

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

Consolidated Financial Statements

December 31, 2021 and 2020

(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, 2021 and 2020, the consolidated statements of profit or loss and other comprehensive income or 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, 2021 and 2020, 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 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.

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 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.

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. 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.

The 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 aggregation and allocation of project costs



- Evaluation and testing of internal controls related to purchasing and production of the Group affecting cost of sales
- Evaluation and testing of internal controls related to revenue recognized over time
- 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 by IT audit to understand the reason of transfer and whether appropriate approval was obtained
- For 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

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.

The 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 project
- 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 each cash generating unit to which goodwill is allocated 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, selection of comparable companies and others. Therefore, we identified the impairment for goodwill as a key audit matter as certain key assumptions, such as growth rate and discount rates, on which management has based cash flow projections are included, are subject to management bias.

The 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 the valuation model applied by the Group
- Understanding of the future cash flows and agreeing whether the estimated future cash flow agrees to business plan approved by the Group's management
- Testing the appropriateness of major assumptions (discount rate, growth rate) applied in the valuation model by comparing to benchmark of peer industry and historical financial information of cash generating unit
- Evaluation of the sensitivity analysis results for the discount rate and permanent growth rate presented by the Group to assess the impact of changes in major assumptions on the impairment assessment
- Testing the appropriateness of use of the market value approach by considering the business and financial characteristics of comparable companies selected

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 Samjory Accounting Corp.

Seoul, Korea
March 22, 2022

This report is effective as of March 22, 2022, 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, 2021 and 2020

<i>(In won)</i>	Note	2021	2020
Assets			
Cash and cash equivalents	4,5,10,33,36 ₩	1,908,603,989,132	2,336,795,020,568
Short-term financial instruments	4,5,10,33	519,150,027,683	316,762,603,159
Short-term investments in securities	4,6,10	197,197,204,569	268,262,018,463
Trade receivables, net	4,7,10,25,34,36	921,080,464,985	2,036,954,321,016
Due from customers for contract work, net	7,25,34	1,632,887,643,517	1,764,133,275,013
Other receivables, net	4,7,10,34,36	207,625,154,622	236,838,070,204
Prepayments, net	7,25	499,609,555,547	452,091,457,840
Prepaid expenses, net		129,779,489,360	94,593,137,930
Short-term loans, net	4,7,10,34	62,126,808,865	149,986,369,488
Derivative financial assets	4,9,10	30,275,102,551	58,352,499,895
Firm commitment assets	9	45,877,394,613	5,900,766,998
Inventories, net	8,25,33,36	1,788,420,159,139	1,958,721,611,748
Assets held for sale	36	319,607,727,615	11,495,049,364
Other current assets, net	4,7,10,14	155,383,385,780	255,909,668,705
Total current assets		8,417,624,107,978	9,946,795,870,391
Long-term financial instruments	4,5,10	29,271,959,777	23,367,497,135
Long-term investments in securities	4,6,10,33	301,709,821,939	926,508,778,964
Investments in associates and joint ventures	11,33,36	582,045,106,081	162,973,738,141
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	44,703,080,573	230,048,605,914
Property, plant and equipment, net	12,14,33,36	5,436,969,444,692	6,157,806,963,024
Intangible assets, net	13,33,38	8,015,980,133,418	6,900,287,804,408
Investment properties, net	15	72,920,331,892	81,937,006,635
Derivative financial assets	4,9,10	8,683,481,005	37,748,633,632
Firm commitment assets	9	20,892,251,073	9,818,569,590
Guarantee deposits, net	4,7,10,34	363,655,647,884	488,311,023,811
Deferred tax assets	30	232,791,073,638	442,532,656,942
Other non-current assets, net	4,7,10,14	90,559,685,047	56,297,638,873
Total non-current assets		15,302,921,520,663	15,620,378,420,713
Total assets		₩ 23,720,545,628,641	25,567,174,291,104

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, 2021 and 2020

<i>(In won)</i>	Note	2021	2020
Liabilities			
Trade payables	4,10,34,36	₩ 1,880,747,776,315	2,194,328,819,387
Short-term borrowings	4,10,16,32,33,34,35	3,908,482,953,731	5,368,579,020,551
Asset-backed borrowings	4,10,16,35	-	59,550,657,597
Other payables	4,10,34,36	399,635,790,173	492,438,703,598
Advance received	25	64,196,097,441	96,754,115,588
Due to customers for contract work	25,34	1,455,693,415,375	1,666,079,090,537
Withholdings		30,295,770,427	32,641,867,115
Accrued expenses	4,10	411,290,713,603	645,041,631,439
Current Income tax liabilities	30	36,231,843,804	38,710,823,579
Current portion of long-term debt	4,10,16,32,33,35	938,862,829,868	1,590,801,459,636
Derivative financial liabilities	9,10	211,671,916,451	61,603,742,869
Firm commitment liabilities	9	10,120,811,188	17,401,805,083
Provisions	18,25,32	320,457,896,603	508,536,449,621
Current lease liabilities	4,10,14,34,35	64,880,159,213	66,465,579,213
Liabilities held for sale	36	273,469,051,609	-
Other current liabilities	4,10	119,728,515,182	231,614,380,403
Total current liabilities		10,125,765,540,983	13,070,548,146,216
Bonds	4,10,16,32,33,35	848,257,259,234	1,800,160,199,498
Long-term borrowings	4,10,16,32,33,35,36	1,516,918,542,299	1,183,035,254,754
Long-term asset-backed borrowings	4,10,16,35	-	49,102,652,561
Long-term other payables	4,10	14,522,398,927	14,928,812,333
Defined benefit liabilities, net	17	540,496,543,264	721,424,677,702
Deposits received	4,10	330,443,720,443	309,091,438,251
Derivative financial liabilities	9,10	37,802,056,172	70,772,172,508
Firm commitment liabilities	9	5,651,863,540	24,633,647,381
Deferred tax liabilities	30	462,047,648,049	334,221,214,442
Provisions	18,25,32	312,515,735,320	370,469,192,358
Non-current lease liabilities	4,10,14,34,35	316,307,158,369	171,864,529,234
Other non-current liabilities	4,10	402,221,517,320	340,425,672,881
Total non-current liabilities		4,787,184,442,937	5,390,129,463,903
Total liabilities		₩ 14,912,949,983,920	18,460,677,610,119

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, 2021 and 2020

<i>(In won)</i>	<u>Note</u>	<u>2021</u>	<u>2020</u>
Equity			
Capital stock	19	₩ 2,675,624,980,000	1,937,707,325,000
Capital surplus	19,20	1,865,083,188,183	2,662,214,482,750
Other components of equity	21	46,159,352,713	47,907,323,727
Accumulated other comprehensive income	9,10,12,22	731,324,738,126	587,157,416,427
Retained earnings (accumulated deficits)	23	<u>773,234,887,563</u>	<u>(2,046,600,548,095)</u>
Equity attributable to owners of the controlling company		<u>6,091,427,146,585</u>	<u>3,188,385,999,809</u>
Non-controlling interests	1	<u>2,716,168,498,136</u>	<u>3,918,110,681,176</u>
Total equity		<u>8,807,595,644,721</u>	<u>7,106,496,680,985</u>
Total liabilities and equity		<u>₩ 23,720,545,628,641</u>	<u>25,567,174,291,104</u>

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
 Consolidated Statements of Profit or Loss
 For the years ended December 31, 2021 and 2020

<i>(In won)</i>	<u>Note</u>	<u>2021</u>	<u>2020</u>
Continuing operations			
Sales	24,25,34	₩ 11,283,610,608,993	9,171,512,226,435
Cost of sales	8,26,34	9,418,698,484,565	8,131,775,775,059
Gross profit		1,864,912,124,428	1,039,736,451,376
Selling and administrative expenses	10,26,27,34	987,029,330,327	1,174,269,457,600
Operating profit (loss)	24	877,882,794,101	(134,533,006,224)
Finance income and expenses		(282,873,403,998)	(411,432,869,348)
Finance income	10,28,34	706,703,501,471	474,250,073,016
Finance expenses	10,28,34	989,576,905,469	885,682,942,364
Other non-operating income and expenses		(45,625,120,667)	(229,336,153,068)
Other non-operating income	10,29,34	66,095,816,734	113,043,040,783
Other non-operating expenses	10,29,34	111,720,937,401	342,379,193,851
Share of profit (loss) of equity method investees	11	20,807,757,283	(7,553,879,386)
Profit (loss) before income tax		570,192,026,719	(782,855,908,026)
Income tax expense (benefit)	30	95,408,945,371	(94,105,083,432)
Profit (loss) from continuing operations		474,783,081,348	(688,750,824,594)
Discontinued operations			
Profit (loss) from discontinued operations, net of tax	37	171,038,065,282	(149,694,948,252)
Profit (loss) for the period	24	₩ 645,821,146,630	(838,445,772,846)
Profit (loss) attributable to:			
Owners of the Company		₩ 495,274,322,486	(1,069,666,921,022)
Non-controlling interests	1	150,546,824,144	231,221,148,176
Earnings (loss) per share			
Basic earnings (loss) per share	31	1,090	(4,279)
Continuing operations		608	(3,529)
Discontinued operations		482	(750)
Diluted earnings (loss) per share	31	1,070	(4,279)
Continuing operations		597	(3,529)
Discontinued operations		473	(750)

See accompanying notes to the consolidated financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
 Consolidated Statements of Comprehensive Income or Loss
 For the years ended December 31, 2021 and 2020

<i>(In won)</i>	Note	2021	2020
Profit (loss) for the period	₩	645,821,146,630	(838,445,772,846)
Other comprehensive income (loss)		593,498,014,003	(146,709,878,308)
Items that will not be reclassified			
subsequently to profit or loss		303,725,743,067	(45,164,958,464)
Remeasurements of the defined benefit liabilities	17,30	102,200,007,170	(41,930,254,474)
Gain (loss) on change in fair value of fair value through other comprehensive income ("FVOCI") financial assets	6,10,30	13,300,846,390	(3,397,942)
Profit (loss) on revaluation of assets	12,30	188,224,889,507	(3,231,306,048)
Items that are or may be reclassified			
subsequently to profit or loss		289,772,270,936	(101,544,919,844)
Effective portion of changes in fair value of cash flow hedges	9,10,30	9,910,627,146	(10,020,296,668)
Equity adjustments in equity method investees	11	(678,448,210)	672,147,102
Gain (loss) on translation of foreign operations		280,540,092,000	(92,196,770,278)
Total comprehensive income (loss) for the period	₩	<u>1,239,319,160,633</u>	<u>(985,155,651,154)</u>
Total comprehensive income (loss) attributable to:			
Owners of the Company	₩	819,845,893,324	(1,148,942,071,827)
Non-controlling interests		419,473,267,309	163,786,420,673

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, 2021 and 2020

<i>(In won)</i>	<u>Capital stock</u>	<u>Capital surplus</u>	<u>Other components of equity</u>	<u>Accumulated other comprehensive income</u>	<u>Retained earnings (Accumulated deficit)</u>	<u>Non-controlling interests</u>	<u>Total Equity</u>
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)
Profit (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 common 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 common 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 the scope of consolidation	-	-	-	14,181,567,042	-	(72,272,921,698)	(58,091,354,656)
Others	-	455,198,220,492	-	-	-	-	455,198,220,492
Balance at December 31, 2020	₩ <u>1,937,707,325,000</u>	<u>2,662,214,482,750</u>	<u>47,907,323,727</u>	<u>587,157,416,427</u>	<u>(2,046,600,548,095)</u>	<u>3,918,110,681,176</u>	<u>7,106,496,680,985</u>

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, 2021 and 2020

<i>(In won)</i>	<u>Capital stock</u>	<u>Capital surplus</u>	<u>Other components of equity</u>	<u>Accumulated other comprehensive income</u>	<u>Retained earnings (Accumulated deficit)</u>	<u>Non-controlling interests</u>	<u>Total Equity</u>
Balance at January 1, 2021	₩ 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
Total comprehensive income (loss):							
Profit (loss) for the period	-	-	-	-	495,274,322,486	150,546,824,144	645,821,146,630
Remeasurements of defined benefit liabilities	-	-	-	-	74,159,780,989	28,040,226,181	102,200,007,170
Profit on change in fair value of FVOCI financial assets	-	-	-	3,601,490,198	8,684,271,763	1,015,084,429	13,300,846,390
Effective portion of changes in fair value of cash flow hedges	-	-	-	9,650,810,954	-	259,816,192	9,910,627,146
Equity adjustments in equity method investees	-	-	-	(678,467,205)	-	18,995	(678,448,210)
Gain on translation of foreign operations	-	-	-	55,367,588,444	-	225,172,503,556	280,540,092,000
Profit on revaluation of assets	-	-	-	59,992,384,467	113,793,711,228	14,438,793,812	188,224,889,507
Subtotal	-	-	-	127,933,806,858	691,912,086,466	419,473,267,309	1,239,319,160,633
Transactions with owners of the Company:							
Issuance of common shares	239,219,780,000	359,337,177,143	-	-	-	-	598,556,957,143
Disposition of deficit	-	(2,127,923,349,192)	-	-	2,127,923,349,192	-	-
Acquisition of treasury stock	-	-	(1,982,779,910)	-	-	-	(1,982,779,910)
Stock option	-	283,741,579	(283,741,579)	-	-	-	-
Exercise of stock warrants	81,700,690,000	111,977,939,313	-	-	-	-	193,678,629,313
Spin-off and merger	416,997,185,000	940,278,255,430	614,558,287	-	-	(1,357,889,998,717)	-
Additional acquisition of investments in subsidiaries	-	541,868,475	-	-	-	(1,251,031,475)	(709,163,000)
Dividends of subsidiaries	-	-	-	-	-	(720,000,000)	(720,000,000)
Stock option of subsidiaries	-	96,007,812	(96,007,812)	-	-	-	-
Transaction of treasury stock of subsidiaries	-	-	-	-	-	(1,092,040,558)	(1,092,040,558)
Exercise of stock warrants of subsidiaries	-	(138,555,998,206)	-	-	-	372,501,632,562	233,945,634,356
Redemption of redeemable convertible preference shares of subsidiaries	-	-	-	-	-	(15,001,913,230)	(15,001,913,230)
Changes in the scope of consolidation	-	-	-	16,233,514,841	-	(614,362,956,492)	(598,129,441,651)
Others	-	56,833,063,079	-	-	-	(3,599,142,439)	53,233,920,640
Balance at December 31, 2021	₩ <u>2,675,624,980,000</u>	<u>1,865,083,188,183</u>	<u>46,159,352,713</u>	<u>731,324,738,126</u>	<u>773,234,887,563</u>	<u>2,716,168,498,136</u>	<u>8,807,595,644,721</u>

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, 2021 and 2020

<i>(In won)</i>	Note	2021	2020
Cash flows from operating activities			
Cash generated from operations:	35 ₩	1,538,046,527,599	796,745,530,423
Profit (loss) for the period		645,821,146,630	(838,445,772,846)
Adjustments		1,385,423,735,763	1,974,417,215,258
Changes in operating assets and liabilities		(493,198,354,794)	(339,225,911,989)
Interest received		27,122,588,036	39,196,722,713
Interest paid		(369,169,312,901)	(415,041,541,521)
Dividends received		2,152,957,046	1,123,058,402
Income tax paid		(170,436,557,453)	(126,800,069,217)
Net cash provided by operating activities		<u>1,027,716,202,327</u>	<u>295,223,700,800</u>
Cash flows from investing activities			
Cash inflows from investing activities:			
Decrease in short-term financial instruments		399,508,662,781	175,221,755,320
Proceeds from disposal of short-term investments in securities		446,720,965,453	28,545,686,029
Collection of short-term loans		83,385,969,336	286,251,740,356
Decrease in long-term financial instruments		103,493,846,775	29,745,896,685
Proceeds from disposal of long-term investments in securities		15,461,740,051	5,634,215,928
Collection of long-term loans		57,467,636,506	656,986,706,878
Proceeds from disposal of investments in associates and joint ventures		18,342,758,666	-
Proceeds from disposal of investments in subsidiaries		-	40,852,098,466
Proceeds from disposal of property, plant and equipment		35,398,079,250	12,418,943,621
Proceeds from disposal of intangible assets		1,766,811,066	10,341,854,969
Proceeds from disposal of investment properties		38,081,395,037	53,367,500
Proceeds from disposal of assets held for sales		12,691,144,592	-
Decrease in lease receivables		2,635,009,067	2,130,535,534
Cash inflow due to changes in the scope of consolidation		10,565,349,759	60,687,143,427
Others		44,140,818,126	-
Subtotal		<u>1,269,660,186,465</u>	<u>1,308,869,944,713</u>
Cash outflows for investing activities:			
Increase in short-term financial instruments		(675,915,664,397)	(224,374,044,873)
Acquisition of short-term investments in securities		(42,493,575,583)	(218,545,148,244)
Increase in short-term loans		(58,791,485,797)	(413,759,248,228)
Increase in long-term financial instruments		(106,615,025,549)	(52,242,481,434)
Acquisition of long-term investments in securities		(57,551,493,121)	(63,786,177,796)
Increase in long-term loans		(183,800,802,243)	(337,095,008,749)
Acquisition of investments in associates and joint ventures		(7,155,385,000)	(13,289,035,002)
Acquisition of investments in subsidiaries		(673,436,459,970)	-
Disposition of investments in subsidiaries		(234,873,065,642)	-
Acquisition of property, plant and equipment		(284,708,398,491)	(262,954,987,025)
Acquisition of intangible assets		(203,251,495,873)	(239,972,434,732)
Acquisition of investment properties		(802,067,668)	(280,896,640)
Others		(5,953,182,847)	(8,547,418,990)
Subtotal		<u>(2,535,348,102,181)</u>	<u>(1,834,846,881,713)</u>
Net cash used in investing activities		<u>(1,265,687,915,716)</u>	<u>(525,976,937,000)</u>

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, 2021 and 2020

<i>(In won)</i>	Note	2021	2020
Cash flows from financing activities			
Cash inflows from financing activities:			
Increase in short-term borrowings, net	₩	-	1,803,462,947,016
Proceeds from asset-backed borrowings		112,904,468,504	937,513,952,782
Issuance of bonds		682,177,186,667	1,457,919,299,190
Proceeds from long-term borrowings		1,328,115,019,899	563,576,990,765
Increase in long-term rent deposit		43,400,000,000	-
Issuance of common shares		-	1,212,523,393,400
Exercise of stock warrants		193,823,570,755	5,554,700
Issuance of common shares of subsidiaries		-	43,879,074,500
Exercise of stock warrants of subsidiaries		233,410,839,550	49,540,236,110
Others		55,097,491,840	-
Subtotal		<u>2,648,928,577,215</u>	<u>6,068,421,448,463</u>
Cash outflows for financing activities:			
Decrease in short-term borrowings, net		(655,321,354,867)	-
Repayment of current portion of long-term debt		(2,112,830,031,071)	(3,132,301,392,568)
Repayment of asset-backed borrowings		(47,752,891,312)	(1,221,014,269,493)
Repayment of long-term borrowings		(18,048,139,288)	(344,832,398,835)
Payment of lease liabilities		(86,420,051,384)	(87,175,065,896)
Payment of lease liabilities in a sales and leaseback		(7,977,606,952)	-
Acquisition of treasury stock		(1,982,779,910)	(16,409,250)
Expense of common shares issuance		(7,034,742,146)	(15,645,359,727)
Additional acquisition of investments in subsidiaries		(709,163,000)	(11,093,317,240)
Payment of dividends in subsidiaries		(720,000,000)	(30,163,749,600)
Redemption of redeemable convertible preference shares of subsidiaries		(15,001,913,230)	-
Acquisition of treasury stock in subsidiaries		(1,101,427,547)	-
Others		(2,458,537,203)	-
Subtotal		<u>(2,957,358,637,910)</u>	<u>(4,842,241,962,609)</u>
Net cash provided by (used in) financing activities		<u>(308,430,060,695)</u>	<u>1,226,179,485,854</u>
Effect of movements in exchange rates on cash held		135,726,395,437	(99,911,916,301)
Classified to assets held for sale		(17,515,652,789)	-
Net increase (decrease) in cash and cash equivalents		(428,191,031,436)	895,514,333,353
Cash and cash equivalents at January 1		<u>2,336,795,020,568</u>	<u>1,441,280,687,215</u>
Cash and cash equivalents at December 31	₩	<u>1,908,603,989,132</u>	<u>2,336,795,020,568</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, 2021 and 2020

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, 2021 is Doosan Corp (holding 39.26% equity ownership).

(2) Consolidated subsidiaries

Details of consolidated subsidiaries as of December 31, 2021 and 2020 are as follows:

Company	Key operating activities	Location	Ownership(%)(*1)		Closing date(*2)
			2021	2020	
Doosan Heavy Industries Vietnam Co., Ltd.	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	Manufacturing	Indonesia	83.64	83.64	"
Doosan Heavy Industries Malaysia Sdn. Bhd	Dormant	Malaysia	100.00	100.00	"
Doosan Heavy Industries Japan Corp.	Sales	Japan	100.00	100.00	"
Doosan Enpure Ltd.	Engineering & Services	UK	100.00	100.00	"
Doosan Power Systems India Private Ltd.	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.(*6)	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.(*6)	Holdings Company	USA	100.00	95.90	"
Doosan Turbomachinery Services Inc.	Manufacturing	USA	100.00	100.00	"
Doosan GridTech Inc.	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	"
Skoda Power Private Ltd.	Engineering	India	100.00	100.00	March 31
Doosan Power Systems Pension Trustee Co., Ltd.	Professional services	UK	100.00	100.00	December 31

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
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Company	Key operating activities	Location	Ownership(%)(*1)		Closing date(*2)
			2021	2020	
Doosan Power Systems Overseas Investments Ltd.(*15)	Holdings Company	UK	100.00	100.00	"
Doosan Babcock Ltd.(*15)	Engineering & Services	UK	100.00	100.00	"
Doosan Power Systems Europe Limited GmbH(*12)	Engineering & Services	Germany	-	100.00	"
Doosan Power Systems Americas LLC(*15)	Engineering & Services, Sales	USA	100.00	100.00	"
Doosan Lentjes GmbH(*12)	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 Services (Overseas) Ltd.(*15)	Engineering & Services	UK	100.00	100.00	"
Doosan Babcock Energy Polska S.A.(*15)	Engineering & Services	Poland	98.91	98.91	"
Doosan Babcock Energy Germany GmbH(*15)	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(*13)	Real estate	UK	-	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 Ukudu Power, LLC(*7)	Engineering & Services	USA	100.00	-	"
Doosan Mecatec Co., Ltd. and the subsidiaries	Manufacturing	Korea, etc.	100.00	100.00	"
KDPP 5 th Co., Ltd.(*4)	Asset Securitization	Korea	-	-	"
U-best 5 th Co., Ltd.(*8)	Asset Securitization	Korea	-	-	"
Doosan Cuvex Co., Ltd. ("Cuvex")(*11)	Operation of resort and golf club	Korea	56.60	56.60	"
Doosan Infracore Co., Ltd. ("DI") and the subsidiaries(*10)	Manufacturing of machinery & equipment	Korea, etc.	-	34.97	"
Doosan Bobcat Inc. and the subsidiaries(*11)	Manufacturing and sales of construction equipment	Korea, etc.	51.05	51.05	"
Doosan Engineering & Construction Co., Ltd. ("DEC") and the subsidiaries(*14)	Construction and manufacturing	Korea	46.35	100.00	"
Doosan Fuel Cell Co., Ltd. ("DFC")(*5,9)	Manufacturing	Korea	30.33	15.59	"
D20 Capital, LLC and the subsidiaries(*11)	Financial investment	USA	100.00	100.00	"

(*1) The ownership percentage represents the ownership interest held by the Company (the parent) in each respective subsidiary, except Cuvex of which 51.67% and 4.93% of equity interest are owned by the Company and Doosan Bobcat Korea Co., Ltd. respectively. Overall, the Company and its subsidiaries ("the Group") has an effective ownership interest of 54.19% of Cuvex.

