



DOOSAN CORPORATION AND ITS SUBSIDIARIES

Consolidated Financial Statements

For the Years Ended December 31, 2021 and 2020

With the independent auditor's report

Doosan Corp.

Contents

Independent auditor's report	Page
Consolidated financial statements	
Consolidated statements of financial position	1-2
Consolidated statements of profit or loss	3
Consolidated statements of comprehensive income (loss)	4
Consolidated statements of changes in equity	5-6
Consolidated statements of cash flows	7-8
Notes to the consolidated financial statements	9-142

Independent auditor's report

The Shareholders and Board of Directors Doosan Corporation

Opinion

We have audited the accompanying consolidated financial statements of Doosan Corporation (the "Company") and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as of December 31, 2021 and 2020, and the consolidated statements of profit or loss, consolidated statements of comprehensive income (loss), consolidated statements of changes in equity and consolidated statements of cash flows for the years then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2021 and 2020, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with Korean International Financial Reporting Standards ("KIFRS").

Basis for opinion

We conducted our audit in accordance with Korean Auditing Standards ("KGAAS"). Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the consolidated financial statements section of our report. We are independent of the Group in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in the 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.

Key audit matters

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

(1) Recognition of revenue based on the input method

As described in Note 2 to the consolidated financial statements, the Group measures percentage-of-completion using the input method and recognizes revenue over time by measuring progress towards complete satisfaction. This revenue recognition accounting policy applies primarily to Doosan Heavy Industries & Construction Co., Ltd. and its subsidiaries within the Group.

As revenue recognition based on the input method varies depending on the measured percentage-of-completion, management's judgment on the method of measuring progress, estimating its total contract cost, and construction progress is required. Therefore, as revenue is exposed to the risk of overstatement due to errors in judgment or the intention, we have identified the recognition of revenue based on the input method of Doosan Heavy Industries & Construction Co., Ltd. and its subsidiaries as a key audit matter.

In this regard, the main audit procedures we performed with the involvement of the component auditors are as follows.

- Evaluation of the design adequacy and testing of operating effectiveness of internal control procedures related to the determination and modification of estimated total contract costs
- Evaluation of the appropriateness and operating effectiveness of the design of internal control procedures related to aggregation and distribution of project costs
- Evaluation of the appropriateness and operating effectiveness of the design of internal control procedures related to purchasing and production that affect the sales costs
- Evaluation of the design adequacy and testing of operating effectiveness of internal control procedures related to revenue recognition based on percentage-of-completion method
- A retrospective analysis by comparing the actual cost incurred during the current reporting period to the estimated costs as of the end of the prior year by selecting significant projects completed during the current reporting period and performed retrospective analysis
- Inquiry and inspection of documents for projects with significant changes in the estimated total contract costs
- Comparative assessment of the estimated total contract costs among similar projects
- Inquiry and analytical review procedures on the causes of volatility in the percentage-of-completion of construction by each reporting period
- Comparative assessment of percentage-of-completion by process (monthly progress report) and cost-based percentage-of-completion for major projects, and inquiry and inspections of documents if there is a significant difference
- Review of transactions selected by the sampling method to confirm the amount of input costs incurred (material costs, outsourcing costs and business expenses), cut-off periods and appropriateness of the projects to which those transactions are attributed.
- Selection and testing of a risk scenario on whether there has been any diversion of costs in projects by IT audit experts support.
- Review of materials in progress and on-site visits of in-process projects
- Recalculation of the percentage-of-completion by projects

(2) Evaluation on the recoverability of trade receivables and due from customers for contract work

As described in Note 2 to the consolidated financial statements, the Group calculates expected credit losses based on the expected duration of the expected credit losses and evaluates the recoverability of trade receivables and due from customers for contract work.

In calculating expected credit losses of Doosan Heavy Industries & Construction Co., Ltd. and its subsidiaries, management's judgment is required in calculating expected credit losses due to the uncertainty over the collection of due from customers for contract work such as delays in payment of orders, changes in terms and conditions, and claims. Therefore, as trade receivables and due from customers for contract work are exposed to the risk of overstatement due to errors in judgment or the intention of management, we have identified the assessment of recoverability of the trade receivables and due from customers for contract work of Doosan Heavy Industries & Construction Co., Ltd. and its subsidiaries as a key audit matter.

In this regard, the main audit procedures we performed with the involvement of the component auditors are as follows.

- Evaluation of design adequacy and testing of operating effectiveness for internal control procedures that identify and evaluate collectability of due from customers for contract works
- Inspection of relevant documents of the terms of payment, delivery timing and other obligations under the contract for projects with significant increases in due from customers for contract work
- Inquiry and inspection of documents of long-term due from customers for contract work
- Review of billing status, collection status and sale of due from customers for contract works in major projects
- For the projects with bad debt allowance reserved over trade receivables assessed whether an allowance is reserved for unbilled accounts receivable and inspected documents
- Requested an opinion from legal experts to review the collectability of due from customers for contract works

(3) Goodwill impairment testing

As described in Note 13 to the consolidated financial statements, the Group conducted an impairment test on cash-generating units to which the goodwill of Doosan Heavy Industries & Construction Co., Ltd. and its subsidiaries had been distributed, as of December 31, 2021. In order to estimate the recoverable amount, the Group used value in use and fair value less any cost of disposal, based on future estimated cash flows based on future financial budgets.

As of December 31, 2021, the carrying amount of goodwill of Doosan Heavy Industries & Construction Co. Ltd. and its subsidiaries is ₩4,917,251 million, accounting for 18.9% of total assets. In addition, the recoverable amount may vary depending on the estimated future cash flow, applied discount rate and selection of similar companies, which are inputs accompanied by management's judgements, which can significantly affect the consolidated financial statements. Therefore, we have identified the estimation of the recoverable amounts of cash-generating units (or groups of cash-generating units) to which the goodwill of Doosan Heavy Industries & Construction Co., Ltd. and its subsidiaries are selected as a key audit matter.

In this regard, the main audit procedures we performed with the involvement of the component auditors are as follows.

- Testing of internal control related to goodwill impairment testing
- Inquiries on valuation models applied by the group
- Testing of future estimated cash flows and analyze whether they are consistent with management approved business plans
- Compare and evaluate the applied discount rate, growth rate, etc. with external benchmarks within the industry and past financial information of cash-generating units (or groups of cash-generating units)
- Conduct a sensitivity analysis of the discount rate and growth rate applied in order to evaluate the effect of changes in major assumptions on the impairment test results
- Review of the business and financial nature of similar companies using the auditor's valuation experts to evaluate the appropriateness of the similar companies selected

Responsibilities of management and those charged with governance for the consolidated financial statements

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

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

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

Auditor's responsibilities for the audit of the consolidated financial statements

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

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

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

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

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

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

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

The engagement partner on the audit resulting in this independent auditor's report is Sang Il Bae.



March 22, 2022

This audit report is effective as of March 22, 2022, the independent auditor's report date. Accordingly, certain material subsequent events or circumstances may have occurred during the period from the independent auditor's report date to the time this report is used. Such events and circumstances could significantly affect the accompanying consolidated financial statements and may result in modifications to this report.

Doosan Corporation and its subsidiaries

Consolidated financial statements
for the years ended December 31, 2021 and 2020

“The accompanying consolidated financial statements, including all footnotes and disclosures, have been prepared by, and are the responsibility of, the Group.”

Sang Chul Kwak
Chief Executive Officer
Doosan Corporation

Doosan Corporation and its subsidiaries
Consolidated statements of financial position
as of December 31, 2021 and 2020
(Korean won)

	Notes	2021	2020
Assets			
Current assets:			
Cash and cash equivalents	4,5,10,35	₩ 2,235,362,000,986	₩ 2,707,378,621,227
Short-term financial instruments	4,5,10,33	1,063,278,992,989	438,760,359,255
Short-term investment securities	4,6,10,33	197,303,691,549	608,638,772,717
Trade receivables	4,7,10,33,34	1,200,207,123,894	2,255,531,445,233
Other receivables	4,7,10,34	299,131,813,657	469,128,689,690
Due from customers for contract work	4,25	1,654,560,197,709	1,756,629,305,829
Current derivative assets	4,9,10	30,477,894,846	58,569,352,182
Current firm commitment assets	9	45,877,394,613	5,900,766,998
Inventories	8,33	2,027,873,938,222	2,421,951,527,992
Assets held for sale	38	319,607,727,615	1,018,584,230,499
Other current assets		821,600,916,079	857,250,785,651
Total current assets		9,895,281,692,159	12,598,323,857,273
Non-current assets:			
Long-term financial instruments	4,5,10,33	40,829,884,045	58,950,464,652
Long-term investment securities	4,6,10,33	508,468,044,157	324,132,653,139
Investments in associates and joint ventures	11,33	740,002,545,608	198,811,853,443
Property, plant and equipment	3,12,16,33,40	5,963,449,229,467	6,983,728,155,921
Intangible assets	3,13,40	7,611,458,909,723	8,240,367,998,573
Investment properties	3,14,16,33	362,693,422,126	388,021,572,778
Long-term trade receivables	4,7,10,34	-	4,969,070,586
Long-term other receivables	4,7,10,34	67,433,353,174	244,549,615,398
Long-term due from customers for contract work	4,25	102,739,503,644	102,739,503,644
Non-current derivative assets	4,9,10	8,683,481,005	37,748,633,632
Non-current firm commitment assets	9	20,892,251,073	9,818,569,590
Deferred tax assets	3,30	251,568,872,923	457,760,460,581
Deposits	4,10	394,832,867,743	495,023,811,376
Other non-current assets		41,518,114,902	56,056,524,084
Total non-current assets		16,114,570,479,590	17,602,678,887,397
Total assets		₩ 26,009,852,171,749	₩ 30,201,002,744,670

(Continued)

Doosan Corporation and its subsidiaries
Consolidated statements of financial position
as of December 31, 2021 and 2020 (cont'd)
(Korean won)

	Notes	2021	2020
Liabilities			
Current liabilities:			
Trade payables	4,10,34	₩ 2,029,122,718,046	₩ 2,404,379,345,425
Other payables	4,10,34	817,707,544,559	1,142,632,299,720
Due to customers for contract work	25	1,468,213,289,760	1,666,422,704,998
Short-term borrowings	4,10,15,32,33	4,725,060,883,659	6,295,837,988,399
Current portion of bonds	4,10,15	690,900,817,693	835,034,919,760
Current portion of long-term borrowings	4,10,15,32,33	463,728,899,773	1,263,652,019,216
Asset-backed loans	4,10,15,32,33	-	59,550,657,597
Current portion of long-term asset-backed loans	4,10,15,32,33	115,042,422,078	332,022,061,884
Current derivative liabilities	4,9,10	212,986,357,385	61,603,742,869
Current firm commitment liabilities	9	10,120,811,188	17,401,805,083
Current tax liabilities		326,719,612,348	224,821,106,095
Current provisions	3,18,25	328,911,072,600	536,917,606,893
Current lease liabilities	4,10,16	99,478,825,596	98,837,543,172
Liabilities held for sale	38	273,469,051,609	211,531,299,713
Other current liabilities		444,986,909,689	657,600,153,222
Total current liabilities		12,006,449,215,983	15,808,245,254,046
Non-current liabilities:			
Bonds	4,10,15	1,139,453,849,847	2,133,792,638,182
Long-term borrowings	4,10,15,32,33	1,520,833,919,822	1,195,457,964,253
Long-term asset-backed loans	4,10,15,32,33	16,434,564,878	215,317,399,320
Net defined benefit liabilities	3,17	578,380,866,156	746,466,527,690
Long-term other liabilities	4,10	676,529,515,464	656,285,441,069
Non-current derivative liabilities	4,9,10	37,802,056,172	70,772,172,508
Non-current firm commitment liabilities	9	5,651,863,540	24,633,647,381
Non-current provisions	3,18,25	316,311,587,838	383,920,553,466
Deferred tax liabilities	3,30,40	483,114,613,725	628,349,951,540
Non-current lease liabilities	4,10,16	591,533,452,732	444,145,611,201
Other non-current liabilities		140,303,729,093	128,044,642,874
Total non-current liabilities		5,506,350,019,267	6,627,186,549,484
Total liabilities		17,512,799,235,250	22,435,431,803,530
Equity			
Equity attributable to owners of the parent:			
Share capital	1,19	123,738,105,000	123,738,105,000
Capital surplus	19,20	1,237,398,733,163	1,090,773,788,457
Other equity items	21	(1,196,429,122,967)	(1,194,599,080,502)
Accumulated other comprehensive income	6,9,22	532,228,980,243	480,451,206,606
Retained earnings	23	1,468,140,643,281	1,159,308,654,316
		2,165,077,338,720	1,659,672,673,877
Non-controlling interests	40	6,331,975,597,779	6,105,898,267,263
Total equity		8,497,052,936,499	7,765,570,941,140
Total liabilities and equity		₩ 26,009,852,171,749	₩ 30,201,002,744,670

The accompanying notes are an integral part of the consolidated financial statements.

Doosan Corporation and its subsidiaries
Consolidated statements of profit or loss
for the years ended December 31, 2021 and 2020
(Korean won)

	Notes	2021	2020
Sales	3,24,25,34	₩ 13,204,153,075,980	₩ 11,428,549,161,427
Cost of sales	26,34	10,961,686,542,121	9,947,641,536,354
Gross profit		<u>2,242,466,533,859</u>	<u>1,480,907,625,073</u>
Selling and administrative expenses	26,27	1,296,535,306,912	1,501,260,193,059
Operating profit		<u>945,931,226,947</u>	<u>(20,352,567,986)</u>
Finance income	10,28	762,619,129,627	543,560,678,138
Finance expenses	10,28	1,090,779,642,132	1,034,137,535,978
Other non-operating income	10,29	152,693,760,918	89,061,204,556
Other non-operating expenses	10,29	164,225,253,749	393,205,829,271
Share of loss of associates and joint ventures accounted for using the equity method	11	4,122,362,486	(6,327,491,067)
Profit (Loss) before income tax expenses		<u>610,361,584,097</u>	<u>(821,401,541,608)</u>
Income tax expenses	30	249,552,158,494	1,954,674,375
Profit (Loss) from continuing operations		<u>360,809,425,603</u>	<u>(823,356,215,983)</u>
Profit (Loss) from discontinued operations	32	295,921,539,416	(140,535,740,533)
Profit (Loss) for the year		<u>₩ 656,730,965,019</u>	<u>₩ (963,891,956,516)</u>
Profit (Loss) for the year attributable to:			
Equity holders of the parent		₩ 211,824,262,879	₩ (553,308,372,608)
Non-controlling interests		₩ 444,906,702,140	₩ (410,583,583,908)
Earnings (Losses) per share attributable to the equity holders of the parent	31		
Basic earnings (losses) per ordinary share from continuing operations		₩ (706)	₩ (26,990)
Basic earnings (losses) per ordinary share		₩ 11,890	₩ (31,092)
Diluted earnings (losses) per ordinary share from continuing operations		₩ (706)	₩ (26,990)
Diluted earnings (losses) per ordinary share		₩ 11,890	₩ (31,092)
Basic earnings (losses) per old-type preferred share from continuing operations		₩ (709)	₩ (26,955)
Basic earnings (losses) per old-type preferred share		₩ 11,940	₩ (31,052)
Diluted earnings (losses) per old-type preferred share from continuing operations		₩ (709)	₩ (26,955)
Diluted earnings (losses) per old-type preferred share		₩ 11,940	₩ (31,052)

The accompanying notes are an integral part of the consolidated financial statements.

