by providing DEC's Changwon 2nd plant as senior collateral. The Group issued ABCPs and ABLs to financial institution for funding and the book value of underlying assets are amounting to ₩75,000 million based on its financial statement as of December 31, 2020. The Group has provided the certain portion of properties for obligation for financial supporting for the company (See Notes 33).
- (*9) KDPP 5th Co., Ltd. was established for the purpose of securitizing future construction receivables belongs to the Company. It is mainly financed by issuing ABSTBs and others from financial institutions. Based on the book value presented in its financial statements, underlying amounted to ₩127,200 million as of December 31, 2020.
- (*10) U-best 5th Co., Ltd. was established for the purpose of securitizing newly issued bonds of the Company and DI. The amount is ₩160,000 million based on the carrying amount in the financial statements.

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(12) Other commitments and contingencies

- 1) As of December 31, 2020, DI issued 57th and 67th series bond denominated in USD 300 million respectively. In accordance with the agreement for issuing the 57th and 67th series bonds, an early redemption clause exists for when DI's guarantor, KDB, becomes no longer controlled by Korean government. In addition, DI has provided its 11,362,886 shares and 13,884,989 shares of Doosan Bobcat Inc. to lenders as collateral for above bonds, respectively. And if the total value of the shares provided is less than the collateral standard price, additional shares or deposits equivalent to the difference amounts should be provided.
- 2) DI has provided 8,595,047 shares of Doosan Bobcat Inc. as collateral for borrowings of ₩160,000 million from KDB and other 4 financial institutions. In connection with the borrowings, if the ratio does not meet the contracted collateral limit, additional collateral must be provided. In addition, in case DI receives a long-term credit rating of BB0 or lower from two or more than two of the domestic credit rating agencies (NICE Investors Service Co., Ltd., Korea Investors Service, Inc., Korea Ratings Corporation), this is a trigger clause for the financial institutions to collect the loans before the maturity.
- 3) For ₩50,000 million of 61st bond issued by DI as of December 31, 2020, DI includes an agreement that constitutes the reason for the loss of profit due when the long-term credit rating granted by one or more of the three domestic credit rating agencies (NICE Investors Service Co., Ltd., Korea Investors Service, Inc., Korea Ratings Corporation) is below BB+.
- 4) As of December 31, 2020, DI has provided 3,650,000 shares of Doosan Bobcat Inc. as collateral for borrowings of ₩100,000 million from SC Bank. In connection with the borrowings, if the ratio does not meet the contracted collateral limit, additional collaterals (shares or deposits) must be provided or early redemption must be made.
- 5) For ₩60,000 million of borrowings agreement between Mizuho Bank and DI as of December 31, 2020, DI includes an agreement that constitutes the reason for forfeiture of benefit of time when the credit rating granted by certified credit rating agencies is below BB+.
- 6) DEC entered into construction contracts with INTDC Co., Ltd. and Daewon Plus Constructions Co., Ltd., to develop Ilsan Zenith project and Haeundae Zenith project, respectively. DEC has provided guarantees to customers, who purchase the Ilsan Zenith and Haeundae Zenith apartments, for the consideration paid to purchase the apartments during the repurchase guarantee periods (2~3 years after the date of sale), should customers apply for such guarantees (See Note 32-(8)). As of December 31, 2020, the Group's consolidated financial statements do not reflect the effect from such guarantees as the Group cannot reasonably predict the number of purchasers applying for the guarantee and the related guaranteed amount.
- 7) As of December 31, 2020, the Company has entered into a contract to assume a liability (limit: ₩223,000 million) if it fails to complete construction of apartments in the Baekbong district of Namyangju, the Anyang Myunghak Knowledge Industry Center, Hanam Misa Knowledge Industry Center, 2nd apartment units in Yangsan and the complex of Ungcheon-dong, Yeosu projects.
- 8) As of December 31, 2020, DI entered into invest agreements with ZIGG CAPITAL I, L.P and other 4 funds and the amounts of agreements are USD 3,885 thousand.
- 9) The Group canceled the Bundang Doosan Tower lease contract with DBC Co., Ltd. on January, 2021, and signed a new lease contract with Bundang Doosan Tower REIT Co., Ltd..
- 10) As of December 31, 2020, Doosan Heavy Industries Vietnam Haiphong Co., Ltd., a subsidiary of Doosan Mecatec Co., Ltd., didn't recognized provisions because it could not estimate payment obligations and the resources to be leaked from the costs incurred at the end of the land permit for the lease of factory land with Haiphong Department of Natural and Resources.