(*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 equity's 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) Additionally acquired in 2021.

(*7) Newly acquired in 2021.

(*8) In 2020, the Group assessed that it has control over the special purpose entity as the entity's activities are substantively governed by the Group and included as subsidiaries. In 2021, the control has been lost due to borrowings repayment.

(*9) The control acquired due to additional acquisition of shares in 2021.

(*10) In 2021, the investment division of DI was split and merged with the Company, and all business segments other than investment division of DI were decided to sell in the market.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
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(*11) In 2021, the shares used to hold by DI and classified as subsidiaries of the Group has transferred to the Company due to spin-off and merger of DI investment division.

(*12) In 2021, Doosan Power Systems Europe Limited GmbH was merged into Doosan Lentjes GmbH.

(*13) Liquidated in 2021.

(*14) The management right has been transferred and the control has lost due to The Zenith holdings Ltd.'s investment in DEC through investment in kind and DEC's issuance of common shares with 3rd parties (See Note 11, 37).

(*15) In 2021, the assets and liabilities of the subsidiaries have classified as assets and liabilities held for sale (See Note 36).

(3) Summarized financial information of major subsidiaries

Summarized financial information of subsidiaries as of and for the years ended December 31, 2021 is as follows:

(In millions of won)

Company	Assets	Liabilities	Sales	Net profit (loss)	Total comprehensive income (loss)
Doosan Heavy Industries Vietnam Co., Ltd.	₩ 583,423	311,711	389,525	62,537	62,537
Doosan HF Controls Corp.	25,751	4,429	9,688	1,005	1,005
PT. Doosan Heavy Industries Indonesia	60,416	133,032	40,481	(655)	(655)
Doosan Heavy Industries Japan Corp.	10,210	6,750	1,628	44	44
Doosan Enpure Ltd.	31,999	33,047	30,639	(1,493)	(1,493)
Doosan Power Systems India Private Ltd.	683,502	793,740	445,600	(67,430)	(67,364)
Doosan Heavy Industries Muscat LLC	15,163	38,643	32,246	(6,774)	(6,774)
Doosan Power Systems Arabia Company Limited	26,965	18,622	13,407	1,668	1,668
Doosan Heavy Industries America Holdings Inc.	156,166	42	-	(6,881)	(6,881)
Doosan Turbomachinery Services Inc.	65,562	44,121	57,993	1,558	1,558
Doosan Heavy Industries America LLC	10,635	2,653	1,946	271	271
Doosan GridTech Inc.	21,328	30,637	77,147	(7,294)	(7,294)
Doosan GridTech EPC, LLC	10,707	7,108	21,461	400	400
Doosan Skoda Power s.r.o	489,064	102,360	185,973	10,487	11,194
Doosan Babcock Ltd.	1,149,967	419,276	463,679	(21,560)	7,915
Doosan Lentjes GmbH	117,154	99,795	116,782	(862)	402
DPS S.A.	1,241,851	1,098,813	-	(26,460)	4,873
Doosan Babcock Energy Polska S.A.	26,360	18,955	28,023	(242)	(242)
Doosan Babcock General Maintenance Services LLC	23,598	73,730	27,577	(1,575)	(1,153)
Doosan Mecatec Co., Ltd. and the subsidiaries	612,844	333,020	294,141	7,452	21,604
Cuvex	323,606	109,291	70,151	9,518	29,109
Doosan Bobcat Inc. and the subsidiaries	8,580,899	4,259,634	5,816,200	385,889	280,150
DFC	698,855	180,667	381,412	8,695	7,508
D20 Capital, LLC and the subsidiaries	91,738	6,922	25,490	17,043	30,343

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
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(4) Changes in the scope of consolidation

Changes in the scope of consolidation for the years ended December 31, 2021 are as follows:

Company	Description	Reason
Doosan Ukudu Power, LLC	Newly included in consolidation	Establishment of new corporation
DFC	Newly included in consolidation	Acquisition of shares
Doosan Infracore USA LLC	Newly included in consolidation	Establishment of new corporation
Doosan Industrial Vehicle Co., Ltd.	Newly included in consolidation	Acquisition of shares
Doosan Industrial Vehicle America Corp.	Newly included in consolidation	Acquisition of shares
Doosan Equipment South East, LLC	Newly included in consolidation	Acquisition of shares
Doosan Industrial Vehicle UK Ltd.	Newly included in consolidation	Acquisition of shares
Doosan Industrial Vehicle Europe N.V.	Newly included in consolidation	Acquisition of shares
Doosan Logistics Europe GmbH	Newly included in consolidation	Acquisition of shares
Doosan Industrial Vehicle China Co., Ltd.	Newly included in consolidation	Acquisition of shares
Genesis Forklift Trucks Limited	Newly included in consolidation	Acquisition of shares
Rushlift Holdings Ltd.	Newly included in consolidation	Acquisition of shares
Doosan Material Handling UK Ltd.	Newly included in consolidation	Acquisition of shares
Rushlift Ltd.	Newly included in consolidation	Acquisition of shares
The First GM 24 th Co., Ltd.	Newly included in consolidation	New borrowings
Doosan International Australia Pty Ltd.	Excluded from consolidation	Liquidation
Great GM 4 th Co. Ltd.	Excluded from consolidation	Repayment of borrowings
DS Munsuru 1 st Co., Ltd.	Excluded from consolidation	Repayment of borrowings
Jonsindongbaek Co., Ltd.	Excluded from consolidation	Repayment of borrowings
U-best 5 th Co., Ltd.	Excluded from consolidation	Repayment of borrowings
Doosan E&C 4 th Co., Ltd.	Excluded from consolidation	Repayment of borrowings
Bildup 1 st Co., Ltd.	Excluded from consolidation	Repayment of borrowings
Doosan Power Systems Europe Limited GmbH	Excluded from consolidation	Statutory merger
DI	Excluded from consolidation	Spin-off and merger / Disposal
Doosan Infracore North America LLC	Excluded from consolidation	Disposal
Doosan Infracore USA LLC	Excluded from consolidation	Statutory merger
Doosan Infracore Europe s.r.o.	Excluded from consolidation	Disposal
Doosan Infracore Japan Corp.	Excluded from consolidation	Disposal
Doosan Bobcat Chile S.A.	Excluded from consolidation	Disposal
Doosan Infracore Norway AS.	Excluded from consolidation	Disposal
Doosan Infracore South America Industria E Comercio De Maquinas De Construca LTDA	Excluded from consolidation	Disposal
Doosan Infracore Construction Equipment India Private Ltd.	Excluded from consolidation	Disposal
Doosan Infracore China Co., Ltd.	Excluded from consolidation	Disposal
Doosan Infracore (Shandong) Co., Ltd.	Excluded from consolidation	Disposal
Doosan Infracore Hunan Corp.	Excluded from consolidation	Disposal
Doosan Infracore Beijing Corp.	Excluded from consolidation	Disposal
Doosan Infracore (China) Investment Co., Ltd.	Excluded from consolidation	Disposal
Doosan (China) Financial Leasing Corp.	Excluded from consolidation	Disposal
Clue Insight Inc.	Excluded from consolidation	Disposal
ECUBE Solution Co., Ltd	Excluded from consolidation	Disposal

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD. AND SUBSIDIARIES
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Company	Description	Reason
Doosan Power Systems (Scotland) Ltd. Partnership	Excluded from consolidation	Liquidation
DEC	Excluded from consolidation	Loss of control
Valuegrowth Co., Ltd.	Excluded from consolidation	Loss of control
DMbest 3rd Co., Ltd.	Excluded from consolidation	Loss of control
Newstart DM 7th Co., Ltd.	Excluded from consolidation	Loss of control
Newstart DM 8th Co., Ltd.	Excluded from consolidation	Loss of control
The First GM 24th Co., Ltd.	Excluded from consolidation	Loss of control

(5) Significant non-controlling interests

Financial information of subsidiaries attributable to significant non-controlling interests as of December 31, 2021 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
Doosan Bobcat Inc. and the subsidiaries	₩ 188,770	2,221,684	-
Cuvex	5,320	98,159	(720)
DFC	6,254	416,552	-

(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, 2021 is as follows:

(In millions of won)

		2021		
		Doosan Bobcat Inc. and the subsidiaries	Cuvex	DFC
I. Net cash flows from operating activities	₩	444,099	9,509	(140,057)
II. Net cash flows from investing activities		(832,190)	11,418	42,087
III. Net cash flows from financing activities		506,015	(21,685)	(28,342)
IV. Effect of movements in exchange rates on cash held		56,149	3	(41)
V. Classified as assets held for sale		(4,516)	-	-
VI. Net increase (decrease) in cash and cash equivalents		169,557	(755)	(126,353)
VII. Cash and cash equivalents at January 1		782,203	6,052	132,366
VIII. Cash and cash equivalents at December 31	₩	951,760	5,297	6,013

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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 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.

- 1) The Group has initially adopted 'Interest Rate Benchmark Reform – Phase 2' from January 1, 2021, which are amendments to K-IFRS No. 1109 'Financial Instruments', K-IFRS No. 1039 'Financial Instrument: Recognition and Measurement', K-IFRS No. 1107 'Financial Instruments: Disclosure', K-IFRS No. 1104 'Insurance Contract', K-IFRS No. 1116 'Lease'.

There is no significant effect of other amendments to the standards on the Group's consolidated financial statements commencing January 1, 2021. The Group has retrospectively applied the Interest Rate Benchmark Reform – Phase 2 amendments.

In accordance with the exceptions permitted in the Phase 2 amendments, the Group has elected not to restate comparatives for the prior periods to reflect the application of these amendments. There is no impact on the opening balance of retained earnings as a result of retrospective application.

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

- Proceeds before Intended Use (K-IFRS No. 1016 'Property, Plant and Equipment'): the amendments clarify the accounting treatment for any proceeds from selling items produced while the Group is preparing the asset for its intended use, and the costs of producing those items
- Onerous Contract: Cost of fulfilling a contract (K-IFRS No. 1037 'Provisions, Contingent Liabilities and Contingent Assets'): the amendments clarify the direct costs include both the incremental costs and an allocation of other costs directly related to fulfilling contracts when assessing whether the contract is onerous
- Reference to the Conceptual Framework (K-IFRS No. 1103 'Business Combinations'): the amendments update a reference of definition of assets and liabilities to be recognized in a business combination and add an exception for the recognition of liabilities and contingent liabilities
- Classification of Liabilities as Current or Non-current (K-IFRS No. 1001 'Presentation of Financial Statements'): the amendments clarify that liabilities are classified as either current or non-current, depending on the substantive rights that exist at the end of the reporting period. Also, the amendments provide guidance on how to apply the concept of materiality to accounting policy disclosures
- Definition of Accounting Estimates (K-IFRS No. 1008 'Accounting policies, changes in accounting estimates and errors'): the amendments define accounting estimates and clarify how to distinguish them from changes in accounting policies

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- Deferred Tax related to Assets and Liabilities arising from a Single Transaction (K-IFRS No. 1012 'Income Taxes'): the amendments include an additional condition to the exemption to initial recognition of an asset or liability that a transaction does not give rise to equal taxable and deductible temporary differences at the time of the transaction
- New Standard (K-IFRS No.1117 'Insurance Contract'): the standard estimates future cash flows of an insurance contract and measures insurance liabilities using discount rates applied with assumptions and risks at the measurement date
- Annual improvements to K-IFRS 2018-2020
 - K-IFRS No. 1101 'First time Adoption of Korean International Financial Reporting Standards': Subsidiaries that are first-time adopters
 - K-IFRS No. 1109 'Financial Instruments': Fees related to the 10% test for derecognition of financial liabilities
 - K-IFRS No. 1116 'Leases': Lease incentives

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 on December 31, 2021. 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.

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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.

(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 presented after deducting accumulated impairment losses.

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.

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.

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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.

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 is 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, ① the 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. ② Income and expense items are translated using the average exchange rates for the period, unless exchange rates fluctuated significantly during that period, in which the exchange rates at the dates of the transactions are used. ③ Exchange 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.

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(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.

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.

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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.

Portfolio of financial assets that meet the definition of trading or which performance is evaluated on a fair value basis is measured at FVTPL.

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.

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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.

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.

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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.

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.

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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.

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. After initial recognition, the land is stated as fair value at revaluation date less accumulated impairment loss. The revaluation is performed periodically to ensure that carrying value of the asset does not differ materially from its fair value at the end of reporting period. 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 are capitalized only if it is highly probable that future economic benefits associated with the assets will flow into the Group.

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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	3~33 years
Others	1~15 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 of 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 an 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).

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	5~20 years
Others	1~20 years

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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 loss 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.

However, useful lives of other intangible assets, 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.

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(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 or sale. Financial assets, inventories that are manufactured in short-term or produced by other method, and assets available for their intended use or sales at the time of acquisition are not eligible for qualifying assets.

Where funds are borrowed specifically, costs eligible for capitalization are the actual costs incurred less any income earned on the temporary investment of such borrowings. Where funds are part of a general pool, the eligible amount is determined by applying a capitalization rate to the expenditure on that asset. The capitalization rate will be the weighted average of the borrowing costs (excluding special purposed borrowing in order to acquire qualifying assets) applicable to the general pool. The borrowing costs eligible for capitalization cannot exceed actual amount of borrowing costs incurred for the reporting period.

(14) Impairment of non-financial assets

The carrying amounts of the Group's non-financial assets other than contract assets recognized for revenue arising from contracts with a customer, assets recognized for the costs to obtain or fulfill a contract with a customer, employee benefits, inventories, deferred tax assets, and non-current assets held for sale are reviewed at the end of the reporting period to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Goodwill and intangible assets that have indefinite useful lives or that are not yet available for use, irrespective of whether there is any indication of impairment, are tested for impairment annually by comparing their recoverable amounts to their carrying amounts.

The Group estimates the recoverable amount of an individual asset, and if it is impossible to measure the individual recoverable amount of an asset, the Group estimates the recoverable amount of cash-generating unit ("CGU"). A CGU is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets. The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. The value in use is estimated by applying a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU for which estimated future cash flows have not been adjusted, to the estimated future cash flows expected to be generated by the asset or CGU.

An impairment loss is recognized in profit or loss to the extent the carrying amount of the asset exceeds its recoverable amount.

Goodwill acquired in a business combination is allocated to each CGU that is expected to benefit from the synergy arising from the business acquired. Any impairment identified at the CGU level will first reduce the carrying amount of goodwill and then be used to reduce the carrying amount of the other assets in the CGU on a pro rata basis. Except for impairment losses in respect of goodwill which are never reversed, an impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortization, if no impairment loss had been recognized.

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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 is 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.

Transaction costs related to a compound financial instrument are allocated to the liability and equity components in proportion to the allocation of proceeds.

(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 qualified 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.

The Group assumes that the interest rate benchmark on which the hedged cash flows and/or hedged risk are based, or the interest rate benchmark on which the cash flows of the hedging instrument are based, is not altered as a result of the interest rate benchmark reform when uncertainty arises in assessment of the economic relationship between the hedged item and the hedging instrument.

To determine whether the hedged cash flows are expected to occur, the Group shall assume that the interest rate benchmark on which the hedged cash flows are based is not altered as a result of the interest rate benchmark reform. To determine for relationship once designated as cash flow hedging accounting whether discontinued cash flow hedging accounting is expected to occur, the Group shall assume that the interest rate benchmark on which the hedged cash flows are based is not altered as a result of the interest rate benchmark reform.

The Group has applied the reliefs in relation to the following hedge accounting, provided under the Phase 2 amendments.

- when the uncertainty arising from the report is no longer present;
- when hedging relationship is discontinued

When modification related with hedged item and/or hedging instrument is made and uncertainty no longer arises on the interest rate benchmark which the hedged cash flows and/or hedged risk are based, or the interest rate benchmark which the cash flows of the hedging instrument are based, the Group changes the official designation of hedging relationship documented in the past to reflect the changes required by the interest rate benchmark reform.

The Group will amend the documentation to reflect the changes to the hedged risk, hedged item and/or hedging instrument as result of the interest rate reform until the end of the reporting period. These amendments of hedge documentation would not require discontinuing the hedging relationships.

When modification on the financial assets or liabilities designated as a hedging relationship or additional modification on designation of hedging relationship are made as a result of interest rate benchmark reform, the Group shall determine whether hedging accounting is no longer applicable and if the hedging accounting continues to be applied, the Group changes the official designation of hedging relationship documented in the past to reflect the changes required by the interest rate benchmark reform.

When modification of hedged item is made on hedging document to reflect the changes required by the interest rate benchmark reform, the amount accumulated in the cash flow hedge reserve shall be deemed to be based on the alternative benchmark rate.

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For a discontinued hedging relationship, when the interest rate benchmark on which the hedged future cash flows had been based is changed as required by interest rate benchmark reform, for the purpose to determine whether the hedged future cash flows are expected occur, the amount accumulated in the cash flow hedge reserve shall be deemed to be based on the alternative benchmark rate.

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 conditions have 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. Under K-IFRS No. 1115, the Group recognized the gross amount expected to be refunded to the customer as a contract liability (refund liability) when customers return the products.

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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). 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, 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. 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 using the input method

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 initiates
- 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

When contract costs incurred to date plus recognized profits less recognized losses exceed progress billing, the surplus is shown as amounts due from customers for contract work. For contracts where progress billings exceed contract costs incurred to date plus recognized profits less recognized losses, the surplus is shown as the amounts due to customers for contract work. Amounts received before the related work is performed are included in the separate statement of financial position, as a liability, as advances received. Amounts billed for work performed but not yet paid by the customer are included in the consolidated statement of financial position under trade receivables.

(28) Government grants

Government grants are recognized only when there is reasonable assurance that the grant will be received and the Group will comply with the conditions associated with 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) Assets held for sale

Non-current assets and disposal groups are classified as assets 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 Gas Emission Right

In connection with Enforcement of Allocation and Trading of Greenhouse Gas Emissions Allowances, the Group applies the following accounting policies for greenhouse gas emissions rights and obligations.

1) Greenhouse gas emissions rights

Greenhouse gas emissions rights consist of the allowances received free of charge from the government and the ones purchased. The allowances received free of charge from the government are measured and recognized at zero, and emissions rights purchased are recognized at acquisition cost by including expenditures arising directly from the acquisition and any other costs incurred during normal course of the acquisition.

Greenhouse gas emissions rights are held by the Group to fulfill the legal obligation and recorded as intangible assets. To the extent that the portion to be submitted to the government within one year from the end of reporting period, the greenhouse gas emissions rights are classified as current assets. Greenhouse gas emissions rights recorded as intangible assets are initially measured at cost and substantially remeasured at cost less accumulated impairment losses.

Greenhouse gas emissions rights with the intention to sell within a short period are classified as current assets and measured at fair value, and changes in fair value are recognized in profit or loss for the year. Greenhouse gas emissions rights are derecognized on submission to the government or when no future economic benefits are expected from its use or disposal.

2) Greenhouse gas emissions obligations

Greenhouse gas emissions obligations are the Group's present legal obligation to submit the greenhouse gas emissions allowances to the government and measured as the sum of the carrying amount of the allocated rights and best estimate of expenditure required to settle the obligation at the end of the reporting period for any excess emission. The Group derecognizes the emission obligations when the Group submits the emissions rights to the government.

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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. The percentage of completion basis according to the input method requires the Group to estimate the ratio of actual costs incurred to total estimated 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.

(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.

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4. Financial risk management

The Group is exposed to various financial risks, such as market (foreign currency risk, interest rate risk and price 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.

(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 with the Group's policy on foreign currencies, and currency trading for speculative purposes is prohibited.

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, 2021 and 2020 are as follows:

(In millions of won)

		2021					
		USD	EUR	JPY	GBP	Others(*1)	Total
Financial assets	₩	1,250,580	149,330	6,869	120,232	780,612	2,307,623
Financial liabilities		1,462,346	554,678	40,280	119,319	562,434	2,739,057
Net assets (liabilities)	₩	(211,766)	(405,348)	(33,411)	913	218,178	(431,434)

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

(In millions of won)

		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.

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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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021		2020	
		10% increase	10% decrease	10% increase	10% decrease
Income before tax impact	₩	(43,143)	43,143	52,774	(52,774)

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, 2021 and 2020.

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, reduces borrowings with high interest rates, maintains an appropriate balance between borrowings with floating interest rate and fixed-interest rate and improves system for 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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021		2020	
Financial assets	₩		205,871		382,572
Financial liabilities			2,790,318		2,118,363
Net liabilities	₩		(2,584,447)		(1,735,791)

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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021		2020	
		1% increase	1% decrease	1% increase	1% decrease
Income before tax impact	₩	(25,844)	25,844	(17,358)	17,358

3) Price risk

The Group is exposed to equity price risks arising from its listed equity investments among financial instruments. 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.

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(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, beneficiary certificates, deposits in financial institutions, derivative financial instruments and financial guarantee contracts.