Doosan Corporation and its subsidiaries
Consolidated statements of comprehensive income (loss)
for the years ended December 31, 2021 and 2020
(Korean won)

	Notes	2021	2020
Profit (loss) for the year		₩ 656,730,965,019	₩ (963,891,956,516)
Other comprehensive income	22		
Items not to be subsequently reclassified to profit or loss			
Remeasurements of net defined benefit liabilities	17	99,099,086,834	(40,504,731,814)
Land revaluation surplus	12	200,920,494,599	(21,375,256,857)
Gain on valuation of financial assets (designated) at fair value through other comprehensive income	6	21,391,099,168	392,276,935,648
Loss on valuation of derivatives designated as hedges	9	-	(34,024,518,250)
Items to be subsequently reclassified to profit or loss			
Gain (loss) on valuation of derivatives designated as cash flow hedges	9	8,332,735,493	(10,512,224,513)
Gain (loss) on foreign operations translation		294,210,299,897	(98,617,106,999)
Equity changes in equity method		1,842,570,202	5,791,490,224
Total other comprehensive income		625,796,286,193	193,034,587,439
Total comprehensive income (loss) for the year		₩ 1,282,527,251,212	₩ (770,857,369,077)
Profit (loss) attributable to:			
Equity holders of the parent		₩ 374,152,898,649	₩ (242,721,734,603)
Non-controlling interests		₩ 908,374,352,563	₩ (528,135,634,474)

The accompanying notes are an integral part of the consolidated financial statements.

Doosan Corporation and its subsidiaries
Consolidated statements of changes in equity
for the years ended December 31, 2021 and 2020
(Korean won)

As of January 1, 2020		Share capital	Capital surplus	Other equity items	Accumulated other comprehensive income	Retained earnings	Non-controlling interests	Total
		₩	₩	₩	₩	₩	₩	₩
Total comprehensive loss:		123,738,105,000	732,266,102,161	(1,192,921,252,356)	648,706,788,956	1,250,724,749,675	5,257,024,881,975	6,819,539,375,411
Profit(Loss) for the year		-	-	-	-	(553,308,372,608)	(410,583,583,908)	(963,891,956,516)
Remeasurements of net defined benefit liabilities		-	-	-	-	(12,753,780,315)	(27,750,951,499)	(40,504,731,814)
Land revaluation surplus		-	-	-	(97,255,674,714)	88,157,911,676	(12,277,493,819)	(21,375,256,857)
Gain (loss) on valuation of financial assets (designated) at fair value through OCI		-	-	-	394,453,294,566	(2,174,386,507)	(1,972,411)	392,276,935,648
Loss on valuation of derivatives designated as cash flow hedges		-	-	-	(40,270,426,909)	-	(4,266,315,854)	(44,536,742,763)
Loss on foreign operations translation		-	-	-	(24,995,228,285)	-	(73,621,878,714)	(98,617,106,999)
Negative equity changes in equity method		-	-	-	5,425,072,566	(144,073)	366,561,731	5,791,490,224
Subtotal		-	-	-	237,357,037,224	(480,078,771,827)	(528,135,834,474)	(770,857,369,077)
Transactions with shareholders directly reflected in shareholders' equity and others:								
Cancellation of stock options		-	1,161,331,400	(1,161,331,400)	-	-	-	-
Payment of dividends		-	-	-	-	(23,312,085,500)	(30,333,118,300)	(53,645,203,800)
Changes in other capital surplus		-	(5,885,370,571)	-	-	-	-	(5,885,370,571)
Reclassification of accumulated other comprehensive income to retained earnings		-	-	-	(411,974,761,968)	411,974,761,968	-	-
Changes in scope of consolidation (see Note 40)		-	-	-	6,362,142,394	-	105,291,597,156	111,653,739,550
Paid-in capital increase of subsidiaries		-	(18,441,867,910)	-	-	-	1,117,839,687,293	1,099,397,819,383
Stock options of subsidiaries		-	516,496,746	(516,496,746)	-	-	-	-
Issuance of convertible bonds in subsidiaries		-	(14,981,797,316)	-	-	-	-	-
Acquisition of treasury stocks in subsidiaries		-	-	-	-	-	64,726,147,447	49,744,350,131
Gain from assets contributed in subsidiaries		-	208,443,360,326	-	-	-	835,806,976	835,806,976
Changes in other equity items		-	187,695,533,621	-	-	-	(7,322,720,828)	(7,322,720,828)
Subtotal		-	358,507,686,296	(1,677,828,146)	(405,612,619,574)	388,662,676,468	1,377,009,019,762	1,716,888,934,606
As of December 31, 2020		₩ 123,738,105,000	₩ 1,090,773,788,457	₩ (1,194,599,080,502)	₩ 480,451,206,606	₩ 1,159,308,654,316	₩ 6,105,898,267,263	₩ 7,765,570,941,140

(Continued)

Doosan Corporation and its subsidiaries
Consolidated statements of changes in equity
for the years ended December 31, 2021 and 2020 (cont'd)
(Korean won)

	Share capital	Capital surplus	Other equity items	Accumulated other comprehensive income	Retained earnings	Non-controlling interests	Total
₩	₩	₩	₩	₩	₩	₩	₩
As of January 1, 2021	123,738,105,000	1,090,773,788,457	(1,194,599,080,502)	480,451,206,606	1,159,308,654,316	6,105,898,267,263	7,765,570,941,140
Total comprehensive loss:	-	-	-	-	211,824,262,879	444,906,702,140	656,730,965,019
Profit for the year	-	-	-	-	27,023,896,769	72,075,190,065	99,099,086,834
Remeasurements of net defined benefit liabilities	-	-	-	-	86,242,246,849	121,101,238,505	200,920,484,599
Land revaluation surplus	-	-	-	(6,422,990,755)	3,636,537,168	11,344,027,902	21,391,099,168
Gain on valuation of financial assets (designated) at fair value through OCI	-	-	-	6,410,534,098	-	5,514,832,596	8,332,735,493
Gain on valuation of derivatives designated	-	-	-	2,817,902,897	-	253,760,771,512	294,210,299,897
Gain on foreign operations translation	-	-	-	40,449,528,385	-	(328,410,157)	1,842,570,202
Equity changes in equity method	-	-	-	2,170,980,359	-	-	-
Subtotal	-	-	-	45,425,954,984	328,726,943,665	908,374,352,563	1,282,527,251,212
Transactions with shareholders directly reflected in shareholders' equity and others:							
Cancellation of stock options	-	1,004,416,477	(1,004,416,477)	-	-	-	-
Payment of dividends	-	-	-	-	(19,894,954,700)	(920,388,700)	(20,815,343,400)
Changes in scope of consolidation	-	-	-	-	-	(1,019,353,279,028)	(1,013,001,460,375)
Changes in share ratio of subsidiaries	-	109,793,530,050	-	6,351,818,653	-	(109,793,530,050)	-
Stock options of subsidiaries	-	278,406,692	(278,406,692)	-	-	-	-
Exercise of stock warrants of subsidiaries	-	12,678,873,759	-	-	-	414,931,236,546	427,610,110,305
Acquisition of treasury stocks in subsidiaries	-	22,869,717,728	(792,377,634)	-	-	(2,291,829,823)	(3,084,207,457)
Changes in other equity items	-	-	245,158,338	-	-	35,130,769,008	56,245,645,074
Subtotal	-	146,624,944,706	(1,830,042,465)	6,351,818,653	(19,894,954,700)	(682,297,022,047)	(551,045,255,853)
As of December 31, 2021	₩ 123,738,105,000	₩ 1,237,398,733,163	₩ (1,196,429,122,967)	₩ 532,228,980,243	₩ 1,468,140,643,281	₩ 6,331,975,597,779	₩ 8,497,052,936,499

The accompanying notes are an integral part of the consolidated financial statements.

Doosan Corporation and its subsidiaries
Consolidated statements of cash flows
for the years ended December 31, 2021 and 2020
(Korean won)

	Notes	2021	2020
Cash flows from operating activities			
Cash generated from operating activities:	35		
Profit (Loss) for the year	₩	656,730,965,019	₩ (963,891,956,516)
Adjustments		1,555,565,836,427	2,430,005,746,854
Changes in operating assets and liabilities		(574,404,723,072)	(718,907,733,960)
		1,637,892,078,374	747,206,056,378
Interest received		40,082,772,503	51,104,542,058
Interest paid		(465,549,884,997)	(510,977,660,159)
Dividends received		8,398,142,411	12,317,699,005
Income tax paid		(477,608,467,082)	(173,114,269,413)
Net cash flows from operating activities		743,214,641,209	126,536,367,869
Cash flows from investing activities			
Cash inflows from investing activities:			
Decrease in short-term financial instruments		441,249,869,408	405,950,836,922
Disposal of short-term investment securities		764,969,811,295	178,259,611,518
Decrease in short-term loans		88,641,358,959	289,730,586,356
Decrease in long-term financial instruments		105,993,635,775	53,979,896,685
Disposal of long-term investment securities		14,644,365,571	242,865,443,251
Decrease in long-term loans		58,135,724,775	660,436,761,791
Disposal of investments in subsidiaries		206,201,504,800	109,338,555,987
Disposal of investments in associates and joint ventures		18,342,758,666	14,004,225,000
Disposal of property, plant and equipment		90,558,011,190	265,689,634,544
Disposal of intangible assets		3,170,932,796	12,330,325,268
Disposal of investment properties		38,081,395,037	527,443,585,102
Net cash flows from discontinued operations		-	33,287,077,974
Disposal of assets held for sale		597,057,432,304	-
Other investing activities		45,073,764,452	4,098,245,720
		2,472,120,565,028	2,797,414,786,118
Cash outflows from investing activities:			
Increase in short-term financial instruments		1,120,473,820,124	548,975,296,873
Acquisition of short-term investment securities		339,169,465,606	656,829,845,460
Increase in short-term loans		62,576,485,797	416,304,261,228
Increase in long-term financial instruments		107,481,433,749	114,927,614,769
Acquisition of long-term investment securities		182,486,800,689	108,552,121,103
Increase in long-term loans		184,390,208,243	337,642,479,676
Acquisition of investments in associates and joint ventures		157,155,385,000	104,691,606,600
Acquisition of property, plant and equipment		400,117,334,155	566,816,138,018
Acquisition of intangible assets		232,451,006,074	270,655,378,179
Acquisition of investment properties		869,799,610	6,865,040,549
Other investing activities		-	8,560,695,081
		(2,787,171,739,047)	(3,140,820,477,536)
Net cash flows used in investing activities		(315,051,174,019)	(343,405,691,418)

(Continued)

Doosan Corporation and its subsidiaries
Consolidated statements of cash flows
for the years ended December 31, 2021 and 2020 (cont'd)
(Korean won)

	Notes	2021	2020
Cash flows from financing activities			
Cash inflows from financing activities:			
Net increase in short-term borrowings	₩	-	₩ 1,973,842,480,629
Increase in asset-backed loans		112,904,468,504	1,198,517,245,209
Issuance of bonds		903,206,806,667	1,814,295,215,990
Increase in long-term borrowings		1,331,894,721,582	959,966,771,628
Paid-in capital increase of subsidiaries		-	1,099,397,819,383
Exercise of stock warrants of subsidiaries		427,610,110,305	49,744,350,131
Other financing activities		55,097,491,840	-
		2,830,713,598,898	7,095,763,882,970
Cash outflows from financing activities:			
Net decrease in short-term borrowings		795,621,868,670	-
Decrease in asset-backed loans		465,979,911,224	1,457,814,269,493
Repayment of bonds		735,161,090,278	2,523,173,999,655
Repayment of long-term borrowings		1,717,072,787,173	1,790,644,033,442
Repayment of finance lease liabilities		120,044,000,000	107,256,000,000
Payment of dividends		20,815,343,400	53,645,203,800
Acquisition of treasury stocks in subsidiaries		3,084,207,457	11,109,726,490
Acquisition of investment in subsidiaries		709,163,000	-
Repayment of sale and leaseback liabilities		7,977,606,952	-
		(3,866,465,978,154)	(5,943,643,232,880)
Net cash flows provided by (used in) financing activities		(1,035,752,379,256)	1,152,120,650,090
Effects of exchange rate changes on cash and cash equivalents		153,087,944,614	(106,204,416,926)
Decrease in cash due to reclassification of assets held for sale	38	(17,515,652,789)	(26,929,404,317)
Increase in cash due to changes in scope of consolidation		-	64,427,226,544
Net increase (decrease) in cash and cash equivalents		(472,016,620,241)	866,544,731,842
Cash and cash equivalents, beginning of the year		2,707,378,621,227	1,840,833,889,385
Cash and cash equivalents, end of the year		₩ 2,235,362,000,986	₩ 2,707,378,621,227

The accompanying notes are an integral part of the consolidated financial statements.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

1. General

1.1 The Parent company information

Doosan Corporation (the "Company") was incorporated on December 18, 1933, under the name of Sohwa-Kirin Beer, Ltd. to manufacture and sell beer. The Company has changed its name to Dongyang Beer, Ltd. in February 1948 and again to OB Beer, Ltd. in February 1996 and finally to Doosan Corporation on September 1, 1998. The consolidated financial statements of the Company and its subsidiaries (collectively, the "Group") have been prepared based on Korean International Financial Reporting Standards ("KIFRS") 1110 *Consolidated Financial Statements*.

Since June 1973, the Company's shares have been listed in the Korea Exchange. After several capital issues, the Company's share capital as of December 31, 2021 is ₩123,738 million, including ₩24,447 million of preferred shares.

The Company's ordinary shares as of December 31, 2021 are owned as follows:

	Number of ordinary shares owned	Ownership percentage (%)
Related parties	7,804,536	47.23
Treasury stocks	3,000,866	18.16
Others	5,718,433	34.61
	16,523,835	100.00

In addition, 35.9% of preferred shares are owned by the largest shareholder and others and 51.6% of preferred shares are owned by others.