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- 11) The Company is an investor of Samcheok Blue Power Co., Ltd. which is responsible for the EPC construction project of Samcheok #1, 2 TPP, and is obligated to make an additional investment of ₩77,740 million in the related investor agreement in September 2023. To fulfill this obligation, the Company agreed to deposit a certain percentage of the construction collection amount into Samcheok Blue Power Co., Ltd.'s account from November 2020 to June 2022.
- 12) The Group is providing payment guarantee to the client in connection with the implementation of the Sharqiyah EPC project. The credit rating of the Company evaluated by the Korea Credit Rating Agency must be maintained at the BBB or higher, and if this is not maintained, it is obligated to provide a valid guarantee under the same conditions within 10 days from the date of the decline in the credit rating. Meanwhile, as of December 31, 2020, the application of the related provisions has been suspended in consideration of various circumstances such as changes in the Company's business environment.
- 13) Doosan Mecatec Co., Ltd. sold real estate in Changwon, Gyeongnam (Changwon Plant 1) to Korea Asset Management Corporation and has been using it through a lease agreement for 5 years from December 2020. Doosan Mecatec Co., Ltd. may exercise the priority purchase right at the market price from one year after the date of the lease contract to 3 months before the expiry of the contract period. If the priority purchase right is not exercised within the exercise period, Korea Asset Management Corporation may request a repurchase. The Group judged that both risks and rewards could not be eliminated and the transaction was marked as a financial transaction.

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33. Assets pledged as collateral

(1) Assets pledged as collateral related with debt

1) As of December 31, 2020, assets that have been pledged as collateral for the Group's borrowings and others are as follows:

(In millions of won)

Pledger	Collateralized asset	Collateralized amount	Amount of borrowings and others	Pledgee
DHI	Short-term financial instruments	₩ 41,888	38,080	KEB Hana Bank and others
	Property, plant and equipment	4,335,725	1,953,997	KDB and others
	Cash and cash equivalents	25,816	40,548	KDB and others
	Shares of subsidiaries and equity shares(*1)	518,452	1,885,489	Construction Guarantee Cooperative and others
	Inventories	19,500	15,000	Korea EXIM Bank
	Subtotal	4,941,381	3,933,114	
DI	Property, plant and equipment(*2)	663,802	310,453	KDB and others
	Inventories(*2)	195,000	150,000	Korea EXIM Bank
	Subtotal	858,802	460,453	
DEC	Short-term financial instruments	4,427	-	IBK bank
	Property, plant and equipment	130,000	75,000	KDB and others
	The rights to the benefits	113,796	-	Woori Bank
	Equity shares	38,250	27,039	Construction Guarantee Cooperative
	Subtotal	286,473	102,039	
Cuvex	The rights to the benefits(*3)	63,600	45,000	Korea Asset Management corporation and others
	Total	₩ 6,150,256	4,540,606	

(*1) The amount of collateral provided for ₩35,000 million is included in borrowing ₩1,546,990 million related to emergency operation fund arrangements. In accordance with this borrowing agreement, Doosan Corp., Park Jeong-won and 31 related persons provide stocks of Doosan Corp., Doosan Heavy Industries & Construction Co., Ltd. and beneficiary certificates and others as collateral (See Note 32).

(*2) The rights to the benefits from property insurance have been pledged as collateral to KDB.

(*3) The rights to the benefits from real estate collateral trust related to property, plant and equipment.

2) Clark Equipment Co. ("CEC"), a subsidiary of DI, entered into a loan agreement to borrow USD 1,345,000 thousand and overdraft limit agreement of USD 150,000 thousand on May 18, 2017. In addition, as of May 29, 2020, it issued USD 300,000 thousand bonds and as of December 15, 2020, made a loan agreement with a limit of USD 20,000 thousand. Doosan Bobcat Inc., a subsidiary of DI, provided all of shares of CEC, Doosan Bobcat EMEA s.r.o, Doosan Bobcat Global Collaboration Center, Inc. and Doosan Bobcat Singapore Pte. Ltd. as collateral for above borrowings, bonds and overdraft limit agreement. Doosan Bobcat Inc. also provided the certain portion of properties and its shares of subsidiaries as collateral. As of December 31, 2020, the relevant balance of borrowings and bonds are USD 943,563 thousand and the total collateral amount is USD 1,385,994 thousand.