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, 2021 and 2020 are as follows:

(In millions of won)

		<u>2021</u>	<u>2020</u>
Cash and cash equivalents	₩	1,908,604	2,336,795
Short and long- term financial instruments		548,422	340,130
Trade receivables and other receivables		1,309,625	2,722,029
Deposits		363,656	488,311
Short and long- term investment in securities (excluding equity securities)		396,796	438,325
Derivative financial assets		38,959	96,101
Total	₩	<u>4,566,062</u>	<u>6,421,691</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, 2021 and 2020 are as follows:

(In millions of won)

		2021					
		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	₩	649,268	83,856	29,791	36,245	335,618	1,134,778
Loans and other receivables		763,557	22,727	10,631	26,353	141,731	964,999
Accrued income		11,905	-	-	-	16,718	28,623
Lease receivables		5,522	-	-	-	-	5,522
Total	₩	<u>1,430,252</u>	<u>106,583</u>	<u>40,422</u>	<u>62,598</u>	<u>494,067</u>	<u>2,133,922</u>

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(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	₩	2,532,342	417,492	138,352	138,414	2,300,712	5,527,312

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 overwhelming 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, 2021 and 2020 are as follows:

(In millions of won)

		2021					
		Nominal cash flows according to contract					
Book value		Total	Less than 1 year	1-2 years	2-5 years	More than 5 years	
Principal on financial liabilities(*1)	₩	10,606,974	10,979,816	7,727,110	1,044,844	2,047,618	160,244
Interest on financial liabilities		-	326,279	176,160	65,125	84,695	299
Total	₩	10,606,974	11,306,095	7,903,270	1,109,969	2,132,313	160,543

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

(In millions of won)

		2020					
		Nominal cash flows according to contract					
Book value		Total	Less than 1 year	1-2 years	2-5 years	More than 5 years	
Principal 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.

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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, 2021 are described in Note 32.

(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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021	2020
Total liabilities (A)	₩	14,912,950	18,460,678
Total equity (B)		8,807,596	7,106,497
Debt-to-equity ratio (A/B)		169.32%	259.77%

5. Restricted financial assets

Details of restricted financial assets as of December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021	2020	Restrictions
Cash and cash equivalents	₩	6,188	79,425	Establishment of pledge related to financial loan and others
Short-term financial instruments		494,952	213,972	Establishment of pledge related to financial loan, Shared growth fund, Government R&D projects(*1), Price Return Swap ("PRS") deposit(*2), and others
Long-term financial instruments		26,422	622	Establishment of pledge related to financial loan, Deposits for maintenance of checking accounts, restricted cash related to government bidding, and others
Total	₩	527,562	294,019	

(*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.'s shares.

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6. Investments in securities

(1) Investments in securities as of December 31, 2021 and 2020 are as follows:

(In millions of won)

Description		2021	2020
Short-term investments in securities	Financial assets as measured at amortized cost	₩ -	98,203
	Financial assets as measured at FVOCI	-	158,701
	Financial assets as measured at FVTPL	197,197	11,358
	Subtotal	197,197	268,262
Long-term investments in securities(*1)	Financial assets as measured at amortized cost	-	15,332
	Financial assets as measured at FVOCI	15,517	4,821
	Financial assets as measured at FVTPL	286,193	906,356
	Subtotal	301,710	926,509
Total	₩ 498,907	1,194,771	

(*1) A portion of long-term investments in securities have been pledged as collateral for developers' project financing and others as of December 31, 2021 (See Note 33).

(2) Details of the Group's investments in securities as of December 31, 2021 and 2020 are as follows:

(In millions of won)

Description			2021	2020
Financial assets as measured at amortized cost	Debt securities	Government and corporate bonds and others	₩ -	113,535
Financial assets as measured at FVOCI	Non-marketable equity securities	AI Asilah Desalination Company and others	15,517	4,821
		Debt securities	-	158,701
	Subtotal	15,517	163,522	
Financial assets as measured at FVTPL	Marketable equity securities	Woori Financial Group Inc. and others	10,196	690,774
		Non-marketable equity securities	76,398	63,262
	Investment in guarantee cooperative	122,561	133,785	
	Beneficiary certificates	171,330	29,893	
	Debt securities	Valuegrowth Co., Ltd. and others	102,905	-
Subtotal		483,390	917,714	
Total		₩ 498,907	1,194,771	

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(3) Changes in financial assets as measured at fair value for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021					
		January 1	Acquisition	Disposal	Gain or loss on valuation	Others(*1)	December 31
Financial assets as measured at FVOCI	₩	163,522	1,932	(275,914)	16,686	109,291	15,517
Financial assets as measured at FVTPL		917,714	97,880	(182,381)	11,947	(361,770)	483,390
Total	₩	<u>1,081,236</u>	<u>99,812</u>	<u>(458,295)</u>	<u>28,633</u>	<u>(252,479)</u>	<u>498,907</u>

(*1) Includes changes in the scope of consolidation

(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	₩	<u>277,445</u>	<u>769,403</u>	<u>(35,697)</u>	<u>67,662</u>	<u>2,423</u>	<u>1,081,236</u>

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7. Trade and other receivables

(1) Trade and other receivables as of December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021			2020		
	Gross	Allowance for doubtful accounts	Book value	Gross	Allowance for doubtful accounts	Book value
Current assets:						
Trade receivables	₩ 1,134,764	(213,684)	921,080	3,221,422	(1,184,468)	2,036,954
Lease receivables	2,239	-	2,239	2,267	-	2,267
Other receivables	288,351	(80,726)	207,625	439,725	(202,887)	236,838
Accrued income	28,623	(12,588)	16,035	120,258	(73,915)	46,343
Short-term loans	136,927	(74,800)	62,127	310,470	(160,484)	149,986
Subtotal	1,590,904	(381,798)	1,209,106	4,094,142	(1,621,754)	2,472,388
Non-current assets:						
Long-term trade receivables	-	-	-	5,025	(56)	4,969
Lease receivables	2,281	-	2,281	5,796	-	5,796
Long-term other receivables	54,677	(1,142)	53,535	12,975	(4,148)	8,827
Long-term loans	483,492	(438,789)	44,703	1,344,376	(1,114,327)	230,049
Subtotal	540,450	(439,931)	100,519	1,368,172	(1,118,531)	249,641
Total	₩ 2,131,354	(821,729)	1,309,625	5,462,314	(2,740,285)	2,722,029

(2) Changes in allowance for doubtful accounts for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021					
	January 1	Provision for (reversal of) allowance	Write-off of uncollectible amounts	Changes in the scope of consolidation	Changes in foreign currency translation and others	December 31
Trade and other receivables:						
Trade receivables	₩ 1,184,524	13,302	(2,085)	(1,002,362)	20,305	213,684
Other receivables	207,035	7,096	(12,883)	(115,871)	(3,509)	81,868
Accrued income	73,915	529	(10,528)	(51,328)	-	12,588
Short and long-term loans	1,274,811	40,030	(165,921)	(616,507)	(18,824)	513,589
Subtotal	2,740,285	60,957	(191,417)	(1,786,068)	(2,028)	821,729
Others:						
Due from customers for contract work	82,701	(307)	-	(18,947)	(3,877)	59,570
Deposits	2,753	1,016	(408)	(571)	10	2,800
Prepayments	1,061	-	(109)	(952)	-	-
Subtotal	86,515	709	(517)	(20,470)	(3,867)	62,370
Total	₩ 2,826,800	61,666	(191,934)	(1,806,538)	(5,895)	884,099

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		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		<u>2,742,449</u>	<u>198,773</u>	<u>(205,874)</u>	<u>4,937</u>	<u>2,740,285</u>
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		<u>67,749</u>	<u>21,474</u>	<u>(1,688)</u>	<u>(1,020)</u>	<u>86,515</u>
Total	₩	<u>2,810,198</u>	<u>220,247</u>	<u>(207,562)</u>	<u>3,917</u>	<u>2,826,800</u>

8. Inventories

Inventories as of December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021			2020		
		Acquisition cost	Valuation allowance	Book value	Acquisition cost	Valuation allowance	Book value
Finished goods	₩	431,346	(31,870)	399,476	548,459	(38,505)	509,954
Merchandise		179,013	(11,199)	167,814	236,512	(23,036)	213,476
Semi-finished goods		22,178	-	22,178	99,577	(514)	99,063
Work-in-process		319,917	(23,170)	296,747	291,381	(10,795)	280,586
Raw materials		602,708	(28,527)	574,181	589,423	(34,922)	554,501
Supplies		26,136	(2,509)	23,627	22,456	(2,603)	19,853
Materials-in-transit		304,397	-	304,397	277,359	-	277,359
Unfinished houses		-	-	-	898	-	898
Sites		-	-	-	3,032	-	3,032
Total	₩	<u>1,885,695</u>	<u>(97,275)</u>	<u>1,788,420</u>	<u>2,069,097</u>	<u>(110,375)</u>	<u>1,958,722</u>

As of December 31, 2021, certain inventories have been pledged as collateral for the Group's debts (See Note 33).

Loss on inventory valuation recognized within the cost of sales amounted to ₩14,381 million for the year ended December 31, 2021 and reversal of loss on inventory valuation deducted from the cost of sales amounted ₩3,046 million for the year ended December 31, 2020.

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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
	Borrowing denominated in foreign currencies	Designating borrowings denominated in foreign currencies as hedging instruments to hedge the fair value change of firm commitments
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
	Currency rate swap ("CRS")	Foreign currency swap to hedge future cash flow
	Interest rate swap ("IRS")	Contracts that pay a fixed rate and receive 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
	Currency rate swap	Contracts that pay a fixed rate of local currency and receive a fixed rate of foreign currency on the future interest and principal payment date in order to avoid the cash flow risk due to fluctuations in exchange rate, but did not apply hedging accounting.
	PRS	Derivative contracts for the purpose of trading that settles the difference in the stock price between the time of sales and time of settlement

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, 2021 and 2020 are as follows:

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

				2021				
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	Amounts	Currency	Amounts					
Forward exchange:								
KRW	2,093,011	USD	1,845,091 ₩	(94,934)	(125,891)	(813)	56,760	
KRW	225,045	EUR	164,330	2,103	1,689	74	(1,061)	
KRW	127,630	JPY	11,211,370	9,055	1,906	375	(4,352)	
KRW	213,437	Others		(4,956)	(4,772)	(246)	2,175	
USD	366,101	KRW	423,902	10,639	15,698	3,561	(2,296)	
EUR	259,550	KRW	354,471	(1,401)	(1,213)	1,112	(17)	
JPY	13,533,707	KRW	165,237	(22,108)	(1,042)	(6,057)	117	
Others		KRW	79,971	1,495	246	1,307	(117)	
GBP and others		EUR and others		(16,795)	46,428	1,561	(261)	
Short and long-term borrowings denominated in foreign currencies(*3)								
KRW	-	USD	-	-	-	-	49	
CRS				13,355	31,772	(332)	-	
PRS(*4)				(106,968)	(106,968)	-	-	
	Subtotal			(210,515)	(142,147)	542	50,997	
Tax effect				-	-	301	-	
Adjustments for consolidation				-	-	15,337	-	
Total				₩	(210,515)	(142,147)	16,180	50,997

(*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 amounting to ₩16,180 million, net of tax, was recognized in accumulated other comprehensive income or loss.

(*2) In consideration of the amounts adjusted in revenue, firm commitments assets of ₩66,770 million and firm commitment liabilities of ₩15,773 million were recognized in the consolidated statement of financial position by applying a fair value hedge accounting.

(*3) The Group designated its short 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.'s shares.

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(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				
Forward exchange:							
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)
Short and long-term borrowing denominated in foreign currencies(*3)							
KRW	-	USD	-	-	-	-	36
CRS				(43,774)	-	6,536	-
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 amounting to ₩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 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.'s shares.

(3) Put option granted for financial investors

During 2019 and 2021, 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 regulatory certification in relation to the preferred shares (USD 74.8 million) acquired by NuScale Korea and others.

The Group classifies these option contracts as derivative financial instruments. As of December 31, 2021, 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, 2021 and 2020 are as follows:

(In millions of won)

		2021					
		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) ₩		1,908,604	-	-	-	1,908,604	1,908,604
Short and long-term financial instruments(*2)		548,422	-	-	-	548,422	548,422
Short and long-term investment in securities(*2)		-	15,517	483,390	-	498,907	498,907
Derivative financial assets		-	-	17,280	21,679	38,959	38,959
Trade and other receivables		1,289,129	20,496	-	-	1,309,625	1,309,625
Deposits		363,656	-	-	-	363,656	363,656
Total	₩	4,109,811	36,013	500,670	21,679	4,668,173	4,668,173

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

(*2) The certain amount of above short-term financial instruments has been pledged as collateral for borrowings (See Note 33).

(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		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.

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(2) Financial liabilities as of December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021				
		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	₩	2,294,906	-	-	2,294,906	2,294,906
Borrowings and bonds		7,212,522	-	-	7,212,522	7,212,522
Derivative financial liabilities		-	122,009	127,465	249,474	249,474
Financial guarantee liabilities		-	-	4,019	4,019	4,019
Lease liabilities		381,187	-	-	381,187	381,187
Others		915,543	-	-	915,543	915,543
Total	₩	10,804,158	122,009	131,484	11,057,651	11,057,651

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

(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.

(3) Fair value hierarchy of financial instruments

As of December 31, 2021, 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.

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

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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.
- other financial techniques such as discounted cash flow analysis.

The level of fair value measurements of financial instruments as of December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021			
		Level 1	Level 2	Level 3	Total
Financial assets measured at fair value:					
Measured at FVOCI	₩	-	20,496	15,517	36,013
Measured at FVTPL		10,196	217,657	272,817	500,670
Others		-	21,679	-	21,679
Total	₩	<u>10,196</u>	<u>259,832</u>	<u>288,334</u>	<u>558,362</u>
Financial liabilities measured at fair value:					
Measured at FVTPL	₩	-	122,009	-	122,009
Others		-	127,465	4,019	131,484
Total	₩	<u>-</u>	<u>249,474</u>	<u>4,019</u>	<u>253,493</u>

(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	₩	<u>690,774</u>	<u>287,785</u>	<u>228,188</u>	<u>1,206,747</u>
Financial liabilities measured at fair value:					
Measured at FVTPL	₩	-	20,260	-	20,260
Others		-	112,116	24,911	137,027
Total	₩	<u>-</u>	<u>132,376</u>	<u>24,911</u>	<u>157,287</u>

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Assumptions used for the measurement of financial assets at fair value based on level 3 valuation techniques as of December 31, 2021 are as follows:

	Valuation techniques	Discount rate	Note
Incheon-Gimpo Expressway Co.	Estimated sales price valuation method	-	Expected sales price
Gyeonggi East-West Beltway Co.	Dividend discount model	5.35%	Expected dividend cash flow for each financial period
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
Engineering Guarantee Insurance	Estimated sales price valuation method	-	Expected sales price
Construction Industry Guarantee	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 Ventures	Estimated sales price valuation method	-	Return rate on investment
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
Valuegrowth Co., Ltd.	Dividend discount model	7.74%	Expected dividend cash flow for each financial period
Others	Estimated sales price valuation method, etc.	-	Expected sales price and others

Changes in financial assets included in level 3 of the fair value hierarchy for the years ended December 31, 2021 and 2020 are summarized as follows and there is no transfer between levels of the fair value.

(In millions of won)

		2021						
		January 1	Acquisition	Disposal	Profit (loss) for the year	Other comprehensive income (loss)	Others(*1)	December 31
Financial assets as measured at FVOCI	₩	4,821	1,932	(13,947)	-	16,686	6,025	15,517
Financial assets as measured at FVTPL		223,367	55,851	(1,514)	26,809	-	(31,696)	272,817
Total	₩	228,188	57,783	(15,461)	26,809	16,686	(25,671)	288,334

(*1) It includes amounts due to consolidation scope changes and assets held for sale.

(In millions of won)

		2020						
		January 1	Acquisition	Disposal	Profit (loss) for the year	Other comprehensive income (loss)	Others	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)	-	423	223,367
Total	₩	197,895	66,949	(25,647)	(11,428)	(4)	423	228,188

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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, 2021 and 2020 are as follows:

(In millions of won)

		2021					
		Gain or loss					Other comprehensive income(*2,3)
	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	₩ 3,437	-	-	(12,799)	(993)	5	-
Measured at							
FVOCI	6,514	-	-	-	(4,943)	-	16,686
Measured at							
FVTPL	1,930	1,602	5,034	-	3,865	-	-
Total	₩ 11,881	1,602	5,034	(12,799)	(2,071)	5	16,686
Financial liabilities:							
Measured at							
amortized cost	₩ (284,577)	-	-	-	3,860	(322)	-
Others							
	(6,539)	-	-	-	-	(9,317)	-
Total	₩ (291,116)	-	-	-	3,860	(9,639)	-

(*1) The amounts in gain or loss on valuation exclude the gain or loss related with foreign exchange and derivatives.

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

(*3) In 2021, it includes the amounts reclassified to retained earnings.

(In millions of won)

		2020					
		Gain or loss					Other comprehensive loss(*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	₩ 9,003	-	-	(25,871)	(12,444)	-	-
Measured at							
FVOCI	4,829	-	-	-	66	-	(4)
Measured at							
FVTPL	247	574	79,262	-	(995)	-	-
Total	₩ 14,079	574	79,262	(25,871)	(13,373)	-	(4)
Financial liabilities:							
Measured at							
amortized cost	₩ (300,890)	-	-	-	(31,385)	-	-
Others							
	-	-	-	-	-	(14,322)	-
Total	₩ (300,890)	-	-	-	(31,385)	(14,322)	-

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

(*2) The amounts in other comprehensive 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, 2021 and 2020 are as follows:

(In millions of won)

		2021		
		Gain or loss on valuation	Gain or loss on settlement	Other comprehensive income (*1)
Derivatives measured at FVTPL	₩	(75,353)	223,232	-
Derivatives for fair value hedge		(134,621)	(2,562)	-
Derivatives for cash flow hedge		67,443	(53,617)	5,153
Total	₩	(142,531)	167,053	5,153

(*1) The amounts in other comprehensive income exclude deferred tax effect.

(In millions of won)

		2020		
		Gain or loss on valuation	Gain or loss on settlement	Other comprehensive loss (*1)
Derivatives measured at FVTPL	₩	21,126	(19,184)	-
Derivatives for fair value hedge		35,267	(3,054)	-
Derivatives for cash flow hedge		30,588	(2,260)	(9,742)
Total	₩	86,981	(24,498)	(9,742)

(*1) The amounts in other comprehensive loss exclude deferred tax effect.

Above gains or losses on financial instruments for the years ended December 31, 2021 and 2020 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, 2021 are as follows:

(In millions of won)

		Eligible for legal right to offset		
		Total assets (liabilities)	Offset amounts	Amounts after offset
Derivative financial assets	₩	25,624	(11,804)	13,820
Derivative financial liabilities		(124,670)	11,804	(112,866)

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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, 2021 and 2020 are as follows:

(In millions of won)

	Countries	Percentage of ownership (%)	Acquisition cost		Book value		
			2021	2020	2021	2020	
Associates:							
The HS-City Expressway(*3,4)	Korea	27.29	₩	9,578	9,578	-	3,081
Samcheok Blue Power Co., Ltd.(*1,2)	Korea	9.00		43,568	43,568	34,764	38,086
Daejung Offshore Wind Power Co., Ltd.	Korea	26.65		3,196	3,196	2,482	2,771
Hychangwon Co., Ltd.(*3,5)	Korea	21.10		5,000	3,000	4,995	2,810
ReCarbon, Inc.(*2)	USA	11.34		8,151	8,151	7,870	8,052
Doosan Property Co., Ltd.(*6,14)	Korea	49.90		53,216	53,216	75,684	52,361
DEC(*11,14)	Korea	46.35		317,666	-	317,666	-
Shinbundang Railroad Co., Ltd.(*12)	Korea	-		-	62,552	-	-
Kyunggi Railroad Co., Ltd.(*12)	Korea	-		-	7,067	-	-
Neo Trans Co., Ltd.(*12)	Korea	-		-	43	-	21,883
New Seoul Railroad Co., Ltd.(*12)	Korea	-		-	8,794	-	6,826
KIAMCO Kyunggi Railway Investment Private property investment trust(*12)	Korea	-		-	28,167	-	-
Incheon Fucell Co., Ltd.(*12)	Korea	-		-	4,700	-	2,999
Bitgoel Eco Energy Co., Ltd.(*12)	Korea	-		-	-	-	-
Daesan Green Energy Co., Ltd.(*2,7,8)	Korea	10.00		3,630	-	2,883	-
Prestolite Asia Ltd.(*9)	Korea	32.31		2,787	-	2,882	-
Ainstein AI, Inc(*2)	USA	9.09		2,360	2,360	2,291	2,176
StructionSite Inc.(*2,5)	USA	19.19		7,007	5,310	10,528	4,760
Potenit Co., Ltd.(*10)	Korea	-		-	5,334	-	-
Subtotal				456,159	245,036	462,045	145,805
Joint ventures:							
Doosan Babcock Blackcat W.L.L(*4)	Qatar	49.00		243	243	-	640
The Zenith holdings Ltd.(*13,14)	Korea	31.75		120,000	-	120,000	-
Tianjin Lovol Doosan Engine Co., Ltd.(*10)	China	-		-	28,163	-	16,327
Others(*10)	USA,etc	-		-	718	-	202
Subtotal				120,243	29,124	120,000	17,169
Total			₩	576,402	274,160	582,045	162,974

(*1) The Group's investments in the 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) The Group's investments in the investee have been pledged as collateral in connection with project financing (See Note 33).

(*4) Classified as assets held for sale in 2021 (See Note 36).

(*5) Additionally acquired in 2021.

(*6) During 2021, the business name of the entity is changed from DBC Co., Ltd. to Doosan Property Co., Ltd.

(*7) As an associate of DFC, which was converted into a subsidiary of the parent company in 2021, it was converted from other related parties of the group to the associate.

(*8) The Group's investments in the investee have been pledged as collateral for the investee's borrowings (See Note 33).

(*9) Transferred from the Group's other related party to associates as the entity is the associates of Doosan Industrial Vehicle Co., Ltd. which has been included in the scope of consolidation in 2021.

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(*10) During 2021, excluded from associates and joint-venture due to sales of DI.

(*11) During 2021, the Group loses its control over the entity and the entity is classified as associates from subsidiaries.

(*12) Excluded from associates of the Group since DEC has been excluded from the scope of consolidation in 2021.

(*13) Newly acquired in 2021

(*14) The Group's ownership interests have been pledged as collateral for the Group's borrowing (See Note 33).