1.2 Consolidated subsidiaries information

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

Subsidiary	Type of business	Location	Ownership ratio of the Group (%) (*1)		Ownership ratio of non-controlling interests (%) (*1)		Financial closing date
			2021	2020	2021	2020	
Oricom Inc.	Advertising	Korea	62.83	63.54	37.17	36.46	December 31
Hancomm Inc.	Advertising	Korea	100.00	100.00	37.17	36.46	December 31
Doosan Bears Inc	Sports	Korea	100.00	100.00	-	-	December 31
Doosan Business Research Institute	Education	Korea	100.00	100.00	-	-	December 31
Doosan Robotics Inc.	Software development and supply	Korea	100.00	100.00	-	-	December 31
Doosan Mobility Innovation Inc	R&D and manufacturing	Korea	100.00	100.00	-	-	December 31
Doosan Logistics Solution Co., Ltd.	Service	Korea	100.00	100.00	-	-	December 31
Doosan Electro-Materials Singapore Pte Ltd.	Wholesale and retail	Singapore	100.00	100.00	-	-	December 31
Doosan (Hong Kong) Ltd.	Wholesale and retail	China	100.00	100.00	-	-	December 31
Doosan Electro-Materials (Shen Zhen) Limited	Wholesale and retail	China	100.00	100.00	-	-	December 31
Doosan Shanghai Chemical Materials Co., Ltd.	Wholesale and retail	China	100.00	100.00	-	-	December 31
Doosan Electro-Materials (Changshu) Co., Ltd.	Manufacturing	China	100.00	100.00	-	-	December 31
Doosan Second Real Estate Securitization Specialty Ltd. (*2)	Specialized in securitization	Korea	-	-	-	-	December 31
Doosan Digital Innovation America LLC	IT service	USA	100.00	100.00	-	-	December 31
Doosan Information & Communications Beijing Co., Ltd.	IT service	China	100.00	100.00	-	-	December 31
Doosan Digital Innovation Europe Limited	IT service	UK	100.00	100.00	-	-	December 31

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

1.2 Consolidated subsidiaries information (cont'd)

Subsidiary	Type of business	Location	Ownership ratio of the Group (%) (*1)		Ownership ratio of non-controlling interests (%) (*1)		Financial closing date
			2021	2020	2021	2020	
Doosan Electro-Materials America, LLC	Marketing	USA	100.00	100.00	-	-	December 31
Doosan Fuel Cell America, Inc.	Manufacturing	USA	100.00	100.00	-	-	December 31
Doosan Energy Solutions America, Inc.,	Electric power generation and sales	USA	100.00	100.00	-	-	December 31
DESA Service, LLC	Electric power generation and sales	USA	100.00	100.00	-	-	December 31
Doosan Property Co., Ltd. (formerly, DBC Co., Ltd.) (*4)	Real estate development	Korea	100.00	100.00	36.23	45.72	December 31
Doosan Mobility Innovation (Shenzhen) Co. Ltd.	Wholesale and retail	China	100.00	100.00	-	-	December 31
Doosan Electro-Materials Vietnam Co., Ltd.	Manufacturing	Vietnam	100.00	100.00	-	-	December 31
Sunny Russel 8th Co., Ltd. (*2)	Specialized in securitization	Korea	-	-	-	-	December 31
D-Pay 2nd Co., Ltd. (*2)	Specialized in securitization	Korea	-	-	-	-	December 31
Doosan H2 Innovation Co., Ltd. (*8)	R&D and Lease	Korea	100.00	-	-	-	December 31
Doosan Heavy Industries & Construction Co., Ltd. ("DHC") (*3)	Other engine and turbine manufacture	Korea	39.26	41.95	60.74	58.05	December 31
Doosan Mecatec Co., Ltd.	Manufacturing	Korea	100.00	100.00	60.74	58.05	December 31
Doosan Heavy Industries Vietnam Haiphong Co., Ltd.	Manufacturing	Vietnam	100.00	100.00	60.74	58.05	December 31
Doosan Heavy Industries Vietnam Co., Ltd.	Other engine and machine manufacture	Vietnam	100.00	100.00	60.74	58.05	December 31
Doosan HF Controls Corp.	Manufacturing	USA	100.00	100.00	60.74	58.05	December 31
Doosan HF Controls Asia Co., Ltd.	Manufacturing	Korea	100.00	100.00	60.74	58.05	December 31
PT. Doosan Heavy Industries Indonesia	Manufacturing	Indonesia	83.64	83.64	67.16	64.91	December 31
Doosan Heavy Industries Malaysia Sdn. Bhd.	Dormant corporation	Malaysia	100.00	100.00	60.74	58.05	December 31
Doosan Heavy Industries Japan Corp.	Wholesale and retail	Japan	100.00	100.00	60.74	58.05	December 31
Doosan Enpure Ltd.	Engineering and service	UK	100.00	100.00	60.74	58.05	December 31
Doosan Power Systems India Private Ltd.	Engineering and service	India	100.00	100.00	60.74	58.05	March 31
Doosan Heavy Industries Muscat LLC	Manufacturing	Oman	70.00	70.00	72.52	70.64	December 31
Doosan Power Systems Arabia Company Limited	Manufacturing service	Saudi Arabia	51.00	51.00	79.98	78.61	December 31
Azul Torre Construction Corporation (*3)	Manufacturing	Philippines	40.00	40.00	84.30	83.22	December 31
Doosan Heavy Industries America Holdings Inc. (*6)	Holding company	USA	100.00	100.00	60.74	58.05	December 31
Doosan Heavy Industries America LLC	Wholesale and retail	USA	100.00	100.00	60.74	58.05	December 31
Doosan ATS America, LLC	Engineering and service	USA	100.00	100.00	60.74	58.05	December 31
Doosan Power Service America, LLC	Engineering and service	USA	100.00	100.00	60.74	58.05	December 31
Doosan Turbomachinery Services Holding, Inc. (*5)	Holding company	USA	100.00	95.90	60.74	59.77	December 31
Doosan Turbomachinery Services Inc.	Manufacturing	USA	100.00	100.00	60.74	58.05	December 31
Doosan GridTech Inc.	Software and systems engineering	USA	100.00	100.00	60.74	58.05	December 31
Doosan GridTech LLC	Software and systems engineering	USA	100.00	100.00	60.74	58.05	December 31
Doosan GridTech CA LLC	Software and systems engineering	USA	100.00	100.00	60.74	58.05	December 31
Doosan GridTech EPC LLC	Software and systems engineering	USA	100.00	100.00	60.74	58.05	December 31
Doosan GridTech C&I LLC	Software and systems engineering	USA	100.00	100.00	60.74	58.05	December 31
Continuity Energy LLC	Software and systems engineering	USA	100.00	100.00	60.74	58.05	December 31

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

1.2 Consolidated subsidiaries information (cont'd)

Subsidiary	Type of business	Location	Ownership ratio of the Group (%) (*1)		Ownership ratio of non-controlling interests (%) (*1)		Financial closing date
			2021	2020	2021	2020	
Doosan Skoda Power s.r.o	Manufacturing	Czech	100.00	100.00	60.74	58.05	December 31
Skoda Power Private Ltd.	Engineering	India	100.00	100.00	60.74	58.05	March 31
Doosan Power Systems Pension Trustee Co., Ltd.	Specialized service	UK	100.00	100.00	60.74	58.05	December 31
Doosan Power Systems Overseas Investments Ltd.	Holding company	UK	100.00	100.00	60.74	58.05	December 31
Doosan Babcock Ltd.	Engineering and service	UK	100.00	100.00	60.74	58.05	December 31
Doosan Power Systems Americas LLC	Engineering, service, Wholesale and retail	USA	100.00	100.00	60.74	58.05	December 31
Doosan Lentjes GmbH (*7)	Engineering and service	Germany	100.00	100.00	60.74	58.05	December 31
Doosan Power Systems S.A.	Holding company	Luxembourg	100.00	100.00	60.74	58.05	December 31
Doosan Babcock Energy Services (Overseas) Ltd.	Engineering and service	UK	100.00	100.00	60.74	58.05	December 31
Doosan Babcock Energy Polska S.A.	Engineering and service	Poland	98.91	98.91	61.17	58.51	December 31
Doosan Babcock Energy Germany GmbH	Engineering and service	Germany	100.00	100.00	60.74	58.05	December 31
Doosan Lentjes Czech s.r.o	Specialized service	Czech	100.00	100.00	60.74	58.05	December 31
Doosan Babcock General Maintenance Services LLC (*3)	Specialized service	UAE	49.00	49.00	80.76	79.44	December 31
Osungpower O&M	Engineering and service	Korea	100.00	100.00	60.74	58.05	December 31
Doosan Ukudu Power, LLC (*8)	Engineering and service	USA	100.00	-	60.74	-	December 31
KDPP 5th Co., Ltd. (*2)	Specialized in securitization	Korea	-	-	-	-	December 31
Doosan Cuvex Co., Ltd	Golf and condominium	Korea	100.00	100.00	38.01	45.53	December 31
D20 Capital, LLC	Financial investment	USA	100.00	100.00	60.74	85.33	December 31
D20 Capital FUND I, L.P. (*3)	Financial investment	USA	-	-	100.00	100.00	December 31
Doosan Bobcat Inc. ("DBI")	Holding company	Korea	51.05	51.05	79.96	92.51	December 31
Doosan Bobcat Singapore Pte. Ltd.	Holding company	Singapore	100.00	100.00	79.96	92.51	December 31
Doosan Bobcat Korea Co., Ltd.	Sales	Korea	100.00	100.00	79.96	92.51	December 31
Doosan Bobcat Chile Compact SpA	Sales	Chile	100.00	100.00	79.96	92.51	December 31
Doosan Bobcat India Private Ltd.	Manufacturing, sales	India	100.00	100.00	79.96	92.51	March 31
Bobcat Corp.	Sales	Japan	100.00	100.00	79.96	92.51	December 31
Doosan Bobcat Mexico S.A. de C.V.	Other service	Mexico	100.00	100.00	79.96	92.51	December 31
Doosan Bobcat China Co., Ltd.	Manufacturing, Sales	China	100.00	100.00	79.96	92.51	December 31
Clark Equipment Co.	Manufacturing, Sales	USA	100.00	100.00	79.96	92.51	December 31
Bobcat Equipment Ltd.	Sales	Canada	100.00	100.00	79.96	92.51	December 31
Doosan Bobcat EMEA s.r.o.	Manufacturing, Sales	Czech	100.00	100.00	79.96	92.51	December 31
Bobcat Bensheim GmbH.	Sales	Germany	100.00	100.00	79.96	92.51	December 31
Doosan Holdings France S.A.S.	Holding company	France	100.00	100.00	79.96	92.51	December 31
CJSC Doosan International Russia	Sales	Russia	100.00	100.00	79.96	92.51	December 31
Doosan International UK Ltd.	Sales	UK	100.00	100.00	79.96	92.51	December 31
Doosan International South Africa Pty Ltd.	Sales	Republic of South Africa	100.00	100.00	79.96	92.51	December 31
Bobcat France S.A.	Manufacturing	France	100.00	100.00	79.96	92.51	December 31
Geith International Ltd.	Sales	Ireland	100.00	100.00	79.96	92.51	December 31
Doosan Bobcat Global Collaboration Center, Inc.	Other service	USA	100.00	100.00	79.96	92.51	December 31
Doosan Industrial Vehicle Co., Ltd. ("DIV") (*9)	Manufacturing, Sales	Korea	100.00	-	79.96	-	December 31

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

1.2 Consolidated subsidiaries information (cont'd)

Subsidiary	Type of business	Location	Ownership ratio of the Group (%) (*1)		Ownership ratio of non-controlling interests (%) (*1)		Financial closing date
			2021	2020	2021	2020	
Doosan Industrial Vehicle Europe N.V.	Sales	Belgium	100.00	100.00	79.96	-	December 31
Doosan Industrial Vehicle U.K. Ltd.	Sales	UK	100.00	100.00	79.96	-	December 31
Doosan Logistics Europe GmbH	Manufacturing, Sales	Germany	100.00	100.00	79.96	-	December 31
Doosan Industrial Vehicle America Corp.	Sales	USA	100.00	100.00	79.96	-	December 31
Doosan Material Handling Solutions LLC	Sales and Lease	USA	100.00	100.00	79.96	-	December 31
Doosan Industrial Vehicle China Co., Ltd.	Manufacturing, Sales	China	100.00	100.00	79.96	-	December 31
Genesis Forklift Trucks Limited	Manufacturing	UK	100.00	100.00	79.96	-	December 31
Rushlift Holdings Ltd.	Holding company	UK	100.00	100.00	79.96	-	December 31
Doosan Materials Handling UK Ltd.	Holding company	UK	100.00	100.00	79.96	-	December 31
Rushlift Ltd.	Sales and Lease	UK	100.00	100.00	79.96	-	December 31
Doosan Fuel Cell Co., Ltd. ("DFC") (*3)	Manufacturing	Korea	30.33	30.33	88.09	78.73	December 31

(*1) The ownership interests held by the Group represents the aggregated total of ownership interests directly held by each entity within the Group. The ownership interests held by non-controlling interests represents the proportion of ownership interests that is not attributable, directly or indirectly, to the entities within the Group and it may differ from the aggregated total, less the effective ownership interests held by the Group.

(*2) Although the Group does not own the equity of the special-purpose company, the Group gets profits from its operation according to the agreement, with structured investment. As the Group has control to decide its operational activity, it also influences the profits significantly.

(*3) Potential voting rights held by the Group on the above subsidiaries for assessing whether or not it controls the subsidiaries are less than 50%, but the Group concluded that the Group has de facto control over the subsidiaries.

(*4) 'DBC Co., Ltd.' changed its name to 'Doosan Property Co., Ltd' during the year ended December 31, 2021.

(*5) The Group additionally acquired the investee, during the year ended December 31, 2021.

(*6) 'Doosan Infracore USA LLC' was acquired by 'Doosan Heavy Industries America Holdings Inc.' during the year ended December 31, 2021.

(*7) 'Doosan Power Systems Europe Limited GmbH' was acquired by 'Doosan Lentjes GmbH' during the year ended December 31, 2021.

(*8) The investee was newly established during the year ended December 31, 2021.

(*9) The Industrial Vehicles BG was newly established according to split-off during the year ended December 31, 2021.