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(2) Other Assets pledged as collateral

1) As of December 31, 2020, assets pledged as collateral on behalf of others are summarized as follows:

(In millions of won)

Pledger	Collateralized asset	Book value	Pledgee	Beneficiary
DHI	Long-term investment securities and others	₩ 8,314	Kookmin Bank and others	Incheon-Gimpo Expressway Co. and others
DEC	Long-term investment securities	56,401	KDB and others	Metropolitan Western Expressway and others
	Investments in associates and joint venture	6,826	KDB and others	New Seoul Railroad Co., Ltd and others
	Subtotal	63,227		
	Total	₩ 71,541		

- 2) As of December 31, 2020, the Company has entered into a contract of completion guarantee regarding the Samcheok #1,2 TPP construction project and provided 1,193,066 shares (₩43,568 million) of Samcheok Blue Power Co., Ltd. as collateral.
- 3) As of December 31, 2020, the Company entered into exchange rights agreement with the Korea EXIM Bank regarding hybrid bonds with equity shares issued by DPS S.A. The Korea EXIM Bank is granted the right to request the exchange of hybrid securities for the Company's common stock and obliged to cash settlement in accordance with the investor's put option rights exercise. In this regard, the Company has provided as collateral 75,509,366 shares (₩1,483,471 million) of the subsidiary DI to Korea EXIM Bank.
- 4) AS of December 31, 2020, the Group provides 1,057,880 shares of DBC (₩53,066 million) as a collateral for ₩375,000 million PF loan signed by its affiliated company, DBC to establish the Doosan Bundang Center. And the collateral was terminated in January, 2021.
- 5) As of December 31, 2020, the Company has signed the export bond insurance limit contract (₩347,000 million) with Korea Export Insurance Corporation and provided part of the land, buildings, and machinery of the Changwon Plant (₩420,000 million) and all shares of DPS S.A. held by the Company (GBP 293 million) as collateral.

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34. Related party transactions

(1) The major related parties of the Group and nature of their relationship with the Group as of December 31, 2020 are as follows:

1) As of December 31, 2020, the Group's ultimate parent company is Doosan Corp. (equity ownership: 41.95%).

2) As of December 31, 2020, the details of the Group's associates and joint ventures, other related parties are as follows:

Control relationship	Related party
Associates and joint ventures(*3)	The HS-City Expressway, Samcheok Blue Power Co., Ltd.(*1), Daejung Offshore Wind Power Co., Ltd., Hychangwon Co., Ltd.(*6), Doosan Babcock Blackcat W.L.L, Shinbundang Railroad Co., Ltd., Kyunggi Railroad Co., Ltd., Neo Trans Co., Ltd., New Seoul Railroad Co., Ltd., KIAMCO Kyunggi Railway Investment Private property investment trust, Incheon fuel cell Co., Ltd., Potenit Co., Ltd., Doosan Infracore Liaoning Machinery Sales Co., Ltd., Tianjin Lovol Doosan Engine Co., Ltd., DBC Co., Ltd., ReCarbon, Inc.(*2) and others
Other related parties	
Subsidiaries of the parent company(*5,8)	Oricom Inc., Hancom Co., Ltd., Doosan Bears Inc., Doosan Business Research Institute(*4), Doosan Robotics Co., Ltd., Doosan Mobility Innovation Inc., Doosan Logistics Solutions Co., Ltd., Sunnyruce 8 th Co., Ltd., D pay 1 st Co., Ltd., D pay 2 nd Co., Ltd.(*6), New Star Motive 1 st Co., Ltd.(*6), Doosan 2 nd Real Estate Securitization Specialty Co., Ltd., Doosan Mobility Innovation (Shenzhen) Co., Ltd., Doosan Electro-Materials Singapore Pte Ltd., Doosan Hongkong Ltd., Doosan Electro-Materials (Shen Zhen) Ltd., Doosan Shanghai Chemical Materials Co., Ltd., Doosan Electro-Materials (Changshu) Co., Ltd., Doosan Digital Innovation America LLC, Doosan Digital Innovation China LLC, Doosan Mottrol (Jiangyin) Co., Ltd., Doosan Digital Innovation Europe Limited, Doosan Industrial Vehicle Europe N.A., Doosan Industrial Vehicle UK Ltd., Doosan Logistics Europe GmbH, Doosan Industrial Vehicle America Corp., Doosan Material Handling Solutions LLC, Doosan Industrial Vehicle Yantai Co., Ltd., Genesis Forklift Trucks Limited, Rushlift Holdings Ltd., Doosan Materials Handling UK Ltd., Rushlift Ltd., Doosan Electro-Materials America, LLC, Doosan Fuel Cell America, Inc., DESA Service. LLC, Doosan Energy Solutions America, Inc., Doosan Electro-Materials Vietnam Company Limited(*6), Mottrol Co., Ltd.(*6), Bundang Doosan Tower REIT Co., Ltd.(*6), Doosan Fuel Cell Co., Ltd.(*10) and others
Associates and joint ventures of the parent company	Prestoliteasia Co., Ltd., KDDI Korea Co., Ltd., Wise fashion Co., Ltd., Protera SAS.(*7), Sichuan Kelun-Doosan Biotechnology Company Limited, PT. SEGARA AKASA(*6), Stathera IP Holding Inc.(*6) and others
Others(*9)	Chung-Ang University, Chung-Ang University Hospital, Doosan Credit Union, Yonkang Foundation, Dongdaemoon Miraechangcho Foundation Daejeon Riverside Expressway Co., Ltd. and others

(*1) The company name was changed from POSPOWER Co., Ltd. to Samcheok Blue Power Co., Ltd. in 2020.