(2) Changes in investment in associates and joint ventures for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021						
	January 1, 2021	Acquisition	Share of profit (loss)(*1)	Decrease in equity of associates	Increase (decrease) in the scope of consolidation	Others(*2)	December 31, 2021
Associates:							
The HS-City Expressway	₩ 3,081	-	(258)	-	-	(2,823)	-
Samcheok Blue Power Co., Ltd.	38,086	-	(3,322)	-	-	-	34,764
Daejung Offshore Wind Power Co., Ltd.	2,771	-	(289)	-	-	-	2,482
Hychangwon Co., Ltd.(*3)	2,810	2,000	185	-	-	-	4,995
ReCarbon, Inc.	8,052	-	688	(870)	-	-	7,870
Doosan Property Co., Ltd.	52,361	-	23,323	-	-	-	75,684
DEC	-	-	-	-	317,666	-	317,666
Shinbundang Railroad Co., Ltd.(*4)	-	-	-	-	-	-	-
Kyunggi Railroad Co., Ltd.(*4)	-	-	-	-	-	-	-
Neo Trans Co., Ltd.	21,883	-	4,314	-	(26,197)	-	-
New Seoul Railroad Co., Ltd.	6,826	-	(635)	-	(6,191)	-	-
KIAMCO Kyunggi Railway Investment Private property investment trust	-	-	-	-	-	-	-
Incheon Fucell Co., Ltd.	2,999	-	(331)	-	(2,668)	-	-
Bitgoel Eco Energy Co., Ltd.	-	3,480	-	-	(3,480)	-	-
Daesan Green Energy Co., Ltd.	-	-	(747)	-	3,630	-	2,883
Prestolite Asia Ltd.	-	-	95	-	2,787	-	2,882
Einstein AI, Inc	2,176	-	(77)	-	-	192	2,291
StructionSite Inc.	4,760	1,697	3,297	-	-	774	10,528
Potenit Co., Ltd.	-	-	-	-	-	-	-
Subtotal	145,805	7,177	26,243	(870)	285,547	(1,857)	462,045
Joint ventures:							
Doosan Babcock Blackcat W.L.L	640	-	(331)	-	-	(309)	-
The Zenith holdings Ltd.	-	120,000	-	-	-	-	120,000
Tianjin Lovol Doosan Engine Co., Ltd.	16,327	-	(1,929)	-	(15,480)	1,082	-
Others	202	-	1,448	-	(322)	(1,328)	-
Subtotal	17,169	120,000	(812)	-	(15,802)	(555)	120,000
Total	₩ 162,974	127,177	25,431	(870)	269,745	(2,412)	582,045

(*1) Share of profit (loss) of equity method includes profit(loss) from discontinued operations.

(*2) Others include transfers to held for sale and changes in foreign currency translation.

(*3) Share of profit (loss) of equity method investees was calculated as a 37.04% share on common stock basis.

(*4) An additional ₩2,237 million was recognized for share of loss of equity method on long-term investment.

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(In millions of won)

	2020					
	January 1, 2020	Acquisition (disposal)	Share of profit (loss)(*1)	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.(*2)	-	3,000	(190)	-	-	2,810
ReCarbon, Inc.(*3)	-	-	(956)	857	8,151	8,052
Doosan Property Co., Ltd.	52,830	-	(468)	(1)	-	52,361
Shinbundang Railroad Co., Ltd.(*4)	-	-	-	-	-	-
Kyunggi Railroad Co., Ltd.(*4)	-	-	-	-	-	-
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 Fucell 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 includes profit(loss) from discontinued operations.

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

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

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

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(3) The condensed financial information of the investees as of and for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021				
	Total assets	Total liabilities	Sales	Net Profit (loss)	Total comprehensive income (loss)
The HS-City Expressway	₩ 160,818	150,472	2,739	(945)	(945)
Samcheok Blue Power Co., Ltd.	2,301,783	1,620,752	-	(6,226)	(6,226)
Daejung Offshore Wind Power Co., Ltd.	5,335	1,769	-	(1,082)	(1,082)
Hychangwon Co., Ltd.	62,111	33,640	-	(1,521)	(1,521)
ReCarbon, Inc.	39,487	7,024	3,559	(6,159)	(6,159)
Doosan Property Co., Ltd.	154,409	5,074	1,366	47,135	47,029
DEC	1,858,901	1,303,488	1,398,624	7,263	9,243
Daesan Green Energy Co., Ltd.	264,617	203,921	88,147	(3,310)	(3,310)
Prestolite Asia Ltd.	13,492	4,571	8,921	294	294
Ainstein AI, Inc	2,504	1,402	4,082	(846)	(846)
Doosan Babcock Blackcat W.L.L	17,963	17,254	16,459	(653)	(653)
The Zenith holdings Ltd.	1,958,319	1,312,620	-	-	-

(In millions of won)

	2020				
	Total assets	Total liabilities	Sales	Net 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)
Doosan Property Co., Ltd.	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)
KIAMCO Kyunggi Railway Investment Private property investment trust	78,718	16	-	4	4
Incheon Fucell 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

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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 as of December 31 2021 and 2020:

(In millions of won)

Company	2021							Book value
	Net asset (a)	Equity ownership (%) (b)	Equity interest in the investee (axb)	Adjustment amount				
				Difference	Internal transaction	Others		
Associates:								
The HS-City Expressway	₩ 10,346	27.29	2,823	-	-	(2,823)	-	
Samcheok Blue Power Co., Ltd.(*1)	39,907	9.00	3,592	38,268	(7,096)	-	34,764	
Daejung Offshore Wind Power Co., Ltd.	3,566	26.65	950	1,532	-	-	2,482	
Hychangwon Co., Ltd.(*2)	11,601	37.04	4,297	-	698	-	4,995	
ReCarbon, Inc.	32,463	11.34	3,681	4,189	-	-	7,870	
Doosan Property Co., Ltd.	149,335	49.90	74,518	701	-	465	75,684	
DEC	555,413	46.35	257,434	60,232	-	-	317,666	
Daesan Green Energy Co., Ltd.	60,696	10.00	6,070	-	(3,187)	-	2,883	
Prestolite Asia Ltd.	8,921	32.31	2,882	-	-	-	2,882	
Ainstein AI, Inc	1,102	9.09	100	2,191	-	-	2,291	
Subtotal	873,350		356,347	107,113	(9,585)	(2,358)	451,517	
Joint ventures:								
Doosan Babcock Blackcat W.L.L	709	49.00	347	-	-	(347)	-	
The Zenith holdings Ltd.(*3)	318,137	31.75	101,009	18,991	-	-	120,000	
Subtotal	318,846		101,356	18,991	-	(347)	120,000	
Total	₩ 1,192,196		457,703	126,104	(9,585)	(2,705)	571,517	

(*1) Includes net assets other than hybrid bonds with equity shares

(*2) Includes net assets and equity ownership other than share on preferred stock.

(*3) Includes net assets other than goodwill and non-controlling interest of individual entities.

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Company	2020						
	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.(*1)	46,133	9.00	4,152	38,268	(4,334)	-	38,086
Daejung Offshore Wind Power Co., Ltd.	4,648	26.65	1,239	1,532	-	-	2,771
Hychangwon Co., Ltd.(*2)	5,622	18.52	2,811	-	(1)	-	2,810
ReCarbon, Inc.	8,369	16.09	1,347	6,560	-	145	8,052
Doosan Property Co., Ltd.	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 Ftucell Co., Ltd.	21,237	20.00	4,247	-	(1,248)	-	2,999
Subtotal	52,776		59,560	47,061	(5,583)	37,831	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	₩ 92,070		79,130	47,061	(7,997)	37,844	156,038

(*1) Includes net assets other than hybrid bonds with equity shares

(*2) Includes net assets and equity ownership other than share on preferred stock.

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12. Property, plant and equipment

(1) Changes in property, plant and equipment for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021						
	Land	Buildings and structures	Machinery	Others	Construction in progress	Right-of-use assets	Total
As of January 1, 2021	₩ 3,944,572	964,609	736,666	144,161	158,402	209,397	6,157,807
Acquisition/ capital expenditure	10,176	23,936	47,062	31,342	173,453	309,456	595,425
Transfer(*1)	(29,656)	20,097	64,077	9,896	(127,565)	(40,312)	(103,463)
Disposals(*2)	(5,960)	(8,093)	(9,477)	(4,317)	(765)	(10,062)	(38,674)
Depreciation	-	(62,290)	(163,191)	(37,727)	-	(90,746)	(353,954)
Impairment	-	(15)	(1,378)	-	-	-	(1,393)
Revaluation	247,686	-	-	-	-	-	247,686
Changes in the scope of consolidation	(806,376)	(251,569)	21,920	(61,221)	26,824	(81,785)	(1,152,207)
Changes in foreign currency translation and others	6,800	29,192	18,414	1,376	6,516	23,444	85,742
As of December 31, 2021	₩ 3,367,242	715,867	714,093	83,510	236,865	319,392	5,436,969
- Acquisition cost	₩ 1,847,075	1,528,855	2,459,513	391,563	273,987	439,338	6,940,331
- Accumulated depreciation and impairment	-	(812,988)	(1,745,420)	(308,053)	(37,122)	(119,946)	(3,023,529)
- Revaluation surplus	1,520,167	-	-	-	-	-	1,520,167

(*1) As of December 31, 2021, includes buildings and others classified as assets held for sale (See Note 36).

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

As of December 31, 2021, certain property, plant and equipment have been pledged as collateral for debts (See Note 33).

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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	₩ 3,944,572	964,609	736,666	144,161	158,402	209,397	6,157,807
- 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 classified as 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 assets held for sale and sold in 2020.

(2) Capitalized borrowing cost

Capitalized borrowing costs for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021	2020
Capitalized borrowing costs	₩ 747	2,117
Interest rate of borrowing costs	3.42%~4.00%	3.40%~3.97%

(3) Depreciation

Details of depreciation on property, plant and equipment for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021	2020
Cost of sales	₩ 230,705	209,204
Selling and administrative expenses	44,944	38,434
Research and development costs and others	4,974	5,221
Profit for the year from discontinued operation	73,331	129,934
Total	₩ 353,954	382,793

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(4) Revaluation of land

In order to determine the fair value of the land, the Group requested fair value evaluation to a recognized independent evaluation agency, and the revaluation date was October 31, 2021.

The fair value of the land was assessed based on the standard land price, and based on the principles of marketability and substitution, the trade cases where similarity is recognized in the neighborhood where the object is located are calculated and the ratification price is calculated by the comparison of transaction cases. The final appraisal was determined by reviewing the adequacy of the amounts calculated based on the standard quoted land prices.

The standard evaluation of the standard land price is based on the public land price of the comparative standard land located in the neighboring area. The price is determined by integrating price-forming factors such as demand and marketability. The other factors are determined by calculating the gap between targets and valuation precedents, taking into account the neighboring land price level and the real estate economic trends.

As of December 31, 2021, the carrying amount of the land measured by applying the cost model is ₩1,847,075 million. The fluctuations in accumulated other comprehensive income due to revaluation for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	2021	2020
As of January, 1	₩ 1,052,418	1,084,073
Increase of other comprehensive income by revaluation	246,873	18,990
Tax effect of other comprehensive income by revaluation	(58,647)	(5,918)
Transfer to retained earnings by disposal of land	(113,794)	(28,424)
Non-controlling interest and others	(14,439)	(16,303)
As of December, 31	₩ <u>1,112,411</u>	<u>1,052,418</u>

Profit on revaluation of lands amounted to ₩531 million after revaluation in 2021 is recognized in profit (loss) for the period.

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13. Intangible assets

(1) Changes in intangible assets for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021				Total
		Goodwill	Industrial property rights	Development costs	Other intangible assets	
As of January 1, 2021	₩	4,434,677	1,125,182	1,128,127	212,302	6,900,288
Increase		1,410,645	1,453	225,661	373,310	2,011,069
Internal development		-	-	206,438	-	206,438
Individual acquisition		-	1,184	-	27,974	29,158
Business combination		1,410,645	269	19,223	345,336	1,775,473
Decrease		-	(1,340)	(109,467)	(67,506)	(178,313)
Amortization		-	(1,331)	(109,467)	(64,438)	(175,236)
Disposal		-	(9)	-	(3,068)	(3,077)
Transfer to assets held for sale		-	-	(2)	(3,274)	(3,276)
Transfer to other assets		-	532	(4,537)	12,135	8,130
Changes in the scope of consolidation		(785,945)	(3,634)	(130,602)	(51,897)	(972,078)
Changes in foreign currency translation and others		194,942	64,430	7,633	8,349	275,354
Impairment loss		-	(9)	(25,014)	(171)	(25,194)
As of December 31, 2021	₩	5,254,319	1,186,614	1,091,799	483,248	8,015,980

As of December 31, 2021, certain intangible assets have been pledged as collateral for the Group's debts (See Note 33).

(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		21,096	3,963	238,670	40,519	304,248
Internal development		-	-	238,670	-	238,670
Individual acquisition		-	3,963	-	24,490	28,453
Business combination		21,096	-	-	16,029	37,125
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 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	₩	4,434,677	1,125,182	1,128,127	212,302	6,900,288

The carrying amounts of intangible assets with indefinite useful lives including goodwill and others as of December 31, 2021 and 2020 amounted to ₩6,472,615 million and ₩5,591,182 million, respectively.

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(2) Research and development costs

Research and development costs expensed as incurred for the years ended December 31, 2021 and 2020 amounted to ₩134,647 million and ₩114,332 million, respectively.

(3) Capitalized borrowing costs for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021	2020
Capitalized borrowing costs	₩	26,863	26,696
Interest rate of borrowing costs		3.42%~4.00%	3.40%~3.97%

(4) Details of amortization of intangible assets for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021	2020
Cost of sales	₩	75,187	103,650
Selling and administrative expenses		49,238	36,546
Research and development costs		-	27
Profit from discontinued operation		50,811	42,157
Total	₩	175,236	182,380

(5) Carrying amount of goodwill allocated to each CGU as of December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>			2021	2020
CGU				
DHI	DHI	₩	727,872	690,850
DI	DI(*1)		-	725,896
Doosan Bobcat Inc.	Doosan Bobcat Inc.		3,114,140	2,957,882
	Doosan Industrial Vehicle Co., Ltd.		329,309	-
DEC	DEC(*1)		-	60,049
DFC	DFC		1,082,998	-
		₩	5,254,319	4,434,677

(*1) Decreased due to changes in the scope of consolidation in 2021.

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, 2021 are as follows:

	DHI	Doosan Bobcat Inc.	Doosan Industrial Vehicle Co., Ltd.	DFC
Valuation methods	Fair value less costs to sell	Value in use	Value in use	Fair value less costs to sell
Major assumptions and estimation methods	Estimated at DHI's share price	Forecast growth rate: 1.50% Discount rate: 7.80%	Forecast growth rate: 1.00% Discount rate: 9.72%	Estimated at DFC's share price

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 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 is calculated by deducting the cost of disposal after adding a management right premium to the share price as of December 31, 2021, valuation date.

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(6) Details of development costs as of December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021		
	Description		Book value	Remaining amortization period(*1)
DHI	Large-sized Gas Turbine	₩	598,663	-
	Gas Turbine 7F Retrofit		43,967	-
	Mid-sized Gas Turbine Development Phase1		761	7.58 years
	Mid-sized Gas Turbine Development Phase2		30,081	-
	8MW Offshore Wind Power		34,666	-
Doosan Bobcat Inc.	Compact product development (relating to new models and emission regulations)(*2)		38,795	-
	Compact product development (relating to new models and emission regulations)(*2)		93,725	3.42 years
	Portable Power product development (relating to new models and emission regulations)(*2)		1,885	-
	Portable Power product development (relating to new models and emission regulations)(*2)		14,710	3.83 years
	Forklift product development (relating to new models and emission regulations)(*2)		9,065	-
	Forklift product development (relating to new models and emission regulations)(*2)		8,730	4.17 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.

(In millions of won)

		2020		
	Description		Book value	Remaining amortization period(*1)
DHI	Large-sized Gas Turbine	₩	518,802	-
	Gas Turbine 7F Retrofit		34,275	-
	Mid-sized Gas Turbine Development Phase1		861	8.58 years
	Mid-sized Gas Turbine Development Phase2		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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(7) Intangible assets for which an impairment loss has been recognized for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021					
Description	Acquisition cost	Impairment loss		Accumulated amortization	Book value	Method used to assess recoverability	
		Loss	Accumulated				
DHI	Development costs(*1)						
	3MW Class model	₩ 5,675	4,162	4,162	1,513	- Value in use	
	Wind Power up Solution (phase 1)	431	366	366	65	- Value in use	
	5.5MW Offshore Wind Power	19,009	19,009	19,009	-	- Value in use	
	Subtotal	25,115	23,537	23,537	1,578	-	
DI(*2)	Development costs						
	Development for DX12 Engine	3,943	1,220	1,220	1,803	- Value in use	
Doosan Bobcat Inc.	Industrial rights						
	Forklift control method and others	12	9	9	3	- Fair value	
	Development costs						
	Medium Frame GenV and others	5,163	257	5,163	-	- Fair value	
	Other intangible assets						
	DS Platform(software) and others	3,408	1,722	1,722	418	1,268 Fair value	
	Subtotal	8,583	1,988	6,894	421	1,268	
	Total	₩ 37,641	26,745	31,651	3,802	1,268	

(*1) The carrying amount is recognized as an impairment loss, as the value in use decreased due to changes in industry environment.

(*2) Impairment loss is recognized as profit (loss) from discontinued operation.

(In millions of won)

		2020					
Description	Acquisition cost	Impairment loss		Accumulated amortization	Book value	Method used to assess recoverability	
		Loss	Accumulated				
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 (Phase 2)	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	-	10,749 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 Value in use	
	Subtotal	18,569	6,471	8,789	2,706	7,074	
Cuvex	Other intangible assets						
	Condo memberships and others	434	5	5	340	89 Fair value	
	Total	₩ 238,317	167,313	189,031	31,374	17,912	

(*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 the carrying amount due to a decrease in value in use compared to the estimate at the time of development.

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(8) Reversal of impairment loss of intangible assets

Reversal of impairment loss of intangible assets for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	Description	Assets	2021		2020	
			Reversal of impairment loss	Method used to assess recoverability	Reversal of impairment loss	Method used to assess recoverability
DHI	Other intangible assets	Golf membership	₩ 85	Fair value	4,420	Fair value
DI(*1)	Other intangible assets	Golf membership	1,455	Fair value	4,538	Fair value
Cuvex	Other intangible assets	Condominium membership	11	Fair value	-	-
	Total		₩ 1,551		8,958	

(*1) Reversal of impairment loss is recognized as profit (loss) from discontinued operation in both 2021 and 2020.

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

For the years ended December 31, 2021 and 2020, item in the consolidated statements of profit or loss for which the Group recognized an impairment loss(reversal) are as follows:

(In millions of won)

	2021	2020
Other non-operating expenses	₩ 25,525	159,972
Other non-operating income	(96)	(4,420)
Profit (loss) from discontinued operation	(235)	2,802
Total	₩ 25,194	158,354

(10) Greenhouse gas emission permits and obligations

1) The emission permits that are received free of charge from the government as the 3rd planning period (from year 2021 to 2025) as of December 31, 2021 are as follows:

(In tons (tCO₂-eq))

	2021	2022	2023	2024	2025	Total
Free emission permits	260,526	260,526	260,526	258,086	258,086	1,297,750

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2) Changes in emission permits for the years ended December 31, 2021 and 2020 are as follows:

(In tons (tCO₂-eq), In millions of won)

	2021													
	2020		2021		2022		2023		2024		2025		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
As of January 1, 2021	457,918	₩ 3,000	362,203	-	362,203	-	362,203	-	358,811	-	358,811	-	2,262,149	3,000
Cancellation of free permits	(5,086)	-	-	-	-	-	-	-	-	-	-	-	(5,086)	-
Borrowing	(5,000)	-	5,000	-	-	-	-	-	-	-	-	-	-	-
Carried forward	(4,224)	-	4,224	-	-	-	-	-	-	-	-	-	-	-
Submission to the government	(300,762)	(365)	-	-	-	-	-	-	-	-	-	-	(300,762)	(365)
Sale	(142,846)	(2,635)	-	-	-	-	-	-	-	-	-	-	(142,846)	(2,635)
Changes in the scope of consolidation	-	-	(106,677)	-	(101,677)	-	(101,677)	-	(100,725)	-	(100,725)	-	(511,481)	-
As of December 31, 2021	-	₩ -	264,750	-	260,526	-	260,526	-	258,086	-	258,086	-	1,301,974	-

(In tons (tCO₂-eq), In millions of won)

	2020													
	2020		2021		2022		2023		2024		2025		Total	
	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
As of January 1, 2020	337,779	₩ -	362,203	-	362,203	-	362,203	-	358,811	-	358,811	-	2,142,010	-
Purchase	100,000	3,000	-	-	-	-	-	-	-	-	-	-	100,000	3,000
Borrowing	(6,898)	-	-	-	-	-	-	-	-	-	-	-	(6,898)	-
Carried forward	27,037	-	-	-	-	-	-	-	-	-	-	-	27,037	-
As of December 31, 2020	457,918	₩ 3,000	362,203	-	362,203	-	362,203	-	358,811	-	358,811	-	2,262,149	3,000

3) Details of emission obligations for the years ended December 31, 2021 and 2020 are as follows:

(in millions of won)

	2021	2020
Beginning balance	₩ 1,327	144
Addition (excess of emission permits held)	-	1,327
Used (submitted to the government)	(1,327)	(144)
Ending balance	₩ -	1,327

4) The estimate of greenhouse gas emissions as of December 31, 2021 was 245,000 tons (tCO₂-eq) and no emission liabilities are recognized as it is not expected to exceed the free emission permits.

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14. Lease

(1) Changes in the right-of-use assets for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021				
		Land	Building & structures	Machinery	Other tangible asset	Total
As of January 1, 2021	₩	15,902	167,152	4,496	21,847	209,397
Acquisition		1,916	282,216	9,095	16,229	309,456
Contract cancelation		-	(8,546)	(2)	(1,514)	(10,062)
Depreciation		(1,212)	(69,993)	(5,034)	(14,507)	(90,746)
Transfer to held for sale		-	(38,519)	-	(1,793)	(40,312)
Changes in scope of consolidation		(12,399)	(56,868)	(7,008)	(5,510)	(81,785)
Foreign currency differences and others		2,943	16,719	61	3,721	23,444
As of December 31, 2021	₩	<u>7,150</u>	<u>292,161</u>	<u>1,608</u>	<u>18,473</u>	<u>319,392</u>
- Acquisition cost	₩	8,241	384,391	3,331	43,375	439,338
- Accumulated depreciation		(1,091)	(92,230)	(1,723)	(24,902)	(119,946)

(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)
Transfer(*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	₩	<u>15,902</u>	<u>167,152</u>	<u>4,496</u>	<u>21,847</u>	<u>209,397</u>
- 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 assets held for sale in 2020.