1.2.1 Changes in the scope of consolidation

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

Subsidiary	Change	Description
Doosan Ukudu Power, LLC	Included	Newly established
Doosan Infracore USA LLC	Included	Newly established
Doosan H2 Innovation Co., Ltd.	Included	Newly established
Doosan Industrial Vehicle Co., Ltd.	Included	Newly established
The First GM 24th Co., Ltd.	Included	New borrowing
Bundang Doosan Tower Reit Co., Ltd.	Excluded	Decrease of equity
New Star Motive 1st Co., Ltd.	Excluded	Liquidation
Doosan International Australia Pty Ltd.	Excluded	Liquidation
Doosan Power Systems (Scotland) Ltd. Partnership	Excluded	Liquidation
Great GM 4th Co., Ltd.	Excluded	Borrowing redemption
DSmunuro 1st Co., Ltd.	Excluded	Borrowing redemption
J on Shindongbaek Co., Ltd.	Excluded	Borrowing redemption
U Best 5th Co., Ltd.	Excluded	Borrowing redemption
Buildup 1st Co., Ltd.	Excluded	Borrowing redemption
Doosan E&C 4th Co., Ltd.	Excluded	Borrowing redemption
Mottrol Co., Ltd.	Excluded	Sale
Doosan Mottrol (Jiangyin) Co., Ltd.	Excluded	Sale
Doosan Infracore Co., Ltd. ("DI")	Excluded	Sale
Doosan Infracore China Co., Ltd.	Excluded	Sale
Doosan Infracore (China) Investment Co., Ltd.	Excluded	Sale
Doosan Infracore Hunan Corp.	Excluded	Sale
Doosan Infracore Beijing Corp.	Excluded	Sale
ECUBE Solution Co., Ltd.	Excluded	Sale
Doosan Infracore North America LLC	Excluded	Sale
Doosan Infracore Japan Corp.	Excluded	Sale
Doosan (China) Financial Leasing Corp.	Excluded	Sale
Doosan Bobcat Chile S.A.	Excluded	Sale
Doosan Infracore (Shandong) Co., Ltd.	Excluded	Sale
Doosan Infracore Norway AS.	Excluded	Sale
Doosan Infracore South America Industria E Comercio De Maquinas De Construção LTDA	Excluded	Sale
Doosan Infracore Construction Equipment India Private Ltd.	Excluded	Sale
Clue Insight Inc.	Excluded	Sale
Doosan Infracore Europe s.r.o.	Excluded	Sale
Doosan Engineering & Construction Co., Ltd. ("DEC")	Excluded	Loss of control
DM Best 3rd Co., Ltd.	Excluded	Loss of control
New Start DM 7th Co., Ltd.	Excluded	Loss of control
New Start DM 8th Co., Ltd.	Excluded	Loss of control
The First GM 24th Co., Ltd.	Excluded	Loss of control
Valuegrowth Co., Ltd.	Excluded	Loss of control

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

1.3 Condensed financial information of the Group's significant consolidated subsidiaries

Condensed financial information of the Group's significant subsidiaries (or intermediate parent) as of and for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021									
	Assets		Liabilities		Sales		Profit (loss) for the year	Total comprehensive income (loss)		
Doosan Property Co., Ltd. (formerly, DBC Co., Ltd.)	₩	154,409	₩	5,074	₩	1,366	₩	47,135	₩	47,029
Doosan Electro-Materials (Changshu) Co., Ltd.		184,379		111,179		213,296		15,949		15,949
Doosan Fuel Cell America, Inc.		367,120		230,478		216,727		(10,077)		(10,077)
Oricom Inc.		144,598		67,224		102,100		2,470		10,775
DHC		14,031,871		8,330,287		3,592,882		26,601		188,528
Doosan Heavy Industries Vietnam Co., Ltd.		583,423		311,711		389,525		62,537		62,537
Doosan Power Systems India Private Ltd.		683,502		793,740		445,600		(67,430)		(67,364)
Doosan Heavy Industries America Holdings Inc.		156,166		42		-		(6,881)		(6,881)
Doosan Babcock Ltd.		1,149,967		419,276		463,679		(21,560)		7,915
Doosan Lentjes GmbH		117,154		99,795		116,782		(862)		402
Doosan Power Systems S.A.		1,241,851		1,098,813		-		(26,460)		4,873
Doosan Mecatec Co., Ltd. and its subsidiaries		612,844		333,020		294,141		7,452		21,604
Doosan Cuvex Co., Ltd		323,606		109,291		70,151		9,518		29,109
DBI and its subsidiaries		8,580,899		4,259,634		5,816,200		385,889		280,150
DFC		698,855		180,667		381,412		8,695		7,508

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

1.3 Condensed financial information of the Group's significant consolidated subsidiaries (cont'd)

	2020				
	Assets	Liabilities	Sales	Profit (loss) for the year	Total comprehensive income (loss)
	₩ 11,147,216	₩ 7,686,539	₩ 3,451,445	₩ (1,880,174)	₩ (1,907,279)
DHC					
Doosan Mecatec Co., Ltd. and its subsidiaries	609,515	351,295	317,538	6,032	7,299
Doosan Heavy Industries Vietnam Co., Ltd.	464,543	274,632	509,155	82,384	82,384
Doosan Power Systems India Private Ltd.	662,058	699,383	363,956	(331,405)	(326,229)
Doosan Heavy Industries America Holdings Inc.	187,874	80,036	-	9,726	9,726
Doosan Babcock Ltd.	1,139,881	473,560	403,538	9,371	(6,489)
Doosan Lentjes GmbH	101,611	87,184	35,549	(8,795)	(39,451)
Doosan Power Systems S.A.	1,293,334	830,782	-	33,605	4,174
Doosan Cuvex Co., Ltd.	307,707	106,780	69,373	4,153	4,280
DI	5,180,810	3,679,161	2,712,338	(37,858)	(24,342)
Doosan Infracore China Co., Ltd.	1,557,410	909,446	1,476,189	72,983	72,983
Doosan Infracore (China) Investment Co., Ltd.	226,536	5,034	10,435	4,314	4,314
Doosan Infracore North America LLC	279,903	194,292	285,039	11,829	11,829
Doosan (China) Financial Leasing Corp.	720,824	499,444	59,408	24,234	24,234
Doosan Bobcat EMEA s.r.o.	249,798	231,740	478,931	7,757	7,705
DBI and its subsidiaries	6,960,608	2,886,803	4,282,058	247,454	418,622
DEC	1,604,940	1,290,931	1,828,661	(179,061)	(180,669)
Valuegrowth Co., Ltd.	266,012	84,656	-	(4,687)	(4,687)
Doosan E&C 4th Co., Ltd.	76,691	76,688	5,636	-	-
Doosan Property Co., Ltd. (formerly, DBC Co., Ltd.)	542,068	439,762	-	(938)	(940)
Doosan Industrial Vehicle America Corp.	90,213	53,460	224,345	3,466	3,466
Doosan Industrial Vehicle U.K. Ltd.	87,033	84,142	29,116	1,520	1,520
Rushlift Ltd.	135,759	121,622	57,965	957	957
Doosan Mottrol (Jiangyin) Co., Ltd.	168,983	104,804	395,268	18,280	18,280
Doosan Electro-Materials (Changshu) Co., Ltd.	136,110	85,502	179,927	16,485	16,485
Doosan Fuel Cell America, Inc.	344,635	283,091	242,412	8,933	8,933
Oricom Inc.	122,047	53,128	82,969	(843)	(156)
Mottrol Co., Ltd.	436,430	203,011	48,242	(6,284)	(5,831)
DFC	790,188	277,644	461,839	14,190	13,889

1.4 Cash flows information

A summarized cash flows information of subsidiaries that non-controlling interests are significant to the Group for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	
	DHC and its subsidiaries	DBI and its subsidiaries
Cash flows from operating activities	₩ 473,742	₩ 444,099
Cash flows from investing activities	982,663	(832,190)
Cash flows from financing activities	(1,100,226)	506,015
Classified as assets held for sale	-	(4,516)
Effect of exchange rate changes on cash and cash equivalents	36,962	56,149
Net increase in cash and cash equivalent	393,141	169,557
Cash and cash equivalents, beginning of the year	576,702	782,203
Cash and cash equivalents, end of the year	₩ 969,843	₩ 951,760

Above financial information is based on consolidated financial information of intermediate controlling company. However, financial information of DHC and its subsidiaries does not include financial information of DBI and its subsidiaries, respectively.

	2020		
	DHC and its subsidiaries	DI and its subsidiaries	DEC and its subsidiaries
Cash flows from operating activities	₩ (690,857)	₩ 1,050,847	₩ (55,328)
Cash flows from investing activities	(554,572)	(503,165)	375,618
Cash flows from financing activities	1,207,469	428,938	(263,731)
Effect of exchange rate changes on cash and cash equivalents	(30,364)	(69,334)	(8)
Net increase (decrease) in cash and cash equivalent	(68,324)	907,286	56,551
Cash and cash equivalents, beginning of the year	645,026	756,173	40,082
Cash and cash equivalents, end of the year	₩ 576,702	₩ 1,663,459	₩ 96,633

Above financial information is based on consolidated financial information of intermediate controlling company. However, financial information of DHC and its subsidiaries does not include financial information of DI, DEC and its subsidiaries, respectively.

1.5 Financial information attributable to non-controlling interests

The ownership interests held by non-controlling interests and details of financial position, result of operation and dividends vested in non-controlling interests by each of the major subsidiaries as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	
	DHC and its subsidiaries	DBI and its subsidiaries
Ownership interests held by non-controlling interests (%)	60.7%	80.0%
Cumulative non-controlling interests	₩ 2,503,190	₩ 3,765,756
Net income vested in non-controlling interests	135,345	297,213
Dividends paid to non-controlling interests (*1)	-	-

(*1) Oricom Inc. except for above subsidiaries paid dividends of ₩920 million vested in non-controlling interests.

Above financial information vested in non-controlling interests is based on consolidated financial information of intermediate controlling company. However, financial information of DHC and its subsidiaries does not include financial information of DBI and its subsidiaries, respectively.

	2020		
	DHC and its subsidiaries	DI and its subsidiaries	DEC and its subsidiaries
Ownership interests held by non-controlling interests (%)	58.1%	85.3%	58.1%
Cumulative non-controlling interests	₩ 1,456,517	₩ 4,194,097	₩ (18,836)
Net income (loss) vested in non-controlling interests	(557,077)	263,352	(119,703)
Dividends paid to non-controlling interests (*1)	-	(29,444)	-

(*1) Oricom Inc. except for above subsidiaries paid dividends of ₩889 million vested in non-controlling interests.

Above financial information vested in non-controlling interests is based on consolidated financial information of intermediate controlling company. However, financial information of DHC and its subsidiaries does not include financial information of DI, DEC and its subsidiaries, respectively.

2. Summary of significant accounting policies

2.1 Basis of preparation

The Group prepares statutory financial statements in Korean in accordance with KIFRS enacted by *the Act on External Audit of Stock Companies*.

Significant accounting policies applied in the preparation of the consolidated financial statements are described below. Significant accounting policies applied in the preparation of the consolidated financial statements for the year ended December 31, 2021 are the same as those adopted in the preparation of the consolidated financial statements for the year ended December 31, 2020, except for the effects related to the adoption of the standards or interpretations described below.

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

2.1.1 New and amended standards and interpretations

The Group applied for the first-time certain standards and amendments, which are effective for annual periods beginning on or after January 1, 2021.

Amendments to KIFRS 1109, KIFRS 1039, KIFRS 1107, KIFRS 1104 and KIFRS 1116 – Interest Rate Benchmark Reform - Phase 2

The amendments provide temporary reliefs which address the financial reporting effects when an interbank offered rate (“IBOR”) is replaced with an alternative nearly risk-free interest rate (“RFR”). The amendments include the following practical expedients:

- A practical expedient to require contractual changes, or changes to cash flows that are directly required by the reform, to be treated as changes to a floating interest rate, equivalent to a movement in a market rate of interest
- Permit changes required by IBOR reform to be made to hedge designations and hedge documentation without the hedging relationship being discontinued
- Provide temporary relief to entities from having to meet the separately identifiable requirement when an RFR instrument is designated as a hedge of a risk component

These amendments had no impact on the financial statements of the Group. The Group intends to use the practical expedients in future periods if they become applicable.

Amendments to KIFRS 1116 – Covid-19 Related Rent Concessions beyond 30 June 2021

On 28 May 2020, the IASB issued Covid-19-Related Rent Concessions - amendment to KIFRS 1116 *Leases*. The amendments provide relief to lessees from applying KIFRS 1116 guidance on lease modification accounting for rent concessions arising as a direct consequence of the Covid-19 pandemic. As a practical expedient, a lessee may elect not to assess whether a Covid-19 related rent concession from a lessor is a lease modification. A lessee that makes this election accounts for any change in lease payments resulting from the Covid-19 related rent concession the same way it would account for the change under KIFRS 1116 if the change were not a lease modification.

The amendment was intended to apply until June 30, 2021, but as the impact of the COVID-19 pandemic is continuing, on March 31, 2021, the IASB extended the period of application of the practical expedient to June 30, 2022. The amendment applies to annual reporting periods beginning on or after April 1, 2021. However, the Company has not received COVID-19-related rent concessions, but plans to apply the practical expedient if it becomes applicable within allowed period of application.

2.1.2 Standards issued but not yet effective

The new and amended standards and interpretations that are issued, but not yet effective, up to the date of issuance of the Group's financial statements are disclosed below. The Group intends to adopt these new and amended standards and interpretations, if applicable, when they become effective.

Amendments to KIFRS 1001: *Classification of Liabilities as Current or Non-current*

The amendments to paragraphs 69 to 76 of KIFRS 1001 specify the requirements for classifying liabilities as current or non-current. The amendments clarify:

- What is meant by a right to defer settlement
- That a right to defer must exist at the end of the reporting period
- That classification is unaffected by the likelihood that an entity will exercise its deferral right
- That only if an embedded derivative in a convertible liability is itself an equity instrument would the terms of a liability not impact its classification

The amendments are effective for annual reporting periods beginning on or after January 1, 2023 and must be applied retrospectively. The Group is currently assessing the impact the amendments will have on current practice and whether existing loan agreements may require renegotiation.

Reference to the Conceptual Framework – Amendments to KIFRS 1103

The amendments are intended to replace a reference to the Framework for the Preparation and Presentation of Financial Statements, issued in 1989, with a reference to the Conceptual Framework for Financial Reporting issued in March 2018 without significantly changing its requirements. The Board also added an exception to the recognition principle of KIFRS 1103 to avoid the issue of potential 'day 2' gains or losses arising for liabilities and contingent liabilities that would be within the scope of KIFRS 1037 or KIFRS 2121 *Levies*, if incurred separately. At the same time, the Board decided to clarify existing guidance in KIFRS 1103 for contingent assets that would not be affected by replacing the reference to the Framework for the Preparation and Presentation of Financial Statements. The amendments are effective for annual reporting periods beginning on or after January 1, 2022 and apply prospectively.

Property, Plant and Equipment: Proceeds before Intended Use – Amendments to KIFRS 1016

The amendments prohibit entities deducting from the cost of an item of property, plant and equipment, any proceeds from selling items produced while bringing that asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Instead, an entity recognizes the proceeds from selling such items, and the costs of producing those items, in profit or loss. The amendment is effective for annual reporting periods beginning on or after January 1, 2022 and must be applied retrospectively to items of property, plant and equipment made available for use on or after the beginning of the earliest period presented when the entity first applies the amendment. The amendments are not expected to have a material impact on the Group.

Onerous Contracts – Costs of Fulfilling a Contract – Amendments to KIFRS 1037

The amendments specify which costs an entity needs to include when assessing whether a contract is onerous or loss-making. The amendments apply a "directly related cost approach". The costs that relate directly to a contract to provide goods or services include both incremental costs and an allocation of costs directly related to contract activities. General and administrative costs do not relate directly to a contract and are excluded unless they are explicitly chargeable to the counterparty under the contract. The amendments are effective for annual reporting periods beginning on or after January 1, 2022. The Group will apply these amendments to contracts for which it has not yet fulfilled all its obligations at the beginning of the annual reporting period in which it first applies the amendments.

Definition of Accounting Estimates - Amendments to KIFRS 1008

The amendments clarify the distinction between changes in accounting estimates and changes in accounting policies and the correction of errors. Also, they clarify how entities use measurement techniques and inputs to develop accounting estimates. The amendments are effective for annual reporting periods beginning on or after January 1, 2023 and apply to changes in accounting policies and changes in accounting estimates that occur on or after the start of that period. Earlier application is permitted as long as this fact is disclosed. The amendments are not expected to have a material impact on the Group.

2.1.2. Standards issued but not yet effective (cont'd)

Disclosure of Accounting Policies - Amendments to KIFRS 1001 and KIFRS Practice Statement 2

The amendments provide guidance and examples to help entities apply materiality judgements to accounting policy disclosures. The amendments aim to help entities provide accounting policy disclosures that are more useful by replacing the requirement for entities to disclose their 'significant' accounting policies with a requirement to disclose their 'material' accounting policies and adding guidance on how entities apply the concept of materiality in making decisions about accounting policy disclosures. The amendments to KIFRS 1001 are applicable for annual periods beginning on or after January 1, 2023 with earlier application permitted. The amendments are not expected to have a material impact on the Group.

