

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Separate 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 separate financial statements of Doosan Heavy Industries & Construction Co., Ltd. ("the Company"), which comprise the separate statements of financial position as of December 31, 2021 and 2020, the separate statements of profit or loss and 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 separate financial statements present fairly, in all material respects, the separate financial position of the Company as of December 31, 2021 and 2020, and its separate financial performance and its separate cash flows for the years then ended in accordance with Korean International Financial Reporting Standards ("K-IFRS").

We also have audited, in accordance with Korean Standards on Auditing ("KSAs"), the Company's Internal Control over Financial Reporting ("ICFR") as of December 31, 2021 based on the criteria established in Conceptual Framework for Designing and Operating ICFR issued by the Operating Committee of ICFR in the Republic of Korea, and our report dated March 22, 2022 expressed an unmodified opinion on the effectiveness of the Company's ICFR.

Basis for Opinion

We conducted our audits in accordance with KSAs. Our responsibilities under those standards are further described in the *Auditors' Responsibilities for the Audit of the Separate Financial Statements* section of our report. We are independent of the Company in accordance with the ethical requirements that are relevant to our audit of the separate 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 separate financial statements of the current period. These matters were addressed in the context of our audit of the separate financial statements as a whole, and in forming our 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 separate financial statements, the Company recognizes its revenue when the control of products and services is transferred to the customers. Therefore, the Company 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 Company 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 separate financial statements, the Company 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 investment in subsidiaries.

As described in the Note 2 to the separate financial statements, the Company assesses whether there are any indicators of impairment for investment in subsidiaries and conducts an impairment test for such investments with impairment indicators. The Company compares the carrying amount of investment in subsidiaries with the recoverable amount which is measured as the value in use using discounted cash flow projection or calculated as the fair value less costs to sell using market value approach to determine whether the investment is impaired.

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 of investment in subsidiaries 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, and are subject to management bias.

The following audit procedures were performed regarding impairment of investment in subsidiaries.

- Evaluation and testing of internal controls related to impairment test for investment in subsidiaries
- Inquiries and assessment of the valuation model applied by the Company
- Understanding of the future cash flows and agreeing whether the estimated future cash flow agrees to business plan approved by the Company'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 the investee
- Evaluation of the sensitivity analysis results for the discount rate and permanent growth rate presented by the Company 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 separate financial statements may differ from those generally accepted and applied in other countries.



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

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

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

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

Auditors' Responsibilities for the Audit of the Separate Financial Statements

Our objectives are to obtain reasonable assurance about whether the separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an 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 separate financial statements.

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

- Identify and assess the risks of material misstatement of the separate financial statements, 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.
- 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 Company'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 separate financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the separate financial statements, including the disclosures, and whether the separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance 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 separate 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 separate 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.

Separate Statements of Financial Position

As of December 31, 2021 and 2020

(In won)

	Note	2021	2020
Assets			
Cash and cash equivalents	4,5,10	₩ 423,695,206,240	281,631,480,208
Short-term financial instruments	4,5,10	446,816,817,888	116,097,319,654
Short-term investments in securities	4,6,10	-	1,600,000,000
Trade receivables, net	4,7,10,24,33	244,299,816,479	349,607,243,924
Other receivables, net	4,7,10,33	174,526,066,190	138,252,020,698
Due from customers for contract work, net	7,24,33	1,297,216,356,404	1,207,449,950,611
Prepayments, net	24	373,337,560,917	281,664,525,792
Prepaid expenses, net		81,768,397,353	41,971,911,164
Short-term loans, net	4,7,10,33	146,163,474,649	160,153,121,939
Derivative financial assets	4,9,10	20,325,859,084	68,617,278,477
Firm commitment assets	9	44,744,321,589	5,595,629,115
Inventories, net	8,24	361,059,871,793	293,320,650,160
Other current assets, net	4,7,10,14	27,456,454,270	24,114,023,815
Assets held for sale	11,12,31,33,35	42,569,442,490	-
Total current assets		3,683,979,645,346	2,970,075,155,557
Long-term financial instruments	4,5,10	22,738,389,537	1,263,671,423
Long-term investments in securities	4,6,10,32	176,629,898,243	790,252,742,997
Investments in subsidiaries, associates and joint ventures	11,32,33,35	5,349,988,195,927	3,088,476,287,069
Long-term loans, net	4,7,10,33	44,758,897,200	40,823,193,860
Property, plant and equipment, net	12,14,32,35	3,309,494,887,803	2,995,973,357,484
Intangible assets, net	13	974,589,544,845	907,454,617,963
Investment property	15,33	79,533,763,370	24,371,746,800
Derivative financial assets	4,9,10	7,740,627,803	35,847,958,429
Firm commitment assets	9	20,692,914,690	9,811,337,143
Deferred tax assets	29	180,001,253,226	66,498,432,227
Guarantee deposits, net	4,7,10	76,702,649,500	109,108,315,479
Due from customers for contract work, net	7,24,33	102,739,503,644	102,739,503,644
Other non-current assets, net	4,7,10,14	2,280,947,851	4,519,838,968
Total non-current assets		10,347,891,473,639	8,177,141,003,486
Total assets		₩ 14,031,871,118,985	11,147,216,159,043

See accompanying notes to the separate financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.
Separate Statements of Financial Position, Continued
As of December 31, 2021 and 2020

(In won)	Note	2021	2020
Liabilities			
Trade payables	4,10,33 ₩	1,075,638,077,057	616,198,979,074
Short-term borrowings	4,10,16,31,32,34	3,279,422,509,546	4,031,380,429,175
Other payables	4,10	178,580,940,502	262,524,124,843
Advance received	24	37,311,941,924	21,793,396,212
Due to customers for contract work	24,33	1,155,525,093,020	1,035,071,221,352
Withholdings		14,661,493,592	97,944,475
Accrued expenses	4,10	82,342,659,211	58,245,671,022
Current income tax liabilities	29	-	636,453,552
Current portion of long-term debt	4,10,16,31,32,33,34	899,500,414,565	462,969,883,340
Current lease liabilities	4,10,14,33,34	26,140,812,082	15,966,723,134
Derivative financial liabilities	9,10	184,346,228,963	15,576,478,356
Firm commitment liabilities	9	9,135,351,642	16,162,172,211
Provisions	18,24	196,415,920,863	258,143,731,053
Other current liabilities	4,10	4,974,128,318	1,958,255,904
Total current liabilities		7,143,995,571,285	6,796,725,463,703
Bonds	4,10,16,31,32,34	422,363,429,340	14,734,537,562
Long-term borrowings	4,10,16,31,32,33,34	122,492,709,630	309,108,947,636
Long-term asset-backed borrowings	4,10,16,32,33,34	-	49,102,652,561
Long-term other payables	4,10	13,601,344,053	14,384,777,140
Defined benefit liabilities, net	17	105,513,435,495	96,154,631,232
Deposits received	4,10	176,049,875,195	198,543,169,243
Non-current lease liabilities	4,10,14,33,34	157,488,642,186	12,146,293,061
Derivative financial liabilities	9,10	35,691,182,736	25,852,173,317
Firm commitment liabilities	9	5,217,579,370	23,745,413,460
Provisions	18	88,336,115,444	108,970,403,058
Other non-current liabilities	4,10	59,536,899,354	37,070,443,819
Total non-current liabilities		1,186,291,212,803	889,813,442,089
Total liabilities		8,330,286,784,088	7,686,538,905,792
Equity			
Capital stock	19	2,675,624,980,000	1,937,707,325,000
Capital surplus	16,19,20	1,811,241,858,539	2,623,051,847,367
Other components of equity	19,21	(1,031,834,273)	620,128,929
Accumulated other comprehensive income	6,9,10,12,22	1,054,965,430,146	901,448,271,520
Retained earnings (accumulated deficits)	23	160,783,900,485	(2,002,150,319,565)
Total equity		5,701,584,334,897	3,460,677,253,251
Total liabilities and equity	₩	14,031,871,118,985	11,147,216,159,043

See accompanying notes to the separate financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Separate Statements of Profit or Loss

For the years ended December 31, 2021 and 2020

<i>(In won)</i>	Note		2021	2020
Sales	24,33	₩	3,592,881,973,679	3,451,444,902,650
Cost of sales	24,25,33		3,181,186,407,210	3,209,753,196,445
Gross profit			411,695,566,469	241,691,706,205
Selling and administrative expenses	10,25,26,33		276,410,496,287	714,753,892,765
Operating profit (loss)			135,285,070,182	(473,062,186,560)
Finance income and expenses			(53,411,337,909)	(287,932,061,798)
Finance income	10,27,33		616,858,661,662	360,386,215,638
Finance expenses	10,27,33		670,269,999,571	648,318,277,436
Other non-operating income and expenses			(216,564,040,453)	(1,345,395,055,704)
Other non-operating income	10,28,33		86,698,117,873	102,829,818,942
Other non-operating expenses	10,28,33		303,262,158,326	1,448,224,874,646
Loss before income tax			(134,690,308,180)	(2,106,389,304,062)
Income tax benefit	29		(161,291,354,762)	(226,215,208,129)
Profit (loss) for the period		₩	26,601,046,582	(1,880,174,095,933)
Earnings (loss) per share				
Basic earnings (loss) per share	30	₩	59	(7,520)
Diluted earnings (loss) per share	30		58	(7,520)

See accompanying notes to the separate financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Separate 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	₩	26,601,046,582	(1,880,174,095,933)
Other comprehensive income (loss)		161,926,982,902	(27,104,507,205)
Items that will not be reclassified			
subsequently to profit or loss		152,504,770,335	(16,033,351,217)
Remeasurements of defined benefit liabilities	17,29	8,013,096,521	(16,235,902,537)
Loss on valuation of fair value through other comprehensive income ("FVOCI") financial assets	6,29	-	(3,397,942)
Profit on revaluation of assets	12,29	144,491,673,814	205,949,262
Items that are or may be reclassified			
subsequently to profit or loss		9,422,212,567	(11,071,155,988)
Effective portion of changes in fair value of cash flow hedges	9,10,29	9,422,212,567	(11,071,155,988)
Total comprehensive income (loss) for the period	₩	188,528,029,484	(1,907,278,603,138)

See accompanying notes to the separate financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Separate Statements of Changes in Equity

For the years ended December 31, 2021 and 2020

(In won)

	Capital stock	Capital surplus	Other components of equity	Accumulated other comprehensive income	Retained earnings (Accumulated deficit)	Total equity
Balance at January 1, 2020	₩ 1,075,255,425,000	1,557,411,464,430	1,463,939,543	912,471,732,950	(105,895,177,857)	3,440,707,384,066
Total comprehensive income (loss):						
Loss for the period	-	-	-	-	(1,880,174,095,933)	(1,880,174,095,933)
Effective portion of changes in fair value of cash flow hedges	-	-	-	(11,071,155,988)	-	(11,071,155,988)
Remeasurements of defined benefit liabilities	-	-	-	-	(16,235,902,537)	(16,235,902,537)
Loss on valuation of FVOCI	-	-	-	(3,397,942)	-	(3,397,942)
Profit on revaluation of assets	-	-	-	51,092,500	154,856,762	205,949,262
Subtotal	-	-	-	(11,023,461,430)	(1,896,255,141,708)	(1,907,278,603,138)
Transactions with owners of the Company:						
Issuance of common shares	827,990,875,000	607,570,209,908	-	-	-	1,435,561,084,908
Exercise of stock warrants	5,735,000	12,900,393	-	-	-	18,635,393
Stock option	-	827,401,364	(827,401,364)	-	-	-
Stock exchange	34,455,290,000	2,031,650,780	(16,409,250)	-	-	36,470,531,530
Others (See Note 20)	-	455,198,220,492	-	-	-	455,198,220,492
Subtotal	862,451,900,000	1,065,640,382,937	(843,810,614)	-	-	1,927,248,472,323
Balance at December 31, 2020	₩ 1,937,707,325,000	2,623,051,847,367	620,128,929	901,448,271,520	(2,002,150,319,565)	3,460,677,253,251
Balance at January 1, 2021	₩ 1,937,707,325,000	2,623,051,847,367	620,128,929	901,448,271,520	(2,002,150,319,565)	3,460,677,253,251
Total comprehensive income:						
Profit for the period	-	-	-	-	26,601,046,582	26,601,046,582
Effective portion of changes in fair value of cash flow hedges	-	-	-	9,422,212,567	-	9,422,212,567
Remeasurements of defined benefit liabilities	-	-	-	-	8,013,096,521	8,013,096,521
Profit on revaluation of assets	-	-	-	144,094,946,059	396,727,755	144,491,673,814
Subtotal	-	-	-	153,517,158,626	35,010,870,858	188,528,029,484
Transactions with owners of the Company:						
Issuance of common shares	239,219,780,000	359,337,177,143	-	-	-	598,556,957,143
Exercise of stock warrants	81,700,690,000	111,977,939,313	-	-	-	193,678,629,313
Stock option	-	283,741,579	(283,741,579)	-	-	-
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)
Spin-off and merger	416,997,185,000	844,514,502,329	614,558,287	-	-	1,262,126,245,616
Subtotal	737,917,655,000	(811,809,988,828)	(1,651,963,202)	-	2,127,923,349,192	2,052,379,052,162
Balance at December 31, 2021	₩ 2,675,624,980,000	1,811,241,858,539	(1,031,834,273)	1,054,965,430,146	160,783,900,485	5,701,584,334,897

See accompanying notes to the separate financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Separate Statements of Cash Flows

For the years ended December 31, 2021 and 2020

(In won)

	Note	2021	2020
Cash flows from operating activities			
Cash generated from operations:	34 ₩	736,148,344,187	(454,004,125,440)
Profit (loss) for the period		26,601,046,582	(1,880,174,095,933)
Adjustments		496,753,896,488	1,837,833,131,445
Changes in operating assets and liabilities		212,793,401,117	(411,663,160,952)
Interest received		3,524,521,723	2,761,772,936
Interest paid		(172,973,554,777)	(179,004,112,560)
Dividends received		1,312,521,921	611,725,177
Income tax paid		(6,951,352,697)	(9,933,582,994)
Net cash provided by (used in) operating activities		561,060,480,357	(639,568,322,881)
Cash flows from investing activities			
Cash inflows from investing activities:			
Decrease in short-term financial instruments		288,267,029,836	170,187,306,802
Collection of short-term loans		31,254,474,523	158,416,000,000
Decrease in long-term financial instruments		83,880,636,012	29,464,966,524
Proceeds from disposal of short-term investments in securities		1,600,000,000	-
Proceeds from disposal of long-term investments in securities		1,480,101,402	1,936,794,289
Collection of long-term loans		11,890,233,660	61,979,706,416
Proceeds from disposal of investments in subsidiaries, associates and joint ventures		709,000,252,425	42,503,246,900
Proceeds from disposal of property, plant and equipment		61,204,664,922	1,433,673,747
Proceeds from disposal of intangible assets		80,000,000	4,393,636,370
Decrease in lease receivables		2,335,009,067	1,830,535,534
Decrease in derivative financial assets		49,240,386,090	-
Decrease in assets held for sale		5,003,769,592	-
Cash inflows from investing activities related to spin-off and merger		309,084,462,403	-
Subtotal		1,554,321,019,932	472,145,866,582
Cash outflows from investing activities:			
Increase in short-term financial instruments		(620,533,016,470)	(167,454,436,195)
Increase in short-term loans		(11,769,636,167)	(308,618,625,306)
Increase in long-term financial instruments		(106,615,025,549)	(29,464,966,524)
Acquisition of long-term investments in securities		(47,504,722,175)	(33,154,839,953)
Increase in long-term loans		(45,080,765,000)	(24,108,352,800)
Acquisition of investments in subsidiaries, associates and joint ventures		(2,041,841,400)	(290,340,942,498)
Acquisition of property, plant and equipment		(47,868,124,737)	(25,199,621,186)
Acquisition of intangible assets		(128,670,437,149)	(135,439,232,405)
Acquisition of right-of-use assets		-	(713,183,534)
Acquisition of investment properties		(419,858,010)	-
Subtotal		(1,010,503,426,657)	(1,014,494,200,401)
Net cash provided by (used in) investing activities		543,817,593,275	(542,348,333,819)

See accompanying notes to the separate financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Separate Statements of Cash Flows, Continued

For the years ended December 31, 2021 and 2020

(In won)

	Note	2021	2020
Cash flows from financing activities			
Cash inflows from financing activities:			
Increase in short-term borrowings, net	₩	-	1,384,016,704,786
Proceeds from long-term borrowings		667,663,365,000	300,000,000,000
Issuance of bonds		93,391,863,763	10,000,000,000
Issuance of common shares		-	1,212,523,393,400
Exercise of stock warrants		193,823,570,755	5,554,700
Subtotal		954,878,799,518	2,906,545,652,886
Cash outflows for financing activities:			
Decrease in short-term borrowings, net		(855,834,164,575)	-
Repayment of long-term borrowings		-	(275,000,000,000)
Repayment of current portion of long-term debt		(968,651,379,992)	(1,417,761,642,102)
Payment of lease liabilities		(23,123,216,481)	(29,351,880,890)
Acquisition of treasury stock		(1,982,779,910)	(16,409,250)
Repayment of asset-backed borrowings		(77,639,119,912)	(41,800,000,000)
Expense of commonshares issuance		(7,034,742,146)	(15,645,359,727)
Subtotal		(1,934,265,403,016)	(1,779,575,291,969)
Net cash provided by (used in) financing activities		(979,386,603,498)	1,126,970,360,917
Effect of movements in exchange rates on cash held		16,572,255,898	(9,254,949,646)
Net increase (decrease) in cash and cash equivalents		142,063,726,032	(64,201,245,429)
Cash and cash equivalents at January 1		281,631,480,208	345,832,725,637
Cash and cash equivalents at December 31	₩	423,695,206,240	281,631,480,208

See accompanying notes to the separate financial statements.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Notes to the Separate Financial Statements

For the years ended December 31, 2021 and 2020

1. Reporting entity

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 thermal and nuclear 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. Significant accounting policies and basis of preparation

(1) Basis of separate financial statements

These financial statements are separate financial statements prepared in accordance with K-IFRS No. 1027, 'Separate Financial Statements' presented by a parent, an investor in an associate or a venturer in a joint venture, in which the investments are accounted for on the basis of the direct equity interest rather than on the basis of the reported results and net assets of the investees.