(2) Changes in the lease liabilities for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021	2020
As of January 1	₩	238,330	256,538
Payment of lease		(111,137)	(102,526)
Acquisition		369,061	82,011
Contract cancelation		(11,319)	(7,067)
Interest expense		24,717	15,351
Transfer to held for sale		(41,813)	-
Changes in scope of consolidation		(103,397)	213
Foreign currency differences and others		16,745	(6,190)
As of December 31	₩	<u>381,187</u>	<u>238,330</u>

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(3) The depreciation of right-of-use assets by type of accounts for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		<u>2021</u>	<u>2020</u>
Cost of sales	₩	35,043	39,300
Selling and administrative expenses		31,978	25,396
R&D costs and others		586	635
Profit from discontinued operation		23,139	27,037
Total	₩	<u>90,746</u>	<u>92,368</u>

(4) The maturity of lease receivables and liabilities as of December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		<u>2021</u>				
		<u>Contractual nominal cash flow</u>				
		<u>Total</u>	<u>Less than 1 year</u>	<u>1-2 years</u>	<u>2-5 years</u>	<u>More than 5 years</u>
Lease receivables	₩	5,522	2,456	3,066	-	-
Lease liabilities		447,736	70,051	40,497	188,638	148,550

<i>(In millions of won)</i>		<u>2020</u>				
		<u>Contractual nominal cash flow</u>				
		<u>Total</u>	<u>Less than 1 year</u>	<u>1-2 years</u>	<u>2-5 years</u>	<u>More than 5 years</u>
Lease receivables	₩	9,419	2,503	2,999	3,365	552
Lease liabilities		269,922	70,529	47,923	95,906	55,564

(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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		<u>2021</u>	<u>2020</u>
Cost of sales	₩	14,739	8,956
Selling and administrative expenses		5,407	5,183
R&D costs and others		7	8
Profit from discontinued operation		3,296	5,151
Total	₩	<u>23,449</u>	<u>19,298</u>

The Group, as an intermediate lessor, recognized a lease income amounted to ₩2,726 million and ₩1,830 million from the sub-lease of right-of-use assets for the years ended December 31, 2021 and 2020, respectively.

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15. Investment properties

(1) Changes in the investment property for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021		
		Land	Buildings(*1)	Total
As of January 1, 2021	₩	52,685	29,252	81,937
Acquisition/ capital expenditure		714	50,840	51,554
Disposal		(6,878)	(5,787)	(12,665)
Depreciation		-	(7,781)	(7,781)
Changes in scope of consolidation		(10,893)	(29,614)	(40,507)
Others		397	(15)	382
As of December 31, 2021	₩	<u>36,025</u>	<u>36,895</u>	<u>72,920</u>
- Acquisition cost	₩	36,025	40,799	76,824
- Accumulated depreciation and impairment loss		-	(3,904)	(3,904)

(*1) During 2021, the sub-lease amount among the assets recognized according to the Bundang Doosan Tower contract signed with BUNDANG DOOSAN TOWER REIT Co., Ltd. is recognized as investment property.

(In millions of won)

		2020		
		Land	Buildings	Total
As of January 1, 2020	₩	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, 2020	₩	<u>52,685</u>	<u>29,252</u>	<u>81,937</u>
- 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.

(2) Rental incomes from investment properties for the years ended December 31, 2021 and 2020 are ₩12,066 million and ₩3,366 million, respectively.

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16. Bonds and borrowings

(1) Borrowings

1) Short-term borrowings as of December 31, 2021 and 2020 are as follows:

(In millions of won)

Type of borrowings	Borrower(*1)	Lender	Annual interest rate (%) as of			
			December 31, 2021	2021(*3)	2020	
Denominated in KRW	DHI	Korea Development Bank ("KDB") and others	2.00~6.39	₩	3,128,420	3,802,627
	DI	Korea EXIM Bank and others	-		-	516,994
	DEC	Construction Guarantee Cooperative	-		-	27,039
Denominated in foreign currencies	DHI	Woori Bank and others	0.15~9.65		758,857	608,073
	Doosan Bobcat Inc.	Korea EXIM Bank and others	1.36~4.98		21,206	-
	DI	KDB and others	-		-	405,740
		Disposal of receivables in foreign currency(*2)	-		-	8,106
Total				₩	<u>3,908,483</u>	<u>5,368,579</u>

(*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).

2) Long-term borrowings as of December 31, 2021 and 2020 are as follows:

(In millions of won)

Type of Borrowings	Borrower(*1)	Lender	Annual interest rate (%) as of			
			December 31, 2021	2021(*2)	2020	
Denominated in KRW	DHI	Korea EXIM Bank and others(*3)	1.13~4.45	₩	528,026	513,291
	Doosan Bobcat Inc.	KDB and others	3M GBP LIBOR +2.50		46,400	-
	DI	KDB and others	-		-	214,000
	DEC	KDB and others	-		-	75,000
	Cuvex	Woori Bank	3.69		20,000	-
Denominated in foreign currencies	DHI	Korea EXIM Bank and others	1.00~2.50 +0.50 or LIBOR		37,974	424,561
	Doosan Bobcat Inc.	Institutional investors and banks in the United States and others	1.36~8.00		1,358,742	728,461
	DI	Industrial and Commercial Bank of China and others	-		-	15,545
	Subtotal					<u>1,991,142</u>
Less: Current portion of long-term borrowings					(463,170)	(778,732)
Less: Discount on long-term borrowings					(11,053)	(9,091)
Total				₩	<u>1,516,919</u>	<u>1,183,035</u>

(*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).

(*3) The certain amount of of above long-term borrowings has been succeeded from spin-off and merger with DI (See Note 32).

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(2) Bonds

1) Details of bonds as of December 31, 2021 and 2020 are as follows:

(In millions of won)

	Annual interest rate (%) as of December 31,		2021	2020
	2021			
Public subscription bonds(*1,2)	1.00~5.88	₩	1,141,950	1,650,200
Private subscription bonds	4.30~4.50		105,500	591,100
Convertible bonds(*3)	2.81~2.87		23,374	33,900
Bonds with stock warrants	1.00		14,607	122,800
Subtotal			1,285,431	2,398,000
Add: Redemption premium			2,370	19,341
Less: Warrants adjustment			(201)	(20,766)
Less: Conversion rights adjustment			(1,299)	(2,985)
Less: Current portion of long-term bonds			(426,389)	(575,309)
Less: Discount on bonds			(11,655)	(18,121)
Long-term bonds		₩	848,257	1,800,160

(*1) The common shares of Doosan Bobcat Inc. have been pledged as collateral for public subscription bond in foreign currencies of the Company (See Note 33).

(*2) Partial of the above public subscription has been succeeded from spin-off and merger with DI (See Note 32).

(*3) It has been succeeded from spin-off and merger with DI (See Note 32).

2) Convertible bonds

Changes in the carrying amount of convertible bonds for year ended December 31, 2021 are as follows:

(In millions of won)

	January 1	Issuance / Redemption	Exercise / Amortization	Change in	December 31
				the scope of consolidatio n	
Convertible bonds	₩ 33,900	-	-	(10,526)	23,374
Redemption premium	2,326	-	-	(722)	1,604
Discount on bond	(188)	-	58	48	(82)
Conversion rights adjustment	(2,985)	-	926	760	(1,299)
Book value	₩ 33,053	-	984	(10,440)	23,597
Consideration for conversion rights (other capital surplus)	₩ 836	-	-	(76)	760

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(a) 59th convertible bonds issued by the Company

Issue date(*2)	Maturity Date	Coupon rate	YTM	Exercise period	Exercise price (in won)	Face value	Issuance value(*1)	Book value
July 1, 2021	June 8, 2023	2.87%	4.82%	2021.06.08~2023.05.08	₩9,190/share	₩1,655 million	₩1,641 million	₩1,667 million

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

(*2) Among the convertible bonds issued by DI on June 8, 2020, the bond has been succeeded to the Company from spin-off merger with DI on July 1, 2021.

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 Redemption at maturity

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

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.

(b) 60th convertible bonds issued by the Company

Issue date(*2)	Maturity Date	Coupon rate	YTM	Exercise period	Exercise price (in won)	Face value	Issuance value(*1)	Book value
July 1, 2021	August 3, 2023	2.81%	4.96%	2021.08.03~2023.07.03	₩10,840/share	₩21,719 million	₩21,584 million	₩21,930 million

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

(*2) Among the convertible bonds issued by DI on August 3, 2020, the bond has been succeeded to the Company from spin-off merger with DI on July 1, 2021.

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 Redemption at maturity

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

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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3) Bond with stock warrants

Changes in the carrying amount of bonds with stock warrants for the year ended December 31, 2021 are as follows:

(In millions of won)

		January 1	Issuance / Redemption	Exercise / Amortization	Change in the scope of consolidation	December 31
Bond with stock warrants	₩	122,800	(7,448)	(714)	(100,031)	14,607
Redemption premium		17,015	(739)	(89)	(15,421)	766
Discount on bond		(715)	-	277	419	(19)
Warrants adjustment		(20,766)	-	3,257	17,308	(201)
Book value	₩	118,334	(8,187)	2,731	(97,725)	15,153
Consideration for stock warrants rights (other capital surplus)	₩	93,101	-	(40,567)	(17,715)	34,819

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

Issue date	Maturity date	Coupon rate	YTM	Exercise period	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	₩15,153 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.

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, 2021, stock warrants were exercised in the amount pertaining to 22.11% of the principal amount of bond with stock warrants and 0.09% of the principal amount was substituted. The number of shares issued as a result of the exercise of the stock warrants was 7,412,157 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. Asset-backed borrowings as of December 31, 2021 and 2020 are as follows:

1) Short-term asset-backed borrowings

(In millions of won)

Company	Lender	Discount rate (%)		2021	2020
DEC	Shinyoung Securities and others	-	₩	-	59,814
	Less: Discount on short-term borrowings			-	(263)
	Total		₩	-	59,551

2) Long-term asset-backed borrowings

(In millions of won)

Company	Lender	Discount rate (%)		2021	2020
DHI	KDB and others	5.28	₩	49,600	287,200
	Less: Current portion of long-term borrowings			(49,304)	(236,759)
	Less: Discount on long-term borrowings			(296)	(1,338)
	Total		₩	-	49,103

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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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	2021	2020
Present value of defined benefit obligations	₩ 2,036,298	2,331,212
Fair value of plan assets(*1)	(1,495,801)	(1,609,787)
Defined benefit liabilities	₩ 540,497	721,425

(*1) Include employer contributions of ₩636 million and ₩917 million to the National Pension Service as of December 31, 2021 and 2020, respectively.

(2) Expenses recognized in consolidated statements of income (loss) for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	2021	2020
Current service cost	₩ 82,392	88,719
Net interest cost	15,663	19,641
Past service cost	(11,799)	1,440
Total	₩ 86,256	109,800

(3) Classification of expenses related to the employee benefit liability for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	2021	2020
Cost of sales	₩ 57,850	57,498
Selling and administrative expenses	8,251	19,401
Research and development costs	1,600	2,685
Profit from discontinued operations	18,555	30,216
Total	₩ 86,256	109,800

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(4) Changes in the present value of the defined benefit obligations for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	2021	2020
As of January 1	₩ 2,331,212	2,345,826
Current service costs	82,392	88,719
Past service costs	(11,799)	1,440
Transfer from related parties	4,203	1,286
Transfer to related parties	(5,310)	(4,415)
Interests	43,436	54,455
Remeasurement gain (loss) in OCI:		
Actuarial changes arising from changes in demographic assumptions	(1,880)	(5,420)
Actuarial changes arising from changes in financial assumptions	(111,903)	187,963
Others	198	(1,132)
Changes in the scope of consolidation	(256,146)	19,357
Contributions by plan participants	2,965	3,166
Benefits paid	(171,949)	(290,252)
Others	130,879	(69,781)
As of December 31	₩ 2,036,298	2,331,212

(5) Changes in the fair value of plan assets for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	2021	2020
As of January 1	₩ 1,609,787	1,671,562
Expected return on plan assets	27,773	34,814
Transfer from related parties	2,819	693
Transfer to related parties	(2,531)	(1,353)
Remeasurement gain (loss) in OCI	35,030	118,394
Contributions by plan participants	29,380	15,138
Contributions by employer	54,440	34,391
Benefits paid	(139,251)	(234,792)
National Pension Service	(26)	(360)
Changes in the scope of consolidation	(205,114)	15,064
Others	83,494	(43,764)
As of December 31	₩ 1,495,801	1,609,787

In relation to the defined benefit plans, the reasonable estimates of future employer contributions during the year 2022 amounts to ₩115,054 million. In addition, the actual return on plan assets for the years ended December 31, 2021 and 2020 amounts to ₩62,803 million and ₩153,208 million, respectively.

(6) The principal assumptions used in determining employee benefit obligation as of December 31, 2021 and 2020 are as follows:

	2021	2020
Discount rate	1.30%~6.80%	1.30%~7.39%
Future salary increase rate	0.80%~6.00%	0.00%~8.00%

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(7) Components of plan assets as of December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021	2020
Equity investments	₩	287,374	299,523
Government bonds		794,073	739,407
Trust funds and others		414,354	570,857
Total	₩	1,495,801	1,609,787

(8) Details of a sensitivity analysis on the defined benefit obligation for changes in the significant assumptions as of December 31, 2021 are as follows:

<i>(In millions of won)</i>		Amount	Ratio
Discount rate:			
1% increase	₩	(271,332)	(13.32%)
1% decrease		308,690	15.16%
Future salary increases:			
1% increase	₩	84,009	4.13%
1% decrease		(80,395)	(3.95%)

(9) The weighted average maturity of defined benefit obligations is approximately 14.24 years as of December 31, 2021.

(10) With regard to the defined contribution pension plans, the Group recognized expenses for the years ended December 31, 2021 and 2020 amounting to ₩29,908 million and ₩19,361 million, respectively.

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18. Provision

Changes in significant provisions for the years ended December 31, 2021 and 2020 are as follows:

		2021							
		January 1	Arising during the year	Unused amounts reversed	Utilized	Others(*1)	December 31	Less: Current	Non-current
Provisions for warranties	₩	462,995	179,385	(22,892)	(133,736)	(155,242)	330,510	(111,788)	218,722
Provisions for construction losses		129,950	20,918	(61,251)	-	4,692	94,309	(36,399)	57,910
Others(*2)		286,060	57,121	(83,452)	(45,032)	(6,542)	208,155	(172,271)	35,884
Total	₩	<u>879,005</u>	<u>257,424</u>	<u>(167,595)</u>	<u>(178,768)</u>	<u>(157,092)</u>	<u>632,974</u>	<u>(320,458)</u>	<u>312,516</u>

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

(*2) As of December 31, 2021, it includes ₩54,855 million in provisions related to guarantee the return of membership fees and other considerations.

		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	₩	<u>713,539</u>	<u>457,690</u>	<u>(42,386)</u>	<u>(180,527)</u>	<u>(69,311)</u>	<u>879,005</u>	<u>(508,536)</u>	<u>370,469</u>

(*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.

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.

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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 common shares issued as of December 31, 2021 and 2020 is 522,220,786 shares and 374,637,255 shares, respectively. The number of shares with limited voting rights under Korean Commercial Code as of December 31, 2021 and 2020 are 95,978 treasury shares and 14,329 treasury shares, respectively. The Company issued 47,843,956 new common shares in exchange for DFC's shares acquired through in-kind investment from Doosan Corp., and issued 83,399,437 and 16,340,138 new common shares respectively after spin-off and merger of DI's investment division and exercise of stock warrants.

Details in capital stock and Paid-in capital in excess of par value as of December 31, 2021 and 2020 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		
	Common shares	Preference shares	Common shares	Preference shares(*1)	Total	Common shares	Preference shares	Total
December 31, 2021	522,220,786	- ₩	2,611,103	64,522	2,675,625	1,234,457	-	1,234,457
December 31, 2020	374,637,255	- ₩	1,873,185	64,522	1,937,707	875,460	299,701	1,175,161

(*1) Redeemable convertible preference shares were purchased and retired using voluntary reserves before prior year, and there is no reduction in capital stock.

20. Capital surplus

Capital surplus as of December 31, 2021 and 2020 are summarized as follows:

(In millions of won)

	2021	2020
Paid-in capital in excess of par value	₩ 1,234,457	1,175,161
Asset revaluation surplus	-	594,262
Other capital surplus(*1)	630,626	892,791
Total	₩ 1,865,083	2,662,214

(*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.

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21. Other components of equity

(1) Other components of equity as of December 31, 2021 and 2020 are summarized as follows:

(In millions of won)

	2021		2020	
Treasury stock	₩	(2,135)		(152)
Stock options		1,103		772
Others		47,191		47,287
Total	₩	46,159		47,907

(2) Treasury stocks as of December 31, 2021 and 2020 are as follows:

(In millions of won except for share, In shares)

	2021		2020	
	Number of shares	Amount	Number of shares	Amount
Common shares	95,978	₩ 2,135	14,329	₩ 152

(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, 2021 are summarized as follows:

(In won, shares)

Grant date	Number of shares to be issued	Exercise period	Exercise price	Estimated fair value as of the grant date
Mar 30 2012	5,700	Mar 30 2015 ~ Mar 29 2022	₩ 66,800	₩ 16,337
Mar 29 2013	14,700	Mar 29 2016 ~ Mar 28 2023	44,900	10,860
Mar 28 2014	29,600	Mar 28 2017 ~ Mar 27 2024	34,550	7,948
Mar 30 2012(*1)	15,383	Mar 30 2015 ~ Mar 29 2022	32,576	17,458
Mar 29 2013(*1)	14,957	Mar 29 2016 ~ Mar 28 2023	22,935	12,383
Mar 21 2014(*1)	17,082	Mar 21 2017 ~ Mar 20 2024	19,867	9,402
Total	97,422			

(*1) It has been succeeded from spin-off and merger with DI during 2021.

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2) Change in the stock options for the year ended December 31, 2021 is summarized as follows:

<i>(In shares)</i> Grant date	Number of shares to be issued			
	January 1	Increase(*1)	Retired	December 31
Mar 25 2011	2,600	-	(2,600)	-
Mar 30 2012	8,400	15,383	(2,700)	21,083
Mar 29 2013	20,400	14,957	(5,700)	29,657
Mar 21 2014	-	17,082	-	17,082
Mar 28 2014	43,900	-	(14,300)	29,600
Total	75,300	47,422	(25,300)	97,422

<i>(In millions of won)</i> Grant date	Valuation			
	January 1	Increase	Retired	December 31
Mar 25 2011	₩ 64	-	(64)	-
Mar 30 2012	137	269	(44)	362
Mar 29 2013	222	185	(62)	345
Mar 21 2014	-	161	-	161
Mar 28 2014	349	-	(114)	235
Total	₩ 772	615	(284)	1,103

(*1) It has been succeeded from spin-off and merger with DI during 2021.

No compensation expenses are recognized for the years ended December 31, 2021 and 2020 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 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%
Mar 30 2012(*2)	3.80%	6.5 years	57.96%	0.44%
Mar 29 2013(*2)	2.57%	6.5 years	54.12%	0.21%
Mar 21 2014(*2)	3.27%	6.5 years	42.29%	0.00%

(*1) Based on a treasury bond yield rate following by the expected exercise period.

(*2) It has been succeeded from spin-off and merger with DI during 2021.

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22. Accumulated other comprehensive income

(1) Accumulated other comprehensive income as of December 31, 2021 and 2020 are summarized as follows:

(In millions of won)

	<u>2021</u>	<u>2020</u>
Loss on valuation of FVOCI	₩ (10,146)	(35,099)
Gain on valuation of derivative financial instruments	16,180	5,197
Change in equity of equity method investments	71	739
Gain on revaluation of assets	1,112,411	1,052,418
Loss on translation of foreign operations	(387,191)	(436,098)
Total	<u>₩ 731,325</u>	<u>587,157</u>

(2) Details of income taxes on OCI items directly reflected in equity as of December 31, 2021 and 2020 are as follows:

(In millions of won)

	<u>2021</u>		
	<u>Balance before tax</u>	<u>Tax effect</u>	<u>Balance after tax</u>
Loss on valuation of FVOCI	₩ (9,363)	(783)	(10,146)
Gain on valuation of derivative financial instruments	11,755	4,425	16,180
Change in equity of equity method investments	162	(91)	71
Gain (loss) on revaluation of assets	1,575,139	(462,728)	1,112,411
Loss on translation of foreign operations	(387,191)	-	(387,191)
Total	<u>₩ 1,190,502</u>	<u>(459,177)</u>	<u>731,325</u>

(In millions of won)

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

23. Retained earnings (accumulated deficits)

(1) Retained earnings (accumulated deficits) as of December 31, 2021 and 2020 are as follows:

(In millions of won)

	<u>2021</u>	<u>2020</u>
Legal reserve	₩ 83,026	138,118
Voluntary reserve	43,396	43,395
Undisposed accumulated deficit	646,813	(2,228,114)
Total	<u>₩ 773,235</u>	<u>(2,046,601)</u>

(2) There is no dividend for the years ended December 31, 2021 and 2020.

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24. Segment information

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

During 2021, the Group reorganized division as follows reflecting changes in all business segments other than investment division of DI and Doosan Fuel Cell's consolidated integration, and restated information of prior year.

<u>Business segment</u>	<u>Main products and services</u>
DHI	NSSS, BOP, Turbine, Seawater desalination plants and water treatment systems, Plants, Road constructing and others
DI(*1)	Internal combustion engines, various construction machinery, transport equipment and others
DBI(*2)	Small construction machinery and equipment, and others
DEC(*3)	Apartment building and others
DFC(*4)	Manufacture and sale of fuel cell, renewable energy business, and others
Others	Operation of resort and golf club

(*1) In 2021, all business segments other than investment division, which were sold to the outside during the current term, have been classified as a discontinued operation (See Note 37).

(*2) Includes Doosan Industrial Vehicle Co., Ltd. and its subsidiaries acquired by Doosan Bobcat Inc. in 2021 (See Note 38).

(*3) In 2021, DEC has been classified as discontinued operation since the Group loses its control over the entity (See Note 37).

(*4) In 2021, the Group acquired control over DFC and has included in the Group's scope of consolidation (See Note 38).