Amendments to KIFRS 1012 "Income Taxes" – Narrowing the scope of the initial recognition exception of deferred income taxes

The amendments narrowed the scope of the initial recognition exemption so that it no longer applies to transactions that, on initial recognition, give rise to equal taxable and deductible temporary difference, thus to resolve accounting diversity in the recognizing of deferred tax assets and liabilities. Paragraphs 15 and 24 (initial recognition exemption of deferred income taxes) of KIFRS 1012 were amended to include an additional condition (3) where a deferred tax asset and liability shall be recognized for a temporary difference that arises on initial recognition of an asset or liability in a single transaction if that transaction give rise to equal amounts of taxable and deductible temporary differences. The amendments are effective for annual reporting periods beginning on or after January 1, 2023 with earlier adoption permitted. The amendments are not expected to have a material impact on the Group.

2018-2020 annual improvements to KIFRS standards process

KIFRS 1101 *First-time Adoption of International Financial Reporting Standards* – *Subsidiary as a first-time adopter*

The amendment permits a subsidiary that elects to apply paragraph D16(1) of KIFRS 1101 to measure cumulative translation differences using the amounts reported by the parent, based on the parent's date of transition to KIFRS. This amendment is also applied to an associate or joint venture that elects to apply paragraph D16(1) of KIFRS 1101. The amendment is effective for annual reporting periods beginning on or after January 1, 2022 with earlier adoption permitted.

KIFRS 1109 *Financial Instruments* – *Fees in the '10 per cent' test for derecognition of financial liabilities*

The amendment clarifies the fees that an entity includes when assessing whether the terms of a new or modified financial liability are substantially different from the terms of the original financial liability. These fees include only those paid or received between the borrower and the lender, including fees paid or received by either the borrower or lender on the other's behalf. An entity applies the amendment to financial liabilities that are modified or exchanged on or after the beginning of the annual reporting period in which the entity first applies the amendment. The amendment is effective for annual reporting periods beginning on or after January 1, 2022 with earlier adoption permitted. The Group will apply the amendments to financial liabilities that are modified or exchanged on or after the beginning of the annual reporting period in which the entity first applies the amendment. The amendments are not expected to have a material impact on the Group.

2.2 Basis of consolidation

The consolidated financial statements comprise the financial statements of the Group as of December 31, 2021. Control is achieved when the Group is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee. Specifically, the Group controls an investee if, and only if, the Group has:

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

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

- The contractual arrangement with the other vote holders of the investee
- Rights arising from other contractual arrangements
- The Entity's voting rights and potential voting rights

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

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

A change in the ownership interests of a subsidiary, without a loss of control, is accounted for as an equity transaction.

If the Group loses control over a subsidiary, it derecognizes the related assets (including goodwill), liabilities, non-controlling interest and other components of equity while any resultant gain or loss is recognized in profit or loss. Any investment is recognized at fair value.

2.3 Business combinations

Acquisitions of subsidiaries and businesses are accounted for using the acquisition method. The cost of an acquisition is measured as the aggregate of the consideration transferred, which is measured at acquisition date fair value, and the amount of any non-controlling interests in the acquiree. For each business combination, the Group elects whether to measure the non-controlling interests in the acquiree at fair value or at the proportionate share of the acquiree's identifiable net assets. Acquisition-related costs are recognized in profit or loss as incurred.

Acquired assets, liabilities and contingent liabilities that are identifiable at the acquisition date are recognized at fair value on the acquisition date except for the following:

- Deferred tax assets and liabilities or assets related to employee benefit arrangements are recognized and measured in accordance with KIFRS 1012 *Income Taxes* and KIFRS 1019 *Employee Benefits*, respectively.
- Liabilities or equity instruments related to share-based payment arrangements of the acquiree or share-based payment arrangements of the Group entered into to replace share-based payment arrangements of the acquiree are measured in accordance with KIFRS 1102 *Share-based Payment* at the acquisition date.
- Non-current assets (or disposal groups) classified as held for sale in accordance with KIFRS 1105 *Non-current Assets Held for Sale and Discontinued Operations* are measured in accordance with KIFRS 1105.

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

Non-controlling interests that are present ownership interests and entitle their holders to a proportionate share of the entity's net assets in the event of liquidation may be initially measured either at fair value or at the non-controlling interests' proportionate share of the recognized amounts of the acquiree's identifiable net assets. The choice of measurement basis is made on a transaction-by-transaction basis. Other types of non-controlling interests are measured at fair value or, when applicable, on the basis specified in another KIFRS.

The transfer consideration of the Group as a result of the business combination includes the assets and liabilities from the contingent consideration arrangement and the contingent consideration is measured at the fair value at the acquisition date and is included as part of the consideration transferred. Changes in fair value after the acquisition date are adjusted retrospectively and adjusted in the corresponding goodwill if the conditions of the measurement period adjustments are met. Measurement Period Adjustments are adjustments that result from acquiring additional information about the facts and circumstances that existed at the acquisition date during the 'Adjustment Period' (which cannot exceed one year from the acquisition date).

2.3 Business combinations (cont'd)

Changes in fair value of contingent consideration that do not qualify for measurement period adjustments are accounted for in accordance with the classification of contingent consideration. Contingent consideration that is classified as equity is subsequently accounted for as equity if the settlement is not made at the reporting date. Contingent consideration that is classified as an asset or a liability is remeasured at subsequent reporting dates in accordance with KIFRS 1039 *Financial Instruments: Recognition and Measurement* or KIFRS 1037 *Provisions, Contingent Liabilities and Contingent Assets*. If the gain or loss is recognized, it is recognized in profit or loss.

In a staged business combination, the Group remeasures the previously held equity interest in the acquiree to its fair value at the acquisition date and, if any, the result is recognized in profit or loss. Recognition of changes in the value of interests in the acquiree prior to the acquisition date to other comprehensive income is reclassified to profit or loss in the same manner as if the previously held equity interests were disposed of directly.

If the initial accounting for the business combination cannot be completed by the end of the reporting period in which the business combination occurs, the Group reports provisional amounts in the consolidated financial statements for items for which accounting is not completed. In the event that there is newly acquired information about facts and circumstances that existed at the acquisition date during the measurement period (see above) the Group would have had an effect on the measurement of the amount recognized at the acquisition date. Recognized provision is adjusted retrospectively or additional assets and liabilities are recognized.

2.4 Investment in associates and joint ventures

An associate is an entity over which the Group has significant influence. Significant influence is the power to participate in the financial and operating policy decisions of the investee, but is not control or joint control over those policies.

A joint venture is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint venture. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control.

Except for the case where an investment in an associate or a joint venture is classified as a held for sale in accordance with KIFRS 1105 *Non-current Assets Held for Sale and Discontinued Operations*, the profit or loss, are included in the consolidated financial statements by applying the equity method. In applying the equity method, investments in associates and joint ventures are carried at the acquisition cost less any impairment loss on the investments in associates and joint ventures, adjusted for changes in equity in net assets of associates and joint ventures consolidated financial statements. Losses of associates and joint ventures that exceed the interests of the Group in relation to the associates and joint ventures (including long-term investments that substantially form part of the net investment of the Group in the associates and joint ventures) Are legally or aggressively obligated, or are required to be paid on behalf of the joint venture.

The cost of acquisition over the fair value of identifiable assets, liabilities and contingent liabilities of associates and joint ventures at the acquisition date in excess of the Group's interest is recognized as goodwill.

Goodwill is included in the carrying amount of the investment and reviewed for impairment as part of the investment. If the Group's share of the net fair value of identifiable assets, liabilities and contingent liabilities exceeding the cost of the consideration, even after review, is recognized in profit or loss.

If the entity has retained some of the investment assets of existing associates and joint ventures even after it has lost significant influence over the associates and joint ventures, the fair value of the investment assets at the point of time when the significant influence is lost, Are considered to be the fair value at the initial recognition of the financial asset in accordance with KIFRS 1039. The difference between the carrying amount of the investment and the fair value of the investment is recognized in profit or loss, including the gain or loss on disposal of the associate. In addition, the investor accounts for all amounts recognized as other comprehensive income in relation to the associate and the joint venture on the same basis as the accounting treatment in case the associate and the joint venture directly dispose of the related asset or liability. Therefore, when an associate is required to reclassify the gain or loss previously recognized in other comprehensive income to the profit or loss as a result of the disposal of the asset or liability, the investor may reclassification gains or losses on equity Reclassified to profit or loss (reclassification adjustment).

2.4 Investment in associates and joint ventures (cont'd)

If the equity method of accounting for associates or joint ventures decreases, but the equity method is applied, if the gain or loss previously recognized in other comprehensive income is reclassified to profit or loss as a result of the disposal of the related asset or liability, The proportionate portion of the decrease in ownership interests is reclassified to profit or loss. In addition, KIFRS 1105 is applied when a portion of investments in associates or joint ventures meets the criteria for sale.

The Group determines whether an impairment loss is recognized in respect of investments in associates and joint ventures in accordance with KIFRS 1039 *Financial Instruments: Recognition and Measurement*. If there is an indication of impairment, the total carrying amount of the associate and joint venture (including goodwill) is compared to the recoverable amount (the greater between fair value less costs to sell and value in use) in accordance with KIFRS 1036 *Asset Impairment*. The recognized impairment loss is not allocated to any assets (including goodwill) that are part of the carrying amount of associates and joint ventures. The reversal of impairment loss is recognized in accordance with KIFRS 1036 as the recoverable amount of the investment assets increases subsequently.

When an associate becomes a joint venture or, conversely, a joint venture becomes an associate, the Group continues to apply the equity method and does not remeasure residual equity.

When the Group transacts with an associate or a joint venture, the gain or loss on the transaction between the associate and the joint venture is recognized only to the extent of the equity interest in the associate and the joint venture, are recognized.

2.5 Investment in joint operation

A joint operation is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint venture. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control.

When an entity performs an activity under a joint venture, the entity recognizes, as a co-operative, its own interest in the joint operation as follows:

- Own assets. Include own shares of assets that are jointly owned.
- Own debt. Including own shares of jointly-generated debt.
- The own share of output from joint sales.
- The own share of the output of the joint sales.
- Own expenses. Include own share of the costs incurred jointly.

The Group accounts for assets, liabilities, income and expenses of its own interests in joint operation in accordance with the standards that apply to certain assets, liabilities, income and expenses.

If a joint operating entity, such as selling or investing in an asset in a joint operation, is deemed to perform a transaction with another party in the joint operation, the entity shall notify the other party. We are only aware of the limit on shareholding.

If the co-operative, the Group, conducts transactions such as joint sales and purchases of assets, the Group does not recognize its portion of the profit or loss until the assets are resold to a third party.

2.6 Goodwill

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

For the purpose of impairment testing, goodwill is allocated to each of the cash-generating units (CGUs) (or group of CGUs) that is expected to benefit from the synergies of the combination.

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

On disposal of the relevant CGU, the attributable amount of goodwill is included in the determination of the profit or loss on disposal.

The Group's accounting policies for goodwill arising on the acquisition of an associate are set out in Note 2.4.

2.7 Assets held for sale and discontinued operations

2.7.1 Assets held for sale

Non-current assets and disposal groups are classified as held for sale if their carrying amount will be recovered principally through a sale transaction rather than through continuing use. This condition is regarded as met only when the sale is highly probable and the non-current asset (or disposal group) is available for immediate sale in its present condition. Management must be committed to the sale, which should be expected to qualify for recognition as a completed sale within one year from the date of classification.

If the Group commits a sale plan that results in a loss of control of the subsidiary, the Group will, if the Group has satisfied the conditions previously mentioned, regardless of whether the Group has a non-controlling interest in the former subsidiary after the sale, all assets and liabilities are classified as held for sale.

If the Group is committed to a sale of an investment in an associate or a joint venture, all or part of the investment in the associate or joint venture to be sold will be classified as held for sale if it meets the criteria for sale, And the Group ceases to apply the equity method for investments in associates or joint ventures related to the items classified as held for sale. The Group continues to apply the equity method of accounting for residual interests in investments in associates or joint ventures that are not classified as held for sale. However, if the Group has a significant influence over the associates or joint ventures, the Group ceases to apply the equity method at the time of sale.

Unless the Group continues to apply the equity method to the Group's remaining retained interests in an associate or joint venture after the sale of an investment in an associate or a joint venture, the Group shall retain the remaining amount of the investment in the associate or joint venture Corporate KIFRS 1039 *Financial assets: Recognition and measurement*.

2.7.2 Non-current assets held for sale

Non-current assets (and disposal groups) classified as held for sale are measured at the lower between their previous carrying amount and fair value less costs to sell.

Property, plant and equipment and intangible assets are not depreciated or amortized once classified as held for sale or as held for distribution.

Assets and liabilities classified as held for sale or for distribution are presented separately as current items in the statement of financial position.

2.7.3 Assets scheduled for distribution to owners (or disposal groups)

The Group also applied the accounting policies related to the types, presentation and measurement of non-current assets (or disposal groups) classified as held for sale to non-current assets (or disposal entities) that are classified as scheduled for distribution to owners who exercise their qualifications as owners.

In addition, if all owners with the same kind of equity instruments are treated equally in distributing these non-cash assets to owners who exercise their qualifications as owners free of charge and the assets are ultimately not controlled by the same party or parties before and after the distribution, we recognize any dividend payable at the time of declaring the distribution (when approved in the shareholders' meeting). The dividend payable is measured at the fair value of the non-cash assets to be distributed at the end of each reporting period and at the settlement date, and the change in the carrying amount of the dividend payable is recognized in other capital items in the financial statement as an adjustment to the amount of the distribution.

In settling the dividend payable, the Group shall recognize any difference between the carrying amount of the non-cash assets distributed and the carrying amount of the dividend payable as profit or loss.

2.7.4 Discontinued operation

Disposal entity is a discontinued operation if:

- It is a separate main business line or business area.
- It is a part of a single plan to dispose of separate major business lines or business areas.
- It is a subsidiary acquired solely for sale.

The Group excludes the profit or loss from the results of the continuing operation and displays the profit or loss as a single amount in the income statement. Additional details of discontinued operations are disclosed in Note 37.

2.8 Revenue from contracts with customers

A. Identifying performance obligations

The Group mainly engages in business area, such as power generation facilities, industrial facilities, construction machinery, engines, manufacture of casting and forgings, and construction.

The Group identifies performance obligations that are distinct in the contract with the customer. Accordingly, a performance obligation, unit of revenue recognition, may be additionally identified in a single contract, or performance obligations in multiple contracts can be combined as a single performance obligation. The timing of the Group's revenue recognition may vary depending on whether each performance obligation identified is satisfied at a point in time or over time.

The Entity identifies a performance obligation as a distinct performance obligation when the customer can benefit from the good or service either on its own or together with other resources that are readily available to the customer and the Entity's promise to transfer the good or service to the customer is separately identifiable from other promises in the contract. Also, for performance obligations that are distinct, a transaction price is allocated based on stand-alone selling prices or, if they are not directly observable, estimated them and allocated to meet the allocation objective.

2.8 Revenue from contracts with customers (cont'd)

B. Performance obligations satisfied over time

The power and industry sector of the Group engage in manufacturing and selling power generation equipment ordered by the customer with design elements designated. The Group determines the contract as a construction contract, measures the progress the input method, and recognizes revenue based on the percentage-of-completion.