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- (*2) It was converted from other related parties into associate.
- (*3) Haman Industrial Complex Company was liquidated in 2020.
- (*4) The company name was changed from Doosan Leadership Institute to Doosan Business Research Institute in 2020.
- (*5) Doosan Mecatec Co., Ltd. was converted from other related parties into subsidiaries in 2020.
- (*6) Newly acquired in 2020.
- (*7) The company name was changed from Geaenzymes to Protera SAS. in 2020.
- (*8) Neoplux Co., Ltd. was disposed in 2020.
- (*9) Doosan Solus Co., Ltd., Doosan Electro-Materials Luxembourg Sarl and Doosan Corporation Europe Kft. were excluded from other related parties due to the disposal of shares in 2020.
- (*10) The company was converted into a subsidiary of the parent company in 2020.

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(2) Significant transactions (excluding financial and investment) with related parties for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020						
	Sales and others			Purchases and others			
	Sales	Disposal of PP&E and intangible assets	Other revenue	Purchase	Acquisition of PP&E and intangible assets	Other expense	Right-of-use asset acquisition
Parent:							
Doosan Corp.	₩ 76,230	499	9,151	146,239	8,504	87,327	2,257
Associates and joint ventures:							
DBC	72,315	-	240	60	-	-	-
New Seoul Railroad Co., Ltd.	53,998	-	-	-	-	-	-
Neo Trans Co., Ltd.	6,143	-	-	-	-	204	-
Samcheok Blue Power Co., Ltd.	363,954	-	-	-	-	-	-
Incheon fuel cell Co., Ltd.	142,135	-	-	-	-	-	-
Others	26,331	-	888	514	77	-	-
Subtotal	664,876	-	1,128	574	77	204	-
Other related parties:							
Oricom Inc.	1,525	-	36	26	-	10,538	-
Doosan Bears Inc.	969	-	-	515	-	15,458	-
Doosan Digital Innovation America LLC	-	-	442	-	-	47,561	75
Doosan Digital Innovation China LLC	-	-	-	-	-	7,934	-
Doosan Mottrol (Jiangyin) Co., Ltd.	-	-	-	101,781	-	-	-
Doosan Business Research Institute	2,112	-	16	-	-	7,104	-
Chung-Ang University	-	-	-	15	-	6,310	-
Doosan Fuel Cell Co., Ltd.	255	-	48	40,427	-	320	-
Mottrol Co., Ltd.	-	-	-	7,356	-	-	-
Others	7,785	-	593	406	-	1,860	140
Subtotal	12,646	-	1,135	150,526	-	97,085	215
Total	₩ 753,752	499	11,414	297,339	8,581	184,616	2,472

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	2019						
	Sales and others			Purchases and others			
	Sales	Disposal of PP&E and intangible assets	Other revenue	Purchase	Acquisition of PP&E and intangible assets	Other expense	Right-of- use asset acquisition
Parent:							
Doosan Corp.	₩ 83,698	2	5,639	111,936	53,324	88,734	5,351
Associates and joint ventures:							
DBC	21,563	-	515	-	-	-	-
New Seoul Railroad Co., Ltd.	43,530	-	-	-	-	-	-
Neo Trans Co., Ltd.	6,187	-	-	-	-	-	-
POSPower Co., Ltd.	124,523	-	-	-	-	-	-
Others	14,502	-	-	-	-	158	-
Subtotal	210,305	-	515	-	-	158	-
Other related parties:							
Oricom Inc.	1,918	-	42	340	-	19,396	-
Doosan Bears Inc.	1,104	-	2	542	-	15,385	-
Doosan Digital Innovation America LLC	-	-	756	-	-	46,771	1,689
Doosan Digital Innovation China LLC	-	-	-	-	37	7,831	-
DLI Co., Ltd	2,119	-	27	1	-	8,917	-
Doosan Energy Solution Kft.	16,151	-	-	-	-	-	-
Doosan Mecatec Co., Ltd.	12,106	-	26	13	-	3	1
Chung-Ang University	-	-	-	-	-	5,500	-
Others	2,520	-	354	87,348	111	3,202	350
Subtotal	35,918	-	1,207	88,244	148	107,005	2,040
Total	₩ 329,921	2	7,361	200,180	53,472	195,897	7,391