(2) Summarized financial information by reportable segments for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021				
	Sales	Intercompany sales(*1)	Net sales	Operating income (loss)	Net Profit (loss)
DHI	₩ 5,856,777	(255,487)	5,601,290	262,170	287,668
DI	2,708,747	(5,709)	2,703,038	239,653	(69,731)
DBI	5,816,200	(831)	5,815,369	595,338	385,889
DEC	1,398,624	(6,717)	1,391,907	83,321	7,263
DFC	309,429	-	309,429	17,674	12,955
Others	95,641	(14,053)	81,588	29,339	26,560
Subtotal	<u>16,185,418</u>	<u>(282,797)</u>	<u>15,902,621</u>	<u>1,227,495</u>	<u>650,604</u>
Attributed to:					
Discontinued operations	<u>(4,631,436)</u>	<u>12,426</u>	<u>(4,619,010)</u>	<u>(335,969)</u>	<u>43,337</u>
Consolidation adjustments	<u>(270,371)</u>	<u>270,371</u>	<u>-</u>	<u>(13,643)</u>	<u>(219,158)</u>
Attributed to:					
Continued operations	<u>₩ 11,283,611</u>	<u>-</u>	<u>11,283,611</u>	<u>877,883</u>	<u>474,783</u>

(*1) Intercompany sales include adjustment to discontinued operations of business segments of DI and DEC.

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(In millions of won)

		2020				
		Sales	Intercompany sales(*1)	Net sales	Operating income (loss)	Net Profit (loss)
DHI	₩	5,518,524	(228,259)	5,290,265	(544,586)	(1,638,024)
DI		3,648,001	(1,946)	3,646,055	264,641	39,316
DBI		4,282,058	-	4,282,058	393,753	245,589
DEC		1,891,692	(24,560)	1,867,132	37,241	(165,066)
Others		73,419	(26,522)	46,897	3,830	4,322
Subtotal		<u>15,413,694</u>	<u>(281,287)</u>	<u>15,132,407</u>	<u>154,879</u>	<u>(1,513,863)</u>
Attributed to:						
Discontinued operations		<u>(6,000,010)</u>	<u>39,115</u>	<u>(5,960,895)</u>	<u>(288,623)</u>	<u>149,695</u>
Consolidation adjustments		<u>(242,172)</u>	<u>242,172</u>	<u>-</u>	<u>(789)</u>	<u>675,417</u>
Attributed to:						
Continued operations	₩	<u>9,171,512</u>	<u>-</u>	<u>9,171,512</u>	<u>(134,533)</u>	<u>(688,751)</u>

(*1) Intercompany sales include adjustment to discontinued operations of business segments of DI and DEC.

(3) Summarized financial information on assets and liabilities by business segments as of December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021		2020	
		Assets	Liabilities	Assets	Liabilities
DHI	₩	17,642,568	11,149,879	14,543,223	10,066,379
DI(*1)		-	-	12,026,886	7,537,888
DBI		8,580,899	4,259,634	-	-
DEC		-	-	1,550,362	1,253,762
DFC		698,855	180,667	-	-
Others		415,344	116,214	307,707	106,780
Subtotal		<u>27,337,666</u>	<u>15,706,394</u>	<u>28,428,178</u>	<u>18,964,809</u>
Consolidation adjustments		<u>(3,617,120)</u>	<u>(793,444)</u>	<u>(2,861,004)</u>	<u>(504,131)</u>
Total	₩	<u>23,720,546</u>	<u>14,912,950</u>	<u>25,567,174</u>	<u>18,460,678</u>

(*1) Assets and liabilities as of 2020 include Doosan Bobcat Inc.'s assets and liabilities.

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25. Revenue

(1) Revenue for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021	2020
Revenue from contracts with customers			
Sales of goods	₩	6,125,510	4,410,230
Construction contracts		4,948,097	4,596,121
Others		191,687	142,981
Subtotal		<u>11,265,294</u>	<u>9,149,332</u>
Others			
Rental and others		86,386	40,966
Hedging losses		(68,069)	(18,786)
Subtotal		<u>18,317</u>	<u>22,180</u>
Total	₩	<u>11,283,611</u>	<u>9,171,512</u>

(2) In the following table, revenue for the years ended December 31, 2021 and 2020 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.

<i>(In millions of won)</i>		2021								
		DHI	DI	DBI	DEC	DFC	Others	Subtotal	Discontinued	Total
Primary geographical market										
Domestic	₩	2,391,867	1,190,309	205,016	1,356,094	309,429	56,098	5,508,813	(2,546,402)	2,962,411
Americas		223,407	237,129	4,201,830	-	-	25,490	4,687,856	(237,129)	4,450,727
Asia		1,520,615	870,821	157,390	35,813	-	-	2,584,639	(906,635)	1,678,004
Middle East		448,345	-	93,709	-	-	-	542,054	-	542,054
Europe		961,057	404,779	1,016,346	-	-	-	2,382,182	(928,844)	1,453,338
Others		55,999	-	141,078	-	-	-	197,077	-	197,077
Total	₩	<u>5,601,290</u>	<u>2,703,038</u>	<u>5,815,369</u>	<u>1,391,907</u>	<u>309,429</u>	<u>81,588</u>	<u>15,902,621</u>	<u>(4,619,010)</u>	<u>11,283,611</u>
Timing of revenue recognition										
At a point in time	₩	207,341	2,594,996	5,778,021	13,124	236,396	81,588	8,911,466	(2,608,121)	6,303,345
Over time		5,393,949	108,042	37,348	1,378,783	73,033	-	6,991,155	(2,010,889)	4,980,266
Total	₩	<u>5,601,290</u>	<u>2,703,038</u>	<u>5,815,369</u>	<u>1,391,907</u>	<u>309,429</u>	<u>81,588</u>	<u>15,902,621</u>	<u>(4,619,010)</u>	<u>11,283,611</u>

<i>(In millions of won)</i>		2020								
		DHI	DI	DBI	DEC	Others	Subtotal	Discontinued	Total	
Primary geographical market										
Domestic	₩	2,438,137	1,459,121	29,375	1,775,881	39,482	5,741,996	(3,218,061)	2,523,935	
Americas		195,607	267,879	3,227,183	31,540	7,415	3,729,624	(299,420)	3,430,204	
Asia		1,494,772	1,466,960	127,811	55,811	-	3,145,354	(1,522,770)	1,622,584	
Middle East		374,170	-	80,026	-	-	454,196	-	454,196	
Europe		748,245	450,524	728,321	3,900	-	1,930,990	(919,073)	1,011,917	
Others		39,334	1,571	89,342	-	-	130,247	(1,571)	128,676	
Total	₩	<u>5,290,265</u>	<u>3,646,055</u>	<u>4,282,058</u>	<u>1,867,132</u>	<u>46,897</u>	<u>15,132,407</u>	<u>(5,960,895)</u>	<u>9,171,512</u>	
Timing of revenue recognition										
At a point in time	₩	254,929	3,427,065	4,237,721	34,978	46,897	8,001,590	(3,429,755)	4,571,835	
Over time		5,035,336	218,990	44,337	1,832,154	-	7,130,817	(2,531,140)	4,599,677	
Total	₩	<u>5,290,265</u>	<u>3,646,055</u>	<u>4,282,058</u>	<u>1,867,132</u>	<u>46,897</u>	<u>15,132,407</u>	<u>(5,960,895)</u>	<u>9,171,512</u>	

(3) Contract balances

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The following table provides information about receivables, contract assets and contract liabilities from contracts with customers as of December 31, 2021 and 2020.

<i>(In millions of won)</i>		<u>2021</u>	<u>2020</u>
Receivables, which are included in 'trade and other receivables'	₩	1,171,819	2,340,739
Contract assets		1,750,115	1,866,873
Contract liabilities		1,707,778	2,048,854

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.

(4) Changes in transaction price for construction contract allocated to the performance obligations satisfied over time for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		<u>2021</u>			
<u>Project name</u>		<u>January 1</u>	<u>Increase (Decrease)</u>	<u>Revenue recognized</u>	<u>December 31</u>
DHI	Vung Ang II Power Project and others	₩ 14,023,501	6,849,478	5,393,950	15,479,029
DEC	Bumil integrated district 3 and others	7,050,375	(5,669,260)	1,381,115	-
DFC	Operational services on consignment	-	1,465,338	73,033	1,392,305
DI	Extended warranty and others	27,286	80,756	108,042	-
DBI	Extended warranty and others	186,931	56,658	37,348	206,241
	Subtotal	<u>21,288,093</u>	<u>2,782,970</u>	<u>6,993,488</u>	<u>17,077,575</u>
	Internal transaction	(74,239)	71,906	(2,333)	-
	Attributed to: Discontinued operations	(8,110,003)	6,099,114	(2,010,889)	-
	Total	<u>₩ 13,103,851</u>	<u>8,953,990</u>	<u>4,980,266</u>	<u>17,077,575</u>

<i>(In millions of won)</i>		<u>2020</u>			
<u>Project name</u>		<u>January 1</u>	<u>Increase (Decrease)</u>	<u>Revenue recognized</u>	<u>December 31</u>
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	26,012	220,264	218,990	27,286
DBI	Extended warranty and others	284,857	(53,589)	44,337	186,931
	Subtotal	<u>21,811,396</u>	<u>6,613,600</u>	<u>7,136,903</u>	<u>21,288,093</u>
	Internal transaction	(73,879)	(6,446)	(6,086)	(74,239)
	Attributed to: Discontinued operations	(8,654,845)	(1,986,297)	(2,531,139)	(8,110,003)
	Total	<u>₩ 13,082,672</u>	<u>4,620,857</u>	<u>4,599,678</u>	<u>13,103,851</u>

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(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.

<i>(In millions of won)</i>	<u>2021</u>	<u>2020</u>
Incremental costs of obtaining a contract with a customer recognized as an asset	₩ 39,743	49,919
The amount of amortization recognized as cost of sales	12,699	26,087

An asset recognized in accordance with above shall be amortized on the same basis that revenue is recognized over time based on the percentage-of-completion of the specific contract concerned.

(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.

<i>(In millions of won)</i>	<u>2021</u>	<u>2020</u>
Costs incurred to fulfill a contract recognized as an asset	₩ 152,344	117,924
The amount of amortization recognized as cost of sales	28,125	63,248

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.

(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 provision for construction loss, changes in total contract revenue and in total estimated contract costs for construction contracts in progress as of December 31, 2021 are as follows:

<i>(In millions of won)</i>	<u>Provision for construction loss</u>	<u>Changes in total contract revenue</u>	<u>Changes in total contract cost</u>	<u>Effect on profit (loss) for the period</u>	<u>Effect on profit (loss) for the future</u>	<u>Changes in due from (to) customer for contract work</u>
DHI	₩ 94,309	732,210	463,545	237,759	30,906	237,759

Impacts on current and future profit (loss) were calculated based on total contract revenue and costs which were estimated based on the current circumstances as of December 31, 2021. Those estimations may change in the future.

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(8) As of December 31, 2021, 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, 2020 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)

	Contract date	Due date / Delivery date(*1)	Percentage-of-completion (%)	Due from customers for contract work		Trade receivables (receivables from construction contract)	
				Gross amounts	Accumulated impairment losses	Gross amounts	Allowance for doubtful accounts
Shingori #3,4 NSSS	Mar-09-07	Dec-31-21	99.86	₩ -	-	-	-
Shingori #5,6 NSSS	Jun-12-15	May-28-25	82.29	71,347	385	-	-
Namyangju Baekbong Apartment	Jun-23-17	Dec-31-21	100.00	-	-	-	-
Shinhanul #1,2 NSSS	Jul-31-09	May-31-22	98.77	7,440	40	-	-
UAE BNPP #1,2 T/G	Jun-30-10	Mar-01-22	94.42	-	-	-	-
UAE BNPP #1,2 NSSS	Jun-30-10	Dec-08-21	97.44	-	-	7,044	959
Shingori #5,6 NSSS	Aug-28-14	Mar-31-25	84.26	53,961	291	-	-
UAE BNPP #3,4 NSSS	Jun-30-10	Nov-30-23	95.51	25,808	139	1,811	-
UAE BNPP #3,4 T/G	Sep-27-11	Jun-30-24	92.69	-	-	-	-
Shinboryung #1, 2 Boiler	Oct-22-13	Feb-28-22	99.93	-	-	91	-
Vinh Tan 4 TPP	Feb-26-14	Oct-31-21	99.76	21,975	119	22,843	4,569
Gangneung Anin #1, 2 Boiler	Mar-31-15	Mar-15-23	87.66	-	-	2,106	6
Song Hau 1	Apr-10-15	Mar-31-22	94.19	86,581	468	-	-
Goseong Hai #1, 2 Boiler	Dec-27-16	Aug-15-22	97.04	-	-	-	-
Vinh Tan 4 Extension	Mar-10-16	Aug-31-21	99.64	-	-	5,397	954
Fadhili CHP	Nov-12-16	Oct-30-21	99.96	-	-	13	-
Samcheok #1,2 EPC	Jul-24-18	Apr-30-24	59.08	317,889	1,717	-	-
Van Phong 1	Aug-26-19	Dec-25-23	53.89	-	-	83	-
Yanbu ph.3 MSF	Dec-04-12	Dec-31-22	98.81	-	-	-	-
Shoaiba RO Ph.4	Mar-29-17	Dec-03-21	92.00	57,499	310	8,646	47
Suncheon Wangji 2	Apr-24-19	Jun-30-24	5.79	12,757	69	-	-
Yanbu 4 IWP	Jan-22-21	Nov-01-23	8.69	-	-	-	-
Dangjin 1st phase #1~4 storage tank	Jul-23-21	Dec-31-25	5.12	12,866	69	-	-
Vung Ang II Power Project	Oct-26-21	Oct-26-25	1.46	-	-	-	-
Nghi Son 2	Dec-24-14	Jul-10-22	87.91	66,888	254	31,062	102
Jawa #9,10	Mar-20-19	Feb-15-25	22.74	132,889	718	-	-
Jawaharpur	Dec-22-16	Apr-21-23	82.15	49,224	-	33,645	-
Obra C	Dec-22-16	Jun-20-23	71.54	-	-	10,476	-

(*1) Date being negotiated 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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		<u>2021</u>	<u>2020</u>
Changes in inventories	₩	(442,682)	195,767
Purchases of raw materials and goods		6,169,813	4,128,408
Salaries		1,520,875	1,535,665
Depreciation and amortization		433,952	364,220
Others		2,723,770	3,081,985
Total	₩	<u>10,405,728</u>	<u>9,306,045</u>

27. Selling and administrative expenses

Selling and administrative expenses for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		<u>2021</u>	<u>2020</u>
Salaries	₩	365,034	295,728
Severance and retirement benefits		9,589	19,134
Termination benefits		2,707	184,992
Employee welfare benefits		63,936	59,108
Travel		15,749	10,944
Training		7,448	5,438
Taxes and dues		16,131	10,302
Commissions		159,504	150,923
Sales commissions		18,869	5,225
Rents		6,573	3,575
Bad debt expenses		14,431	18,037
Transportation		6,951	4,400
Depreciation		48,644	38,931
Amortization		49,237	36,546
Research		127,389	108,054
Expansion expenses of overseas market		10,986	12,697
Advertising		51,017	39,811
Warranty		1,486	9,506
Provision for loss compensation (reversal)		(62,225)	92,100
Others		73,573	68,818
Total	₩	<u>987,029</u>	<u>1,174,269</u>

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28. Finance income and expenses

(1) Finance income for the years ended December 31, 2021 and 2020 are summarized as follows:

<i>(In millions of won)</i>		2021	2020
Interest income	₩	11,881	14,079
Dividend income		1,602	574
Gain on foreign currency transaction		111,448	119,404
Gain on foreign currency translation		108,591	111,268
Gain on settlement of derivative financial instruments		246,321	103,178
Gain on valuation of derivative financial instruments		101,457	115,026
Gain on valuation of firm commitments		121,534	10,454
Gain on financial guarantee		11	267
Gain on redemption of borrowing		3,859	-
Total	₩	<u>706,704</u>	<u>474,250</u>

(2) Finance expenses for the years ended December 31, 2021 and 2020 are summarized as follows:

<i>(In millions of won)</i>		2021	2020
Interest expenses	₩	284,577	300,889
Loss on foreign currency transaction		112,633	159,824
Loss on foreign currency translation		186,742	110,822
Loss on settlement of derivative financial instruments		79,268	127,677
Loss on valuation of derivative financial instruments		243,988	28,045
Loss on valuation of firm commitments		7,665	70,281
Payment of guarantee fee		68,164	56,309
Loss on redemption of bonds		-	31,385
Others		6,540	451
Total	₩	<u>989,577</u>	<u>885,683</u>

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29. Other non-operating income and expenses

(1) Other non-operating income for the years ended December 31, 2021 and 2020 are summarized as follows:

<i>(In millions of won)</i>	<u>2021</u>	<u>2020</u>
Gain on disposal of property, plant and equipment	₩ 1,692	895
Gain on disposal of assets held for sale	21,383	-
Reversal of impairment loss on intangible assets	96	4,420
Gain on valuation of short and long-term financial assets	21,882	85,529
Commissions income	1,713	3,610
Miscellaneous gain and others	19,330	18,589
Total	₩ <u>66,096</u>	<u>113,043</u>

(2) Other non-operating expenses for the years ended December 31, 2021 and 2020 are summarized as follows:

<i>(In millions of won)</i>	<u>2021</u>	<u>2020</u>
Loss on disposal of trade receivables	₩ 5,936	12,444
Loss on disposal of property, plant and equipment	1,590	640
Other bad debt expenses	2,560	11,905
Impairment loss of property, plant and equipment	1,435	36,123
Impairment loss of intangible assets	25,525	157,188
Impairment loss of assets held for sale	2,487	-
Loss on valuation of short and long-term investment in securities	31,274	8,993
Donations	2,715	3,067
Miscellaneous loss and others	38,199	112,019
Total	₩ <u>111,721</u>	<u>342,379</u>

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30. Income tax expense (benefit)

(1) The component of income tax expense (benefit) for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021	2020
Current income tax expense	₩ 157,777	120,371
Adjustments in respect of current income tax of prior year	3,358	14,241
Tax effect of temporary difference	337,568	(38,529)
Total income tax expense	<u>498,703</u>	<u>96,083</u>
Current income tax related to items recognized in equity during the year	(3,745)	(119,166)
Deferred tax related to items recognized in equity during the year	(168,785)	(1,967)
Income tax benefit related to discontinued operation	(151,999)	(68,641)
Others	(78,765)	(414)
Income tax expense (benefit)	<u>₩ 95,409</u>	<u>(94,105)</u>

(2) The component of income tax and deferred tax related to items recognized in equity for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021	2020
Loss on revaluation of assets	₩ (57,533)	(17,154)
Loss on valuation of FVOCI	(3,385)	1
Loss on valuation of derivative financial instruments	(3,065)	(295)
Remeasurements of defined benefit liabilities	(24,059)	9,728
Others	(84,488)	(113,413)
Total	<u>₩ (172,530)</u>	<u>(121,133)</u>

(3) Changes in deferred tax assets (liabilities) for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021		
	January 1	Change	December 31
Provision for retirement and severance benefits	₩ 226,113	(50,431)	175,682
Allowance for doubtful accounts	483,065	(182,401)	300,664
Property, plant and equipment	22,889	(51,033)	(28,144)
Reserve for research and human resource	-	(25,015)	(25,015)
Intangible assets	81,154	(550,753)	(469,599)
Derivative financial instruments	(9,983)	39,848	29,865
Foreign currency denominated assets	2,720	1,150	3,870
Gain (loss) on revaluation of assets	(684,349)	154,672	(529,677)
Others	(13,298)	326,395	313,097
Total	<u>₩ 108,311</u>	<u>(337,568)</u>	<u>(229,257)</u>

(In millions of won)

	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 (loss) on revaluation of assets	(671,230)	(13,119)	(684,349)
Others	(41,798)	28,500	(13,298)
Total	<u>₩ 69,782</u>	<u>38,529</u>	<u>108,311</u>

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(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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	<u>2021</u>	<u>2020</u>	
Deductible temporary differences	₩ 2,675,620	3,278,185	Uncertainty of future taxable income
Deferred accumulated deficit (After 2022)	214,584	1,928,639	Uncertainty of future taxable income
Deferred tax credit carried forward (Expires between 2026 and 2031)	35,173	27,533	Uncertainty of future taxable income
Total	₩ <u>2,925,377</u>	<u>5,234,357</u>	

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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	<u>2021</u>	<u>2020</u>
Investment in subsidiaries	₩ (436,391)	1,870,491
Investment in associates or joint ventures	1,737,016	-
Total	₩ <u>1,300,625</u>	<u>1,870,491</u>

(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, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	<u>2021</u>	<u>2020</u>
Profit (loss) before income tax	₩ 570,192	(782,856)
Income tax expense (benefit) using the statutory tax rate	179,734	(325,241)
Adjustments:		
Permanent differences	(95,429)	44,923
Unrecognized deferred tax related to temporary differences	(26,546)	149,178
Tax credit	(9,491)	(15,988)
Others	47,141	53,023
Income tax expense (benefit)	₩ <u>95,409</u>	<u>(94,105)</u>
Effective tax rate (Income tax benefit (expense)/ Profit (loss) before income tax)(*1)	16.73%	-

(*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. Earnings (loss) per share

(1) Basic earnings (loss) per share

Basic earnings (loss) per share attributable to the owners of the Company for the years ended December 31, 2021 and 2020 are as follows:

<i>(In won, except for share)</i>	<u>2021</u>	<u>2020</u>
Profit (loss) for the period attributable to the owners of the Company	₩ 495,274,322,486	(1,069,666,921,022)
Profit (loss) from continuing operations	276,071,826,655	(882,378,656,573)
Profit (loss) from discontinued operations	219,202,495,831	(187,288,264,449)
Weighted-average number of ordinary shares at the end of period	454,191,535 shares	250,006,947 shares
Earnings (loss) per share:		
Basic earnings (loss) per share	₩ 1,090	(4,279)
Continuing operations	₩ 608	(3,529)
Discontinued operations	482	(750)

Weighted-average number of common shares for the years ended December 31, 2021 and 2020 are as follows:

<i>(In shares)</i>	<u>2021</u>	<u>2020</u>
Issued ordinary shares at the beginning of the period(*1)	374,622,926	202,138,396
Acquisition of treasury stock	(37,072)	(4,731)
Disposition of treasury stock	300	-
Issuance of common shares	35,915,737	47,873,092
Exercise of bonds with stock warrants	6,217,021	190
Issuance of common shares related to spin-off and merger	37,472,623	-
Weighted-average number of ordinary shares at the end of period	<u>454,191,535</u>	<u>250,006,947</u>

(*1) The number of shares is net of treasury stocks.