The principal accounting policies are set out below. Except for the effect of the amendments to K-IFRS and new interpretations set out below, the principal accounting policies used to prepare the separate financial statements as of and for the year ended December 31, 2021 are consistent with the accounting policies used to prepare the separate financial statements as of and for the year ended December 31, 2020.

The accompanying separate financial statements have been prepared on the historical cost basis except for certain 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.

1) The Company 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 Company's separate financial statements commencing January 1, 2021. The Company has retrospectively applied the Interest Rate Benchmark Reform – Phase 2 amendments.

In accordance with the exceptions permitted in the Phase 2 amendments, the Company 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

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Notes to the Separate Financial Statements

For the years ended December 31, 2021 and 2020

- 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 Company 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
- 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 Company anticipates that the application of the enactment and amendments will not have a significant impact on the Company's separate financial statements.

(2) Investments in subsidiaries, associates and joint ventures

The Company has elected to use book value under previous generally accepted accounting principles as deemed cost for subsidiaries, joint ventures and associates at the date of transition to K-IFRS. After the date of transition, subsidiaries, joint ventures and associates are measured at cost. Dividend income from investments in subsidiaries, joint ventures and associates is recognized in profit or loss in the period when the shareholders' right to receive payment has been established.

(3) Foreign currency translation

The Company's separate financial statements are presented in the currency of the primary economic environment in which it operates (its functional currency). The functional currency of the Company and the presentation currency for the separate financial statements of the Company are Korean won. Transactions in currencies other than the entity's functional currency is recognized at the rates of exchange prevailing at the dates of the transactions. Foreign currency gain (loss) from settlements of foreign currency transactions or translation of monetary items denominated in foreign currencies are recognized in profit or loss whereas the gain (loss) from qualified cash flow hedge and net investment hedge for foreign operations is deferred as an equity item.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Notes to the Separate Financial Statements

For the years ended December 31, 2021 and 2020

(4) 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 separate statements of financial position.

(5) 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 Company 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 Company 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 Company 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.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Notes to the Separate Financial Statements

For the years ended December 31, 2021 and 2020

The Company 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 Company'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 Company 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 Company 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 Company'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 amount, a feature that permits or requires prepayment at an amount that substantially represents the contractual par amount 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.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.
Notes to the Separate Financial Statements
For the years ended December 31, 2021 and 2020

The following accounting policies apply to the subsequent measurement 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 Company 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 Company neither transfers nor retains substantially all of the risks and rewards of ownership and it does not retain control of the financial asset.

The Company 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 separate statement of financial position only when the Company 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.

(6) Impairment of financial assets

1) Recognition of impairment on financial assets

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

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

The Company'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: ECL that resulted from all possible default events over the expected life of a financial instrument)

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Notes to the Separate Financial Statements

For the years ended December 31, 2021 and 2020

The Company 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 ECLs, the Company considers both quantitative and qualitative information that is reasonable and supportable, including historical experience and forward-looking information that is available without undue cost or effort.

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.

2) Measurement of ECL

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 Company 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 becoming probable that the borrower will enter bankruptcy or other financial reorganization; or
- the disappearance of an active market for that financial asset because of financial difficulties.

4) Presentation of credit loss allowance on financial position

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

5) De-recognition

The Company 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 Company 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 Company does not expect that such write-off will be recovered but they may be subject to collection activity according to the Company past due collection process.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Notes to the Separate Financial Statements

For the years ended December 31, 2021 and 2020

(7) Trade receivables

Trade receivables are amounts owed by customer for products and services provided in the ordinary course of business. Trade 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 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.

(8) Inventories

Inventories are stated at the lower of cost and net realizable value. Cost of inventories includes fixed and variable manufacturing overhead costs which is 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 Company 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.

(9) 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 Company.

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	10~40 years
Structures	10~40 years
Machinery	5~20 years
Right-of-use asset	Lease term
Others	3~15 years

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.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

Notes to the Separate Financial Statements

For the years ended December 31, 2021 and 2020

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

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

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.

(10) 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.

While land is not depreciated, building excluding investment property transferred from lease assets is depreciated using the straight-line method over the useful lives between 10 and 40 years.

The Company reviews the depreciation method, the estimated useful lives and residual values of Investment property 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.

(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

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.

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For the years ended December 31, 2021 and 2020

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 Company has the ability to measure reliably the expenditure attributable to the development. Capitalized development costs 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 Company, are not amortized but tested for impairment once a year.

(12) 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.

(13) Impairment of non-financial assets

The carrying amounts of the Company's non-financial assets other than assets arising from contracts with customer, costs to obtain or fulfil a contract, 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.

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The Company estimates the recoverable amount of an individual asset, and if it is impossible to measure the individual recoverable amount of an asset, the Company estimates the recoverable amount of cash-generating unit ("CGU"). 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, immediately.

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 value 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.

(14) Non-derivative financial liabilities

The Company 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 Company recognizes financial liabilities in the separate statement of financial position when the Company 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 Company derecognizes financial liability when its contractual obligations are discharged, cancelled or expired. The Company 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.

DOOSAN HEAVY INDUSTRIES & CONSTRUCTION CO., LTD.
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For the years ended December 31, 2021 and 2020

(15) Borrowings

Borrowings are measured initially at fair value, net of transaction costs and subsequently at amortized cost using the effective interest method, 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 Company 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.

(16) Compound financial instrument

Compound financial instruments issued by the Company 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 Company which can, at the option of the holder, be converted into a fixed number of equity instruments in the Company, is classified as equity.

The liability component of a convertible bonds and bonds with stock warranties is recognized at the fair value of a similar liability on initial recognition and be measured at amortized cost by applying the effective interest method 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.

(17) Financial guarantee contracts

The Company 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.

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(18) Employee benefits liability

The Company 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.

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 separate 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 Company's obligation.

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.

(19) Provisions

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

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(20) Leases

The Company 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 Company 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 Company allocates the consideration of the contract to each lease element based on its relative stand-alone price. However, the Company 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 Company 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.

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 right-of-use 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 right-of-use 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 Company's incremental borrowing rate. Generally, the Company 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 assets is adjusted and the remeasurement amount is recognized in profit or loss if the carrying amount of the right-of-use assets 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 Company 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 Company shall recognize the lease charges relating to these leases as expenses in accordance with the straight-line method over the lease term.

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2) Lessor

The accounting policies applied during comparative periods by the Company as a lessor are not different from those in K-IFRS No. 1116. As a lessor, the Company determines whether the lease is a finance lease or an operating lease at the inception of the lease. To classify each lease, the Company 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.

(21) 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.

1) Hedge accounting

The Company 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 Company documents the relationship between the hedging instrument and the hedged item, along with its risk management objectives and its strategy for undertaking various hedge transactions. Furthermore, at the inception of the hedge and on an ongoing basis, the Company assesses whether there is an economic relationship between the hedged item and the hedging instrument.

The Company 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 Company 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 Company 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 Company 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

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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 Company changes the official designation of hedging relationship documented in the past to reflect the changes required by the interest rate benchmark reform.

The Company 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 Company shall determine whether hedging accounting is no longer applicable and if the hedging accounting continues to be applied, the Company 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.

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.

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2) Separable embedded derivatives

Embedded derivatives are separate 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) instrument 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.

(22) Dividend

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

(23) 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 Company's decision, or the distribution of dividends is solely upon the Company's decision. Once a general meeting of shareholders meeting approves dividends, the Company 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 Company's own equity instruments.

(24) Share-based payments

The Company 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 Company determines the fair value of share option using the Black-Scholes option pricing model.

(25) 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 separate statement of financial position under trade receivables.

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(26) Government grants

Government grants are recognized only when there is reasonable assurance that the grant will be received and the company 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.

(27) 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 Company's liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities in the separate financial statements and the corresponding tax bases used in the computation of taxable 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.

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.

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(28) 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 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.

(29) Greenhouse gas emissions rights

In connection with Enforcement of Allocation and Trading of Greenhouse Gas Emissions Allowances, the Company 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 Company 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 Company'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 Company derecognizes the emission obligations when the Company submits the emissions rights to the government.

(30) Operation segments

The Company presents disclosure relating to operating segments on its consolidated financial statements in accordance with K-IFRS No. 1108 'Operating Segments' and such disclosures are not separately disclosed on these separate financial statements.

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(31) Revenue from contracts with customers

1) Identify performance obligations

The Company is mainly engaged in the businesses of power generation facilities, industrial facilities, manufacturing of casting and forging products and comprehensive construction business. The Company 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 Company 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) Obligations to perform over period

The Company manufactures and sells specialized power machinery which are built based on customer's orders designating the design elements. The Company 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 Company and there is an enforceable right to payment for performance completed to date.

3) Measurement of the percentage-of-completion by using the input method

The Company 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 Company recognizes revenue following percentage-of-completion method, judging whether the construction/service contracts are provided over period if it meets all the following conditions:

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

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

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

4) Variable consideration

The Company estimates an amount of variable consideration by using the method the Company expects to better predict the amount of consideration to which it will be entitled. The Company includes an amount of variable consideration in the transaction price only to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the return period expires.

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5) Allocating the transaction price to performance obligations

The Company allocates the transaction price to each performance obligation on a relative stand-alone selling price basis. The Company 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.

6) Warranty obligation

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

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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 Company's assets and liabilities within the next financial year.

(1) Recognition of revenue

The Company 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. In recognition of revenue according to the input method, the amount of revenue recognized differs depending on the measured progress, so it is required to estimate the method for measuring progress, estimated total contract costs, and changes in construction work. 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) Defined benefit liability

The Company 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.

(3) Provisions

Provisions are recognized when the Company 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.

(4) Deferred tax

Recognition and measurement of deferred tax assets and liabilities require judgment of the Company'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.

(5) Impairment of non-financial assets

The Company is assessing whether there is any indication that an asset may be impaired at the end of each reporting period. The Company 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 Company 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 Company. 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 Company enters into derivative contracts to hedge against certain risks. The Company 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 Company's exposure to the risk of changes in foreign currency exchange rates relates primarily to the Company's operating activities and net investments in foreign subsidiaries. The Company'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 Company's policy on foreign currencies, and currency trading for speculative purposes is prohibited.

The Company's basis for foreign currency management is to reduce income/loss volatility. The Company 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 Company'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)
Financial assets	₩	472,789	18,129	3,423	26,333	267,223
Financial liabilities		259,010	95,498	16,857	1,178	54,829
Net assets (liabilities)	₩	213,779	(77,369)	(13,434)	25,155	212,394

(*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)
Financial assets	₩	406,596	28,521	15,378	84,170	124,068
Financial liabilities		335,128	92,145	19,537	4,210	81,966
Net assets (liabilities)	₩	71,468	(63,624)	(4,159)	79,960	42,102

(*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 Company's income before tax for the year, assuming a 10% increase and decrease in currency exchange rates, as of December 31, 2021 and 2020 are as follows:

(In millions of won)	2021		2020	
	10% increase	10% decrease	10% increase	10% decrease
Income before tax impact	₩ 36,053	(36,053)	12,575	(12,575)

The above-mentioned sensitivity analysis is based on monetary assets and liabilities denominated in foreign currencies other than the Company'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 Company 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 Company 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 and long-term borrowings. The Company 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:

(In millions of won)	2021		2020	
Financial assets	₩	107,000		119,000
Financial liabilities		929,111		831,521
Net liabilities	₩	(822,111)		(712,521)

A sensitivity analysis on the Company's income before tax for the year, assuming a 1% increase and decrease in interest rates, as of December 31, 2021 and 2020 are as follows:

(In millions of won)	2021		2020	
	1% increase	1% decrease	1% Increase	1% decrease
Income before tax impact	₩ (8,221)	8,221	(7,125)	7,125

3) Price risk

The Company is exposed to equity price risks arising from its listed equity investments among financial instruments. The Company 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 Company's portfolio are individually managed, and acquisition and disposal are approved by the Board of Directors.

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(2) Credit risk

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

The Company 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 Company periodically reassesses the credit quality of customers by auditing credit limits and adjusts the amount covered by collaterals when deemed necessary. The Company also monitors whether the collection of financial assets have been impaired to take relevant actions.

The carrying amount of financial assets represents the Company's maximum exposure. The maximum exposure to credit risk as of December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021	2020
Cash and cash equivalents	₩	423,695	281,631
Short and long- term financial instruments		469,555	117,361
Trade receivables and other receivables		628,461	707,939
Deposits in financial institutions		76,703	109,108
Short and long- term investment in securities (excluding equity securities)		125,946	100,192
Derivative financial assets		28,066	104,466
Total	₩	1,752,426	1,420,697

In addition to the above, the maximum amounts to be paid for the principal debtor related to financial guarantee contract are described in Notes 31 (6), (7) and (8).

The Company'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	₩	159,327	11,523	12,040	14,194	398,063	595,147
Loans and other receivables		945,886	12,463	3,837	3,893	113,219	1,079,298
Accrued income		13,865	-	-	-	16,720	30,585
Lease receivables		4,520	-	-	-	-	4,520
Total	₩	1,123,598	23,986	15,877	18,087	528,002	1,709,550

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		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	₩	200,039	50,030	40,402	49,559	334,701	674,731
Loans and other receivables		881,372	13,867	7,312	8,548	83,906	995,005
Accrued income		8,397	-	-	-	16,794	25,191
Lease receivables		6,501	-	-	-	-	6,501
Total	₩	1,096,309	63,897	47,714	58,107	435,401	1,701,428

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

(3) Liquidity risk

The Company 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 Company 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 Company'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)	₩	6,473,189	6,532,722	5,560,975	718,263	152,343	101,141
Interest on financial liabilities		-	57,553	53,193	3,977	383	-
Total	₩	6,473,189	6,590,275	5,614,168	722,240	152,726	101,141

(*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)	₩	6,074,653	6,078,445	5,487,526	575,542	12,998	2,379
Interest on financial liabilities		-	97,060	90,253	6,805	2	-
Total	₩	6,074,653	6,175,505	5,577,779	582,347	13,000	2,379

(*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 Company as of December 31, 2021 are described in Notes 31 (6), (7) and (8).

(4) Capital risk

The objective of the Company'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 Company 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:

(In millions of won)

	2021	2020
Total liabilities (A)	₩ 8,330,287	7,686,539
Total equity (B)	5,701,584	3,460,677
Debt-to-equity ratio (A/B)	146.10%	222.11%

5. Restricted financial assets

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

(In millions of won)

	2021	2020	Restrictions
Cash and cash equivalents	₩ -	55,428	Establishment of pledge related to financial loan
Short-term financial instruments	277,115	23,255	Establishment of pledge related to financial loan and Government R&D projects(*1)
	157,702	80,843	Price Return Swap ("PRS") deposit(*2)
	12,000	12,000	Shared growth fund
Long-term financial instruments	22,738	4	Establishment of pledge related to financial loan, deposits for maintenance of checking accounts and leasehold deposit of Bundang Doosan Tower
Total	₩ 469,555	171,530	

(*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	₩ -	1,600
Long-term investments in securities	Financial assets as measured at FVOCI	3,885	3,885
	Financial assets as measured at FVTPL	172,745	786,368
	Subtotal	176,630	790,253
	Total	₩ 176,630	791,853

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

(In millions of won)

	Description	2021
Short-term	Financial assets as measured at amortized cost	
	Debt securities	
	57 U-best 5 th Co., Ltd.(P-CBO)	₩ -
	Total	₩ -
Long-term	Financial assets as measured at FVOCI	
	Equity securities	
	Al Asilah Desalination Company	₩ 3,885
	Subtotal	3,885
	Financial assets as measured at FVTPL	
	Equity securities	
	Doosan Fuel Cell Co., Ltd.(*3)	-
	Woori Financial Group Inc.(*4)	10,160
	NuScale Power LLC	35,692
	HTC Purenergy Inc	35
	Others	912
	SOC	
	Incheon-Gimpo Expressway Co.(*1)	6,855
	Gyeonggi East-West Beltway Co.(*1)	5,671
	Investment in guarantee cooperative	
	Machinery Financial Cooperative	8,620
	Construction Guarantee Cooperative(*2)	81,317
	Engineering Guarantee Insurance(*2)	5,448
	Construction Industry Guarantee	7,518
	Others	414
	Beneficiary certificates	
	Gyeongnam GNTech Creative Economy Innovation Fund	1,703
	Korea EXIM Bank - Public Carbon Fund	326
	Emerald Technology Ventures	8,074
	Subtotal	172,745
	Total	₩ 176,630

(*1) It has been pledged as collateral for developers' project financing as of December 31, 2021 (See Note 32).

(*2) It has been pledged as collateral for the Company's debt as of December 31, 2021 (See Note 32).

(*3) It was given free of charge by related person during the prior year. In 2021, the Company acquired control by additional acquisition of shares hold by parent company, Doosan Corporation, through in-kind investments, and the amount has been reclassified as investment in subsidiaries.

(*4) It has been succeeded from spin-off and merger of DI's investment division in 2021.