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(3) The outstanding receivables and payables arising from the transactions with related parties (excluding dividend and investment) as of December 31, 2020 and 2019 are as follows:

(In millions of won)

		2020						
		Receivables			Payables			
		Trade receivables	Loans receivables	Other receivables	Trade payables	Borrowings	Other payables	Lease liabilities
Parent:								
Doosan Corp.	₩	24,442	-	6,969	36,318	-	45,330	1,872
Associates and joint ventures:								
Kyunggi Railroad Co., Ltd.		-	40,757	-	-	-	-	-
Shinbundang Railroad Co., Ltd.		11,023	32,574	-	-	-	-	-
DBC		117	-	18,747	-	-	-	-
Others		5,228	-	-	67	-	202	-
Subtotal		16,368	73,331	18,747	67	-	202	-
Other related parties:								
Oricom Inc.		607	-	180	2,084	-	5,650	-
Doosan Mottrol (Jiangyin) Co., Ltd.		-	-	-	33,630	-	-	-
Doosan Fuel Cell America, Inc.		-	-	-	-	21,760	82	-
Mottrol Co., Ltd.		-	-	16	27,328	-	1,135	-
Doosan Fuel Cell Co., Ltd.		-	-	-	9,800	-	404	-
Others		441	-	1,411	-	-	3,814	966
Subtotal		1,048	-	1,607	72,842	21,760	11,085	966
Total	₩	41,858	73,331	27,323	109,227	21,760	56,617	2,838

(In millions of won)

		2019						
		Receivables			Payables			
		Trade receivables	Loans receivables	Other receivables	Trade payables	Other payables	Lease liabilities	
Parent:								
Doosan Corp.	₩	11,659	-	5,200	19,247	23,610		5,285
Associates and joint ventures:								
Kyunggi Railroad Co., Ltd.		792	36,521	-	-	-		-
Shinbundang Railroad Co., Ltd.		11,023	32,574	-	-	-		-
Others		3,493	-	9	-	152		-
Subtotal		15,308	69,095	9	-	152		-
Other related parties:								
Oricom Inc.		763	-	18	6,035	5,092		-
Doosan Mecatec Co., Ltd.		2,321	-	11	-	6,960		-
Others		3,490	-	772	43,596	4,986		1,863
Subtotal		6,574	-	801	49,631	17,038		1,863
Total	₩	33,541	69,095	6,010	68,878	40,800		7,148

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(4) Financial transactions (including investment) with related parties for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

(In millions of won)

		2020								
		Loans		Borrowings			Investments		Dividend	
				Repayment of			Increase of			
		Loans	Collection	Borrowings	Repayment	lease	capital	Investment	Income	Payout
Parent:										
Doosan Corp.	₩	-	-	-	-	5,871	710,054	-	-	-
Associates and joint ventures:										
Kyunggi Railroad Co., Ltd.		4,236	-	-	-	-	-	-	-	-
Incheon fuel cell Co., Ltd.		20,500	20,500	-	-	-	-	-	-	-
Tianjin Lovol Doosan Engine Company Ltd.		-	-	-	-	-	-	2,523	-	-
Ainstein AI, Inc.		-	-	-	-	-	-	2,360	-	-
Hychangwon Co., Ltd.		-	-	-	-	-	-	3,000	-	-
Others		-	-	-	-	-	-	5,774	-	-
Sub total		24,736	20,500	-	-	-	-	13,657	-	-
Other related parties:										
Doosan Fuel Cell America, Inc.		-	-	23,470	-	-	-	-	-	-
KDDI Korea Co., Ltd.		-	-	-	-	-	-	-	8	-
Others		-	-	-	-	1,229	7,331	-	-	-
Total	₩	24,736	20,500	23,470	-	7,100	717,385	13,657	8	-

(In millions of won)

(In millions of won)		2019									
		Loans		Borrowing		Investments		Dividend		Share	
						Increase of					
		Loans	Collection	Borrowings	Repayment	capital	Investment	Income	Payout	Acquisition	Disposal
Parent:											
Doosan Corp.	₩	-	-	-	-	141,586	-	-	-	-	29,114
Associates and joint ventures:											
Kyunggi Railroad Co., Ltd.		6,159	-	-	-	-	-	-	-	-	-
Tianjin Lovol Doosan Engine Company Ltd.		-	-	-	-	12,913	-	-	-	-	-
Other related parties:											
KDDI Korea Co., Ltd.		-	-	-	-	-	-	58	-	-	-
Doosan Fuel Cell America, Inc.		-	-	6,258	6,258	-	-	-	-	-	-
Doosan Mecatec Co., Ltd.		-	-	-	-	-	-	-	6,200	-	-
Total	₩	6,159	-	6,258	6,258	154,499	-	58	6,200	-	29,114

(5) The Group provides payment guarantees and collateral to certain related parties as of December 31, 2020 (See Notes 32 and 33).