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(2) Diluted earnings (loss) per share

Diluted earnings (loss) per share attributable to the owners of the Company for the years ended December 31, 2021 and 2020 are as follows:

<i>(In won, except for share)</i>	<u>2021</u>	<u>2020</u>
Profit (loss) for the period before adjustment	₩ 495,274,322,486	(1,069,666,921,022)
Add: Interest expense on redemption premium	70,059,146	-
Profit (loss) for the period after adjustment	495,344,381,632	(1,069,666,921,022)
Profit (loss) from continuing operations	276,141,885,801	(882,378,656,573)
Profit (loss) from discontinued operations	219,202,495,831	(187,288,264,449)
Weighted-average number of ordinary shares at the end of the period after adjustment	462,933,245 shares	250,006,947 shares
Diluted earnings (loss) per share	₩ <u>1,070</u>	<u>(4,279)</u>
Continuing operations	₩ 597	(3,529)
Discontinued operations	473	(750)

Weighted-average number of ordinary shares after adjustment for diluted earnings (loss) for the years ended December 31, 2021 and 2020 are as follows:

<i>(In shares)</i>	<u>2021</u>	<u>2020</u>
Weighted-average number of ordinary shares at the end of the period before adjustment	454,191,535	250,006,947
Adjustment: bonds with stock warrants	6,110,110	-
Adjustment: stock warrants	2,160,125	-
Adjustment: convertible bonds	471,475	-
Weighted-average number of ordinary shares at the end of the period after adjustment	<u>462,933,245</u>	<u>250,006,947</u>

Details of potential ordinary shares that are potentially dilutive but were not included in the calculation of earnings (loss) per share, as there were no dilutive effects for the years ended December 31, 2021 and 2020 are as follows:

<i>(In shares)</i>	<u>2021</u>	<u>2020</u>
Stock option (Mar 25, 2011)	-	2,600
Stock option (Mar 30, 2012)	21,083	8,400
Stock option (Mar 29, 2013)	29,657	20,400
Stock option (Mar 21, 2014)	17,082	-
Stock option (Mar 28, 2014)	29,600	43,900
Bonds with stock warrants	-	33,530,786
Total	<u>97,422</u>	<u>33,606,086</u>

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32. Commitments and contingencies

(1) Pledged check and others

As of December 31, 2021, 7 blank checks have been provided as collateral to relevant financial institutions and others for the Group's debt payment guarantee contract and fund replenishment agreement.

(2) Financial commitments

- 1) As of December 31, 2021, the Group has credit lines for borrowings, bank overdraft and others from financial institutions up to ₩7,256,147 million and used ₩3,163,040 million, with unused credit lines amounting to ₩4,093,107 million.
- 2) As of December 31, 2021, asset-backed borrowings of ₩49,600 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) As of December 31, 2021, the Company issued foreign currency-denominated bonds of USD 600,000 thousand (2 bonds of USD 300,000 thousand, respectively). In accordance with the agreement for these bonds, an early redemption clause exists for when the guarantor, KDB, becomes no longer controlled by Korean government. In addition, the Company 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. The above bonds have been succeeded from spin-off and merger with DI(currently, Hyundai Doosan Infracore Co., Ltd.) to the Company as of July 1, 2021.
- 4) As of December 31, 2021, the Company has provided 8,595,047 shares of Doosan Bobcat Inc. as collateral for long-term borrowings of ₩160,000 million from KDB and 4 other financial institution. In relation to the borrowings, if the ratio does not meet the certain collateral limit predetermined in the agreement, additional shares or deposits must be provided as collateral. In addition, in case the Company 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. and Korea Ratings Corporation), it will be a trigger for the financial institutions to collect the loans before the maturity. The above borrowings have been succeeded from spin-off and merger with DI(currently, Hyundai Doosan Infracore Co., Ltd.) to the Company as of July 1, 2021.
- 5) As of December 31, 2021, the Company has provided 3,650,000 shares of Doosan Bobcat Inc. as collateral for borrowings of ₩100,000 million from SC Bank. In relation to the borrowings, if the ratio does not meet the certain collateral limit predetermined in the agreement, either shares or deposits equivalent to the difference amounts must be provided as collateral or some loans must be redeemed early. The above borrowings have been succeeded from spin-off and merger with DI(currently, Hyundai Doosan Infracore Co., Ltd.) to the Company as of July 1, 2021.
- 6) As of December 31, 2021, the Company's short-term borrowing of ₩490,000 million from NH Investment and Securities Co., Ltd. and other 2 financial institutions includes an early redemption clause within two business days from the payment date of issuance of common shares. As of audit report date, the covenant has been terminated by full redemption.

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- 7) As of December 31, 2021, the Company's borrowing of ₩31,990 million from KDB and others in order to respond to short-term liquidity risks includes an early redemption clause when if assets of ₩10,000 million and above are sold or new financial inflow such as issuance of common shares or sale of asset due to improved financial structure are made. As of audit report date, the covenant has been terminated by full redemption of emergency operation fund.
- 8) As of December 31, 2021, the Company's short-term borrowing of ₩30,000 million from KEB includes a clause to repay of ₩13,000 million immediately after redemption of ₩3,000,000 million borrowing from KDB. The covenant constitutes reasons for the loss of interest on the due date in case of non-fulfillment. As of audit report date, the covenant has been terminated by full redemption of ₩13,000 million from KEB after full redemption of emergency operation fund.
- 9) As of December 31, 2021, the 48th bond with stock warrants of ₩14,607 million issued by the Company includes a clause to maintain debt ration under 500%.
- 10) As of December 31, 2021, the 59th and 60th convertible bonds of ₩23,374 million issued by the Company include a clause to maintain the credit rating at BB0 or higher and the covenant constitutes reasons for the loss of interest on the due date if otherwise. The above bonds have been succeeded from spin-off and merger with DI(currently, Hyundai Doosan Infracore Co., Ltd.) to the Company as of July 1, 2021.

(3) Pending litigations and others

As of December 31, 2021, the Group is involved in pending lawsuits as a defendant with total claims against the Group amounting to approximately ₩91,235 million and the result is currently unpredictable.

(4) Technical contract

As of December 31, 2021, the Group has entered into 17 technical contracts with Mitsubishi Hitachi Power Systems, Ltd. and others. For the years ended December 31, 2021 and 2020, royalty payments amounted to ₩18,020 million and ₩686 million, respectively.

(5) Guarantees of payment provided by third parties

As of December 31, 2021, payment guarantees by financial institutions amounting to ₩8,960,933 million are provided for the Group in connection with domestic and overseas construction projects and others.

(6) Guarantees of payment provided to the third parties

As of December 31, 2021, the Group provides guarantees of payment amounting to ₩360,096 million to subcontractors and customers for domestic and overseas business purposes.

(7) Guarantees of payment and collateral provided by and to the related party

- 1) As of December 31, 2021, the Company has provided a guarantee of payments amounting to ₩43,774 million to Employee Stock Ownership Association for the purpose of member loan guarantee. Also, Doosan Mecatec Co., Ltd., a subsidiary as of December 31, 2021, has been provided a guarantee of payment amounting to ₩90,342 million from Doosan Corp. for the purpose of construction guarantee.

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- 2) As of December 31, 2021, the Company has entered into borrowing agreements of ₩3,000,000 million with the KDB and the Korea EXIM Bank. In accordance with above borrowing agreements, Doosan Corp., Park Jeong-won and 31 related persons provide stocks of Doosan Corp., DHI and others and beneficiary certificates (Collateralized amount: ₩3,600,000 million) and others as collateral. As of audit report date, the collateral has been terminated.
- 3) As of December 31, 2021, subsidiaries including Doosan Industrial Vehicle China Co., Ltd. and others have been provided a payment guarantee amounting to ₩20,718 million from Doosan Corp. for the purpose of borrowing guarantee.

(8) Commitments related with consolidated structured entities

The carrying amount of assets and liabilities related to the consolidated structured entities' interests in the Group, details of the financial support provided and the maximum exposure amount of the Group to structured entity's loss as of December 31, 2021 are as follows:

(In millions of won)

Entity	Financial support for structured entities	Book value of liabilities regarding structured entities' interests	The maximum exposure amount of the Group to structured entities' loss
DHI KDPP 5 th Co., Ltd.(*1)	Obligation for fund replenishing including principal and interest of borrowings and others	₩ 49,600	64,480

(*1) KDPP 5th Co., Ltd. was established for the purpose of securitizing future construction receivables belongs to the Company. It is mainly financed by issuing ABCP and others from financial institutions. As of December 31, 2021, the amount of underlying assets is ₩49,600 million based on the book value presented in its financial statements.

(9) Other commitments and contingencies

- 1) As of December 31, 2021, the Company has entered into a contract to assume a liability (limit: ₩250,666 million) if it fails to complete construction of the Hanam Misa Knowledge Industry Center, 3rd apartment units in Yangsan Deokgye, 5th apartment units in Yangsan Deokgye, the complex of Ungcheon-dong, Yeosu project, and Suncheon city development project.
- 2) As of December 31, 2021, the Group entered into invest agreements with ZIGG CAPITAL I, L.P and other 8 funds, and the total remaining amounts of agreements are USD 3,438 thousand.
- 3) The Group signed a new lease contract with BUNDANG DOOSAN TOWER REIT Co., Ltd. for 5 years on January 8, 2021 in conjunction with Doosan Corp. and Hyundai Doosan Infracore Co., Ltd. (formerly, Doosan Infracore Co., Ltd.). In accordance with above contracts, the Group jointly has lease obligations. If certain condition of the lease contract is not met, the contract will be extended once for 5 years under the same conditions. In addition, the sublease of the real estate is jointly performed by parties including the Group, Doosan Corp. and Hyundai Doosan Infracore Co., Ltd. and each party has the right to the rental income to the extent applicable excluding the self-lease and related expenses.

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- 4) The Group accounts for the above-mentioned 3) joint lease contract as joint operation in which the parties jointly control the lease arrangement also have the right to assets and liabilities of the leased asset in accordance to K-IFRS No. 1111 'Joint Arrangements.' As of December 31, 2021, the Group's participating rate is 72.2%.
- 5) As of December 31, 2021, Doosan Heavy Industries Vietnam Haiphong Co., Ltd., a subsidiary of Doosan Mecatec Co., Ltd., has not recognized any provisions in relation to expense incurred upon termination of the land permit for the lease contract of factory site with Haiphong Department of Natural and Resources, because the payment obligations and outflow of resources cannot be reliably estimated.
- 6) As of December 31, 2021, 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 obligated to make an additional investment of ₩77,740 million in September 2023 in accordance with the investor agreement. 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. As of December 31, 2021, the amount of ₩39,715 million has been accrued according to the agreement and included in the long-term deposit account.
- 7) 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, 2021, the application of the related provisions has been suspended in consideration of various circumstances such as changes in the Company's business environment.
- 8) Doosan Mecatec Co., Ltd., a subsidiary, 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.
- 9) DFC, a subsidiary, has joint liability to pay the debt before the spin-off with Doosan Corp. and contingent tax liabilities may arise due to joint tax payment obligation.
- 10) Doosan Bobcat Inc., a subsidiary, has succeeded to the joint liability for financial and operating liabilities of Doosan Industrial Vehicle Co., Ltd. and Doosan Corp in relation to business combination with Doosan Industrial Vehicle Co., Ltd, and judged that the possibility of an outflow of resources is remote.
- 11) Clark Equipment Co., a subsidiary, has entered into a Supply Chain in Financing agreement with Doosan Bobcat EMEA s.r.o and recognized the related amount as trade payables.

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- 12) Daesan Green Energy Co., Ltd., an associate of DFC which is a subsidiary, has entered into a loan agreement with financial institutions including KDB and others. In this regards, investors of Daesan Green Energy Co., Ltd. including DFC and other shareholders have entered into an investor agreement with the financial institutions. The agreement states that if net operating cash inflow of Daesan Green Energy Co. does not meet the risk-sharing level, each of them is obligated to replenish the insufficient amount according to their respective investment shares. Accordingly, if DFC is obligated to fulfill the settlement according to the settlement agreement signed by Daesan Green Energy Co., Ltd. with other investors, DFC should fulfill either one of the following methods : providing cash, executing subordinated loans, or not receiving its payment.
- 13) The Company compensates for the shortfall to the extent of the recoverable amount from DEC stock (ownership 46.35%) if final distribution amount of the sales price of DEC stock (ownership 53.65%) held by The Zenith holdings Ltd. has not met the investment capital of the investors (excluding 2018 QCP No. 13 Private Equity Joint venture, the representative PEF).

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33. Assets pledged as collateral

(1) Assets pledged as collateral related with debt

1) As of December 31, 2021, 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	₩ 45,642	41,493	KEB Hana Bank
	Property, plant and equipment(*1)	1,836,630	1,328,134	KDB and others
	Cash and cash equivalents	2,083	21,431	Bank for Investment and Development of Vietnam and others
	Shares of subsidiaries and equity shares(*1)	1,555,368	1,140,977	KDB and others
	Inventories	19,500	15,900	Korea EXIM Bank
	Subtotal	3,459,223	2,547,935	
Doosan Bobcat Inc.	Property, plant and equipment	52,177	47,863	Shinhan Bank and others
	Inventories	110,228	34	WELLS FARGO BANK
	Subtotal	162,405	47,897	
Cuvex	The rights to the benefits(*2)	24,152	20,000	Woori Bank
	Total	₩ 3,645,780	2,615,832	

(*1) As of December 31, 2021, in accordance with bond, borrowing, and borrowing covenant held by the Company, 51,176,250 shares of Doosan Bobcat Inc., a subsidiary of the Company, and land are provided as collateral (See Note 32).

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

2) Clark Equipment Co. ("CEC"), a subsidiary of Doosan Bobcat Inc., entered into an agreement for its borrowing of USD1,345,000 thousand and a credit line agreement up to USD 150,000 thousand on May 18, 2017, and issued bonds of USD 300,000 thousand on May 29, 2020. In addition, CEC entered into an agreement for its new borrowing of USD 500,000 thousand and a credit line agreement up to \$50,000 thousand on June 8, 2021. Doosan Bobcat Inc. has provided all of its equity shares in 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 credit line agreement. In addition, the equity shares held by CEC in its respective subsidiaries as well as certain property, plant, and equipment, intangible assets and other assets of CEC are pledged as collateral. As of December 31, 2021, the relevant balance of borrowings and bonds are USD 1,426,363 thousand and the total collateral amount is USD 1,531,907 thousand.

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(2) Other Assets pledged as collateral

1) As of December 31, 2021, assets pledged as collateral on behalf of others are summarized as follows:

(In millions of won)

<u>Pledger</u>	<u>Collateralized asset</u>	<u>Book value</u>	<u>Pledgee</u>	<u>Beneficiary</u>
DHI	Long-term investment securities and others	₩ 12,526	Kookmin Bank and others	Gyeonggi East-West Beltway Co. and others
	Investments in associates	7,818	BNK Kyongnam Bank and others	The HS-City Expressway and others
	Subtotal	<u>20,344</u>		
DFC	Investments in associates	2,883	KDB	Daesan Green Energy Co., Ltd.
	Total	<u>₩ 23,227</u>		

2) As of December 31, 2021, the Company has entered into a contract of completion guarantee regarding the EPC construction project of Samcheok #1,2 TPP and provided 1,193,066 shares (Collateralized amount: ₩43,568 million) of Samcheok Blue Power Co., Ltd. as collateral.

3) As of December 31, 2021, the Company provided deposit and stock held by the Company to Korea EXIM Bank as collateral (Collateralized amount: ₩208,294 million) regarding operation fund borrowed by DPS S.A. and Doosan Power System Arabia Company Limited, subsidiaries of the Company.

4) As of December 31, 2021, 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 (Collateralized amount: ₩420,000 million) and all shares of DPS S.A. held by the Company (Collateralized amount: GBP 293 million) as collateral.

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34. Related party transactions

(1) The related parties of the Group and nature of their relationship with the Group as of December 31, 2021 are as follows:

- 1) As of December 31, 2021, the Group's ultimate parent company is Doosan Corp. (equity ownership: 39.26%).
- 2) As of December 31, 2021, the details of the Group's associates, joint ventures, and other related parties are as follows :

Control relationship	Related party
Associates and joint ventures(*9)	The HS-City Expressway(*4), Samcheok Blue Power Co., Ltd., Daejung Offshore Wind Power Co., Ltd., Hychangwon Co., Ltd., Doosan Babcock Blackcat W.L.L, Doosan Property Co., Ltd.(*10), ReCarbon, Inc., Daesan Green Energy Co., Ltd.(*6), Prestolite Asia Ltd.(*6), Ainstein AI, Inc, StructionSite Inc., The Zenith holdings Ltd.(*7), DEC and the subsidiaries(*3)
Other related parties	
Subsidiaries of the parent company(*1,5)	Oricom Inc., Hancorn Co., Ltd., Doosan Bears Inc., Doosan Business Research Institute, Doosan Robotics Co., Ltd., Doosan Mobility Innovation Inc., Doosan Logistics Solutions Co., Ltd., Doosan Mobility Innovation (Shenzhen) Co., Ltd., Doosan Electro-Materials Singapore Pte Ltd., Doosan Hongkong Ltd., Doosan Electro-Materials (Shen Zhen) Limited., Doosan Shanghai Chemical Materials Co., Ltd., Doosan Electro-Materials (Changshu) Co., Ltd., Doosan Electro-Materials Vietnam Company Limited, Doosan 2nd Real Estate Securitization Specialty Co., Ltd., Doosan Digital Innovation America LLC., Doosan Information & Communications Beijing Co., Ltd., Doosan Digital Innovation Europe Limited, Doosan Electro-Materials America, LLC, Doosan Fuel Cell America, Inc., Doosan Energy Solutions America, Inc., DESA Service, LLC, Sunny Russel 8 th Co., Ltd., D pay 2nd Co., Ltd., Doosan H2 Innovation(*7), and others
Associates and joint ventures of the parent company	Protera SAS., Wise Fashion Co., Ltd., KDDI Korea Corporation, PT. SEGARA AKASA, Stathera IP Holding Inc., Sichuan Kelun-Doosan Biotechnology Company Limited, Mastern Professional Investment Type Private Security Investment Trust No.98(*7), BUNDANG DOOSAN TOWER REIT Co., Ltd.(*2), Weve holdings Ltd.(*7), SiO2 Materials Science(*7), and others
Others	Chung-Ang University, Chung-Ang University Hospital, Doosan Credit Union, Doosan Yonkang Foundation, Thepathwithyou foundation(*8) and others

(*1) In 2021, Mottrol Co., Ltd., Doosan Mottrol (Jiangyin) Co., Ltd., and New Star Motive 1st Co., Ltd. was disposed.

(*2) In 2021, the entity has transferred from subsidiary of the parent company to associate of the parent company.

(*3) In 2021, DEC and the subsidiaries have transferred to associate and 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 Fucell Co., Ltd., Daejeon Riverside Expressway Co., Ltd., and Bitgoel Eco Energy Co., Ltd. were excluded from the group of related party.

(*4) Classified as assets held for sale in 2021 (See Note 36).

(*5) In 2021, DFC, Doosan Industrial Vehicle Europe N.V., Doosan Industrial Vehicle U.K. Ltd., Doosan Logistics Europe GmbH, Doosan Industrial Vehicle America Corp., Doosan Equipment South East, LLC, Doosan Industrial Vehicle China Co., Ltd., Genesis Forklift Trucks Limited, Rushlift Holdings Ltd., Doosan Materials Handling UK Ltd., and Rushlift Ltd. were transferred to subsidiaries from other related parties.

(*6) Transferred from other related parties to associates in 2021.

(*7) Newly acquired in 2021.

(*8) In 2021, the entity's name has changed from Dongdaemoon Miraechangcho Foundation.

(*9) In 2021, Potenit Co., Ltd., Doosan Infracore Liaoning Machinery Sales Co. Ltd., and Tianjin Lovol Doosan Engine Co. Ltd. were excluded from the group of related party due to spin-off and merger of DI'S investment division.

(*10) In 2021, the entity's name has changed from DBC Co., Ltd.

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(2) Significant transactions with related parties

Significant transactions (excluding financial and investment) with related parties for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021						
	Sales and others			Purchases and others			
	Sales	Disposal of		Purchase	Acquisition		Acquisition of right-of-use assets
		PP&E and intangible assets	Other revenue		of PP&E and intangible assets	Other expense	
Parent:							
Doosan Corp.	₩ 39,618	61	3,541	78,099	5,787	88,294	1,935
Associates and joint ventures:							
Doosan Property Co., Ltd.	10,091	-	4	-	-	-	-
Samcheok Blue Power Co., Ltd.	529,661	-	-	-	-	-	-
New Seoul Railroad Co., Ltd.(*1)	51,399	-	-	-	-	-	-
Incheon Fucell Co., Ltd.(*1)	46,544	-	-	-	-	-	-
Daesan Green Energy Co., Ltd.	10,875	-	-	-	-	32	-
Hychangwon Co., Ltd.	9,766	-	-	-	-	-	-
Others	54,946	-	-	1,445	-	1,263	-
Subtotal	713,282	-	4	1,445	-	1,295	-
Other related parties:							
Oricom Inc.	1,832	-	65	33	-	9,992	-
Doosan Bears Inc.	965	-	-	490	-	15,456	-
Doosan Digital Innovation America LLC	-	-	18	-	-	48,661	1,472
Doosan Business Research Institute	1,891	-	164	-	-	7,267	-
Chung-Ang University	-	-	-	-	-	5,924	-
Doosan Information & Communications Beijing Co., Ltd.	-	-	-	-	-	4,819	-
Doosan Digital Innovation Europe Limited	186	-	-	271	-	22,839	-
BUNDANG DOOSAN TOWER REIT Co., Ltd.	-	-	-	-	53,080	17,875	199,354
Doosan Fuel Cell America, Inc.	22,595	-	1	141,879	-	838	-
Others	2,803	-	300	5,130	48	2,293	-
Subtotal	30,272	-	548	147,803	53,128	135,964	200,826
Total	₩ 783,172	61	4,093	227,347	58,915	225,553	202,761

(*1) Excluded from the related parties during 2021 and the amounts represent transactions before the entities were excluded from the related parties.