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(In millions of won)

Description				2020
Short-term	Financial assets as measured at amortized cost	Debt securities	57 U-best 5 th Co., Ltd.(P-CBO)	
				₩ 1,600
			Total	₩ 1,600
Long-term	Financial assets as measured at FVOCI	Equity securities	Al Asilah Desalination Company	
				₩ 3,885
			Subtotal	3,885
	Financial assets as measured at FVTPL	Equity securities	Doosan Fuel Cell Co., Ltd.(*2,3)	682,850
			NuScale Power LLC	4,737
			HTC Purenergy Inc	128
			Others	61
		SOC	Incheon-Gimpo Expressway Co.(*1)	780
			Gyeonggi East-West Beltway Co.(*1)	4,453
		Investment in guarantee cooperative	Machinery Financial Cooperative	8,588
			Construction Guarantee Cooperative(*2)	69,458
			Engineering Guarantee Insurance(*2)	5,130
			Others	1,409
		Beneficiary certificates	Gyeongnam GNTech Creative Economy Innovation Fund	2,473
			Korea EXIM Bank - Public Carbon Fund	325
			Emerald Technology Ventures	5,976
			Subtotal	786,368
			Total	₩ 790,253

(*1) It has been pledged as collateral for developers' project financing as of December 31, 2020 (See Note 32).

(*2) It has been pledged as collateral for the Company's debt as of December 31, 2020 (See Note 32).

(*3) It was given free of charge by related person in 2020.

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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	₩	3,885	-	-	-	3,885
Financial assets as measured at FVTPL		786,368	56,665	(1,480)	(12,806)	172,745
Total	₩	790,253	56,665	(1,480)	(12,806)	176,630

(*1) Includes the amount of reclassification between accounts.

(In millions of won)

		2020				
		January 1	Acquisition	Disposal	Gain or loss on valuation	December 31
Financial assets as measured at FVOCI	₩	3,889	-	-	(4)	3,885
Financial assets as measured at FVTPL		76,506	633,680	(1,938)	78,120	786,368
Total	₩	80,395	633,680	(1,938)	78,116	790,253

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 asset:							
Trade receivables	₩	595,147	(350,847)	244,300	674,731	(325,124)	349,607
Other receivables		304,271	(129,745)	174,526	245,547	(107,295)	138,252
Accrued income		30,585	(16,392)	14,193	25,191	(12,588)	12,603
Short-term loans		224,670	(78,507)	146,163	234,953	(74,800)	160,153
Lease receivables		2,239	-	2,239	1,981	-	1,981
Subtotal		1,156,912	(575,491)	581,421	1,182,403	(519,807)	662,596
Non-current asset:							
Long-term loans		550,357	(505,598)	44,759	514,505	(473,682)	40,823
Lease receivables		2,281	-	2,281	4,520	-	4,520
Subtotal		552,638	(505,598)	47,040	519,025	(473,682)	45,343
Total	₩	1,709,550	(1,081,089)	628,461	1,701,428	(993,489)	707,939

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(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 allowance	Others	December 31
Trade and other receivables:					
Trade receivables	₩	325,124	25,723	-	350,847
Other receivables		107,295	22,450	-	129,745
Accrued income		12,588	3,804	-	16,392
Short and long-term loans		548,481	35,624	-	584,105
Subtotal		993,488	87,601	-	1,081,089
Others:					
Due from customers for contract work		54,873	57,518	-	112,391
Deposits		2,339	461	-	2,800
Subtotal		57,212	57,979	-	115,191
Total	₩	1,050,700	145,580	-	1,196,280

(In millions of won)

		2020			
		January 1	Provision for allowance	Others	December 31
Trade and other receivables:					
Trade receivables	₩	159,954	165,170	-	325,124
Other receivables		91,752	643	14,900	107,295
Accrued income		12,588	-	-	12,588
Short and long-term loans		475,459	73,022	-	548,481
Subtotal		739,753	238,835	14,900	993,488
Others:					
Due from customers for contract work		52,138	2,735	-	54,873
Deposits		2,339	-	-	2,339
Subtotal		54,477	2,735	-	57,212
Total	₩	794,230	241,570	14,900	1,050,700

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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	₩	23,916	(4,123)	19,793	21,495	(2,110)	19,385
Work-in-process		247,251	(23,164)	224,087	207,446	(10,790)	196,656
Raw materials		47,761	(3,214)	44,547	42,112	(2,757)	39,355
Supplies		19,351	(2,508)	16,843	18,150	(2,581)	15,569
Materials-in-transit		55,790	-	55,790	22,356	-	22,356
Total	₩	394,069	(33,009)	361,060	311,559	(18,238)	293,321

Losses on inventory valuation recognized within the cost of sales amounted to ₩14,771 million and ₩2,973 million for the years ended December 31, 2021 and 2020, respectively.

9. Derivatives

(1) Overview of the derivatives of the Company 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
	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 ("CRS")	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 Company 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	1,983,930	USD	1,750,491 ₩	(91,984)	(122,217)	(813)	55,719
KRW	112,827	EUR	82,830	207	287	74	(194)
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	13,510,510	KRW	164,988	(22,103)	(1,042)	(6,052)	117
Others		KRW	79,971	1,496	246	1,307	(117)
Short and long-term borrowing denominated in foreign currencies(*3)							
KRW	-	USD	-	-	-	-	49
CRS				14,044	31,772	-	-
Stock warrant(*4)				-	56,148	-	-
PRS(*5)				(106,968)	(106,968)	-	-
Subtotal				(191,971)	(130,155)	(682)	51,084
Tax effect				-	-	165	-
Total				₩ (191,971)	(130,155)	(517)	51,084

(*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 (-) ₩517 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 ₩65,437 million and firm commitment liabilities of ₩14,353 million were recognized in the separate statements of financial position by applying a fair value hedge accounting.

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

(*4) It is stock warrants of detachable bonds with stock warrants issued by Doosan Infracore Co., Ltd. and during the current year the entire stock was sold.

(*5) The Company 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	1,926,579	USD	1,722,052 ₩	49,645	69,081	1,724	(21,622)
KRW	181,670	EUR	133,820	969	452	(465)	(404)
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	13,798,410	KRW	172,915	(24,486)	(2,705)	(6,254)	130
Others		KRW	54,232	(2,337)	(14)	(2,272)	7
Short and long-term borrowing denominated in foreign currencies(*3)							
KRW	-	USD	-	-	-	-	36
IRS				(832)	-	(832)	-
Stock warrant(*4)				19,605	17,755	-	-
PRS(*5)				24,613	24,613	-	-
	Subtotal			63,037	98,051	(13,112)	(24,501)
Tax effect				-	-	3,173	-
	Total		₩	63,037	98,051	(9,939)	(24,501)

(*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 (-) ₩9,939 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 ₩15,407 million and firm commitment liabilities of ₩39,908 million were recognized in the separate statements of financial position by applying a fair value hedge accounting.

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

(*4) It is stock warrants of detachable bonds with stock warrants issued by DI.

(*5) The Company 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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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	₩	423,695	-	-	-	423,695	423,695
Short and long-term financial instruments		469,555	-	-	-	469,555	469,555
Short and long-term investment in securities		-	3,885	172,745	-	176,630	176,630
Derivative financial assets		-	-	17,280	10,786	28,066	28,066
Trade and other receivables		628,461	-	-	-	628,461	628,461
Deposits		76,703	-	-	-	76,703	76,703
Total	₩	1,598,414	3,885	190,025	10,786	1,803,110	1,803,110

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

(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	₩	281,631	-	-	-	281,631	281,631
Short and long-term financial instruments		117,361	-	-	-	117,361	117,361
Short and long-term investment in securities		1,600	3,885	786,368	-	791,853	791,853
Derivative financial assets		-	-	50,332	54,134	104,466	104,466
Trade and other receivables		707,939	-	-	-	707,939	707,939
Deposits		109,108	-	-	-	109,108	109,108
Total	₩	1,217,639	3,885	836,700	54,134	2,112,358	2,112,358

(*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)

(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	₩	1,267,820	-	-	1,267,820	1,267,820
Borrowings and bonds		4,723,779	-	-	4,723,779	4,723,779
Derivative financial liabilities		-	122,009	98,028	220,037	220,037
Financial guarantee liabilities		-	-	4,018	4,018	4,018
Lease liabilities		183,629	-	-	183,629	183,629
Others		239,088	-	-	239,088	239,088
Total	₩	6,414,316	122,009	102,046	6,638,371	6,638,371

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

(In millions of won)

(In millions of won)

		2020				
		Financial liabilities as measured at amortized cost	Financial liabilities as measured at FVTPL	Other financial liabilities (*1)	Carrying amounts	Fair value
Trade and other payables	₩	893,108	-	-	893,108	893,108
Borrowings and bonds		4,867,296	-	-	4,867,296	4,867,296
Derivative financial liabilities		-	20,260	21,169	41,429	41,429
Financial guarantee liabilities		-	-	1,121	1,121	1,121
Lease liabilities		28,113	-	-	28,113	28,113
Others		230,159	-	-	230,159	230,159
Total	₩	6,018,676	20,260	22,290	6,061,226	6,061,226

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

(3) Fair value hierarchy of financial instruments

As of December 31, 2021 and 2020, the Company 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 separate statements of financial position. These instruments are included in level 1, Instruments included in level 1 primarily comprise listed equity investments classified as trading securities.

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

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

Specific valuation techniques used to value financial instruments include:

- quoted or dealer price of similar instruments.
- the fair value of forward foreign exchange contracts determined by using forward exchange rates at the reporting date, with the resulting value discounted to present value.
- 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	₩	-	-	3,885	3,885
Measured at FVTPL		10,196	17,280	162,549	190,025
Others		-	10,786	-	10,786
Total	₩	<u>10,196</u>	<u>28,066</u>	<u>166,434</u>	<u>204,696</u>
Financial liabilities measured at fair value:					
Measured at FVTPL	₩	-	122,009	-	122,009
Others		-	98,028	4,018	102,046
Total	₩	<u>-</u>	<u>220,037</u>	<u>4,018</u>	<u>224,055</u>

(In millions of won)

		2020			
		Level 1	Level 2	Level 3	Total
Financial assets measured at fair value:					
Measured at FVOCI	₩	-	-	3,885	3,885
Measured at FVTPL		682,980	50,332	103,388	836,700
Others		-	54,134	-	54,134
Total	₩	<u>682,980</u>	<u>104,466</u>	<u>107,273</u>	<u>894,719</u>
Financial liabilities measured at fair value:					
Measured at FVTPL	₩	-	20,260	-	20,260
Others		-	21,169	1,121	22,290
Total	₩	<u>-</u>	<u>41,429</u>	<u>1,121</u>	<u>42,550</u>

The above tables exclude financial assets and financial liabilities which are not measured at fair value as differences between the carrying amounts and fair values are not significant.

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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 Venture	Estimated sales price valuation method	-	Return rate on investment
AI Asilah Desalination Company	Net asset value assessment	-	Fair value of net asset
NuScale Power LLC	Net asset value assessment	-	Fair value of net asset
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	Gain or loss on valuation	Others	December 31
Financial assets as measured at FVOCI	₩	3,885	-	-	-	-	3,885
Financial assets as measured at FVTPL		103,388	48,827	(1,480)	11,814	-	162,549
Total	₩	107,273	48,827	(1,480)	11,814	-	166,434

(In millions of won)

		2020					
		January 1	Acquisition	Disposal	Gain or loss on valuation	Others	December 31
Financial assets as measured at FVOCI	₩	3,889	-	-	-	(4)	3,885
Financial assets as measured at FVTPL		76,283	33,155	(1,938)	(4,112)	-	103,388
Total	₩	80,172	33,155	(1,938)	(4,112)	(4)	107,273

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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					
		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	₩	12,137	-	-	(89,610)	(988)	927
Measured at							
FVTPL		-	1,313	(12,806)	-	-	-
Financial liabilities:							
Measured at							
amortized cost	₩	(178,996)	-	-	-	-	-
Others		-	-	-	-	-	(9,279)

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

(In millions of won)		2020						
		Gain or loss						
		Interest income (expense)	Dividend income	Gain or loss on valuation(*1)	Impairment loss on financial instruments	Gain or loss on disposal	Gain or loss on financial guarantee (*1)	Other comprehensive income (loss)(*2)
Financial assets:								
Measured at								
amortized cost	₩	9,831	-	-	(238,835)	(7,758)	-	-
Measured at								
FVTPL		-	612	78,119	-	-	-	-
Measured at								
FVOCI		-	-	-	-	-	-	(4)
Financial liabilities:								
Measured at								
amortized cost	₩	(186,409)	-	-	-	(31,385)	-	-
Others		-	-	-	-	-	(2,915)	

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

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

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

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2) Details of gains and losses on valuation and settlement of derivative financial instruments for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021		
		Gain or loss on valuation	Gain or loss on settlement	Other comprehensive income (loss) (*1)
Derivatives measured at FVTPL	₩	(19,205)	220,268	-
Derivatives for fair value hedge		(109,633)	-	-
Derivatives for cash flow hedge		(1,317)	(780)	12,430
Total	₩	(130,155)	219,488	12,430

(*1) Amounts in other comprehensive income or loss exclude deferred tax effect.

(In millions of won)

		2020		
		Gain or loss on valuation	Gain or loss on settlement	Other comprehensive income (loss)(*1)
Derivatives measured at FVTPL	₩	38,880	(19,870)	-
Derivatives for fair value hedge		59,503	-	-
Derivatives for cash flow hedge		(332)	(416)	(14,605)
Total	₩	98,051	(20,286)	(14,605)

(*1) Amounts in other comprehensive income or loss exclude deferred tax effect.

Above gains or losses of financial instruments for the years ended December 31, 2021 and 2020 include selling and administrative expenses, finance income or expenses, other non-operating income or 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 subsidiaries and associates and joint ventures

(1) Details of share of investment in subsidiaries and associates as of December 31, 2021 and 2020 are as follows:

(In millions of won)

	Location of incorporation	Percentage of ownership (%)	2021	2020
Subsidiaries:				
Doosan Infracore Co., Ltd. ("DI")(*13)	Korea	-	₩ -	1,483,471
Doosan Fuel Cell Co., Ltd. ("DFC")(*1,2,12)	Korea	30.33	1,262,549	-
Doosan Cuvex Co., Ltd.(*1,15)	Korea	51.67	93,781	40,139
Doosan Power Systems S.A. ("DPS S.A.")(*7)	Luxembourg	100.00	265,933	404,074
Doosan Enpure Ltd.	UK	100.00	4,951	4,951
Doosan Ukudu Power, LLC(*8)	USA	100.00	1	-
Doosan Heavy Industries Vietnam Co., Ltd.	Vietnam	100.00	203,038	203,038
Doosan Heavy Industries Japan Corp.	Japan	100.00	1,993	1,993
Doosan Heavy Industries America Holdings Inc.(*9,15)	USA	100.00	146,008	101,437
Doosan HF Controls Corp.	USA	100.00	5,642	5,642
Doosan Power Systems India Private Ltd. ("DPSI")	India	99.90	-	-
Doosan Heavy Industries Muscat LLC	Oman	70.00	319	319
Doosan Power Systems Arabia Company Limited	Saudi Arabia	51.00	3,968	3,968
Doosan GridTech Inc.(*19)	USA	100.00	60,218	70,455
Azul Torre Construction Corporation(*3)	Philippines	40.00	-	9
Osung Power O&M Co., Ltd.	Korea	100.00	360	360
PT. Doosan Heavy Industries Indonesia	Indonesia	83.64	761	761
Doosan Heavy Industries Malaysia Sdn. Bhd	Malaysia	100.00	-	-
Doosan Mecatec Co., Ltd.(*1)	Korea	100.00	269,210	269,210
KDPP 5 th Co., Ltd.(*4)	Korea	-	-	-
U-best 5th Co., Ltd. (*11)	Korea	-	-	-
Doosan Bobcat Inc.(*1,15)	Korea	51.05	2,435,990	-
D20 Capital, LLC(*15)	USA	100.00	63,596	-
Subtotal			4,818,318	2,589,827
Associate:				
Doosan Engineering & Construction Co., Ltd.("DEC")(*1,16)	Korea	46.35	317,666	439,307
The HS-City Expressway(*10,14)	Korea	27.29	-	9,578
Samcheok Blue Power Co., Ltd.(*5,6)	Korea	9.00	43,568	43,568
Daejung Offshore Wind Power Co., Ltd.	Korea	26.65	3,196	3,196
Hychangwon Co., Ltd.(*9,14)	Korea	21.10	5,000	3,000
Doosan Property Co., Ltd. (*1,15,17)	Korea	27.01	42,240	-
Subtotal			411,670	498,649
Joint ventures:				
The Zenith Holdings Ltd.(*1,8,18)	Korea	31.75	120,000	-
Total			₩ 5,349,988	3,088,476

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- (*1) As of December 31, 2021, it is provided as collateral for our debt. (See Note 32, 36).
- (*2) Although the Company's ownership interest in the investee is less than 50%, the Company assessed that it exercises 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.
- (*3) Although the Company's ownership interest in the investee is less than 50%, it is classified as a consolidated subsidiary since the Company is considered to have the voting rights in the board of directors, and others. As of December 31, 2021, the carrying value exceeds its recoverable amount and recognized ₩9 million as impairment loss (other non-operating expenses).
- (*4) The Company assessed that it has control over the special purpose entity as the entity's activities are substantively governed by the Company.
- (*5) Investments in the investee have been pledged as collateral for the Company's project financing and contract of completion guarantee (See Note 32).
- (*6) Although the Company's equity 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 and others.
- (*7) As of December 31, 2021, investments in the investee have been pledged as collateral for export bond insurance limit contract signed with Korea Export Insurance Corporation (See Note 32). As of December 31, 2021, the carrying value exceeds its recoverable amount and recognized ₩138,141 million as impairment loss (other non-operating expenses).
- (*8) Newly acquired in 2021.
- (*9) Additionally acquired in 2021.
- (*10) All amounts have classified as assets held for sale in 2021 (See Note 35).
- (*11) The Company assessed that it has control over the special purpose entity as of December 31, 2020 since the entity's activities are substantively governed by the Company. In 2021, it was excluded from consolidation due to repayment of borrowing.
- (*12) During the previous year, the Company granted shares of DFC with no charge, and in 2021, the Company acquired control by additional acquisition of shares hold by parent company, Doosan Corporation, through in-kind investments. The amount includes ₩657,323 million which acquired during the previous year and had been classified as long-term investments in securities.
- (*13) In 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 decided to sell in the market.
- (*14) Investments in the investee have been pledged as collateral for the Company's project financing (See Note 32).
- (*15) Newly and additionally acquired in 2021 due to investment division of DI spun off and merged with the Company.
- (*16) During 2021, the Company loses its control over the entity and the entity is classified as associates from subsidiaries.
- (*17) The business name of the entity is changed from DBC Co., Ltd. to Doosan Property Co., Ltd.
- (*18) It is classified as a joint venture in accordance with agreement requiring consents from every parties holding the joint control over the entity when decision making in related activities.
- (*19) As of December 31, 2021, the carrying value exceeds its recoverable amount and recognized ₩10,237 million as impairment loss (other non-operating expenses).