(6) Key management personnel are standing directors who have authorities and responsibilities for planning, operation and control of the business of the Group. Compensation for key management personnel for the years ended December 31, 2020 and 2019 consists of following:

(In millions of won)

		2020	2019
Short-term employee benefits	₩	32,699	46,142
Severance and retirement benefits		2,845	4,162
Total	₩	35,544	50,304

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35. Consolidated statements of cash flows

(1) Details of cash generated from operation for the years ended December 31, 2020 and 2019 are as follows:

<i>(In millions of won)</i>	2020	2019
Loss for the period	₩ (838,446)	(104,367)
Adjustments:		
Interest expenses	457,918	509,356
Loss on foreign currency translation	160,323	122,759
Bad debt expenses (reversal)	42,540	(4,331)
Other bad debt expenses	177,707	153,571
Loss on valuation of inventory	2,843	20,982
Loss on valuation of derivative financial instruments	28,386	112,278
Loss on valuation of firm commitments	70,281	23,613
Loss on equity method investments	16,348	14,344
Depreciation	386,386	374,831
Amortization of intangible assets	182,380	176,063
Loss on disposal of property, plant and equipment	1,701	31,068
Impairment loss on property, plant and equipment	36,097	40,897
Impairment loss on intangible assets	158,354	13,058
Impairment loss on investment property	3,149	57
Loss on short-term and long-term investment securities evaluation	24,400	10,684
Severance and retirement benefits	109,800	93,173
Provision for warranties	153,407	223,780
Provision for others	261,897	107,559
Loss on redemption of bonds	55,663	7,281
Loss on disposal of trade receivables	17,935	22,010
Income tax expense (benefit)	(25,463)	210,203
Interest income	(43,386)	(57,009)
Dividend income	(1,123)	(1,341)
Gain on foreign currency translation	(147,895)	(81,477)
Gain on valuation of derivatives financial instruments	(115,026)	(84,819)
Gain on valuation of firm commitments	(10,454)	(61,896)
Gain on disposal of property, plant and equipment	(2,089)	(1,981)
Gain on short-term and long-term investment securities evaluation	(89,340)	(8,140)
Gain on disposal of discontinued operations	-	(29,862)
Others	61,678	4,748
Subtotal	1,974,417	1,941,459
Changes in operating assets and liabilities:		
Trade receivables	202,789	21,134
Due from customers for contract work	91,812	68,664
Other receivables	(140,176)	137,810
Derivative financial assets and liabilities	(32,464)	17,083
Firm commitments assets and liabilities	(12,941)	15,052
Inventories	304,999	(312,640)
Other current assets	(4,777)	(33,742)
Other non-current assets	2,664	5,487
Trade payables	(593,772)	(651,295)
Due to customers for contract work	190,238	183,204

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	2020	2019
Other payables	₩ (134,883)	74,248
Provision for construction warranties	(153,988)	(156,580)
Provision for others	(26,539)	116,884
Other current liabilities	23,732	2,533
Other non-current liabilities	45,544	(157,890)
Severance payments paid	(287,086)	(222,710)
Plan assets	185,623	86,880
Subtotal	(339,225)	(805,878)
Cash generated from operations	₩ 796,746	1,031,214

(2) Significant non-cash transactions for the years ended December 31, 2020 and 2019 are as follows:

(In millions of won)

	2020	2019
Transfer from PP&E to investment property	₩ 24,372	449,271
Transfer from investment property to PP&E	433,702	-
Transfer from construction-in-progress to other assets	98,440	156,676
Transfer to current portion of bonds and borrowings and others	1,431,161	3,366,648
Acquisition of long-term investment in securities through stock receipt	600,525	-
Change in other payables from acquisition of property, plant and equipment	(10,152)	(591)

(3) Changes of liability in financing activities for the years ended December 31, 2020 and 2019 are summarized as follows:

(In millions of won)