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	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		Right-of- use asset acquisition
Other expense							
Parent:							
Doosan Corp.	₩ 76,230	499	9,151	146,239	8,504	87,327	2,257
Associates and joint ventures:							
Doosan Property Co., Ltd.	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 Fucell 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

Above transactions include amounts attributed to discontinued operations on the consolidated Statements of profit or loss in 2021 and 2020.

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(3) Significant balances related to the transactions with related parties

The outstanding receivables and payables arising from the transactions with related parties (excluding dividend and investment) as of December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021						
	Receivables			Payables			
	Trade receivables	Loans receivables	Other receivables	Trade payables	Borrowings	Other payables	Lease liabilities
Parent:							
Doosan Corp.	₩ 787	-	2,606	61,351	-	63,597	1,843
Associates and joint ventures:							
Doosan Property Co., Ltd.	-	-	-	-	-	42	-
Hychangwon Co., Ltd.	12,210	-	-	-	-	46,428	-
DEC	5,895	-	11,133	122	-	20,332	-
Daesan Green Energy Co., Ltd.	3,625	-	-	-	-	4	-
Samcheok Blue Power Co., Ltd.(*1)	-	-	317,889	-	-	-	-
Subtotal	21,730	-	329,022	122	-	66,806	-
Other related parties:							
Oricom Inc.	140	-	51	-	-	4,839	-
Doosan Digital Innovation Europe Limited	104	-	-	230	-	13,375	-
BUNDANG DOOSAN TOWER REIT Co., Ltd.	-	-	17,499	-	-	-	161,693
Doosan Fuel Cell America, Inc.(*2)	79	-	80,379	4,827	-	4,988	-
Others	488	-	279	83	-	2,870	-
Subtotal	811	-	98,208	5,140	-	26,072	161,693
Total	₩ 23,328	-	429,836	66,613	-	156,475	163,536

(*1) As of December 31, 2021, the Group has set an allowance for doubtful accounts of ₩1,717 million for receivables of Samcheok Blue Power Co., Ltd. and the same amount was recognized as bad debt expenses in 2021.

(*2) As of December 31, 2021, the Group has set an allowance for doubtful accounts of ₩1,142 million for receivables of Doosan Fuel Cell America, Inc. and the same amount was recognized as bad debt expenses in 2021.

(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	-	-	-	-	-
Doosan Property Co., Ltd.	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	-
DFC	-	-	-	9,800	-	404	-
Others	637	-	1,411	1	-	13,960	966
Subtotal	1,244	-	1,607	72,843	21,760	21,231	966
Total	₩ 42,054	73,331	27,323	109,228	21,760	66,763	2,838

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(4) Financial transactions between the Group and related parties

Financial transactions (including investment) with related parties for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021									
	Loans		Borrowings			Investments		Dividend		
	Loans	Collection	Borrowings	Repayment	Repayment of lease	Increase (decrease) of capital	Investment	Income	Payout	
Parent:										
Doosan Corp.	₩	-	-	-	-	646	605,226	-	-	-
Associates and joint ventures:										
Hychangwon Co., Ltd.		-	-	-	-	-	-	2,000	-	-
The Zenith holdings Ltd.		-	-	-	-	-	-	120,000	-	-
Kyunggi Railroad Co., Ltd.(*1)		10,000	-	-	-	-	-	-	-	-
Bitgoel Eco Energy Co., Ltd.(*1)		-	-	-	-	-	-	3,458	-	-
StructionSite Inc.		-	-	-	-	-	-	1,697	-	-
Subtotal		10,000	-	-	-	-	-	127,155	-	-
Other related parties:										
BUNDANG DOOSAN TOWER REIT Co., Ltd.		-	-	-	-	21,058	-	-	-	-
Doosan Fuel Cell America, Inc.		-	-	-	23,750	-	-	-	-	-
Others		-	-	-	-	931	-	-	273	-
Subtotal		-	-	-	23,750	21,989	-	-	273	-
Total	₩	10,000	-	-	23,750	22,635	605,226	127,155	273	-

(*1) Excluded from the related parties during 2021 and the amounts represent transactions before the entities were excluded from the related parties.

The Group paid USD 664,100 thousand (₩750,433 million) in cash to Doosan Corp. in exchange for acquiring of Doosan Industrial Vehicle Co., Ltd. during 2021 (See Note 38).

(In millions of won)

	2020									
	Loans		Borrowings			Investments		Dividend		
	Loans	Collection	Borrowings	Repayment	Repayment of lease	Increase of capital	Investment	Income	Payout	
Parent:										
Doosan Corp.	₩	-	-	-	-	5,871	710,054	-	-	-
Associates and joint ventures:										
Kyunggi Railroad Co., Ltd.		4,236	-	-	-	-	-	-	-	-
Incheon Fucell 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	-

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(5) Guarantees of payment and collateral provided by and to the related party

The Group provides payment guarantees and collateral for certain related parties and receives payment guarantees and collateral from certain related parties as of December 31, 2021 (See Notes 32 and 33).

(6) Key management compensation

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, 2021 and 2020 consists of following:

<i>(In millions of won)</i>		<u>2021</u>	<u>2020</u>
Short-term employee benefits	₩	28,188	32,699
Severance and retirement benefits		2,222	2,845
Total	₩	<u>30,410</u>	<u>35,544</u>

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35. Consolidated statements of cash flows

(1) Details of cash generated from operation for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	<u>2021</u>	<u>2020</u>
Profit (loss) for the period:	₩ 645,821	(838,446)
Adjustments:		
Interest expenses	369,819	457,918
Loss on foreign currency translation	217,698	160,323
Bad debt expenses	16,473	42,540
Other bad debt expenses	46,738	177,707
Loss on valuation of inventory	15,237	2,843
Loss on valuation of derivative financial instruments	251,845	28,386
Loss on valuation of firm commitments	7,665	70,281
Loss (gain) on equity method investments	(19,898)	16,348
Depreciation	361,735	386,386
Amortization	175,236	182,380
Loss on disposal of property, plant and equipment	1,848	1,701
Impairment loss on property, plant and equipment	1,393	36,097
Impairment loss on intangible assets	25,194	158,354
Impairment loss on investment property	-	3,149
Impairment loss on asset held for sale	2,487	-
Loss on valuation of short and long-term investment securities	41,806	24,400
Severance and retirement benefits	86,256	109,800
Provision for warranty expenses	156,493	153,407
(Reversal of) Provision for construction warranties	(40,333)	123,383
(Reversal of) Provision for others	(26,331)	138,514
Loss on redemption of bonds	84	55,663
Loss on disposal of trade receivables	10,189	17,935
Income tax expense (benefit)	247,408	(25,463)
Interest income	(44,539)	(43,386)
Dividend income	(2,153)	(1,123)
Gain on foreign currency translation	(139,954)	(147,895)
Gain on valuation of derivatives financial instruments	(101,842)	(115,026)
Gain on valuation of firm commitments	(121,534)	(10,454)
Gain on disposal of property, plant and equipment	(8,634)	(2,089)
Gain on valuation of short and long-term investment securities	(31,789)	(89,340)
Gain on disposal of discontinued operation	(93,967)	-
Others	(19,206)	61,678
Subtotal	₩ <u>1,385,424</u>	<u>1,974,417</u>

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(In millions of won)

	2021	2020
Changes in operating assets and liabilities:		
Trade receivables	₩ (61,106)	202,789
Due from customers for contract work	(62,431)	91,812
Other receivables	89,115	(140,176)
Derivative financial assets and liabilities	16,762	(32,464)
Firm commitments assets and liabilities	36,535	(12,941)
Inventories	(427,953)	304,999
Other current assets	(230,352)	(4,777)
Other non-current assets	563	2,664
Trade payables	384,940	(593,772)
Due to customers for contract work	170,748	190,238
Other payables	878	(134,883)
Provision for warranty expenses	(133,736)	(153,988)
Provision for others	(45,032)	(26,539)
Other current liabilities	(51,096)	23,732
Other non-current liabilities	(67,506)	45,544
Severance payments paid	(168,984)	(287,086)
Plan assets	55,457	185,623
Subtotal	(493,198)	(339,225)
Cash generated from operations	₩ <u>1,538,047</u>	<u>796,746</u>

(2) Significant non-cash transactions for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021	2020
Transfer from property, plant and equipment to investment property	₩ -	24,372
Transfer from investment property to property, plant and equipment	-	433,702
Transfer from construction-in-progress to other assets	124,656	98,440
Acquisition of right-of-use assets	309,456	82,059
Transfer to current portion of bonds, borrowing and others	1,639,346	1,431,161
Acquisition of long-term investment in securities through stock receipt	-	600,525
Changes in other payables through acquisition of property, plant and equipment	536	(10,152)
Transfer to assets and liabilities held for sale	51,572	11,495
Acquisition of investment in associates and joint ventures	437,666	-
Acquisition of investment properties	50,752	-

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(3) Change of liability in financing activities for the years ended December 31, 2021 and 2020 are summarized as follows:

(In millions of won)

	Balance at January 1, 2021	Cash flows from financing activities, net	Non-cash changes				Balance at December 31, 2021
			Current portion of long-term debt	Changes in foreign currency translation	Changes in consolidation scope	Others	
Short-term borrowings	₩ 5,368,579	(655,321)	-	54,012	(778,674)	(80,113)	3,908,483
Asset-backed borrowings	59,551	65,152	-	-	(126,163)	1,460	-
Current portion of long-term debt	1,590,801	(2,112,830)	1,568,775	72,411	(184,242)	3,948	938,863
Current portion of lease liabilities	66,466	(64,043)	70,571	1,034	(26,897)	17,749	64,880
Bonds	1,800,160	682,177	(530,807)	58,773	(1,184,489)	22,443	848,257
Long-term borrowings	1,183,035	1,310,067	(987,847)	45,534	(46,218)	12,348	1,516,919
Long-term asset-backed borrowings	49,103	-	(50,122)	-	-	1,019	-
Non-current lease liabilities	171,864	(22,377)	(70,570)	15,938	(76,500)	297,952	316,307
Sales and lease back liabilities	174,386	(7,978)	-	-	102,704	15,048	284,160
Total	₩ 10,463,945	(805,153)	-	247,702	(2,320,479)	291,854	7,877,869

(In millions of won)

	Balance at January 1, 2020	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	
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 portion of 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
Sales and lease back liabilities	-	-	-	-	-	174,386	174,386
Total	₩ 10,507,975	(22,849)	-	(222,677)	45,904	155,592	10,463,945

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36. Assets and liabilities held for sale

(1) On December 22, 2021, the Group decided to sell its shares of Doosan Bobcat Chile Compact SpA ("DBCC"), wholly owned by Doosan Bobcat Singapore Pte. Ltd., in accordance with a resolution of the board of directors of Doosan Bobcat Singapore Pte. Ltd. Assets and liabilities related to DBCC. were classified as assets and liabilities held for sale. The transaction was completed on January 4, 2022.

(2) In accordance with a resolution at the Board of Director's meeting on October 2021, the Company decided to sell a subsidiary company, Doosan Babcock Ltd. and the Group classified assets and liabilities of Doosan Babcock Ltd. ("DBL") and the subsidiaries, as of December 31, 2021, as assets and liabilities held for sale. The details of accounts classified as held for sale as of December 31, 2021 are as follows:

<i>(In millions of won)</i>		DBCC	DBL	Total
Assets held for sale(*1)				
Cash and cash equivalents	₩	4,516	13,000	17,516
Trade and other receivables		2,606	83,448	86,054
Due from customers for contract work		-	47,476	47,476
Inventories		4,538	740	5,278
Investments in associates and joint ventures		-	354	354
Property, plant and equipment		1,234	49,829	51,063
Intangible assets		-	3,276	3,276
Other assets		923	71,852	72,775
Total	₩	<u>13,817</u>	<u>269,975</u>	<u>283,792</u>
Liabilities held for sale				
Trade and other payables	₩	2,378	110,626	113,004
Due to customers for contract work		-	12,946	12,946
Bonds and borrowings		1,201	51,799	53,000
Lease liabilities		-	41,813	41,813
Provisions		-	14,264	14,264
Other liabilities		48	38,394	38,442
Total	₩	<u>3,627</u>	<u>269,842</u>	<u>273,469</u>

(*1) There is no impairment loss incurred by reclassification of held for sale as of December 31, 2021 since the net fair value, which is measured at fair value of disposal group held for sale less costs to sell, exceeds the carrying amount.

(3) The Group's other assets held for sale as of December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021	2020
Investments in associates(*1)	₩	2,823	-
Property, plant and equipment (*2,3)		35,479	11,495
Subtotal		<u>38,302</u>	<u>11,495</u>
Accumulated impairment loss(*2,3)		(2,487)	-
Total	₩	<u>35,815</u>	<u>11,495</u>

(*1) In 2021, the Group decided to sell all shares related with the HS-City Expressway and classified the holding shares as assets held for sale.

(*2) In 2021, the Group classified the land and buildings in Songlimdong, Incheon as assets held for sale and recognized ₩1,568 million as an impairment loss. The buildings owned by Doosan Bobcat China Co., Ltd., a subsidiary, which were classified as assets held for sale, were disposed.

(*3) As of December 31, 2021, the construction equipment related with rental business were in active process of sales and classified as assets held for sale. The Group recognized impairment loss of ₩919 million in 2021.

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37. Discontinued operations

(1) Summary of discontinued operations

- 1) On July 1, 2021, the investment division of DI was spun off and merged with the Company, and all business segments other than investment division of DI were sold to Hyundai Genuine Co., Ltd. on August 19, 2021.
- 2) On December 21, 2021, the Company transfers the management right of DEC, a subsidiary, to The Zenith holdings Ltd. and loses its control over DEC.
- 3) The Company decided to sell Doosan Babcock Ltd., a subsidiary, with a resolution of Board of Director's meeting held on October 2021.

In this regard, the Group has reclassified the business division of DI, DEC and DBL as discontinued operation and restated the comparative financial statements as of December 31, 2020.

(2) Assets and liabilities classified as discontinued operations

As of December 31, 2021, the Group classified assets and liabilities of DBL as assets and liabilities as held for sale (See Note 36). At disposition date, assets and liabilities classified as discontinued operations are as follows:

<i>(In millions of won)</i>		DI	DEC	Total
Assets				
Cash and cash equivalents	₩	809,602	115,929	925,531
Trade and other receivables		1,404,236	420,663	1,824,899
Due from customers for contract work		-	153,389	153,389
Inventories		952,399	6,878	959,277
Investment in associates and joint ventures		15,802	38,536	54,338
Property, plant and equipment		1,207,129	275,171	1,482,300
Intangible assets		910,121	61,957	972,078
Other assets		459,058	472,081	931,139
Total	₩	<u>5,758,347</u>	<u>1,544,604</u>	<u>7,302,951</u>
Liabilities				
Trade and other payables	₩	1,045,732	328,322	1,374,054
Due to customers for contract work		-	425,261	425,261
Bonds and borrowings		2,323,216	183,632	2,506,848
Lease liabilities		59,002	60,809	119,811
Provisions		158,146	68,076	226,222
Other liabilities		497,188	107,561	604,749
Total	₩	<u>4,083,284</u>	<u>1,173,661</u>	<u>5,256,945</u>

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(3) Operational performance of discontinued operations of the Group for the years ended December 31, 2021 and 2020 are as follow:

(In millions of won)

	2021			
	DI	DEC	DBL	Total
Sales	₩ 2,703,038	1,391,907	524,066	4,619,011
Cost of sales	2,103,696	1,230,088	456,196	3,789,980
Selling and administrative expenses	359,623	78,474	54,965	493,062
Operating profit	239,719	83,345	12,905	335,969
Other non-operating income and expenses	(31,243)	(74,119)	(1,537)	(106,899)
Income before income tax	208,476	9,226	11,368	229,070
Income tax expenses (benefit)	277,223	556	(5,372)	272,407
Profit (loss) from discontinued operation	(68,747)	8,670	16,740	(43,337)
Gain on disposal of discontinued operation	48,426	45,541	-	93,967
Income tax benefit related with disposal of discontinued operation	(9,154)	(111,254)	-	(120,408)
Subtotal of disposal of discontinued operation	57,580	156,795	-	214,375
Total profit (loss) from discontinued operation	₩ (11,167)	165,465	16,740	171,038
Profit (loss) from discontinued operation attributable to:				
Owners of the Company	₩ 36,997	165,465	16,740	219,202
Non-controlling interests	(48,164)	-	-	(48,164)

(In millions of won)

	2020			
	DI	DEC	DBL	Total
Sales	₩ 3,631,103	1,865,144	464,647	5,960,894
Cost of sales	2,809,815	1,719,955	415,589	4,945,359
Selling and administrative expenses	559,384	116,307	51,221	726,912
Operating profit (loss)	261,904	28,882	(2,163)	288,623
Other non-operating income and expenses	(149,855)	(220,859)	1,038	(369,676)
Income (loss) before income tax	112,049	(191,977)	(1,125)	(81,053)
Income tax expenses	54,348	13,949	345	68,642
Total profit (loss) from discontinued operation	₩ 57,701	(205,926)	(1,470)	(149,695)
Profit (loss) from discontinued operation attributable to:				
Owners of the Company	₩ 20,107	(205,926)	(1,470)	(187,289)
Non-controlling interests	37,594	-	-	37,594

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(4) The net cash flows incurred by discontinued operations of the Group for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021			
	DI	DEC	DBL	Total
Net cash flows from operating activities	₩ (168,758)	97,274	(4,276)	(75,760)
Net cash flows from investing activities(*1)	684,694	(102,958)	5,460	587,196
Net cash flows from financing activities	262,139	24,977	(6,998)	280,118
Effect of exchange rate fluctuations on cash held	89,373	2	8,369	97,744
Net increase in cash and cash equivalents	₩ 867,448	19,295	2,555	889,298

(*1) In 2021, the net cash flows from investing activities include cash flow related with sales price of discontinued operation.

(In millions of won)

	2020			
	DI	DEC	DBL	Total
Net cash flows from operating activities	₩ 269,949	(55,269)	81,230	295,910
Net cash flows from investing activities	(120,782)	375,618	(7,595)	247,241
Net cash flows from financing activities	169,033	(254,695)	(65,864)	(151,526)
Effect of exchange rate fluctuations on cash held	(23,998)	(9)	(1,825)	(25,832)
Net increase in cash and cash equivalents	₩ 294,202	65,645	5,946	365,793

38. Business combinations

(1) Summary of business combinations

1) DFC

On November 26, 2020, the Company received shares of DFC for free from Park Jeong-won and other related parties to improve the financial structure and capital expansion, and on April 1, 2021, additionally acquired shares of DFC held by Doosan Corp., the largest shareholder of the Company, through investment in kind. Therefore, the Group obtained control of DFC during the year ended December 31, 2021. The Group's percentage of ownership on DFC after acquisition is 30.33%.

2) Doosan Industrial Vehicle Co., Ltd.

In accordance with the resolution of the board of directors on March 11, 2021, the Group acquired 100% of shares in Doosan industrial Vehicle Co., Ltd. and the subsidiaries from Doosan Corp., on July 6, 2021. As a result of the acquisition, the main business activity of Doosan Industrial Vehicle Co., Ltd. and the subsidiaries is forklift manufacturing and sales business, and the Group expects synergies through product and regional portfolio diversification.

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(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>	DFC	Doosan Industrial Vehicle Co., Ltd.
I. Consideration transferred		
Cash and cash equivalents	₩ -	750,433
Long-term investment securities(*1)	657,323	-
Common stock (47,843,956 shares)	605,226	-
Subtotal	<u>1,262,549</u>	<u>750,433</u>
II. The amounts recognized as identifiable assets and liabilities		
Assets		
Cash and cash equivalents	10,565	76,997
Trade and other receivables	116,380	122,361
Short and long-term investment securities	330,382	860
Inventories	136,930	186,666
Investment in associates	3,630	2,787
Property, plant and equipment	61,633	268,460
Intangible assets(*2,3)	145,224	219,604
Other assets	82,855	31,683
Total assets	<u>887,599</u>	<u>909,418</u>
Liabilities		
Trade and other payables	78,163	205,641
Bonds and borrowings	98,929	88,133
Lease liabilities	6,335	10,079
Deferred tax liabilities	34,479	51,077
Provisions	28,368	4,416
Other liabilities	49,276	127,286
Total liabilities	<u>295,550</u>	<u>486,632</u>
Fair value of total identifiable net assets	<u>592,049</u>	<u>422,786</u>
III. Fair value of total identifiable net assets attributed to owners of the Company	<u>179,551</u>	<u>422,786</u>
IV. Goodwill (I- III)	<u>₩ 1,082,998</u>	<u>327,647</u>

(*1) The fair value of the shares previously held by the Company at the acquisition date.

(*2) The identifiable intangible assets of DFC including orders on hand of ₩94,813 million and technology value of ₩46,406 million.

(*3) The identifiable intangible assets of Doosan Industrial Vehicle Co., Ltd. including customer relationship of ₩126,179 million and technology value of ₩67,082 million.

The sales and profit generated from DFC for the year ended December 31, 2021 after acquisition was ₩309,429 million and ₩12,955 million, respectively. The sales and loss generated from Doosan Industrial Vehicle Co., Ltd. and the subsidiaries for the year ended December 31, 2021 after acquisition was ₩535,600 million and ₩4,074 million, respectively.

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The sales and profit that would have been included in the consolidated statement of profit or loss, if DFC and Doosan Industrial Vehicle Co., Ltd. and the subsidiaries were included in the consolidated financial statements from the beginning of the reporting period, are as follows:

(In millions of won)

		Before adjustments	Adjustments	After adjustments
Sales	₩	11,807,676	570,579	12,378,255
Profit for the period		645,821	11,091	656,912

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 fund through issuance of new common shares on December 2020, sales on business segments other than investment division of DI in August 2021, and another issuance of common shares in February 2022 to repay the debts of State-owned Banks. The Company fully repay the borrowings from State-Owned Banks as of February 28, 2022 and the covenant related with the financial improvement plan has been terminated.

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, 2021, As the Group cannot reasonably estimate the effects of COVID-19, the effects are not reflected in the consolidated financial statements

41. Subsequent events

- (1) On January 4, 2022, the Group sold the subsidiary, Doosan Bobcat Chile Compact SpA., in consideration of management efficiency.
- (2) On February 18, 2022, the Company issued common stock of 82,872,900 shares (Issuance value: ₩1,147,790 million) through capital increase.

42. Approval of consolidated financial statements

The consolidated financial statements for 2021 were authorized for issue by the Board of Directors on February 11, 2022 and will get final approval during the shareholders' meeting on March 29, 2022.