The Group recognizes revenue according to the percentage-of-completion only in case when it does not create an asset with an alternative use to the Group as it performs its performance obligations and has an enforceable right to payment for performance completed to date since it considers the control of the goods or services is transferred over time.

As a result of review on possibility of alternative use and right to payment by contracts, the Group recognizes revenue by applying the percentage-of-completion.

C. Measurement of progress using input method

The power sector of the Group will purchase, manufacture, and install power generation related materials, such as boilers and turbines and generally carry out construction work over a long period of time. The Group determines that construction/service contract satisfies a performance obligation and recognizes revenue over time, if one of the following criteria is met: i) Customer simultaneously receives and consumes the benefits provided by the entity's performance as the entity performs or ii) The entity's performance creates or enhances an asset that the customer controls as the asset is created or enhanced.

In addition, The Group is required to faithfully represent the performance of The Group in terms of profits When i) At the commencement of the contract, the goods are not distinguished, ii) Customer is expected to have significant control over the goods before receiving services related to the goods, iii) The cost of the goods being transferred is significant compared to the total cost expected to fully fulfill the performance, iv) Companies procure goods from third parties obligation, v) There is no significant involvement in the design and production of the goods, all of these conditions are fulfilled, Revenue recognizes the same amount as the cost of the goods used to fulfill the performance obligation.

D. Variable consideration

The Group estimates variable consideration using the expected value method that better predicts to which it will be entitled and recognizes revenue in the amount of the transaction price that include variable consideration that is constrained until it is highly probable that a significant revenue reversal in the amount of cumulative revenue recognized until the expiry of return date. The Group recognizes a refund liability for the amount to which it does not expect to be entitled among the consideration received or expected to receive.

E. Allocation of the transaction price

The Group allocates the transaction price on the basis of the stand-alone selling price to the various performance obligations identified in a single contract. The Group uses the 'adjusted market assessment approach' to estimate the stand-alone selling price of each performance obligation and, in exceptional transactions, the 'expected cost plus a margin approach' to predict expected costs and add appropriate profit margins.

2.9 Due from/to customers for contract work

The amount in which the recognized profit is added to the accrued cost (subtracting the recognized loss) exceeds the progress claim is indicated as due from customers for contract work. The amount in which the progress claim exceeds the amount recognized by adding the profit (deducting the recognized loss) to the cumulative cost is indicated as due to customers for contract work. The amount received before the relevant construction work is recognized as advances received in the consolidated financial statement. The amount that has been charged to the customer for the work carried out but has not yet been received is included in the trade receivable in the consolidated financial statement.

2.10 Rental income

The Group's policy for recognition of revenue from operating leases is described in Note 2.11.

2.11 Leases

The Group determines whether the contract itself is a lease or the contract contains lease at the time of agreement, considering whether the contract exchange the control of the identified asset for a certain period of time with price of the contract.

The Group as a lessee

The Group applies a single method on every lease except short-term leases and leases of low-value assets. The Group recognizes lease liabilities that represent the obligation to pay the leases and right-of-use assets that represents right-of-use.

2.11.1 Right-of-use assets

The Group recognizes right-of-use assets on lease commencement date (the date when the underlying asset is usable). Right-of-use asset is measured as cost, and the Group applies cost model on subsequent measurement. To apply cost model, the Group deducts accumulated depreciation and accumulated loss of impairment, and recognizes adjustments base on remeasurement of lease liabilities. The cost of the right-of-use assets includes the amount of the perceived lease liabilities, the initial direct cost, and the lease fee paid before or after the lease commencement date with received lease incentive deducted. The right-of-use assets are depreciated on a flat basis over a short period of time between the lease period and the estimated useful life of the assets.

If the ownership of the underlying asset is transferred to the Group at the end of the lease term or if the Group is expected to exercise the purchase option at the cost of the right-of-use assets, depreciation is calculated using the estimated useful life of the underlying asset of the asset.

The right-of-use assets are also subject to damage and the relevant accounting policy is described in Note 2.21.

2.11.2 Lease liabilities

On lease commencement date, the Group recognizes lease liabilities at the present value of the lease to be paid over the lease period. The lease fee consists of a fixed fee (including a substantial fixed fee, and the lease incentive to receive is deducted), a variable lease payment that varies according to the index or rate, and an amount expected to be paid according to the residual value guarantee. Lease fee also includes the amount to be borne to terminate the lease if the Group is fairly certain to exercise buying options, considering exercise cost of the buying options and termination options to lease term.

A variable lease that does not varies according to the index of rate (unless not from the production of inventories) is recognized during the period of time when an event or condition that causes a lease happens.

When the Group evaluates the present value of lease fee, it uses the incremental borrowing interest rate of the lease commencement date because it cannot easily calculate the internal rate of return of the lease. After the lease commencement date, the amount of lease liabilities increase to reflect interest and decreases to reflect the lease fee paid. In addition, the book values of the lease liabilities are remeasured if there is a change in the lease term, a change in the lease fee (for example, a change in the future lease due to a change in the index or rate used to calculate the lease fee), or a change in the option assessment to buy the underlying asset.

2.11.3 Short-term lease and Leases of low-value assets

The Group applies exemption rule for the recognition of short-term lease, which has a lease-term less than 12 months from the lease commencement date and do not include purchase options. In addition, the Group applies exemption rule for the recognition of leases of low-value assets on office equipment, etc., which is considered as low value assets. Lease fee of Short-term lease and leases of low-value of assets are recognized as cost based on straight-line method through the lease term.

The Group as lessor

The Group classifies leases that do not transfer most of the risks and compensation for the ownership of underlying assets as operating leases. Lease revenues are recognized based on straight-line method through the lease term and it can be classified as sales in the consolidated statements of profit or loss depending on the nature of the business.

2.12 Foreign currencies

The consolidated financial statements of the Group are presented in the currency of the primary economic environment in which the entity operates (its functional currency). For the purpose of the consolidated financial statements, the results and financial position of each group entity are expressed in Korean won, which is the functional currency of the entity and the presentation currency for the consolidated financial statements.

In preparing the financial statements, transactions in currencies other than the entity's functional currency (foreign currencies) are recognized at the rates of exchange prevailing at the dates of the transactions. At the end of each reporting period, monetary items denominated in foreign currencies are retranslated at the rates prevailing at that date. Non monetary items carried at fair value that are denominated in foreign currencies are retranslated at the rates prevailing at the date when the fair value was determined. Non monetary items that are measured in terms of historical cost in a foreign currency are not retranslated.

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

- Exchange differences on foreign currency borrowings relating to assets under construction for future productive use, which are included in the cost of those assets when they are regarded as an adjustment to interest costs on those foreign currency borrowings
- Exchange differences on transactions entered into in order to hedge certain foreign currency risks (see Note 2.25 below for hedging accounting policies)
- Exchange differences on monetary items forming part of the net investment in the foreign operation.

In order to prepare consolidated financial statements, the assets and liabilities of foreign operations included in the Group are presented using the exchange rates at the end of the reporting period. Unless the foreign currency exchange rate fluctuates significantly during the period and the exchange rate at the transaction date is not required to be used, the items of profit or loss are translated at the average exchange rate for the year. Foreign exchange differences arising from such differences are recognized in other comprehensive income and accumulated in equity (If appropriate, allocate to non-controlling interests).

When a foreign operation is disposed of (In other words, the disposal of the entire amount of the Group's foreign operations, the disposal of the subsidiary including its overseas operations, the partial disposal of the equity of the joint venture, or the partial disposal of the equity interest in an associate If the equity interest is a financial asset that includes overseas business sites), the entire amount of foreign exchange differences related to the foreign operations attributable to the parent is reclassified to profit or loss. The cumulative exchange differences related to the foreign operations attributable to the non-controlling interests are eliminated but are not reclassified to profit or loss.

For certain dispositions that do not result in a loss of control over subsidiaries, including foreign operations, the proportionate share of the accumulated foreign exchange differences is reassigned to non-controlling interests and is not reclassified to profit or loss. For all other disposals (In other words, a decrease in ownership interests in an associate or joint venture of a group that does not result in significant influence or loss of joint control), the proportionate share of the accumulated foreign exchange differences is reclassified to profit or loss.

Fair value adjustments for goodwill and identifiable assets and liabilities arising from the acquisition of foreign operations are recognized in the income statement as assets and liabilities at the foreign operations and are translated at the exchange rates at the balance sheet date, the resulting foreign exchange difference is recognized as capital.

In determining the spot exchange rate to use on initial recognition of the related asset, expense or income (or part of it) on the derecognition of a non-monetary asset or non-monetary liability relating to advance consideration, the date of the transaction is the date on which the Group initially recognizes the non-monetary asset or non-monetary liability arising from the advance consideration. If there are multiple payments or receipts in advance, the Group determines the transaction date for each payment or receipt of advance consideration.

2.13 Borrowing costs

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

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization.

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

2.14 Retirement benefit costs and termination benefits

The Group operates a defined benefit pension plan. The cost of providing benefits is determined using the projected unit credit method, with actuarial valuations being carried out at the end of each reporting period. Remeasurement, comprising actuarial gains and losses, the effect of the changes to the asset ceiling (if applicable) and the return on plan assets are reflected immediately in the consolidated financial statement with a charge or credit recognized in other comprehensive income in the period in which they occur. Remeasurement recognized in other comprehensive income is reflected immediately in retained earnings and will not be reclassified to profit or loss. Past service cost is recognized in profit or loss in the period of a plan amendment. Net interest is calculated by applying the discount rate at the beginning of the period to the net defined benefit liability or asset.

Defined benefit costs are composed of service cost (including current service cost, past service cost, as well as gains and losses on curtailments and settlements), net interest expense (income) and remeasurement.

The Group presents the service cost and net interest expense (income) components in profit or loss, and the remeasurement component in other comprehensive income. Curtailment gains and losses are accounted for as past service costs.

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

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

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

2.15 Share-based payment transactions of the Group

Equity-settled share-based payments to employees are measured at the fair value of the equity instruments at the grant date.

The fair value determined at the grant date of the equity-settled share-based payments is expensed on a straight-line basis over the vesting period, based on the Group's estimate of equity instruments that will eventually vest. At the end of each reporting period, the Group revises its estimate of the number of equity instruments expected to vest. The impact of the revision of the original estimates, if any, is recognized in profit or loss, such that the cumulative expense reflects the revised estimate, with a corresponding adjustment in other component of equity.

2.16 Taxation

Income tax expenses represent the sum of the tax currently payable and deferred tax.

2.16.1 Current tax

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

2.16.2 Deferred tax

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

The Group can control the timing of the extinguishment of the temporary difference and the additions to the subsidiary, the investment in the associate and the interest in the joint venture, unless it is probable that the temporary difference will not cease in the foreseeable future deferred tax liabilities are recognized for temporary differences. Deferred tax assets arising from temporary differences arising from these investments and investments are highly probable to be taxable enough to enable the benefits of the temporary difference and are likely to expire in the foreseeable future recognize only if high.

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 profits will be available to allow all or part of the asset to be recovered.

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

Deferred income tax assets and liabilities are recognized when the Group has a legally enforceable right to offset current tax assets and current tax liabilities and are subject to the same taxation entities as the taxable entity. Are intended to settle the liabilities at the same time as they are expected to be settled at the balance sheet date, if the Group intends to settle the current tax liabilities and assets on a net basis, deferred tax liabilities are settled or deferred tax assets are recovered only offset.

2.16.3 Current and deferred taxes for the year

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

2.17 Government grants

Government grants are not recognized until there is reasonable assurance that the Group will comply with the conditions attaching to them and that the grants will be received.

The benefit of a government loan at a below-market rate of interest is treated as a government grant, measured as the difference between proceeds received and the fair value of the loan based on prevailing market interest rates.

Government grants related to assets are presented in the consolidated financial statement by deducting the grant from the carrying amount of the asset. The related grant is recognized in profit or loss over the life of a depreciable asset as a reduced depreciation expense.

Government grants related to income are recognized in profit or loss on a systematic basis over the periods in which the Group recognizes as expenses the related costs for which the grants are intended to compensate. Government grants that are receivable as compensation for expenses or losses already incurred or for the purpose of giving immediate financial support to the Group with no future-related costs are recognized in profit or loss in the period in which they become receivable.

2.18 Property, plant and equipment

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

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

The Group does not depreciate land. Depreciation expense is computed using the straight-line method based on the estimated useful lives of the assets as follows:

	Estimated useful lives (in years)
Buildings	4-50
Structures	2-40
Machinery	2-20
Other property, plant and equipment	2-20

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

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

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

2.19 Investment properties

Investment properties are properties held to earn rentals and/or for capital appreciation (including property under construction for such purposes). Investment properties are measured initially at cost, including transaction costs. Subsequent to initial recognition, investment properties are stated at fair value, with any gains or losses arising on fair value fluctuation recognized in profit or loss.

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

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

2.20 Intangible assets

2.20.1 Intangible assets acquired separately

Intangible assets with finite useful lives that are acquired separately are carried at cost, less accumulated amortization and accumulated impairment losses. Amortization is recognized on a straight-line basis over their estimated useful lives. The estimated useful life and amortization method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for on a prospective basis. Intangible assets with indefinite useful lives that are acquired separately are carried at cost less accumulated impairment losses.

2.20.2 Internally generated intangible assets - research and development expenditure

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

Expenditure arising from development (or from the development phase of an internal project) is recognized as an intangible asset if, and only if, the development project is designed to produce new or substantially improved products, and the Group can demonstrate the technical and economic feasibility and measure reliably the resources attributable to the intangible asset during its development.

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

2.20.3 Intangible assets acquired in a business combination

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

2.20.4 Derecognition of intangible assets

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

2.20.5 Amortization of intangible assets

Intangible assets other than memberships with indefinite useful lives are amortized using the straight-line method with acquiring cost, except for residual value, with the amortization beginning when the asset is available for use. The estimated useful lives of the assets are as follows:

	<u>Estimated useful lives (in years)</u>
Development costs	3-20
Industrial rights	5-10
Other intangible assets	2-20

2.21 Impairment of property, plant, equipment and intangible assets other than goodwill

At the end of each reporting period, the Group reviews the carrying amounts of its tangible and intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). When it is not possible to estimate the recoverable amount of an individual asset, the Group estimates the recoverable amount of the CGU to which the asset belongs.

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

Recoverable amount is the higher of fair value less costs to sell and value in use. If the recoverable amount of an asset (or a CGU) is estimated to be less than its carrying amount, the carrying amount of the asset (or the CGU) is reduced to its recoverable amount and the reduced amount is recognized in profit or loss.

Where an impairment loss subsequently reverses, the carrying amount of the asset (or a CGU) is increased to the revised estimate of its recoverable amount, but so that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognized for the asset (or the CGU) in previous years. A reversal of an impairment loss is recognized immediately in profit or loss.

2.22 Inventories

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

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

2.23 Provisions

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

The amount recognized as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. When a provision is measured using the cash flows estimated to settle the present obligation, its carrying amount is the present value of those cash flows (where the effect of the time value of money is material). The discount rate used is a pretax rate that reflects current market assessments of the time value of money and the risks specific to the liability. Where discounting is used, the increase in the provision due to the passage is recognized in profit or loss as borrowing cost.

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

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

2.24 Financial instruments

A financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity.