		Cash flows from financing activities, net	Non-cash changes				Balance at December 31, 2020
			Current portion of long-term debt	Changes in foreign currency translation	Changes in consolidation scope	Others	
	Balance at January 1, 2020						
Short-term borrowings	₩ 3,767,270	1,803,463	-	(105,596)	45,691	(142,249)	5,368,579
Asset-backed borrowings	381,574	(283,500)	-	-	-	(38,523)	59,551
Current portion of long-term debt	3,265,485	(3,132,301)	1,386,679	636	-	70,302	1,590,801
Current lease liabilities	80,788	(65,873)	44,482	38	98	6,933	66,466
Bonds	846,835	1,457,919	(456,670)	(52,650)	-	4,726	1,800,160
Long-term borrowings	1,697,983	218,745	(685,291)	(58,877)	-	10,475	1,183,035
Long-term asset backed borrowings	292,290	-	(244,718)	-	-	1,531	49,103
Non-current lease liabilities	175,750	(21,302)	(44,482)	(6,228)	115	68,011	171,864
Total	₩ 10,507,975	(22,849)	-	(222,677)	45,904	(18,794)	10,289,559

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	Balance at January 1, 2019	Cash flows from financing activities, net	Non-cash changes				Balance at December 31, 2019
			Current port ion of long- term debt	Changes in foreign currency translation	Changes in consolidation scope	Others(*1)	
Short-term borrowings	₩ 2,840,072	910,965	-	16,233	-	-	3,767,270
Asset-backed borrowings	491,371	(109,900)	-	-	-	103	381,574
Current portion of long-term debt	2,049,828	(2,133,370)	3,285,612	54,478	-	8,937	3,265,485
Current lease liabilities	-	(91,305)	81,036	1,811	-	89,246	80,788
Bonds	2,053,033	899,205	(2,164,206)	9,360	-	49,443	846,835
Long-term borrowings	3,043,437	(292,948)	(957,606)	75,088	(180,600)	10,612	1,697,983
Long-term asset backed borrowings	248,788	204,863	(163,800)	-	-	2,439	292,290
Non-current lease liabilities	-	-	(81,036)	(302)	-	257,088	175,750
Total	₩ 10,726,529	(612,490)	-	156,668	(180,600)	417,868	10,507,975

(*1) The amount of lease liabilities recognized in accordance with K-IFRS No. 1116 is included.

36. Discontinued operations

(1) Summary of discontinued operations

1) Business division of DBC

For the year ended December 31, 2019, the Group completed the disposal of shares of its subsidiary, DBC and lost control. The Group reclassified segment of DBC to discontinued operations in 2019.

2) HRSG & CPE business division

The Group completed the disposal of its HRSG and CPE divisions (owned by DEC and Doosan Heavy Industries Vietnam Co., Ltd., subsidiaries of the Company) in 2017.

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(2) The results of discontinued operations of the Group for the year ended December 31, 2019 is as follows:

		2019			
		DBC	HRSB	CPE	Total
<i>(In millions of won)</i>					
Sales	₩	-	258	-	258
Cost of sales		-	120	-	120
Selling and administrative cost		54	16,609	(1,598)	15,065
Operating profit (loss)		(54)	(16,471)	1,598	(14,927)
Other non-operating income (expense)		13	(3,689)	(613)	(4,289)
Gain (loss) before income tax		(41)	(20,160)	985	(19,216)
Income tax expense		-	-	-	-
Gain (loss) from discontinued operations		(41)	(20,160)	985	(19,216)
Gain on disposal of discontinued operations		29,862	-	-	29,862
Tax expense related to discontinued operations		51	-	-	51
Subtotal		29,811	-	-	29,811
Gain (loss) for the period from discontinued operations	₩	29,770	(20,160)	985	10,595
- Owners of the Company	₩	29,788	(17,948)	876	12,716
- Non-controlling interests		(18)	(2,212)	109	(2,121)

(3) The net cash flows incurred by discontinued operations of the Group for the year ended December 31, 2019 is as follows:

		2019			
		DBC	HRSB	CPE	Total
<i>(In millions of won)</i>					
Net cash flows provided by (used in) operating activities	₩	698	(14,834)	(23,948)	(38,084)
Net cash flows provided by (used in) investing activities(*1)		20,187	(2)	48	20,233
Net cash flows provided by financing activities		2,400	14,836	23,900	41,136
Net increase in cash and cash equivalents	₩	23,285	-	-	23,285

(*1) Investing activities includes cash flows from disposal of discontinued operations.

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37. Business combinations

(1) Summary of business combinations

In accordance with the resolution of the Board of Directors on December 5, 2019, the Group acquired 100% of Doosan Mecatec Co., Ltd. common shares held by Doosan Corp. on February 5, 2020, through investment in kind.