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(2) Impairment on investment in subsidiaries, associates and joint ventures

1) DPS S.A.

The Company recognized an impairment loss (other non-operating expenses) of ₩138,141 million based on the impairment test of DPS S.A. for the year ended December 31, 2021 as the carrying amount exceeds the aggregate recoverable amount of DPS S.A.

The recoverable amount of DPS S.A is valued based on value-in-use and fair value calculated by the independent valuation expert in 2021. The value in use was computed based on expected future cash flow from impairment test date as of today and discount rate of 7.5~10.5%.

2) Doosan GridTech Inc.

The Company recognized an impairment loss (other non-operating expenses) of ₩10,237 million based on the impairment test of Doosan GridTech Inc. for the year ended December 31, 2021 as the carrying amount exceeds the aggregate recoverable amount of Doosan GridTech Inc.

The recoverable amount of Doosan GridTech Inc. is valued based on value-in-use calculated by the independent valuation expert in 2021. The value in use was computed based on expected future cash flow from impairment test date as of today and discount rate of 10.0%.

3) Azul Torre Construction Corporation

As the carrying amount exceeded its recoverable amount due to the slowdown in the coal power market and the suspension of new orders, the Company recognized an impairment loss of ₩9 million (other non-operating expenses) for the year ended December 31, 2021.

The Company decided that the asset value appropriately reflects recoverable amount of Azul Torre Construction Corporation and assessed it as fair value less cost to sell. Net fair value is calculated as the value of financial assets and PP&E and others less cost to sell.

4) DEC

The Company recognized an impairment loss (other non-operating expenses) of ₩739,034 million based on the impairment test of DEC for the years ended December 31, 2020 as the carrying amount exceeds the aggregate recoverable amount of DEC.

The recoverable amount of DEC is valued based on fair value in 2020 as it is included in the sale list in accordance with the financial structure Improvement plan signed with the Korea development bank and Korea EXIM bank. The market value approach was applied to calculate fair value.

5) DPSI

As the carrying amount exceeded its recoverable amount due to the slowdown in the Indian coal power market and the suspension of new orders, the Company recognized an impairment loss of ₩331,392 million (other non-operating expenses) including ₩200,000 million contributed in 2020.

The Company decided that the asset value appropriately reflects recoverable amount of DPSI and assessed it as fair value less cost to sell. Net fair value is calculated as the value of financial assets and PP&E and others less cost to sell.

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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
As of January 1, 2021	₩	2,407,605	234,059	244,748	23,027	65,209	21,325
Acquisition/ capital expenditure		1,889	435	2,300	776	47,077	156,152
Transfer(*1)		(29,418)	5,375	13,128	8,103	(36,847)	-
Disposals(*2)		(53,858)	(4,864)	(478)	(1,439)	-	(1,200)
Depreciation		-	(26,657)	(40,683)	(7,665)	-	(25,966)
Increase due to revaluation		190,924	-	-	-	-	-
Increase due to spin-off and merger		96,691	7,876	75	-	12,924	-
Others		-	-	-	-	-	(1,128)
As of December 31, 2021	₩	2,613,833	216,224	219,090	22,802	88,363	149,183
- Acquisition cost	₩	1,221,874	748,311	1,195,458	195,883	124,470	181,766
- Accumulated depreciation(*3)		-	(532,087)	(976,368)	(173,081)	(36,107)	(32,583)
- Revaluation surplus		1,391,959	-	-	-	-	-

(*1) In 2021, others are partially classified as assets held for sale (See Note 35).

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

(*3) Includes the accumulated impairment losses.

As of December 31, 2021, certain property, plant and equipment and others have been pledged as collateral for borrowings (See Note 32).

(In millions of won)

		2020					
		Land	Buildings and structures	Machinery	Others	Construction in progress	Right-of-use assets
As of January 1, 2020	₩	2,432,461	259,689	263,165	27,854	115,849	36,008
Acquisition / capital expenditure		-	-	523	900	25,852	14,198
Transfer(*1)		(24,372)	3,262	23,680	2,799	(40,304)	-
Disposals(*2)		(484)	(349)	(40)	(143)	-	(1,210)
Depreciation		-	(28,543)	(42,580)	(8,383)	-	(31,317)
Impairment loss		-	-	-	-	(36,107)	-
Others		-	-	-	-	(81)	3,646
As of December 31, 2020	₩	2,407,605	234,059	244,748	23,027	65,209	21,325
- Acquisition cost	₩	1,206,173	740,692	1,193,764	214,500	101,316	62,296
- Accumulated depreciation(*3)		-	(506,633)	(949,016)	(191,473)	(36,107)	(40,971)
- Revaluation surplus		1,201,432	-	-	-	-	-

(*1) In 2020, the land of ₩24,372 million was reclassified as investment property (See Note 15).

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

(*3) Includes the accumulated impairment losses.

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(2) Borrowing costs

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	₩	636	2,075
Interest rate of borrowing costs		3.42%	3.40%

(3) Depreciation

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

<i>(In millions of won)</i>		2021	2020
Cost of sales	₩	82,750	96,871
Selling and administrative expenses		18,221	13,952
Total	₩	<u>100,971</u>	<u>110,823</u>

(4) Revaluation of land

In order to determine the fair value of the land, the Company 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 ₩1,221,874 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	₩	920,521	920,470
Increase of other comprehensive income by revaluation		190,688	272
Tax effect of other comprehensive income by revaluation		(46,196)	(66)
Transfer to retained earnings by disposal of land		(397)	(155)
As of December, 31	₩	<u>1,064,616</u>	<u>920,521</u>

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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			
		Goodwill(*1)	Industrial property rights	Development costs	Other intangible assets
As of January 1, 2021	₩	3,014	3,014	830,648	70,779
Increase		-	988	153,904	15,033
Internal development		-	-	153,904	-
Individual acquisition		-	988	-	288
Transfer from other assets		-	-	-	6,736
Increase due to spin-off and merger		-	-	-	8,009
Decrease		(3,014)	(723)	(79,419)	(19,634)
Amortization		-	(723)	(51,083)	(19,633)
Impairment loss		(3,014)	-	(23,537)	85
Disposal		-	-	-	(86)
Transfer to other assets		-	-	(4,799)	-
As of December 31, 2021	₩	-	3,279	905,133	66,178

(*1) In 2021, all related goodwill was recognized as impairment due to termination of the rental business in the Middle East and plan for the sale of construction equipment accordingly.

(In millions of won)

		2020			
		Goodwill	Industrial property rights	Development costs	Other intangible assets
As of January 1, 2020	₩	3,014	67	902,749	77,932
Increase		-	3,963	156,776	24,478
Internal development		-	-	156,776	-
Individual acquisition		-	3,963	-	46
Transfer from other assets		-	-	-	24,432
Decrease		-	(1,016)	(228,877)	(31,631)
Amortization		-	(1,016)	(64,165)	(20,711)
Impairment loss		-	-	(147,304)	(6,329)
Disposal		-	-	-	(4,591)
Transfer to other assets		-	-	(16,952)	-
Transfer to other expenses		-	-	(456)	-
As of December 31, 2020	₩	3,014	3,014	830,648	70,779

The carrying amounts of intangible assets with indefinite useful lives including membership and others as of December 31, 2021 and 2020 amounted to ₩32,707 million and ₩27,494 million, respectively.

(2) Research and development costs

Research and development costs expensed as incurred for the years ended December 31, 2021 and 2020 amounted to ₩15,701 million and ₩10,681 million, respectively.

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(3) Recognition criteria of development cost

The new R&D project is approved by the new business technology committee semi-annually, considering the commercial feasibility and others and it is decided whether to continue or stop the R&D through reviewing the appropriateness of investment. After completion of technical development, the Company performs a final review of the appropriateness of development costs through commercial operation. The Company classifies the projects into research or technology development projects based on the capitalization criteria (technical feasibility, intention, future economic benefits). Research projects are recognized as an expense when it is incurred and technology development projects are recorded as intangible assets.

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

(In millions of won)

	Description		2021		2020	
			Book value	Remaining amortization period(*1)	Book value	Remaining amortization period(*1)
Development costs	Large-sized Gas Turbine	₩	598,663	-	518,802	-
	Gas Turbine 7F Retrofit		43,967	-	34,275	-
	Mid-sized Gas Turbine Development Phase 1		761	7.58 years	861	8.58 years
	Mid-sized Gas Turbine Development Phase 2		30,081	-	17,835	-
	5.5MW Offshore Wind Power		-	-	17,220	-
	8MW Offshore Wind Power		34,666	-	15,728	-

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

(5) 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)

Description		Acquisition cost	2021		Accumulated amortization	Book value	Method used to assess recoverability
			Impairment loss	Accumulated			
			Loss				
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	-	
Goodwill							
Rental business in the Middle East		3,014	3,014	3,014	-	-	Value in use
Total	₩	28,129	26,551	26,551	1,578	-	

(*1) The carrying amounts related to 3MW and 5.5MW wind power are recognized as an impairment loss, as the value in use decreased due to changes in industry environment.

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(In millions of won)

Description	2020					
	Acquisition cost	Impairment loss		Accumulated amortization	Book value	Method used to assess recoverability
		Loss	Accumulated			
Development costs(*1)						
500MW Standard TPP ₩	55,931	55,931	55,931	-	-	Value in use
IGCC Gasification Plant	47,493	44,197	44,197	3,296	-	Value in use
3MW Class III Wind Turbine Generator	25,612	14,293	14,293	11,319	-	Value in use
USC CFB Boiler RPM Development	16,894	10,921	10,921	5,973	-	Value in use
Others(*2)	29,702	21,962	21,962	7,740	-	Value in use
Subtotal	175,632	147,304	147,304	28,328	-	
Other intangible assets						
Reclamation license	40,898	10,749	30,149	-	10,749	Value in use
Total ₩	216,530	158,053	177,453	28,328	10,749	

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

(*2) The amount of impairment loss for development costs for 18 cases other than the above 4 cases.

(6) 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
Other intangible assets	Golf membership ₩	85	Net fair value	4,420	Net fair value

(7) Statement of income items included (reversal of) impairment loss

For the years ended December 31, 2021 and 2020, statement of profit (loss) items the Company recognized (reversal of) impairment loss are as follows:

(In millions of won)

	2021	2020
Other non-operating expenses ₩	26,551	158,053
Other non-operating income	(85)	(4,420)
Total ₩	26,466	153,633

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

(In millions of won)

	2021	2020
Capitalized borrowing costs ₩	26,510	24,890
Interest rate of borrowing costs	3.42%	3.40%

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(9) 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	₩	55,684	66,700
Selling and administrative expenses		15,755	19,192
Total	₩	71,439	85,892

(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:

<i>(In tons (tCO₂-eq))</i>	2021	2022	2023	2024	2025	Total
Free emission permits	260,526	260,526	260,526	258,086	258,086	1,297,750

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

<i>(In tons (tCO₂-eq))</i>	2020	2021	2022	2023	2024	2025	Total
As of January 1, 2021	292,754	260,526	260,526	260,526	258,086	258,086	1,590,504
Cancellation of free permits	(4,211)	-	-	-	-	-	(4,211)
Submission to the government	(229,319)	-	-	-	-	-	(229,319)
Sale of free permits	(55,000)	-	-	-	-	-	(55,000)
Carried forward	(4,224)	4,224	-	-	-	-	-
As of December 31, 2021	-	264,750	260,526	260,526	258,086	258,086	1,301,974

<i>(In tons (tCO₂-eq))</i>	2020	2021	2022	2023	2024	2025	Total
As of January 1, 2020	265,717	260,526	260,526	260,526	258,086	258,086	1,563,467
Carried forward	27,037	-	-	-	-	-	27,037
As of December 31, 2020	292,754	260,526	260,526	260,526	258,086	258,086	1,590,504

As of December 31, 2021 and 2020, there was no permit other than the allowances that are received free of charge from the government and it was measured at zero book value.

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

(In millions of won)

	2021			
	Land	Buildings	Other tangible assets	Total
As of January 1, 2021	₩ -	16,810	4,515	21,325
Acquisition	1,321	148,394	6,437	156,152
Depreciation	(295)	(21,145)	(4,526)	(25,966)
Contract cancelation	-	(800)	(400)	(1,200)
Others	-	(832)	(296)	(1,128)
As of December 31, 2021	₩ 1,026	142,427	5,730	149,183
- Acquisition cost	₩ 1,321	168,485	11,960	181,766
- Accumulated depreciation	(295)	(26,058)	(6,230)	(32,583)

(In millions of won)

	2020		
	Buildings	Other tangible assets	Total
As of January 1, 2020	₩ 22,867	13,141	36,008
Acquisition	9,436	4,762	14,198
Depreciation	(19,791)	(11,526)	(31,317)
Contract cancelation	(27)	(1,183)	(1,210)
Others	4,325	(679)	3,646
As of December 31, 2020	₩ 16,810	4,515	21,325
- Acquisition cost	₩ 49,368	12,928	62,296
- Accumulated depreciation	(32,558)	(8,413)	(40,971)

(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	₩ 28,113	43,686
Payment of lease	(33,810)	(31,863)
Acquisition of leased assets	180,289	14,198
Interest expense	10,687	2,511
Contract cancelation	(1,248)	(1,252)
Others	(402)	833
As of December 31	₩ 183,629	28,113

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

(In millions of won)

	Depreciation of right-of-use assets	
	2021	2020
Cost of sales	₩ 13,904	20,962
Selling and administrative expenses	12,062	10,355
Total	₩ 25,966	31,317

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

(In millions of won)

		Contractual nominal cash flow				
		Total	Less than 1 year	1-2 years	2-5 years	More than 5 years
Lease receivables	₩	5,522	2,456	3,066	-	-
Lease liabilities		236,517	28,557	31,618	75,201	101,141

(5) Expenses incurred in short-term leases and low-value asset lease that are not included in the right-of-use assets for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

		2021	2020
Cost of sales	₩	6,006	1,440
Selling and administrative expenses		1,171	1,657
Total	₩	7,177	3,097

The Company, 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.

15. Investment Property

(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	₩	24,372	-	24,372
Acquisition/ capital expenditure		332	37,233	37,565
Depreciation		-	(3,294)	(3,294)
Increase due to spin-off and merger		19,426	1,465	20,891
As of December 31, 2021	₩	44,130	35,404	79,534
- Acquisition cost	₩	44,130	38,698	82,828
- Accumulated depreciation		-	(3,294)	(3,294)

(*1) 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	
As of January 1, 2020	₩	-	-
Acquisition/ capital expenditure		-	-
Transfer(*1)			24,372
As of December 31, 2020	₩		24,372
- Acquisition cost	₩		24,372

(*1) In order to build a hydrogen liquefaction plant, the Company started lease to Hychangwon Co., Ltd. during 2020 and reclassified it as an investment property.

(2) Rental income from investment properties for the years ended December 31, 2021 and 2020 are ₩7,572 million and ₩238 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	Lender	Annual interest rate (%) as of December 31, 2021		2021	2020
Denominated in KRW	Korean Development Bank ("KDB") and others(*1)	2.00~6.39	₩	3,128,420	3,802,627
Denominated in foreign currencies	Woori Bank and others(*1)	0.35~3.99		151,003	228,753
	Total		₩	3,279,423	4,031,380

(*1) The Company's PP&E and others have been pledged as collateral for borrowings (See Note 32).

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

(In millions of won)

Type of borrowings	Lender	Maturity	Annual interest rate (%) as of December 31, 2021		2021	2020
Denominated in KRW	Korea EXIM Bank and others(*1,2)	2022.03.15~2024.07.01	1.13~4.45	₩	528,026	513,291
Denominated in foreign currencies	Korea EXIM Bank	2022.07.26	2.63		28,595	91,966
	Subtotal				556,621	605,257
	Less: Current portion				(433,796)	(296,148)
	Less: Discount				(332)	-
	Total			₩	122,493	309,109

(*1) The Company's PP&E and others have been pledged as collateral for borrowings (See Note 32).

(*2) The certain amount of the above long-term borrowings has been succeeded from spin-off and merger with DI.