2.24.1 Financial assets

[Initial recognition and measurement]

Financial assets are classified, at initial recognition, as subsequently measured at amortized cost, fair value through other comprehensive income (OCI), and fair value through profit or loss.

The classification of financial assets at initial recognition depends on the financial asset's contractual cash flow characteristics and the Group's business model for managing them.

In order for a financial asset to be classified and measured at amortized cost or fair value through OCI, it needs to give rise to cash flows that are 'solely payments of principal and interest (SPPI)' on the principal amount outstanding. This assessment is referred to as the SPPI test and is performed at an instrument level.

The Group's business model for managing financial assets refers to how it manages its financial assets in order to generate cash flows. The business model determines whether cash flows will result from collecting contractual cash flows, selling the financial assets, or both.

Purchases or sales of financial assets that require delivery of assets within a time frame established by regulation or convention in the market place (regular way trades) are recognized on the trade date, i.e., the date that the Group commits to purchase or sell the asset.

[Subsequent measurement]

For purposes of subsequent measurement, financial assets are classified in four categories:

- Financial assets at amortized cost (debt instruments)
- Financial assets at fair value through OCI with recycling of cumulative gains and losses (debt instruments)
- Financial assets designated at fair value through OCI with no recycling of cumulative gains and losses upon derecognition (equity instruments)
- Financial assets at fair value through profit or loss

2.24.1 Financial assets (cont'd)

Financial assets at amortized cost (debt instruments)

The Group measures financial assets at amortized cost if both of the following conditions are met:

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

Financial assets at amortized cost are subsequently measured using the effective interest rate(EIR) method and are subject to impairment. Gains and losses are recognized in profit or loss when the asset is derecognized, modified or impaired.

Financial assets at fair value through OCI (debt instruments)

The Group measures debt instruments at fair value through OCI if both of the following conditions are met:

- The financial asset is held within a business model with the objective of both holding to collect contractual cash flows and selling, and
- The contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding

For debt instruments at fair value through OCI, interest income, foreign exchange revaluation and impairment losses or reversals are recognized in the statements of profit or loss and computed in the same manner as for financial assets measured at amortized cost. The remaining fair value changes are recognized in OCI. Upon derecognition, the cumulative fair value change recognized in OCI is recycled to profit or loss.

Financial assets designated at fair value through OCI (equity instruments)

Upon initial recognition, the Group can elect to classify irrevocably its equity investments as equity instruments designated at fair value through OCI when they meet the definition of equity under KIFRS 1032 *Financial Instruments: Presentation* and are not held for trading.

Gains and losses on these financial assets are never recycled to profit or loss. Dividends are recognized as other income in the statements of profit or loss when the right of payment has been established, except when the Group benefits from such proceeds as a recovery of part of the cost of the financial asset, in which case, such gains are recorded in OCI. Equity instruments designated at fair value through OCI are not subject to impairment assessment.

The Group can elect to classify irrevocably its non-listed equity investments under this category.

Financial assets at fair value through profit or loss

Financial assets at fair value through profit or loss include financial assets held for trading and financial assets designated upon initial recognition at fair value through profit or loss. Financial assets are classified as held for trading if they are acquired for the purpose of selling or repurchasing in the near term. Derivatives, including separated embedded derivatives, are also classified as held for trading unless they are designated as effective hedging instruments. Financial assets with cash flows that are not solely payments of principal and interest are classified and measured at fair value through profit or loss, irrespective of the business model. Notwithstanding the criteria for debt instruments to be classified at amortized cost or at fair value through OCI, as described above, debt instruments may be designated at fair value through profit or loss on initial recognition if doing so eliminates, or significantly reduces, an accounting mismatch.

Financial assets at fair value through profit or loss are carried in the statements of financial position at fair value with net changes in fair value recognized in profit or loss.

2.24.1 Financial assets (cont'd)

This category contains derivatives and listed equity instruments that do not make an irrevocable choice to account for changes in fair value in other comprehensive income. Dividends on listed equity instruments are recognized in profit or loss at the time the rights are established.

A derivative embedded in a hybrid contract, with a financial liability or non-financial host, is separated from the host and accounted for as a separate derivative if: the economic characteristics and risks are not closely related to the host; a separate instrument with the same terms as the embedded derivative would meet the definition of a derivative; and the hybrid contract is not measured at fair value through profit or loss. Embedded derivatives are measured at fair value with changes in fair value recognized in profit or loss. Reassessment only occurs if there is either a change in the terms of the contract that significantly modifies the cash flows that would otherwise be required or a reclassification of a financial asset out of the fair value through profit or loss category.

A derivative embedded within a hybrid contract containing a financial asset host is not accounted for separately. The financial asset host together with the embedded derivative is required to be classified in its entirety as a financial asset at fair value through profit or loss.

[Derecognition]

A financial asset (or, where applicable, a part of a financial asset or part of a group of similar financial assets) is primarily derecognized (i.e., removed from the Group's consolidated financial statement) when:

- The rights to receive cash flows from the asset have expired, or
- The Group has transferred its rights to receive cash flows from the asset or has assumed an obligation to pay the received cash flows in full without material delay to a third party under a 'pass-through' arrangement; and either (a) the Group has transferred substantially all the risks and rewards of the asset, or (b) the Group has neither transferred nor retained substantially all the risks and rewards of the asset, but has transferred control of the asset

When the Group has transferred its rights to receive cash flows from an asset or has entered into a pass-through arrangement, it evaluates if, and to what extent, it has retained the risks and rewards of ownership. When it has neither transferred nor retained substantially all of the risks and rewards of the asset, nor transferred control of the asset, the Group continues to recognize the transferred asset to the extent of its continuing involvement. In that case, the Group also recognizes an associated liability. The transferred asset and the associated liability are measured on a basis that reflects the rights and obligations that the Group has retained.

Continuing involvement that takes the form of a guarantee over the transferred asset is measured at the lower of the original carrying amount of the asset and the maximum amount of consideration that the Group could be required to repay.

[Impairment of financial assets]

The Group recognizes an allowance for expected credit losses (ECLs) for all debt instruments not held at fair value through profit or loss. ECLs are based on the difference between the contractual cash flows due in accordance with the contract and all the cash flows that the Group expects to receive, discounted at an approximation of the original effective interest rate. The expected cash flows will include cash flows from the sale of collateral held or other credit enhancements that are integral to the contractual terms.

ECLs are recognized in two stages. For credit exposures for which there has not been a significant increase in credit risk since initial recognition, ECLs are provided for credit losses that result from default events that are possible within the next 12-months (a 12-month ECL). For those credit exposures for which there has been a significant increase in credit risk since initial recognition, a loss allowance is required for credit losses expected over the remaining life of the exposure, irrespective of the timing of the default (a lifetime ECL).

2.24.1 Financial assets (cont'd)

For trade receivables and contract assets, the Group applies a simplified approach in calculating ECLs. Therefore, the Group does not track changes in credit risk, but instead recognizes a loss allowance based on lifetime ECLs at each reporting date. The Group has established a provision matrix that is based on its historical credit loss experience, adjusted for forward-looking factors specific to the debtors and the economic environment.

2.24.2 Financial liabilities

[Initial recognition and measurement]

Financial liabilities are classified, at initial recognition, as financial liabilities at fair value through profit or loss, financial liabilities as subsequently measured at amortized cost, or as derivatives designated as hedging instruments in an effective hedge, as appropriate.

All financial liabilities are recognized initially at fair value and, in the case of loans and borrowings and payables, net of directly attributable transaction costs.

[Subsequent measurement]

The measurement of financial liabilities depends on their classification, as described below.

Financial liabilities at fair value through profit or loss

Financial liabilities at fair value through profit or loss include financial liabilities held for trading and financial liabilities designated upon initial recognition as of fair value through profit or loss.

Financial liabilities are classified as held for trading if they are incurred for the purpose of repurchasing in the near term. This category also includes derivative financial instruments entered into by the Group that are not designated as hedging instruments in hedge relationships as defined by KIFRS 1109. Separated embedded derivatives are also classified as held for trading unless they are designated as effective hedging instruments.

Gains or losses on liabilities held for trading are recognized in profit or loss.

Financial liabilities designated upon initial recognition at fair value through profit or loss are designated at the initial date of recognition, and only if the criteria in KIFRS 1109 are satisfied.

Financial liabilities as subsequently measured at amortized cost

After initial recognition, interest-bearing loans and borrowings are subsequently measured at amortized cost using the EIR method. Gains and losses are recognized in profit or loss when the liabilities are derecognized as well as through the EIR amortization process.

Amortized cost is calculated by taking into account any discount or premium on acquisition and fees or costs that are an integral part of the EIR.

This category generally applies to interest-bearing loans and borrowings.

[Derecognition]

A financial liability is derecognized when the obligation under the liability is discharged or cancelled or expires. When an existing financial liability is replaced by another from the same lender on substantially different terms, or the terms of an existing liability are substantially modified, such an exchange or modification is treated as the derecognition of the original liability and the recognition of a new liability. The difference in the respective carrying amounts is recognized in profit or loss.

2.24.3 Offsetting of financial instruments

Financial assets and financial liabilities are offset and the net amount is reported in the consolidated financial statements if there is a currently enforceable legal right to offset the recognized amounts and there is an intention to settle on a net basis, to realize the assets and settle the liabilities simultaneously.

2.24.4 Financial guarantee liabilities

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

Financial guarantee liabilities are initially measured at their fair values and, if not designated as financial liabilities at fair value through profit or loss, or unless the transfer of a financial asset does not meet the derecognition criteria or the continuing involvement approach is applied are subsequently measured at the higher of:

- The amount loss allowances determined in accordance with KIFRS 1109 5.5, and
- The amount initially recognized, less cumulative amortization recognized in accordance with the KIFRS 1115

2.25 Equity instruments

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

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

2.26 Derivative financial instruments and hedge accounting

The Group uses derivative financial instruments, such as forward currency contracts, interest rate swaps and forward commodity contracts, to hedge its foreign currency risks, interest rate risks and commodity price risks, respectively. Such derivative financial instruments are initially recognized at fair value on the date on which a derivative contract is entered into and are subsequently remeasured at fair value. Derivatives are carried as financial assets when the fair value is positive and as financial liabilities when the fair value is negative.

For the purpose of hedge accounting, hedges are classified as:

- Fair value hedges when hedging the exposure to changes in the fair value of a recognized asset or liability or an unrecognized firm commitment
- Cash flow hedges when hedging the exposure to variability in cash flows that is either attributable to a particular risk associated with a recognized asset or liability or a highly probable forecast transaction or the foreign currency risk in an unrecognized firm commitment
- Hedges of a net investment in a foreign operation

At the inception of a hedge relationship, the Group formally designates and documents the hedge relationship to which the Group wishes to apply hedge accounting and the risk management objective and strategy for undertaking the hedge.

The documentation includes identification of the hedging instrument, the hedged item, the nature of the risk being hedged and how the Group will assess whether the hedging relationship meets the hedge effectiveness requirements (including the analysis of sources of hedge ineffectiveness and how the hedge ratio is determined). A hedging relationship qualifies for hedge accounting if it meets all of the following effectiveness requirements.

2.26 Derivative financial instruments and hedge accounting (cont'd)

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

Hedges that meet the strict criteria for hedge accounting are accounted for, as described below.

Fair value hedges

The change in the fair value of a hedging derivative is recognized in the statements of profit or loss. However, any changes in the fair value of a hedging derivative of equity instrument that the Group elects to present in OCI are recognized in OCI. The change in the fair value of the hedged item attributable to the risk hedged is recorded as part of the carrying value of the hedged item and is also recognized in the statements of profit or loss.

For fair value hedges relating to items carried at amortized cost, any adjustment to carrying value is amortized through profit or loss over the remaining term of the hedge using the EIR method. EIR amortization may begin as soon as an adjustment exists and no later than when the hedged item ceases to be adjusted for changes in its fair value attributable to the risk being hedged.

If the hedged item is derecognized, the unamortized fair value is recognized immediately in profit or loss.

When an unrecognized firm commitment is designated as a hedged item, the subsequent cumulative change in the fair value of the firm commitment attributable to the hedged risk is recognized as an asset or liability with a corresponding gain or loss recognized in profit and loss.

Cash flow hedges

The effective portion of the gain or loss on the hedging instrument is recognized in OCI in the cash flow hedge reserve, while any ineffective portion is recognized immediately in the statements of profit or loss. The cash flow hedge reserve is adjusted to the lower of the cumulative gain or loss on the hedging instrument and the cumulative change in fair value of the hedged item.

The Group uses forward currency contracts as hedges of its exposure to foreign currency risk in forecast transactions and firm commitments, as well as forward commodity contracts for its exposure to volatility in the commodity prices. The ineffective portion relating to forward contracts is recognized as finance income or finance expenses.

The amounts accumulated in OCI are accounted for, depending on the nature of the underlying hedged transaction. If the hedged transaction subsequently results in the recognition of a non-financial item, the amount accumulated in equity is removed from the separate component of equity and included in the initial cost or other carrying amount of the hedged asset or liability. This is not a reclassification adjustment and will not be recognized in OCI for the year. This also applies where the hedged forecast transaction of a non-financial asset or non-financial liability subsequently becomes a firm commitment for which fair value hedge accounting is applied.

For any other cash flow hedges, the amount accumulated in OCI is reclassified to profit or loss as a reclassification adjustment in the same period or periods during which the hedged cash flows affect profit or loss.

If cash flow hedge accounting is discontinued, the amount that has been accumulated in OCI must remain in accumulated OCI if the hedged future cash flows are still expected to occur. Otherwise, the amount will be immediately reclassified to profit or loss as a reclassification adjustment. After discontinuation, once the hedged cash flow occurs, any amount remaining in accumulated OCI must be accounted for depending on the nature of the underlying transaction as described above.

2.26 Derivative financial instruments and hedge accounting (cont'd)

Hedges of a net investment in a foreign operation

Hedges of a net investment in a foreign operation, including a hedge of a monetary item that is accounted for as part of the net investment, are accounted for in a way similar to cash flow hedges. Gains or losses on the hedging instrument relating to the effective portion of the hedge are recognized as OCI while any gains or losses relating to the ineffective portion are recognized in the statement of profit or loss. On disposal of the foreign operation, the cumulative value of any such gains or losses recorded in equity is transferred to the statement of profit or loss.

2.27 Fair value

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, regardless of whether that price is directly observable or estimated using another valuation technique. In estimating the fair value of an asset or a liability, the Group takes into account the characteristics of the asset or liability if market participants would take those characteristics into account when pricing the asset or liability at the measurement date. Fair value for measurement and/or disclosure purposes in these consolidated financial statements is determined on such a basis, except for share-based payment transactions that are within the scope of KIFRS 1102 *Share-based Payment*, leasing transactions that are within the scope of KIFRS 1017 *Leases* and measurements that have some similarities to fair value but are not fair value, such as net realizable value in KIFRS 1002 *Inventories*, or value in use in KIFRS 1036 *Impairment of Assets*.

In addition, for financial reporting purposes, fair value measurements are categorized into Levels 1, 2 or 3 based on the degree to which the inputs to the fair value measurements are observable and the significance of the inputs to the fair value measurement in their entirety, which are described in Note 10.

2.28 Greenhouse gas emissions

The Group accounts for greenhouse gas emission rights and emission liabilities arising under the Act on the Allocation and Transaction of Greenhouse Gas Emissions. The detailed information is as follows.