	Description
Name of the acquired company	Doosan Mecatec Co., Ltd.
Major business activities	Manufacture of chemical equipment for oil, gas, and petrochemical plants
Purpose of acquisition	Creating business synergy with power generation facility supply business and diversifying portfolio
Ownership after acquisition	100%

(2) Acquisition accounting

The amounts of assets and liabilities were measured at fair value at the acquisition-date. The consideration transferred and fair value of identifiable net assets are as follows:

<i>(In millions of won)</i>	Amount
I. Consideration transferred	₩ 238,199
Common stock (44,102,845 shares)	
II. The amounts recognized as identifiable assets and liabilities	
Assets	
Cash and cash equivalents	60,687
Trade and other receivables	39,950
Due from customers for contract work	128,801
Inventories	12,456
Property, plant and equipment	30,931
Intangible assets(*1)	16,029
Other assets	120,571
Total assets	409,425
Liabilities	
Trade and other payables	92,785
Short-term borrowings	45,691
Due to customers for contract work	24,388
Deferred tax liabilities	3,322
Other liabilities	26,136
Total liabilities	192,322
Fair value of total identifiable net assets	217,103
III. Goodwill (I-II)	₩ 21,096

(*1) The identifiable intangible assets include orders on hand of ₩6,200 million and customer relationship of ₩8,900 million.

The Group prepared the consolidated financial statements considering that the business combination occurred on January 1, 2020, and the revenue and net profit generated from Doosan Mecatec Co., Ltd. for year ended December 31, 2020 after acquisition was ₩313,324 million and ₩5,663 million, respectively

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38. Subsequent events

(1) In accordance with the resolution of the Board of Directors on February 5, 2021, the Group decided to sell the common shares of Doosan Infracore Co., Ltd. ("DI") and the details are as follows:

	Description
Subject entity	DI
Purpose of disposal	Enhancement of business efficiency and improvement of governance structure
Disposal consideration	₩ 850,000 million
Subject of disposal	All common stock and stock warrant held by the Group after the carve-out from some assets, liabilities, human resources, and contract relations that are not directly related to the business operated by DI

(2) Doosan Bobcat Inc., a subsidiary, signed a contract to acquire 100% of the shares of the newly established company spun off from the industrial vehicle business division operated by Doosan Corp. on March 11, 2021.

39. Pursuance of the financial structure improvement plan

The Group faces financial difficulties as the global power market slump and external environmental change resulted in accumulated losses incurred in the Group's business from 2014. Accordingly, the Company is carrying out the plan to streamline its business for improving profitability (i.e., human-resources restructuring) and the plan to improve the financial structure in stages for reducing debts through expansion of capital.

The Company received financial support (approximately ~~₩~~3,000,000 million) from KDB and Korea EXIM Bank (hereinafter referred to as "State-owned Banks") in the first half of 2020, in order to respond to short-term liquidity risks. The Company, Doosan Corp., Park Jeong-won and other related persons provided collateral to State-owned Banks for their respective major assets and signed agreements with State-owned Banks to implement the plan to improve financial structure in June 2020. The agreement contains that the Company, Doosan Corp., Park Jeong-won and other related persons repay debts to State-owned Banks by raising more than ~~₩~~3,000,000 million through self-rescue efforts, including the sale of non-core assets. In order to implement the financial structure improvement plan, the Company raised approximately ~~₩~~1,200,000 million through issuance of new shares in December 2020 to repay the debts of State-owned Banks and received 12,764 thousand shares of Doosan Fuel Cell Co., Ltd. for free from Park Jeong-won and other related parties on November 26, 2020 for capital expansion. The management of the Company judges that sufficient liquidity can be secured according to the financial structure improvement work being carried out in accordance with the agreements with State-owned Banks.

Meanwhile, although the Group's consolidated financial statements are accounted for under the assumption that assets and liabilities can be recovered or redeemed through ordinary course of business, depending on the success or failure of the financial and business improvement plan, there is a possibility that the financial position and management performance may fluctuate significantly. If these plans are disrupted, the Group's assets and liabilities may not be recovered or redeemed at their carrying amount through the ordinary course of business, and the Group's consolidated financial statements do not reflect such adjustments in relation to the assets and liabilities and the classification thereof and the related profit or loss that may arise from this uncertainty.

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40. Effect of coronavirus disease-19 ("COVID-19")

The World Health Organization declared a global pandemic against COVID-19 on March 11, 2020 and the Group believes that the spread and persistence of COVID-19 will have a negative impact on the Group's business and financial environment. However, as of December 31, 2020, the effects of COVID-19 are not reflected in the consolidated financial statement in case the Group cannot reasonably estimate the effects.

41. Approval of the consolidated financial statements

The consolidated financial statements for 2020 were authorized for issue by the Board of Directors on February 9, 2021 and will be get final approval the shareholders' meeting on March 30, 2021.