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(2) Bonds

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

(In millions of won)

Type	Series	Maturity	Annual interest rate (%) as of December 31, 2021		2021	2020
Public subscription bond in foreign currencies(*1,2)	-	2022.11.18	2.25	₩	355,650	-
	-	2023.07.21	1.00		355,650	-
Private subscription bond	57	-	-		-	80,000
	58	-	-		-	10,000
	61	2022.12.23	4.30		10,000	-
	62	2022.12.29	4.30		12,000	-
	64	2023.01.30	4.30		15,000	-
	65	2023.02.06	4.30		14,000	-
	66	2023.02.17	4.30		14,500	-
	67	2023.02.28	4.30		10,000	-
	68	2023.03.24	4.30		5,000	-
	69	2023.05.17	4.30		10,000	-
	70	2023.06.09	4.30		5,000	-
Convertible bonds(*2)	59	2023.06.08	2.87		1,655	-
	60	2023.08.03	2.81		21,719	-
Bonds with stock warrants	48	2022.05.04	1.00		14,607	14,825
	Subtotal				844,781	104,825
	Add: Redemption premium				2,370	778
	Less: Conversion adjustment				(1,299)	
	Less: Warrants adjustment				(201)	(795)
	Less: Current portion of long-term bonds				(416,401)	(90,000)
	Less: Discount on bonds				(6,887)	(73)
	Total			₩	422,363	14,735

(*1) The common shares of Doosan Bobcat Inc. have been pledged as collateral for public subscription bond in foreign currencies (See Note 32).

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

2) As of December 31, 2021, bonds with stock warrants are summarized as follows:

Issue date	Maturity date	Coupon rate	YTM	Exercise period	Exercise price (in won)	Issuance 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	₩491,546 million (Par value : ₩500,000 million)

① Early redemption

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

② Redemption at maturity

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

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③ Calculation of exercise price

The exercise price is adjusted when there is an increase in paid-in capital through issuance of common 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.

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

<i>(In millions of won)</i>	January 1, 2021	Exercise / Amortization	December 31, 2021
Bond with stock warrants	₩ 14,825	(218)	14,607
Redemption premium	778	(12)	766
Discount on bond	(73)	54	(19)
Warrants adjustment	(795)	594	(201)
Book value	₩ 14,735	418	15,153
Consideration for stock warrants rights (other capital surplus)	₩ 49,464	(14,645)	34,819

As of December 31, 2021, stock warrants were exercised in the amount pertaining to 22.11% of the principal amount of 48th 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.

3) As of December 31, 2021, convertible bonds succeeded from spin-off and merger with DI are summarized as follows:

No.	Issue date	Maturity date	Coupon rate	YTM	Exercise period	Exercise price (in won)	Issuance value
59th	July 1, 2021(*1)	June 8, 2023	2.87%	4.82%	2021.06.08~ 2023.05.08	₩9,190/ share	₩1,641 million (Par value: ₩1,655 million)
60th	July 1, 2021(*2)	August 3, 2023	2.81%	4.96%	2021.08.03~ 2023.07.03	₩10,840/ share	₩21,584 million (Par value: ₩21,719 million)

(*1) Among the 65th convertible bonds issued by DI on June 8, 2020, it has been succeeded to the Company from spin-off and merger with DI on July 1, 2021.

(*2) Among the 69th convertible bonds issued by DI on August 3, 2020, it has been succeeded to the Company from spin-off and merger with DI on July 1, 2021.

① Early redemption

No.	Exercise Period of early redemption right
59th	The claimant of this bond may exercise early redemption right as a whole or in part against the face value of convertible bonds at the interest payment date after June 8, 2022.
60th	The claimant of this bond may exercise early redemption right as a whole or in part against the face value of convertible bonds at the interest payment date after August 3, 2022.

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② Redemption at maturity

No.	Redemption at maturity
59th	On June 8 2023, the maturity date of the bond, 106.2537% of the remaining principal of the bond is to be paid in full.
60th	On August 3 2023, the maturity date of the bond, 106.9085% of the remaining principal of the bond is to be paid in full.

③ Calculation of exercise price

The exercise price is adjusted when there is an increase in paid-in capital through issuance of common 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.

Changes in convertible bonds for the years ended December 31, 2021 are as follows:

(In millions of won)		January 1, 2021	Spin-off and merger	Redemption	Amortization	December 31, 2021
Convertible bond	₩	-	23,374	-	-	23,374
Redemption premium		-	1,604	-	-	1,604
Discount on bond		-	(106)	-	24	(82)
Conversion adjustment		-	(1,688)	-	389	(1,299)
Book value	₩	-	23,184	-	413	23,597
Consideration for conversion right (other capital surplus)	₩	-	760	-	-	760

(3) Securitization of construction contract

The Company 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:

(In millions of won)	Type	Maturity	Discount rate (%)	2021	2020
	KDPP 5 th Co., Ltd.(*1)	2022.01.29~2022.10.29	5.28	₩ 49,600	127,200
	Subtotal			49,600	127,200
	Less: Current portion			(49,304)	(76,822)
	Less: Discounts			(296)	(1,275)
	Total			₩ -	49,103

(*1) The Company provides payment guarantees to above Asset-backed borrowings (See Note 31).

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17. Defined benefit liabilities

The Company 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:

(In millions of won)

		2021	2020
Present value of defined benefit obligations	₩	345,652	347,272
Fair value of plan assets(*1)		(240,139)	(251,117)
Defined benefit liabilities	₩	105,513	96,155

(*1) Include employer contributions of ₩584 million and ₩605 million to the National Pension Service as of December 31, 2021 and 2020, respectively.

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

(In millions of won)

		2021	2020
Current service cost	₩	30,050	32,035
Net interest cost		2,502	1,866
Past service cost(*1)		-	6,241
Total	₩	32,552	40,142

(*1) Changes in retirement benefit obligations due to voluntary retirement were recognized as past service costs in 2020.

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

(In millions of won)

		2021	2020
Cost of sales	₩	26,199	29,516
Selling and administrative expenses		6,353	10,626
Total	₩	32,552	40,142

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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	₩ 347,272	419,018
Current service costs	30,050	32,035
Transfer from related parties	1,148	316
Transfer to related parties	(739)	(1,257)
Interests	7,839	7,219
Remeasurement loss in OCI:		
Actuarial changes arising from changes in demographic assumptions	(34)	(4,153)
Actuarial changes arising from changes in financial assumptions	(10,046)	16,384
Others	(2,924)	8,344
Reduction and liquidation	-	6,241
Benefits paid	(26,914)	(136,875)
As of December 31	₩ 345,652	347,272

- (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	₩ 251,117	354,882
Expected return on plan assets	5,337	5,352
Transfer from related parties	966	-
Transfer to related parties	(115)	(714)
Remeasurement loss in OCI	(2,432)	(844)
Benefits paid	(14,713)	(107,199)
Transfer to national pension service	(21)	(360)
As of December 31	₩ 240,139	251,117

- (6) The principal assumptions used in determining employee benefit obligation for the years ended December 31, 2021 and 2020 are as follows:

	2021	2020
Discount rate	3.00%	2.30%
Future salary increase rate	Technical employee 3.70% Office employee 3.00% Executive 0.80%	Technical employee 3.00% Office employee 3.00% Executive 1.40%

- (7) Details of fair value of plan assets as of December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>	2021	2020
Insurance contracts	₩ 108,528	116,876
Bank deposits	14,702	8,504
Trust funds and others	116,909	125,737
Total	₩ 240,139	251,117

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(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:

(In millions of won)		1%p increase	1%p decrease
Discount rate	₩	(30,721)	34,420
Future salary increase rate		25,666	(24,111)

(9) The weighted average maturity of defined benefit obligations is approximately 9.67 years as of December 31, 2021.

18. Provision

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

(In millions of won)		2021						
		January 1	Arising during the year	Unused amounts reversed	Utilized	December 31	Less: Current	Non-current
Provisions for construction warranties	₩	108,970	22,980	(10,793)	(17,635)	103,522	(15,186)	88,336
Provisions for construction losses		45,583	4,751	(18,926)	-	31,408	(31,408)	-
Others(*1)		212,561	16,424	(74,752)	(4,411)	149,822	(149,822)	-
Total	₩	367,114	44,155	(104,471)	(22,046)	284,752	(196,416)	88,336

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

(In millions of won)		2020						
		January 1	Arising during the year	Unused amounts reversed	Utilized	December 31	Less: Current	Non-current
Provisions for construction warranties	₩	99,509	18,180	(162)	(8,557)	108,970	-	108,970
Provisions for construction losses		6,072	40,801	(1,290)	-	45,583	(45,583)	-
Others(*1)		115,826	136,695	-	(39,960)	212,561	(212,561)	-
Total	₩	221,407	195,676	(1,452)	(48,517)	367,114	(258,144)	108,970

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

The Company estimates expenses required to settle the Company'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 is 95,978 treasury shares and 14,329 treasury shares, respectively.

During the year, the Company issued 47,843,956 new commonshares in exchange for DFC's common shares acquired through in-kind investment from Doosan Corp., and the Company issued 83,399,437 and 16,340,138 new common shares respectively due to 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
Balance at								
December 31, 2021	522,220,786	- ₩	2,611,103	64,522	2,675,625	1,234,457	-	1,234,457
Balance at								
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)		576,785	853,629
Total	₩	1,811,242	2,623,052

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

21. Other components of equity

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

(In millions of won)		2021	2020
Stock options	₩	1,103	772
Treasury stock		(2,135)	(152)
Total	₩	(1,032)	620

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(2) 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.

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

(In shares)

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

(In millions of won)

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.

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- 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.

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)

	2021	2020
Loss on valuation of FVOCI	₩ (9,134)	(9,134)
Loss on valuation of derivative financial instruments	(517)	(9,939)
Gain on revaluation of assets	1,064,616	920,521
Total	₩ 1,054,965	901,448

- (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)

	2021		
	Balance before tax	Tax effect	Balance after tax
Gain (loss) on valuation of FVOCI	₩ (12,050)	2,916	(9,134)
Gain (loss) on valuation of derivative financial instruments	(682)	165	(517)
Gain (loss) on revaluation of assets	1,404,507	(339,891)	1,064,616
Total	₩ 1,391,775	(336,810)	1,054,965

(In millions of won)

	2020		
	Balance before tax	Tax effect	Balance after tax
Gain (loss) on valuation of FVOCI	₩ (12,050)	2,916	(9,134)
Gain (loss) on valuation of derivative financial instruments	(13,112)	3,173	(9,939)
Gain (loss) on revaluation of assets	1,214,408	(293,887)	920,521
Total	₩ 1,189,246	(287,798)	901,448

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23. Retained earnings (accumulated deficits)

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

<i>(In millions of won)</i>		2021	2020
Legal reserve	₩	82,966	138,118
Voluntary reserve		42,807	42,807
Undisposed accumulated earnings (deficits)		35,011	(2,183,075)
Total	₩	<u>160,784</u>	<u>(2,002,150)</u>

(2) Changes in accumulated earnings (deficits) for the years ended December 31, 2021 and 2020 are as follows:

<i>(In millions of won)</i>		2021	2020
Undisposed accumulated earnings (deficits)	₩	35,011	(2,183,075)
Unappropriated retained earnings (deficits) at the beginning of the year		-	(286,821)
Profit (loss) for the period		26,601	(1,880,174)
Remeasurements of defined benefit liability		8,013	(16,235)
Gain on revaluation of lands		397	155
Voluntary reserve and others		-	-
Reserves for sinking Funds		-	-
Disposal of earnings (deficits)		-	2,183,075
Paid-in capital in excess of par value		-	1,175,161
Gain on disposal of treasury stock		-	358,500
Asset revaluation surplus		-	594,262
Legal reserve		-	55,152
Undisposed accumulated earnings (deficits) at the end of the year	₩	<u>35,011</u>	<u>-</u>

The proposed date of disposition of accumulated deficits for 2021 will be March 29, 2022 and the approved date of appropriation of retained earnings for 2020 was March 30, 2021.

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

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24. 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	₩	188,166	240,838
Construction contracts		3,462,112	3,226,537
Subtotal		3,650,278	3,467,375
Others			
Hedging gains		(65,576)	(16,771)
Others		8,180	841
Subtotal		(57,396)	(15,930)
Total	₩	3,592,882	3,451,445

(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 Company's reportable segments.

<i>(In millions of won)</i>		2021	2020
Primary geographical market			
Domestic	₩	2,380,144	2,393,512
Americas		18,431	16,573
Asia		808,792	751,405
Middle East		336,274	238,642
Europe		48,106	47,033
Others		1,135	4,280
Total	₩	3,592,882	3,451,445
Timing of revenue recognition			
At a point in time	₩	186,793	239,636
Over time		3,406,089	3,211,809
Total	₩	3,592,882	3,451,445

(3) Contract balances

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>		2021	2020
Receivables, which are included in 'trade and other receivables'			
	₩	245,723	356,546
Contract assets		1,399,956	1,310,189
Contract liabilities		1,161,077	1,038,284

The contract assets primarily relate to the Company'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. Of the contract liabilities as of December 31, 2020, the amount of recognized as revenue in 2021 is ₩787,555 million.

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- (4) Changes in transaction price for construction contract allocated to the performance obligations satisfied over time

Transaction prices allocated to the remaining performance obligations as of December 31, 2021 include contracts whose initial expected duration of performance obligations are less than one year old but not include contracts in which recognize the right to payment as revenue that corresponds directly with the value to the customer of the Company's performance completed to date.

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:

(In millions of won)

		2021			
	Project name	January 1	Increase (Decrease)	Revenue recognized	December 31
VAPCO and others	Vung Ang II Power Project and others	₩ 10,171,355	4,407,783	3,406,089	11,173,049

(In millions of won)

		2020			
	Project name	January 1	Increase (Decrease)	Revenue recognized	December 31
ENGIE and others	Fadhili CHP and others	₩ 10,182,072	3,201,092	3,211,809	10,171,355

- (5) As of December 31 2021 and 2020, the Company shall recognize as an asset for the incremental costs of obtaining a contract with a customer that is, agent fee if the Company expects to recover those costs.

(In millions of won)

	2021	2020
Incremental costs of obtaining a contract with a customer recognized as an asset	₩ 38,651	48,720
The amount of amortization recognized as cost of sales	12,512	25,726

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) As of December 31 2021 and 2020, the Company 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 Company can specifically identify. The Company believes that these costs generate or enhance resources of the Company that will be used in satisfying performance obligations in the future and are expected to be recovered.

(In millions of won)

	2021	2020
Costs incurred to fulfill a contract recognized as an asset	₩ 141,649	106,241
The amount of amortization recognized as cost of sales	22,405	50,847

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

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- (7) Changes in profit or loss in current and future reporting periods and the book value of due from (to) customers for contracts work (excluding foreign currency translation effect) resulting from 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:

(In millions of won)

		Provision for construction loss	Changes in total contract revenue	Changes in total contract cost	Effect on profit (loss) for the period	Effect on profit (loss) for the future	Changes in due from (to) customer for contract work
Vung Ang II Power Project and others	₩	31,408	630,796	403,988	208,105	18,703	208,105

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

- (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 Company decided not to disclose due to the prohibition by related regulations or contracts.

(In millions of won)

	Contract date	Due date / Delivery date in contract(*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
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	-	-
Shinhanul #1,2 NSSS	Jul-31-09	May-31-22	98.77	7,440	40	-	-
Samcheok #1,2 EPC	Jul-24-18	Apr-30-24	59.08	317,889	1,717	-	-
UAE BNPP #3,4 NSSS	Jun-30-10	Nov-30-23	95.51	25,808	139	1,811	-
Vinh Tan 4 TPP	Feb-26-14	Oct-31-21	99.76	21,975	119	22,843	4,569
Jawa #9, 10	Mar-20-19	Feb-15-25	26.82	132,889	718	-	-
Yanbu ph.3 MSF	Dec-4-12	Dec-31-22	98.81	-	-	-	-
Fadhili CHP	Nov-12-16	Oct-30-21	99.96	-	-	13	-
Song Hau1	Apr-10-15	Mar-31-22	94.19	86,581	468	-	-
Nghi Son 2	Dec-24-14	Jul-10-22	92.65	46,953	254	18,870	102
UAE BNPP #3, 4 T/G	Sep-27-11	Jun-30-24	92.69	-	-	-	-
UAE BNPP #1, 2 T/G	Jun-30-10	Mar-01-22	94.42	-	-	-	-
Vinh Tan 4 Extension	Mar-10-16	Aug-31-21	99.64	-	-	5,397	954
Shinboryung #1, 2 Boiler	Oct-22-13	Feb-28-22	99.93	-	-	91	-
Shingori #5, 6 main equipment construction	Jun-12-15	May-28-25	82.29	71,347	385	-	-
Suncheon Wangji 2	Apr-24-19	Jun-30-24	5.79	12,757	69	-	-
Shingori #3,4 main equipment construction	Mar-09-07	Dec-31-21	99.86	-	-	-	-
Van Phong 1	Aug-26-19	Dec-25-23	53.89	-	-	83	-
Namyangju Altheim	Jun-23-17	Dec-31-21	100.00	-	-	-	-
			- -				

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(In millions of won)

	Contract date	Due date / Delivery date in contract(*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
Gangneung Anin #1, 2 Boiler	Mar-31-15	Mar-15-23	87.66	₩ -	-	2,106	6
Shoaiba RO Ph.4	Mar-29-17	Dec-03-21	92.00	57,499	310	8,646	47
Goseong Hai #1, 2 Boiler	Dec-27-16	Aug-15-22	97.04	-	-	-	-
Shinhanul #1, 2 T/G	Jun-23-09	Jul-31-23	99.32	-	-	-	-
Shingori #5, 6 T/G	Aug-28-14	Mar-31-25	93.16	16,880	91	-	-
Doha RO Stage-I	May-30-16	Dec-31-21	94.67	71,133	384	9,334	561
Whasung-Dongtan2 collective energy cyclor	Aug-11-14	Jun-30-21	99.99	-	-	-	-
Seoul complex #1,2 cyclor	Jul-05-13	Jun-30-21	100.00	-	-	-	-
Muara Tawar Add-On	Mar-29-17	Mar-28-23	90.95	49,998	270	56	-
Al Khaliy Boiler Package PJT(*2)	Nov-01-08	Dec-31-18	98.61	36,543	197	-	-
Vogtle #3,4 AP1000	May-08-08	Dec-31-22	99.93	10,806	58	-	-
Seoul forest Doosan weve	Oct-21-13	Dec-31-21	99.99	-	-	359	-
Hanbit #5,6 RSG	Aug-31-16	Jul-31-21	99.49	-	-	-	-
Hanbit #3,4 RSG	Oct-31-14	Aug-31-22	98.81	2,336	13	-	-
Tripoli West(*2)	Dec-23-10	Apr-30-15	59.04	-	-	-	-
Gyungju yonggangdong Doosan weve	Jan-11-18	Dec-31-21	100.00	-	-	3,700	-
Samcheok greenpower #1,2	Jun-28-10	Jul-31-21	99.94	-	-	-	-
Gimpo cogeneration powerblock EPC	Jun-17-20	Jul-30-23	32.80	-	-	2,569	14
Kudgi STPP	Oct-15-14	Dec-31-22	99.36	-	-	836	-
Yangsan Deokgye 3rd	Sep-05-20	Jun-30-24	5.74	-	-	-	-
IEC Orot Rabin FGD	Jun-30-10	Jul-01-22	92.56	560	3	148	148
Yanbu 4 IWP	Jan-22-21	Nov-01-23	8.69	-	-	-	-
Boryung 4 Eco-friendly equipment	Jun-23-20	Dec-15-22	56.23	22,608	122	11,673	63
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	-	-	-	-
Shinboryung #1, 2 T/G	Oct-22-13	Jun-30-22	99.56	-	-	-	-
Yangsan 2nd Doosan weve	Dec-22-17	Mar-02-21	100.00	-	-	-	-

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

(*2) Construction was temporarily suspended due to civil war in Libya and others.

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25. 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>		2021	2020
Changes in inventories	₩	(67,739)	50,906
Purchases of raw materials and goods		1,412,198	1,353,483
Salaries		485,678	660,283
Depreciation and amortization		175,704	196,715
Others		1,451,756	1,663,120
Total	₩	<u>3,457,597</u>	<u>3,924,507</u>

26. 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>		2021	2020
Salaries	₩	94,958	96,520
Severance and retirement benefits		3,647	4,385
Termination benefits		2,706	184,987
Employee welfare benefits		13,139	14,983
Travel		1,766	1,549
Training		995	643
Taxes and dues		2,056	1,978
Commissions		45,530	53,569
Rents		1,178	2,113
Bad debt expenses		83,703	167,905
Depreciation		18,221	13,952
Amortization		15,755	19,192
Insurance		4,288	5,649
Research		15,251	10,672
Expansion expenses of overseas market		9,437	12,646
Advertising		6,511	5,573
Warranty		1,418	9,495
Provision for loss compensation(reversal)		(62,225)	92,100
Others		18,076	16,843
Total	₩	<u>276,410</u>	<u>714,754</u>

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27. 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	₩	12,137	9,831
Dividend income		1,313	612
Gain on foreign currency transaction		60,232	71,376
Gain on foreign currency translation		71,353	46,469
Gain on settlement of derivative financial instruments		245,673	102,171
Gain on valuation of derivative financial instruments		107,949	122,483
Gain on valuation of firm commitments		117,275	7,443
Gain on financial guarantee		927	1
Total	₩	<u>616,859</u>	<u>360,386</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	₩	178,996	186,409
Loss on foreign currency transaction		75,035	132,245
Loss on foreign currency translation		89,996	47,132
Loss on settlement of derivative financial instruments		26,185	122,457
Loss on valuation of derivative financial instruments		238,104	24,432
Loss on valuation of firm commitments		7,643	66,946
Loss on financial guarantee		9,279	2,916
Loss on redemption of bond		-	31,385
Commission expenses		45,032	34,396
Total	₩	<u>670,270</u>	<u>648,318</u>

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28. 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>		2021	2020
Commission income	₩	3,364	7,851
Gain on disposal of property, plant and equipment		2,164	630
Gain on disposal of investment in subsidiaries		59,523	1,731
Gain on valuation of long-term investment in securities		16,811	85,527
Reversal of impairment loss of intangible assets		85	4,420
Miscellaneous gain and others		4,751	2,671
Total	₩	86,698	102,830

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

<i>(In millions of won)</i>		2021	2020
Commission fee	₩	12,814	11,518
Loss on disposal of trade receivables		988	7,758
Loss on disposal of property, plant and equipment		1,598	212
Loss on disposal of intangible assets		6	197
Donations		324	284
Impairment loss of property, plant and equipment		-	36,107
Impairment loss of intangible assets		26,551	158,053
Impairment loss of assets held for sale		1,786	-
Loss on valuation of short and long-term investment in securities		29,617	7,408
Loss on disposal of investment in subsidiaries		1,682	-
Loss on disposal of assets held for sale		1,090	-
Other bad debt expenses		63,425	73,665
Impairment loss of investment in subsidiaries		148,387	1,070,485
Depreciation expense of idle assets		2,524	3,839
Miscellaneous loss and others		12,470	78,699
Total	₩	303,262	1,448,225

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29. Income tax benefit

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

<i>(In millions of won)</i>		2021	2020
Current income tax expense (benefit)	₩	6,951	(1,951)
Adjustments in respect of current income tax of prior year		(3,008)	14,079
Tax effect of temporary difference		(113,503)	(101,670)
Total income tax benefit		(109,560)	(89,542)
Current income tax related to items recognized in equity during the year		(127)	(145,442)
Deferred tax related to items recognized in equity during the year		(51,636)	8,769
Others		32	-
Income tax benefit	₩	(161,291)	(226,215)

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

<i>(In millions of won)</i>		2021	2020
Loss on revaluation of assets	₩	(46,196)	(66)
Gain on valuation of FVOCI		-	1
Gain(loss) on valuation of derivative financial instruments		(3,008)	3,535
Remeasurements of defined benefit liabilities		(2,558)	5,183
Other capital surplus		(1)	(145,326)
Total	₩	(51,763)	(136,673)

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

<i>(In millions of won)</i>		2021	
	January 1	Change	December 31
Provision for retirement and severance benefits	₩	83,893	(387)
Allowance for doubtful accounts		264,582	35,644
Property, plant and equipment		11,061	(150)
Development costs		29,208	(6,381)
Derivative financial instruments (including firm commitments)		(4,757)	34,561
Foreign currency denominated assets (liabilities)		1,024	3,819
Gain on revaluation of assets		(475,641)	(46,070)
Others		157,128	92,467
Total	₩	66,498	113,503

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(In millions of won)

	2020		
	January 1	Change	December 31
Provision for retirement and severance benefits	₩ 101,169	(17,276)	83,893
Allowance for doubtful accounts	203,579	61,003	264,582
Property, plant and equipment	11,841	(780)	11,061
Development costs	31,068	(1,860)	29,208
Derivative financial instruments (including firm commitments)	17,298	(22,055)	(4,757)
Foreign currency denominated assets (liabilities)	10,752	(9,728)	1,024
Gain on revaluation of assets	(475,691)	50	(475,641)
Others	64,812	92,316	157,128
Total	₩ (35,172)	101,670	66,498

(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:

(In millions of won)

	2021	2020
Deductible temporary differences	₩ 2,600,570	2,650,780
Tax credit carried forward	20,220	5,325

The probability of deferred tax assets being realized depends on the Company'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 Company periodically reviews such matters.

(5) Temporary differences related to investments in subsidiaries, associates and joint ventures which are not recognized as deferred tax asset as of December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021	2020
Investments in subsidiaries and others	₩ 2,115,185	2,166,980

(6) Reconciliation of loss before income tax at the statutory tax rate to income tax benefit at the effective income tax rate of the Company for the years ended December 31, 2021 and 2020 are as follows:

(In millions of won)

	2021	2020
Loss before income tax	₩ (134,690)	(2,106,389)
Income tax benefit using statutory tax rate	(32,595)	(509,746)
Adjustments:		
Permanent differences	(94,256)	22,638
Unrecognized deferred tax related to temporary differences	32,913	276,963
Tax credit	2	-
Others	(67,355)	(16,070)
Income tax benefit	₩ (161,291)	(226,215)
Effective tax rate(*1)	-	-

(*1) Effective tax rate for the years ended December 31, 2021 and 2020 were not calculated due to loss before income tax.

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30. Earnings (loss) per share

(1) Basic earnings (loss) per share

1) Basic earnings (loss) per share for the years ended December 31, 2021 and 2020 are as follows:

<i>(In won, except for share)</i>	2021	2020
Profit (loss) for the period	₩ 26,601,046,582	(1,880,174,095,933)
Weighted-average number of ordinary shares at the end of the period	454,191,535 shares	250,006,947 shares
Basic earnings (loss) per share	₩ 59	(7,520)

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

<i>(In shares)</i>	2021	2020
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 the period	454,191,535	250,006,947

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

(2) Diluted earnings (loss) per share

1) Diluted earnings (loss) per share for the years ended December 31, 2021 and 2020 are as follows:

<i>(In won, except for share)</i>	2021	2020
Profit (loss) for the period before adjustment	₩ 26,601,046,582	(1,880,174,095,933)
Add: Interest expense on redemption premium	70,059,146	-
Profit (loss) for the period after adjustment	26,671,105,728	(1,880,174,095,933)
Weighted-average number of ordinary shares outstanding at the end of the period after adjustment	462,933,245 shares	250,006,947 shares
Diluted earnings (loss) per share	₩ 58	(7,520)

2) 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>	2021	2020
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	462,933,245	250,006,947

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- 3) 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>	2021	2020
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	97,422	33,606,086

31. Commitments and contingencies

- (1) Pledged check provided as collateral

As of December 31, 2021, 7 blank checks (regarding the ₩18,162 million funds replenishing requirement) have been provided as collateral to Incheon-Gimpo Expressway Co. in relation with Incheon-Gimpo Expressway SOC construction project, to the HS-City Expressway in relation with Bibong-Maesong Expressway construction project and to Gyeonggi East-West Beltway Co. in relation with Bongdam-Songsan Expressway construction project.

- (2) Financial commitments

- As of December 31, 2021, the Company has credit lines of borrowings, bank overdraft and others from financial institutions up to ₩6,284,636 million and used ₩2,774,342 million. As a result, the Company maintains unused credit lines amounting to ₩3,510,294 million as of December 31, 2021.
- 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.
- 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.) as of July 1, 2021.
- 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.) as of July 1, 2021.

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- 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.) 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.
- 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 includes 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.) as of July 1, 2021.

(3) Pending litigations and others

As of December 31, 2021, the Company is involved in pending lawsuits as a defendant with total claims against the Company amounting to approximately ₩42,346 million and the result is currently unpredictable.

(In millions of won)

		Claim amount
Arbitration	₩	2,422
Litigation		39,924
Total	₩	42,346

(4) Technical contract

As of December 31, 2021, the Company has entered into 21 technical contracts with Mitsubishi Hitachi Power System, Ltd. and others, which have been effective from April 12, 2007 to August 24, 2035. For the years ended December 31, 2021 and 2020, royalty payments amounted to ₩10,322 million and ₩4,709 million, respectively.

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(5) Guarantees of payment provided by third parties

As of December 31, 2021, the Company has been provided with guarantees of W7,574,679 million from financial institutions in connection with domestic and overseas construction and W717,079 million from financial institutions related with foreign bonds held by the Company.

(6) Guarantees of payment provided to the third parties

As of December 31, 2021, payment guarantees for progress loans are also provided to pre-sale buyers for apartments in the apartments of Deungchon Doosan We've, the complex of Ungcheon-dong, Yeosu project, and Hanam Misa Knowledge Industry Center in total amount of W136,171 million.

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

1) As of December 31, 2021, details of guarantees provided by the Company for developers' project financing are as follows:

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

Guarantee	Currency	Guarantee amount	Translated in KRW	Guarantee plan	Beneficiary
Doosan Babcock General Maintenance Service LLC	AED	25,000 ₩	8,069	Debt guarantee	Mashreq Bank
	AED	7,068	2,281	Construction guarantee	Machinery Financial Cooperative
Doosan Babcock Ltd.	GBP	26,700	42,727	Construction guarantee	NNB Generation (HPC) Ltd.
	GBP	25,000	40,006	Debt guarantee	SC Bank
Doosan Enpure Ltd.	GBP	63,280	101,264	Construction guarantee	Northumbrian Water and others
	GBP	6,500	10,402	Debt guarantee	SC Bank
Doosan Power Systems S.A.	EUR	19,980	26,820	Debt guarantee	KDB
	GBP	27,795	44,479	Debt guarantee	Woori Bank and others
	GBP	21,000	33,605	Others(*2)	London Heights Property LLP
	USD	270,000	320,085	Debt guarantee	Korea EXIM Bank
Doosan GridTech Inc.	AUD	122,249	104,998	Construction guarantee	Wandoan BESS Project Co Pty Ltd and others
	USD	7,281	8,631	Construction guarantee	Construction guarantee cooperative and others
Doosan Heavy Industries America LLC	USD	4,500	5,335	Debt guarantee	Woori Bank
Doosan Heavy Industries Indonesia LLC	IDR	1,340,752,915	111,417	Construction guarantee	Construction guarantee cooperative and others
Doosan Heavy Industries Japan Corp.	JPY	220,000	2,267	Debt guarantee	KDB
Doosan Heavy Industries Muscat LLC	OMR	1,432	4,410	Construction guarantee	Arab Bank
	USD	166,306	197,156	Construction guarantee(*1)	AL ASILAH DESALINATION COMPANY S.A.O.C and others
Doosan Heavy Industries Vietnam Co., Ltd.	USD	98,686	116,992	Debt guarantee	Korea EXIM Bank and others
	VND	4,554,673,854	237,299	Construction guarantee	Construction guarantee cooperative
	VND	751,800,000	39,169	Debt guarantee	Woori Bank and others

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

Guarantee	Currency	Guarantee amount	Translated in KRW	Guarantee plan	Beneficiary
Doosan Lentjes GmbH	EUR	194,852 ₩	261,558	Construction guarantee	Construction guarantee cooperative and others
Doosan Power Systems Arabia Company Limited	SAR	11,825	3,734	Debt guarantee	SABB
	USD	8,000	9,484	Debt guarantee	Korea EXIM Bank
	SAR	6,000	1,895	Construction guarantee	Machinery Financial Cooperative
Doosan Power Systems India Private Ltd.	EUR	10,021	13,451	Construction guarantee	Axis Bank and others
	INR	48,197,956	767,793	Construction guarantee	Construction guarantee cooperative and others
	INR	3,630,000	57,826	Debt guarantee	SC Bank and others
	JPY	347,730	3,582	Construction guarantee	Seoul guarantee insurance and others
	USD	106,111	125,794	Construction guarantee	Construction guarantee cooperative and others
	USD	1,400	1,659	Construction guarantee	Construction guarantee cooperative
Doosan Ukudu Power, LLC	USD	1,400	1,659	Construction guarantee	Machinery Financial Cooperative
Doosan Babcock W.L.L	QAR	25,435	8,279	Construction guarantee	Korea EXIM Bank
DEC	EUR	7,847	10,533	Construction guarantee	Seoul guarantee insurance
	USD	717	850	Construction guarantee	KDB and others
KDPP 5 th Co., Ltd.	KRW	64,480	64,480	Debt guarantee	KDB and others
Employee Stock Ownership Association	KRW	43,774	43,774	Member loan guarantee	Korea Securities Finance
Total			₩ 2,832,104		

(*1) The Company is providing parent company payment guarantee (guarantee amount: USD 117,657 thousand / maturity: end of project) 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.

(*2) DPS S.A. is obligated to lease the office building in use until September 2033, and the Company provides payment guarantees in relation to the lease.

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., Doosan Heavy Industries & Construction Co., Ltd. and others and beneficiary certificates (₩3,600,000 million) and others as collateral. As of audit report date, the collateral has been terminated.

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(8) 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) The Company signed a new lease contract with BUNDANG DOOSAN TOWER REIT Co., Ltd. for 5 years on January 8, 2021 in conjunction with Doosan Corp., Doosan Bobcat Korea Co., Ltd. and Hyundai Doosan Infracore Co., Ltd. (formerly, Doosan Infracore Co., Ltd.). In accordance with above contracts, the Company 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 Company, Doosan Corp., Doosan Bobcat Korea Co., Ltd. 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.

- 3) The Company accounts for the above-mentioned 2) 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 Company's participating rate is 62.5%.
- 4) During 2019 and 2021, the Company and financial investors, NuScale Korea and others, acquired preferred shares of NuScale Power LLC. As of December 31, 2021, the Company entered into a put option contract that could only be exercised under the certain conditions of non-compliance in relation to the preferred shares (USD 74,800 thousand) acquired by NuScale Korea and others.
- 5) 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.
- 6) During 2019, the Company sold the Doosan R&D center located in Seongbokdong, Sujigu, Yongin, Gyeonggi-do and has lease obligations for five years after the sale.
- 7) 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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32. Assets pledged as collateral

(1) As of December 31, 2021, assets that have been pledged as collateral for the Company's borrowings and others are as follows:

(In millions of won)

Collateralized asset	Collateralized amount	Amount of borrowings and others	Pledgee
Land, buildings, equipment and others(*1)	₩ 1,708,533	1,297,523	KDB, Korea EXIM Bank, SC Bank
Common shares of Doosan Bobcat Inc.(*1)	1,045,079	871,300	KDB and others
Common shares of DEC	423,523	199,764	Woori Bank
Equity shares of Construction Guarantee Cooperative	81,317	67,663	Construction Guarantee Cooperative
Equity shares of Engineering Guarantee Insurance	5,448	2,250	Engineering Guarantee Insurance
Total	₩ 3,263,900	2,438,500	

(*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 31).

(2) As of December 31, 2021, among the long-term investment in securities and associates of the Company (including assets held for sale), the shares of Incheon-Gimpo Expressway Co. and others with the book value of ₩27,104 million are pledged for the project financing of that entity to Kookmin Bank (PF syndicate) and others.

(In millions of won)

Collateralized asset	Book value	Pledgee
Incheon-Gimpo Expressway Co.	₩ 6,855	Kookmin Bank and others
Gyeonggi East-West Beltway Co.	5,671	Kookmin Bank and others
The HS-City Expressway	9,578	Hanwha Life Co., Ltd. and others
Hychangwon Co., Ltd.	5,000	BNK Kyongnam Bank
Total	₩ 27,104	

(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.

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 (the book value of ₩43,568 million) in Samcheok Blue Power Co., Ltd. as collateral. 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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33. Related party transactions

(1) The related parties of the Company and nature of their relationship with the Company as of December 31, 2021 and 2020 are as follows:

1) As of December 31, 2021, the Company's ultimate parent company is Doosan Corp. (equity ownership: 39.26%).

2) As of December 31, 2021 and 2020, the details of the Company's subsidiaries are as follows:

Related party	Equity ownership (%)(*1)	
	2021	2020
Doosan Heavy Industries Vietnam Co., Ltd.	100.00	100.00
Doosan HF Controls Corp.	100.00	100.00
Doosan HF Controls Asia Co., Ltd.	100.00	100.00
PT. Doosan Heavy Industries Indonesia	83.64	83.64
Doosan Heavy Industries Malaysia Sdn. Bhd	100.00	100.00
Doosan Heavy Industries Japan Corp.	100.00	100.00
Doosan Enpure Ltd.	100.00	100.00
Doosan Power Systems India Private Ltd.	100.00	100.00
Doosan Heavy Industries Muscat LLC	70.00	70.00
Doosan Power Systems Arabia Company Limited	51.00	51.00
Azul Torre Construction Corporation	40.00	40.00
Doosan Heavy Industries America Holdings Inc.(*2)	100.00	100.00
Doosan Heavy Industries America LLC	100.00	100.00
Doosan ATS America, LLC	100.00	100.00
Doosan Power Service America, LLC	100.00	100.00
Doosan Turbomachinery Services Holding, Inc.(*2)	100.00	95.90
Doosan Turbomachinery Services Inc.	100.00	100.00
Doosan GridTech Inc.	100.00	100.00
Doosan GridTech LLC	100.00	100.00
Doosan GridTech CA LLC	100.00	100.00
Doosan GridTech EPC LLC	100.00	100.00
Doosan GridTech C&I LLC	100.00	100.00
Continuity Energy LLC	100.00	100.00
Doosan Skoda Power s.r.o	100.00	100.00
Skoda Power Private Ltd.	100.00	100.00
Doosan Power Systems Pension Trustee Co., Ltd.	100.00	100.00
Doosan Power Systems Overseas Investments Ltd.	100.00	100.00
Doosan Babcock Ltd.	100.00	100.00
Doosan Power Systems Europe Limited GmbH(*7)	-	100.00
Doosan Power Systems Americas LLC	100.00	100.00
Doosan Lentjes GmbH(*7)	100.00	100.00
DPS S.A.	100.00	100.00
Doosan Babcock Energy Services (Overseas) Ltd.	100.00	100.00
Doosan Babcock Energy Polska S.A.	98.91	98.91
Doosan Babcock Energy Germany GmbH	100.00	100.00
Doosan Lentjes Czech s.r.o	100.00	100.00
Doosan Power Systems (Scotland) Ltd. Partnership(*10)	-	100.00
Doosan Babcock General Maintenance Services LLC	49.00	49.00
Doosan Ukudu Power, LLC(*3)	100.00	-
Osung Power O&M Co., Ltd.	100.00	100.00
Doosan Mecatec Co., Ltd. and the subsidiaries	100.00	100.00
KDPP 5 th Co., Ltd.	-	-
U-best 5 th Co., Ltd.(*4)	-	-
Doosan Cubex Co., Ltd.	56.60	56.60
Doosan Bobcat Inc. and the subsidiaries(*6)	51.05	51.05
DI and the subsidiaries(*8)	-	34.97
DEC and the subsidiaries(*9)	46.35	100.00
DFC(*5)	30.33	15.59
D20 Capital, LLC and the subsidiaries(*6)	100.00	100.00

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(*1) The ownership represents addition of the investment owned by the Company and its subsidiaries.

(*2) Additionally acquired in 2021.

(*3) Newly acquired in 2021.

(*4) The Company assessed that it has control over the special purpose entity as of December 31, 2020 since the entity's activities are substantively governed by the Company. In 2021, it was excluded from consolidation due to repayment of borrowing.

(*5) In 2021, DFC has transferred from subsidiary of the parent company to subsidiary of the Company.

(*6) In 2021, the investment division of DI was spun off and merged into the Company, and the subsidiaries of DI has transferred to subsidiaries of the Company.

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

(*8) In 2021, the investment division of DI was spun off and merged with the Company, all business segments other than investment division of DI were disposed.

(*9) In 2021, the Company loses its control over DEC and the subsidiaries and has excluded them from the scope of consolidation.

(*10) Liquidated in 2021.

3) The associates and joint ventures and other related parties of the Company and nature of their relationship with the Company as of December 31, 2021 are as follows:

Control relationship	Related party
Associates and joint ventures	The HS-City Expressway(*4), Samcheok Blue Power Co., Ltd., Daejung Offshore Wind Power Co., Ltd., Hychangwon Co., Ltd., Doosan Property Co., Ltd.(*10), DEC and the subsidiaries(*11), The Zenith Holdings Ltd.(*3)
Related parties:	
Subsidiaries of the parent company(*1,5,8)	Oricom Inc., Hancor Co., Ltd., Doosan Bears Inc., Doosan Business Research Institute, Doosan Robotics Co., Ltd., Doosan Mobility Innovation Co., Ltd., Doosan Logistics Solutions Co., Ltd, Sunny Russel 8 th Co., Ltd., DPAY 2 nd Co., Ltd., Doosan 2 nd Real Estate Securitization Specialty Co., Ltd., Doosan Mobility Innovation (Shen Zhen) Co., Ltd., Doosan Electro-Materials Singapore Pte Ltd., Doosan (Hong Kong) Ltd., Doosan Electro-Materials (Shen Zhen) Limited., Doosan Shanghai Chemical Materials Co., Ltd., Doosan Electro-Materials (Changshu) 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, Doosan Electro-Materials Vietnam Company Limited, Doosan H2 Innovation(*3), and others
Associates and joint ventures of the parent company	KDDI Korea Corporation, Wise-fashion Co., Ltd., Protera SAS, Sichuan Kelun-Doosan Biotechnology Company Limited, PT. SEGARA AKASA, Stathera IP Holding Inc., BUNDANG DOOSAN TOWER REIT Co., Ltd.(*2), Mastern Professional Investment Type Private Security Investment Trust No.98(*3), SiO2 Materials Science(*3), Weve Holdings Ltd.(*3), and others
Others(*7,11)	Thepathwithyou Foundation(*9), Doosan Credit Union, Doosan Yonkang Foundation, Chung-Ang University, Chung-Ang University Hospital, Prestolite Asia Ltd.(*6), Doosan Babcock BlackCat W.L.L, ReCarbon, Inc., Daesan Green Energy Co., Ltd., Ainstein AI, Inc and others

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

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

(*3) Newly acquired in 2021.

(*4) In 2021, the entity was classified as assets held for sale (See Note 35).

(*5) In 2021, DFC has transferred from subsidiary of the parent company to subsidiary of the Company.

(*6) In 2021, Prestolite Asia Ltd. has transferred from associate of the parent company to associate of Doosan Industrial Vehicle Co., Ltd., which is a subsidiary of Doosan Bobcat Inc.

(*7) 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.

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(*8) In 2021, 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 of Doosan Industrial Vehicle Co., Ltd., which is a subsidiary of Doosan Bobcat Inc.

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

(*10) In 2021, the entity's name has changed from DBC Co., Ltd. and transferred from other related party to associate due to spin-off and merger of DI's investment division.

(*11) In 2021, DEC and the subsidiaries has 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.

(2) Significant transactions between the Company and 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)

(In millions of won)		2021							
		Sales and others			Purchases and others				
		Sales	Sale of PP&E and intangible assets	Other revenue	Purchase	Acquisition of PP&E and intangible assets	Acquisition of right-of-use asset	Other expense	
									Related party
Parent:									
	Doosan Corp.	₩	-	-	318	27,471	-	-	36,336
Subsidiaries:									
	Doosan Cuvex Co., Ltd.		42	-	-	7,116	-	-	3,787
	Osung Power O&M Co., Ltd.		-	-	4	5,739	-	-	-
	KDPP 5 th Co., Ltd.		-	-	-	-	-	-	4,584
	Doosan Heavy Industries Vietnam Co., Ltd.		2,263	-	780	173,821	-	-	-
	Doosan Power Systems India Private Ltd.		23,006	-	3,536	-	-	-	-
	Doosan Power Systems Arabia Company Limited		-	-	50	10,440	-	-	-
	Doosan ATS America, LLC		-	-	-	4,223	-	-	-
	Doosan Babcock Ltd.		371	-	3,414	2,098	-	-	-
	Doosan Skoda Power s.r.o		100	-	-	4,594	-	-	-
	U-best 5 th Co., Ltd.		-	-	-	-	-	-	1,414
	Doosan Industrial Vehicle Co., Ltd.		130	58,410	-	-	-	-	-
	Others(*1)		734	-	3,004	14,838	628	-	807
	Subtotal		26,646	58,410	10,788	222,869	628	-	10,592
Associates and joint ventures:									
	DEC		-	-	75	-	976	-	767
	Samcheok Blue Power Co., Ltd.		529,661	-	-	-	-	-	-
	The HS-City Expressway		16	-	-	-	-	-	-
	Hychangwon Co., Ltd.		9,766	-	-	-	-	-	-
	Subtotal		539,443	-	75	-	976	-	767
Others:									
	Oricom Inc.		-	-	-	-	-	-	2,341
	BUNDANG DOOSAN TOWER REIT Co., Ltd.		-	-	-	-	37,145	144,727	15,958
	Others		-	-	153	567	48	-	1,329
	Subtotal		-	-	153	567	37,193	144,727	19,628
	Total	₩	566,089	58,410	11,334	250,907	38,797	144,727	67,323

(*1) Includes transactions prior to spin-off and merger of DI.

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(In millions of won)

Related party	2020				
	Sales and others		Purchases and others		
	Sales	Other revenue	Purchase	Acquisition of PP&E and intangible assets	Other expense
Parent:					
Doosan Corp.	₩ -	357	24,575	-	29,826
Subsidiaries:					
Clark Equipment Co.	-	-	1,158	-	-
DEC	-	-	2,256	(5,070)	1,340
Doosan Cuvex Co., Ltd.	42	-	10,835	-	369
Osung Power O&M Co., Ltd.	-	4	5,461	-	-
KDPP 5 th Co., Ltd.	-	-	-	-	9,251
Doosan Mecatec Co., Ltd.	3,856	-	-	-	-
Doosan Heavy Industries Vietnam Co., Ltd.	1,475	861	113,860	-	-
Doosan Heavy Industries America LLC	-	11	1,992	-	-
S.C. Doosan IMGB S.A("IMGB")(*1)	-	-	4,743	-	-
DPSI	40,116	3,602	14	-	-
Doosan Enpure Ltd.	-	221	664	-	-
Doosan Heavy Industries Muscat LLC	9,818	778	-	-	-
Doosan Power Systems Arabia Company Limited	-	61	9,634	-	-
Doosan ATS America, LLC	-	-	5,595	-	-
Doosan Babcock Ltd.	159	494	8,949	-	-
Doosan Skoda Power s.r.o	2,441	-	15,499	-	1,509
Doosan HF Controls Corp.	-	-	7,123	-	-
U-best 5 th Co., Ltd.	-	-	-	-	3,900
Others	576	2,311	5,075	-	1,630
Subtotal	58,483	8,343	192,858	(5,070)	17,999
Associates					
Samcheok Blue Power Co., Ltd.	363,954	-	-	-	-
The HS-City Expressway	32	-	-	-	-
Hychangwon Co., Ltd.	21	238	-	-	-
Subtotal	364,007	238	-	-	-
Others:					
Oricom Inc.	-	-	-	-	2,122
Others	-	-	936	-	120
Subtotal	-	-	936	-	2,242
Total	₩ 422,490	8,938	218,369	(5,070)	50,067

(*1) The relationship ended during 2020, and the above amount is aggregated before the relationship ended.

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(3) Significant balances related to the transactions between the Company and 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)

Related party	2021						
	Receivables			Payables			
	Trade receivable	Loans receivable	Other receivable	Trade payable	Borrowings	Other payable	Lease liabilities
Parent:							
Doosan Corp.	₩ -	-	1,381	50,960	-	51,430	-
Subsidiaries:							
Doosan Cuvex Co., Ltd.	-	-	5,333	574	-	26	-
KDPP 5 th Co., Ltd.	-	-	-	-	49,600	-	-
Doosan Heavy Industries Vietnam Co., Ltd.	2,230	-	1,033	194,436	-	29,375	-
Doosan Heavy Industries America LLC	-	-	27	8,322	-	-	-
Doosan Heavy Industries Japan Corp.	-	-	36	1,169	-	402	-
Doosan Power Systems India Private Ltd.(*1)	179,562	66,809	102,421	12	-	-	-
Doosan Enpure Ltd.	3,880	-	1,904	540	-	-	-
Azul Torre Construction Corporation(*2)	-	3,707	4,622	-	-	-	-
Doosan Heavy Industries America Holdings Inc.	-	-	-	-	-	-	-
Doosan Power Systems S.A.	-	12,082	5,894	-	-	-	-
Doosan Babcock Ltd.	-	69,611	18,915	6,306	-	-	-
Doosan Skoda Power s.r.o	-	-	531	7,332	-	-	-
Doosan GridTech Inc.	-	5,928	1,068	-	-	-	-
Doosan Power Systems Arabia Company Limited	507	-	82	1,489	-	1	-
Others	-	236	13,172	13,840	-	-	-
Subtotal	186,179	158,373	155,038	234,020	49,600	29,804	-
Associates							
Samcheok Blue Power Co., Ltd.(*3)	-	-	317,889	-	-	-	-
DEC	-	-	11,133	122	-	16,992	-
Hychangwon Co., Ltd.	12,210	-	-	-	-	46,428	-
Subtotal	12,210	-	329,022	122	-	63,420	-
Related Parties							
Oricom Inc.	-	-	-	-	-	2,235	-
BUNDANG DOOSAN TOWER REIT Co., Ltd.	-	-	17,499	-	-	-	161,693
Others	-	-	28	84	-	-	-
Subtotal	-	-	17,527	84	-	2,235	161,693
Total	₩ 198,389	158,373	502,968	285,186	49,600	146,889	161,693

(*1) As of December 31, 2021, the Company has set an allowance for doubtful accounts of ₩348,792 million for receivables of Doosan Power Systems India Private Ltd., and the ₩129,365 million was recognized as bad debt expenses in 2021.

(*2) As of December 31, 2021, the Company has set an allowance for doubtful accounts of ₩8,329 million for receivables of Azul Torre Construction Corporation and the same amount was recognized as bad debt expenses in 2021.

(*3) As of December 31, 2021, the Company 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.

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Related party	2020					
	Receivables			Payables		
	Trade receivable	Loans receivable	Other receivables	Trade payable	Borrowings	Other payables
Parent:						
Doosan Corp.	₩ -	-	1,117	21,922	-	21,210
Subsidiaries:						
DEC	-	-	8,807	122	-	14,842
Doosan Cuvex Co., Ltd.	-	-	4,826	731	-	37
KDPP 5 th Co., Ltd.	-	-	-	-	127,200	-
U-best 5 th Co., Ltd.	-	-	-	-	80,000	-
Doosan Heavy Industries Vietnam Co., Ltd.	951	-	4,104	104,981	-	26,542
Doosan Heavy Industries America LLC	-	-	10	15,141	-	-
Doosan Heavy Industries Japan Corp.	-	-	47	4,588	-	511
Doosan Power Systems India Private Ltd.(*1)	185,940	34,891	34,308	734	-	-
Doosan Enpure Ltd.	-	-	5,037	1,169	-	-
Doosan Heavy Industries Muscat LLC	-	-	1,410	-	-	-
Doosan Power Systems Arabia Company Limited	466	-	27	1,184	-	-
Azul Torre Construction Corporation	-	3,616	4,242	-	-	-
Doosan Heavy Industries America Holdings Inc.	-	28,288	1,974	-	-	-
DPS S.A.	-	-	5,314	-	-	-
Doosan Babcock Ltd.	-	64,485	12,823	8,115	-	-
Doosan Skoda Power s.r.o	-	-	1,123	11,407	-	-
Doosan GridTech Inc.	-	5,440	414	-	-	-
Doosan HF Controls Corp.	-	-	3	855	-	-
Others	-	-	1,804	3,563	-	318
Subtotal	187,357	136,720	86,273	152,590	207,200	42,250
Others:						
Doosan Property Co., Ltd.	-	-	12,255	-	-	-
Others	-	-	-	-	-	3,029
Subtotal	-	-	12,255	-	-	3,029
Total	₩ 187,357	136,720	99,645	174,512	207,200	66,489

(*1) As of December 31, 2020, the Company has set an allowance for doubtful accounts of ₩219,427 million for receivables of Doosan Power Systems India Private Ltd., and the same amount was recognized as bad debt expenses in 2020.

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(4) Financial transactions between the Company 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)

(In millions of won)		2021										
		Loans		Borrowings			Dividend		Investments		Shares	
Related party		Lending	Collection	Borrowed	Repaid	Lease liability paid	Income	Payout	Received	Provided	Acquisition	Disposal
Parent:												
Doosan Corp.	₩	-	-	-	-	-	-	-	605,226	-	-	-
Subsidiaries:												
KDPP 5 th Co., Ltd.		-	-	-	77,600	-	-	-	-	-	-	-
DPS S.A.		11,273	-	-	-	-	-	-	-	-	-	-
Doosan Ukudu Power, LLC.		225	-	-	-	-	-	-	-	1	-	-
Doosan Power Systems India Private Ltd.		29,054	-	-	-	-	-	-	-	-	-	-
U-best 5th Co., Ltd.		-	-	-	80,000	-	-	-	-	-	-	-
DFC		-	-	-	-	-	-	-	-	-	605,226	-
Doosan Heavy Industries America Holdings Inc.		-	30,875	-	-	-	-	-	-	-	44,572	-
D20 Capital, LLC		-	-	-	-	-	-	-	-	-	63,595	-
Doosan Bobcat Inc.		-	-	-	-	-	-	-	-	-	2,435,990	-
Doosan Cuvex Co., Ltd.		-	-	-	-	-	-	-	-	-	53,642	-
Subtotal		40,552	30,875	-	157,600	-	-	-	-	1	3,203,025	-
Associates:												
Hychangwon Co., Ltd.		-	-	-	-	-	-	-	-	2,000	-	-
Doosan Property Co., Ltd.		-	-	-	-	-	-	-	-	-	42,240	-
The Zenith Holdings Ltd.		-	-	-	-	-	-	-	-	120,000	-	-
DEC		-	-	-	-	-	-	-	-	-	-	-
Subtotal		-	-	-	-	-	-	-	-	122,000	42,240	-
Others:												
BUNDANG DOOSAN TOWER REIT Co., Ltd.		-	-	-	-	15,439	-	-	-	-	-	-
KDDI Korea Corporation		-	-	-	-	-	273	-	-	-	-	-
Subtotal		-	-	-	-	15,439	273	-	-	-	-	-
Total	₩	40,552	30,875	-	157,600	15,439	273	-	605,226	122,001	3,245,265	-

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(In millions of won)

Related party	2020									
	Loans		Borrowings		Dividend		Investments		Shares	
	Lending	Collection	Borrowed	Repaid	Received	Provided	Income	Payout	Acquisition	Disposal
Doosan Corp.	₩	-	-	-	-	-	673,376	-	-	-
Subsidiaries:										
DEC		-	-	-	-	-	-	-	51,009	-
KDDP 3 th Co., Ltd.		-	276	-	40,000	-	-	-	-	-
KDDP 5 th Co., Ltd.		-	-	-	41,800	-	-	-	-	-
Osung Power O&M Co., Ltd.		-	-	-	-	600	-	-	-	-
Doosan Mecatec Co., Ltd.		-	-	-	-	-	-	-	238,199	-
Doosan Heavy Industries Vietnam Co., Ltd.		-	-	-	-	-	-	-	63,697	-
DPSI		-	-	-	-	-	-	200,000	-	-
Azul Torre Construction Corporation		201	-	-	-	-	-	-	-	-
Doosan Heavy Industries America Holdings Inc.		20,686	33,516	-	-	-	-	-	-	-
Doosan GridTech Inc.		-	-	-	-	-	-	8,846	-	-
Doosan Skoda Power s.r.o		-	-	-	69,468	-	-	-	-	-
Doosan Babcock Limited PT. Doosan Heavy Industries Indonesia		64,484	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	760	-	-
Subtotal		85,371	33,792	-	151,268	600	-	209,606	352,905	-
Associates and joint ventures:										
Daejung Offshore Wind Power Co., Ltd.		-	-	-	-	-	-	369	-	-
Hychangwon Co., Ltd.		-	-	-	-	-	-	3,000	-	-
Subtotal		-	-	-	-	-	-	3,369	-	-
Others:										
KDDI Korea Corporation		-	-	-	-	8	-	-	-	-
Total	₩	85,371	33,792	-	151,268	608	-	673,376	212,975	352,905

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

The Company provides or receives payment guarantees and collateral with regard to the related party as of December 31, 2021 (See Notes 31 and 32).

(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 Company. Compensation for key management personnel for the years ended December 31, 2021 and 2020 consists of following:

(In millions of won)	2021	2020
Short-term employee benefits	₩ 6,544	9,356
Severance and retirement benefits	933	1,253
Total	₩ 7,477	10,609

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34. Separate statements of cash flows

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

(In millions of won)

	2021	2020
Profit (loss) for the period	₩ 26,601	(1,880,174)
Adjustments:		
Interest expenses	178,996	186,409
Loss on foreign currency translation	89,996	47,132
Bad debt expenses	83,703	167,905
Other bad debt expenses	63,425	73,665
Loss on valuation of derivative financial instruments	238,104	24,432
Loss on settlement of derivative financial instruments	2,992	-
Loss on valuation of firm commitments	7,643	66,946
Provision for warranty expenses	22,980	18,180
Depreciation	104,265	110,823
Amortization	71,439	85,892
Income tax benefit	(161,291)	(226,215)
Severance and retirement benefits	32,552	40,142
Loss on valuation of inventory	14,771	2,973
Loss on disposal of property, plant and equipment	1,598	212
Loss on disposal of intangible assets	6	197
Impairment loss on intangible assets	26,551	36,107
Impairment loss of assets held for sale	1,786	158,053
Loss on disposal of assets held for sale	1,090	-
Impairment loss on investments in subsidiaries	148,387	1,070,485
Loss on disposal of investments in subsidiaries	1,682	-
Loss on valuation of long-term investment securities	29,617	7,408
Loss on redemption of bond	-	31,385
Loss on disposal of trade receivables	988	7,758
Provision for loss compensation	10,970	92,100
Interest income	(12,137)	(9,831)
Dividend income	(1,313)	(612)
Gain on foreign currency translation	(71,353)	(46,469)
Gain on valuation of derivatives financial instruments	(107,949)	(122,483)
Gain on valuation of firm commitments	(117,275)	(7,443)
Gain on disposal of property, plant and equipment	(2,164)	(630)
Reversal of impairment loss of intangible assets	(85)	(4,420)
Gain on valuation of long-term investment securities	(16,811)	(85,527)
Gain on disposal of investments in subsidiaries	(59,523)	(1,731)
Reversal of provision for loss compensation	(73,195)	-
Reversal of provision for construction warranties	(18,926)	(1,290)
Reversal of provision for warranty expenses	(10,793)	(162)
Others	16,028	116,442
Subtotal	₩ 496,754	1,837,833

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(In millions of won)

	2021	2020
Changes in operating assets and liabilities:		
Trade receivables	₩ 111,313	(43,033)
Due from customers for contract work	(162,705)	(14,019)
Other receivables	(37,280)	(38,635)
Prepayments	(101,742)	(60,705)
Inventories	(86,330)	34,616
Derivative financial assets and liabilities	43,801	(55,737)
Firm commitments assets and liabilities	34,048	(14,703)
Trade payables	455,528	(270,300)
Other payables	(91,965)	6,665
Advanced receipts	(5,864)	1,916
Due to customers for contract work	120,454	169,635
Accrued expenses	10,165	(5,037)
Severance payments paid	(26,914)	(136,875)
Plan assets	14,734	107,559
Others	(64,450)	(93,010)
Subtotal	212,793	(411,663)
Cash generated from operations	₩ 736,148	(454,004)

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

(In millions of won)

	2021	2020
Transfer to current portion of bonds, borrowings and others	₩ 1,391,966	377,445
Transfer from construction-in-progress to other assets	36,847	40,304
Acquisition of investment in subsidiaries through investment in kind	605,226	238,199
Transfer from long-term investment in securities to investment in subsidiaries	657,323	-
Acquisition of investment in subsidiaries through comprehensive stock exchange	-	36,971
Acquisition of long-term investment in securities through stock receipt	-	600,525
Transfer to assets held for sale	47,302	40,772
Changes in other payables through acquisition of property, plant and equipment	3,973	-
Acquisition of right-of-use assets	156,152	6,201
Acquisition of investment properties	37,145	24,372
Net increase(decrease) from spin-off and merger	953,042	-
Transfer from investment in subsidiaries to investment in associates	317,666	-
Acquisition of investment in joint ventures through investment in kind	120,000	-

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

(In millions of won)

(In millions of won)		2021						
		Non-cash changes						Balance as of December 31
	Balance as of January 1	Cash flows from financing activities, net	Current portion of long-term debt	Changes in foreign currency translation	Interest expenses amortization	Changes due to spin-off and merger	Others(*1)	
Short-term borrowings	₩ 4,031,380	(855,834)	-	3,877	-	100,000	-	3,279,423
Current portion of								
long-term debt	462,970	(1,046,290)	1,358,669	19,150	565	104,647	(211)	899,500
Current lease liabilities	15,967	(23,123)	33,297	-	-	-	-	26,141
Bonds	14,735	93,392	(399,489)	16,800	3,078	693,858	(11)	422,363
Long-term borrowings	309,109	667,663	(909,058)	-	88	54,691	-	122,493
Long-term asset-backed								
borrowings	49,103	-	(50,122)	-	1,019	-	-	-
Non-current lease liabilities	12,146	-	(33,297)	(174)	-	-	178,813	157,488
Total	₩ 4,895,410	(1,164,192)	-	39,653	4,750	953,196	178,591	4,907,408

(*1) Non-cash changes such as loss on debt redemption and account transfer are included.

(In millions of won)

		2020						Balance as of December 31
		Balance as of January 1	Cash flows from financing activities, net	Current portion of long-term debt	Changes in foreign currency translation	Interest expenses amortization	Others(*1)	
Short-term borrowings	₩	2,659,815	1,384,017	-	(12,452)	-	-	4,031,380
Current portion of								
long-term debt		1,529,162	(1,459,562)	359,791	(5,338)	7,532	31,385	462,970
Current lease liabilities		28,084	(29,352)	17,654	-	-	(419)	15,967
Bonds		80,000	10,006	(75,665)	-	412	(18)	14,735
Long-term borrowings		484,078	25,000	(199,408)	(561)	-	-	309,109
Long-term asset-backed								
borrowings		132,514	-	(84,718)	-	1,307	-	49,103
Non-current lease liabilities		15,602	-	(17,654)	-	-	14,198	12,146
Total	₩	4,929,255	(69,891)	-	(18,351)	9,251	45,146	4,895,410

(*1) Non-cash changes such as loss on debt redemption and account transfer are included.

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35. Assets held for sale

Details of assets held for sale as of December 31, 2021 are as follows:

<i>(In millions of won)</i>		2021
Investment in associates(*1)	₩	9,578
Property, plant and equipment(*2,3)		34,777
Subtotal		44,355
Accumulated impairment loss(*2,3)		(1,786)
Total	₩	42,569

(*1) In 2021, the Company decided to sell all shares related with the HS-City Expressway and classified the holding shares as assets held for sale (Note 11).

(*2) In 2021, the Company classified the land, buildings and others in Songlimdong, Incheon as assets held for sale and recognized ₩867 million as an impairment loss.

(*3) As of December 31 2021, the Company classified the related construction equipment as held for sale assets as the construction equipment rental business in the Middle East was expected to close during the first half of the year, and an recognized ₩919 million as an impairment loss.

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For the years ended December 31, 2021 and 2020

36. Pursuance of the financial structure improvement plan

The Company faces financial difficulties as the global power market slump and external environmental change resulted in accumulated losses incurred in the Company'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 common shares on December 2020, sales on business segments other than investment division of DI on August 2021, and another issuance of common shares on 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.

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

The World Health Organization declared a global pandemic against COVID-19 on March 11, 2020, and the Company believes that the spread and persistence of COVID-19 will have a negative impact on the Company's business and financial environment. However, as of December 31, 2021, the Company cannot reasonably estimate the effects of COVID-19, the effects are not reflected in the separate financial statements.

38. Subsequent events

On February 18, 2022, the Company issued common stock of 82,872,900 shares (Issuance value: ~~₩~~1,147,790 million) through capital increase.

39. Approval of financial statements

The separate financial statements 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.

Independent Auditors' Report on Internal Control over Financial Reporting

Based on a report originally issued in Korean

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

Opinion on Internal Control over Financial Reporting

We have audited Doosan Heavy Industries & Construction Co., Ltd.'s ("the Company") internal control over financial reporting ("ICFR") as of December 31, 2021 based on the criteria established in the Conceptual Framework for Designing and Operating ICFR ("ICFR Design and Operation Framework") issued by the Operating Committee of Internal Control over Financial Reporting in the Republic of Korea (the "ICFR Committee").

In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on ICFR Design and Operation Framework.

We also have audited, in accordance with Korean Standards on Auditing (KSAs), the separate financial statements of the Company, which comprise the separate statements of financial position as of December 31, 2021 and 2020, the separate statements of loss and comprehensive loss, changes in equity and cash flows for the years then ended, and notes, comprising significant accounting policies and other explanatory information, and our report dated March 22, 2022 expressed an unmodified opinion on those separate financial statements.

Basis for Opinion

We conducted our audit in accordance with KSAs. Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Internal Control over Financial Reporting section of our report. We are independent of the Company in accordance with the ethical requirements that are relevant to our audit of the internal control over financial reporting in Republic of Korea, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Internal Control over Financial Reporting

The Company's management is responsible for designing, operating and maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Report on the Operations of Internal Control over Financial Reporting.

Those charged with governance are responsible for overseeing the Company's internal control over financial reporting.

Auditors' Responsibilities for the Audit of the Internal Control over Financial Reporting

Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We conducted our audit in accordance with KSAs. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.



Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with Korean International Financial Reporting Standards ("K-IFRS"). The company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with K-IFRS, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

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

KPMG Samjony 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 internal control over financial reporting. 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.

대표이사 및 내부회계관리자의 내부회계관리제도 운영실태보고서

두산중공업㈜ 주주, 이사회 및 감사위원회 귀중

본 대표이사 및 내부회계관리자는 2021년 12월 31일 현재 동일자로 종료하는 회계연도에 대한 당사의 내부회계관리제도의 설계 및 운영실태를 평가하였습니다.

내부회계관리제도의 설계 및 운영에 대한 책임은 본 대표이사 및 내부회계관리자를 포함한 회사의 경영진에 있습니다.

본 대표이사 및 내부회계관리자는 회사의 내부회계관리제도가 신뢰할 수 있는 재무제표의 작성 및 공시를 위하여 재무제표의 왜곡을 초래할 수 있는 오류나 부정행위를 예방하고 적발할 수 있도록 효과적으로 설계 및 운영되고 있는지의 여부에 대하여 평가하였습니다.

본 대표이사 및 내부회계관리자는 내부회계관리제도의 설계 및 운영을 위해 내부회계관리제도 운영위원회에서 발표한 '내부회계관리제도 설계 및 운영 개념체계'를 준거기준으로 사용하였습니다. 또한 내부회계관리제도의 설계 및 운영실태를 평가함에 있어 내부회계관리제도 운영위원회에서 발표한 '내부회계관리제도 평가 및 보고 모범규준'을 평가기준으로 사용하였습니다.

본 대표이사 및 내부회계관리자의 내부회계관리제도 운영실태 평가결과, 2021년 12월 31일 현재 당사의 내부회계관리제도는 '내부회계관리제도 설계 및 운영 개념체계'에 근거하여 볼 때, 중요성의 관점에서 효과적으로 설계되어 운영되고 있다고 판단됩니다.

본 대표이사 및 내부회계관리자는 보고내용이 거짓으로 기재되거나 표시되지 아니하였고, 기재하거나 표시하여야 할 사항을 빠뜨리고 있지 아니함을 확인하였습니다. 또한 본 대표이사 및 내부회계관리자는 보고내용에 중대한 오해를 일으키는 내용이 기재되거나 표시되지 아니하였다는 사실을 확인하였으며, 충분한 주의를 다하여 직접 확인 검토하였습니다.

2022년 3월 // 일

대 표 이 사 정 연 인

내부회계관리자 박 상 현

Report on the Operations of Internal Control over Financial Reporting **("ICFR")**

English Translation of a Report Originally Issued in Korean

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

We, as the CEO and Internal Accounting Control Officer ("IACO") of Doosan Heavy Industries & Construction Co., Ltd. ("the Company"), assessed the status of the design and operation of the Company's ICFR for the year ended December 31, 2021.

The Company's management including CEO and IACO are responsible for designing and operating ICFR. We, as the CEO and IACO, assessed whether the ICFR has been appropriately designed and is effectively operating to prevent and detect any error or fraud which may cause any misstatement of the financial statements, for the purpose of preparing and disclosing reliable financial statement.

We, as the CEO and IACO, adopted the 'ICFR Design and Operation Concept Framework' established by the Operating Committee of Internal Control over Financial Reporting for the design and operation of the ICFR. Also applied the 'ICFR Assessment and Reporting Standards' established by the Operating Committee of Internal Control over Financial Reporting for the assessment of design and operation of the ICFR.

Based on assessment of the ICFR, the Company's ICFR has been appropriately designed and is operating effectively as of December 31, 2021, in all material respect, in accordance with the ICFR Design and Operation Concept Framework.

We, as the Company's CEO and IACO, confirmed that the contents of the report are not misstated or displayed, and there is no missing information to be stated or displayed.

Also, We, as the Company's CEO and IACO, confirmed that the report did not contain or display any content that cause major misunderstanding, and sufficiently reviewed the report.

11 February 2022

Chief Executive Officer YEONIN JUNG
Internal Accounting Control Officer SANGHYUN PARK