1) Greenhouse gas emission rights

Greenhouse gas emission rights consist of those allocated free of charge by the government and those purchased for a fee. The free quota emission right shall be measured and recognized as zero, purchased emission rights are recognized as acquisition costs by adding other costs that are directly related to acquisition and normally occur. The Group classifies greenhouse gas emissions rights as intangible assets and measures the amount of accumulated impairment losses after initial recognition as carrying amount, the part to be submitted to the government within one year from the end of the reporting period is classified as current assets. Emission rights held to obtain short-term gains from trading are classified as current assets and measured at fair value at the end of each reporting period, changes in fair value are recognized in profit or loss. Greenhouse gas emissions rights are removed when they are no longer available for submission, sale or sale to the government and future economic benefits are no longer expected.

2) Emission liabilities

Emissions liabilities are the current obligation to submit emissions rights to the Government, they are measured by summing the carrying amount of the emission rights held and the estimated expenditure required to fulfill the obligations for excess emissions. Emissions liabilities are removed when submitted to the Government.

2.29 Approval of consolidated financial statements

The consolidated financial statements of the Group were approved by the Board of Directors on March 8, 2022 and will be finalized at the annual general meeting of shareholders on March 29, 2022.

3. Significant accounting judgements and key sources of estimation uncertainties

In the application of the Group's accounting policies for the consolidated financial statements, which are described in Note 2, management is required to make judgments, estimates and assumptions about the carrying amounts of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimate is revised if the revision affects only that period or in the period of the revision and future periods if the revision affects both current and future periods.

3.1 Revenue recognition

Revenue from a contract to provide services is recognized by reference to the stage of completion of the contract. The stage of completion of the contract is determined as reasonable estimation and is subject to change as related factors change.

3.2 Impairment of non-financial assets

Determining whether non-financial assets is impaired requires an estimation of the recoverable amount of the CGUs to which non-financial assets has been allocated. The value in use calculation requires the directors to estimate the future cash flows expected to arise from the CGU and a suitable discount rate in order to calculate the present value.

3.3 Defined benefit liabilities

The Group's defined benefit liabilities are determined based on the actuarial valuation carried out at the end of each annual reporting period. Actuarial assumptions are the Group's best estimates of the variables, such as discount rates, rates of expected future salary increases and mortality rates.

3.4 Provisions

The Group provides warranty for products when it recognizes the relevant revenue. The Group calculates the guarantee provision as the best estimate that is deemed necessary to enhance future and current warranty obligations at the end of each reporting period. The Group continues to market new products using complex technologies, and depending on the local laws and practices, these accounting estimates may be changed to establish additional provisions in the future fiscal periods.

In addition, provisions for the expected cost of warranty obligations are recognized at the best estimate of the expenditure required to settle the Group's current and future obligations. Provisions are determined by the estimate based on past experience.

3.5 Revaluation model on land and fair value model on investment properties

As stated in Note 12 and Note 14, the Group uses evaluation technique, including inputs that are not based on observable market data to approximate revalued amount of land classified as property, plant and equipment and fair value of investment properties. The Group's management believes that the evaluation technique and assumptions that are used for valuation on land and investment properties are fair.

3.6 Deferred tax

Recognition and measurement of deferred tax assets and liabilities require the management's judgment, in particular, whether to recognize if the scope of deferred tax assets is affected by management's judgment and assumption in the future.

3.7 Special taxation for investment and facilitation of mutually beneficial cooperation

In accordance with the *Special Taxation for Investment and Facilitation of Mutually Beneficial Cooperation*, if a certain portion of taxable income of each fiscal year is not utilized for investment and salary increase purpose, the Group is obliged to pay additional income taxes calculated by the same Act. As a result, as the Group reflects the tax consequences for investment and promotion of collaborative cooperation when measuring the income tax in the same period, the income tax to be borne by the Group in the future may vary depending on the level of investment, wage increase and mutually-beneficial cooperation in each year.

3.8 Estimated useful lives of property, plant and equipment and intangible assets

Useful lives for depreciation and amortization are determined by the management's judgment.

3.9 Lease - Calculation of incremental borrowing rate

The Group cannot readily determine the interest rate implicit in the lease, therefore, it uses its incremental borrowing rate ("IBR") to measure lease liabilities. The IBR is the rate of interest that the Group would have to pay to borrow over a similar term, and with a similar security, the funds necessary to obtain an asset of a similar value to the right-of-use asset in a similar economic environment. The IBR therefore reflects what the Group 'would have to pay', which requires estimation when no observable rates are available (such as for subsidiaries that do not enter into financing transactions) or when they need to be adjusted to reflect the terms and conditions of the lease.

The Group estimates the IBR using observable inputs (such as market interest rates) when available and is required to make certain entity-specific estimates (such as the subsidiary's stand-alone credit rating).

3.10 Determining the lease term of contracts with renewal & termination options – Group as lessee

The Group determines the lease term as the non-cancellable term of the lease, together with any periods covered by an option to extend the lease if it is reasonably certain to be exercised, or any periods covered by an option to terminate the lease, if it is reasonably certain not to be exercised.

The Group has several lease contracts that include extension and termination options. The Group applies judgement in evaluating whether it is reasonably certain whether or not to exercise the option to renew or terminate the lease. That is, it considers all relevant factors that create an economic incentive for it to exercise either the renewal or termination. After the commencement date, the Group reassesses the lease term if there is a significant event or change in circumstances that is within its control and affects its ability to exercise or not to exercise the option to renew or to terminate (e.g., construction of significant leasehold improvements or significant customization to the leased asset).

3.11 Lease classification – Group as lessor

The Group has sub-lease contracts for right-of-use assets classified as investment properties. The Group has determined, based on an evaluation of the terms and conditions of the arrangements for most sub-leasing contracts, such as the lease term not constituting a major part of the economic life of the right-of-use assets and the present value of the minimum lease payments not amounting to substantially all of the fair value of the right-of-use assets, that it retains substantially all the risks and rewards incidental to ownership of these properties and accounts for the contracts as operating leases.

3.12 Revenue recognition - Items deducted from sales

The Group deducts the promotions and incentives provided to customers from sales, and if the sales deduction items related to the generated sales are not settled, the amount is recognized based on the occurrence standard.

Unsettled amounts such as promotions and incentives are estimated based on accumulated experience at the time of sale, and the revenue of the Group is affected by the predicted sales deduction.

3.13 Fair value

When the fair values of financial instruments recorded in the consolidated financial statements cannot be measured based on quoted prices in active markets, their fair value is measured using valuation techniques including the discounted cash flow ("DCF") model. The inputs to these models are taken from observable markets where possible, but where this is not feasible, a degree of judgement is required in establishing fair values. Judgements include considerations of inputs such as liquidity risk, credit risk and volatility. Changes in assumptions relating to these factors could affect the reported fair value of financial instruments.

3.14 Determination of consolidation

As of December 31, 2021, the Company holds 39.3% of voting rights of DHC, and the Company and DHC together hold 30.3% of voting rights of DFC. Most of the remaining stakes are held by small shareholders of less than 1%. The management of the Group reassess whether it controls subsidiaries listed above for the first time (January 1, 2013) and at the end of each subsequent reporting period. The executives of the Group concluded that they have control over the absolute size of the voting rights of the Group and the relative size of other shareholding voting rights and the degree of shareholding of other voting rights holders.

4. Financial risk management

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

Financial risk management activities are performed by Treasury and International Finance department, in accordance with the aforementioned documented risk management policies. In addition, the Group enters into derivative contracts to hedge against certain risks.

4.1 Market risk

4.1.1 Foreign currency risk

The Group's exposure to the risk of changes in foreign exchange rates relates primarily to the Group's operating activities (when revenue or expense is denominated in a foreign currency). The Group's basis for foreign currency risk management is to reduce income/loss volatility. Foreign currency risk is managed by the Group's policy on foreign currencies and foreign currency management for speculative purpose is strictly prohibited.

The Group reduces exposure to foreign currency risk by matching the inflow and the outflow of foreign currencies (natural hedge) and manages foreign currency risk for the remaining exposure by using derivatives, such as currency forwards.

The carrying amount of the Group's monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency as of December 31, 2021 and 2020 is as follows (Korean won in millions):

		December 31, 2021					
		USD	EUR	JPY	GBP	Others	Total
Assets		₩ 1,444,998	₩ 155,763	₩ 9,216	₩ 128,368	₩ 789,092	₩ 2,527,437
Liabilities		(1,630,120)	(555,415)	(42,190)	(120,591)	(571,943)	(2,920,259)
		<u>₩ (185,122)</u>	<u>₩ (399,652)</u>	<u>₩ (32,974)</u>	<u>₩ 7,777</u>	<u>₩ 217,149</u>	<u>₩ (392,822)</u>

		December 31, 2020					
		USD	EUR	JPY	GBP	Others	Total
Assets		₩ 1,851,984	₩ 238,771	₩ 19,015	₩ 228,223	₩ 622,976	₩ 2,960,969
Liabilities		(1,484,934)	(264,274)	(40,074)	(38,145)	(270,388)	(2,097,815)
		<u>₩ 367,050</u>	<u>₩ (25,503)</u>	<u>₩ (21,059)</u>	<u>₩ 190,078</u>	<u>₩ 352,588</u>	<u>₩ 863,154</u>

A sensitivity analysis on the Group's profit before income tax expenses assuming a 10% increase and decrease in currency exchange rates for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	Impact on profit before income tax expenses	
	2021	2020
10% Increase	₩ (39,282)	₩ 86,315
10% Decrease	39,282	(86,315)

The above-mentioned sensitivity analysis is based on monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency as of December 31, 2021 and 2020.

4.1.2 Interest rate risk

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

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

The carrying amount of the Group's financial assets and liabilities with floating interest rates exposed to interest rate risk as of December 31, 2021 and 2020 is as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Financial assets	₩ 249,700	₩ 570,203
Financial liabilities	(3,125,417)	(2,331,875)
	<u>₩ (2,875,717)</u>	<u>₩ (1,761,672)</u>

A sensitivity analysis on the Group's profit before income tax expenses assuming a 1% increase and decrease in interest rates for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	Impact on profit before income tax expenses	
	2021	2020
1% Increase	₩ (28,757)	₩ (17,617)
1% Decrease	28,757	17,617

4.1.3 Price risk

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

4.2 Credit risk

Credit risk refers to risk of financial losses to the Group when the counterparty defaults on the obligations of the contract. Credit risk arises from financial assets which are not equity securities, deposits in financial institution, financial derivatives and guarantee limit, and others. As well as from the Group's normal transactions and investing activities. To manage credit risk, the Group evaluates the creditworthiness of each customer or counterparty considering the financial status, past experience and other factors. The Group establishes credit limit for each customer and counterparty.

The Group evaluates the creditworthiness using open financial information and information provided by credit rating institution when the Group contracts with new customers. The Group decides credit transaction limit and is provided with collateral and guarantee based on evaluation.

Also, the Group reevaluates customers' creditworthiness periodically, reassesses credit transaction limit and readjusts level of collateral. The Group reports the present condition of delayed collection and collection measures periodically to financial assets, which has delayed collection and takes measures by causes of delay.

4.2 Credit risk (cont'd)

The carrying amount for the financial assets exposed to credit risk as of December 31, 2021 and 2020 are as follows (Korean won in millions). The carrying amount indicates the maximum exposure to credit risk.

	December 31, 2021	December 31, 2020
Cash and cash equivalents	₩ 2,235,362	₩ 2,707,379
Short-term and long-term financial instruments	1,104,109	497,711
Trade and other receivables	1,566,772	2,974,179
Deposits	394,833	495,024
Short-term and long-term investment securities (excluding equity securities):		
Financial assets at amortized cost	107	193,509
Financial assets at fair value through OCI	-	158,702
Financial assets at fair value through profit or loss	408,214	439,005
Derivative assets	39,161	96,318
	₩ 5,748,558	₩ 7,561,827

Apart from the above, in the case of contracts such as financial guarantees provided by the Group, the amount of guarantees to be paid by the Group at the request of the guarantee is the maximum amount exposed to the credit risk (see Note 32).

Details of trade receivables and due from customers for contract work exposed to credit risk, presented using forecast model, as of December 31, 2021 and 2020 are as follows (Korean won in millions):

December 31, 2021									
Trade receivables									
	Individually assessed trade receivables (*1)	Trade receivables assessed for impairment on a collective basis (*2)						Due from customers for contract work (*1)	Total
		Within due	Less than 3 months	3-6 months	6-12 months	More than 12 months	Total		
Book value	₩ 623,700	₩ 662,142	₩ 76,255	₩ 18,923	₩ 16,918	₩ 25,548	₩ 1,423,486	₩ 1,816,871	₩ 3,240,357
Expected credit loss rate	33.23%	0.13%	1.24%	3.34%	12.09%	45.15%		3.28%	
Expected credit loss	₩ 207,271	₩ 834	₩ 948	₩ 632	₩ 2,046	₩ 11,534	₩ 223,265	₩ 59,571	₩ 282,836

(*1) Trade receivables with indication of impairment that are individually identifiable, such as bankruptcy.

(*2) Trade receivables that are not individually significant and are classified into groups according to their similar characteristics.

December 31, 2020									
Trade receivables									
	Individually assessed trade receivables (*1)	Trade receivables assessed for impairment on a collective basis (*2)						Due from customers for contract work (*1)	Total
		Within due	Less than 3 months	3-6 months	6-12 months	More than 12 months	Total		
Book value	₩ 1,848,168	₩ 1,432,366	₩ 115,282	₩ 21,000	₩ 12,280	₩ 42,873	₩ 3,471,969	₩ 1,942,070	₩ 5,414,039
Expected credit loss rate	63.55%	0.32%	0.87%	3.16%	13.53%	33.83%		4.26%	
Expected credit loss	₩ 1,174,569	₩ 4,596	₩ 1,000	₩ 664	₩ 1,662	₩ 14,506	₩ 1,196,997	₩ 82,701	₩ 1,279,698

(*1) Trade receivables with indication of impairment that are individually identifiable, such as bankruptcy.

(*2) Trade receivables that are not individually significant and are classified into groups according to their similar characteristics.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

4.2 Credit risk (cont'd)

Details of other receivables among the financial assets as of December 31, 2021 and 2020 are as follows (Korean won in millions):

		December 31, 2021						
		Individually assessed other receivables	Other receivables assessed for impairment on a collective basis (*1)					Total
			Within due	Less than 3 months	3–6 months	6–12 months	More than 12 months	
Loans and non-trade receivables	₩	877,834	₩ 53,748	₩ 4,318	₩ 306	₩ 287	₩ 156	₩ 936,649
Accrued income		36,585	345	-	-	-	-	36,930
Financial lease receivables		-	5,522	-	-	-	-	5,522
	₩	914,419	₩ 59,615	₩ 4,318	₩ 306	₩ 287	₩ 156	₩ 979,101

(*1) Trade receivables that are not individually significant and are classified into groups according to their similar characteristics.

		December 31, 2020						
		Individually assessed other receivables	Other receivables assessed for impairment on a collective basis(*1)					Total
			Within due	Less than 3 months	3–6 months	6–12 months	More than 12 months	
Loans and non-trade receivables	₩	2,134,774	₩ 8,815	₩ 35,070	₩ 86	₩ 706	₩ 16,611	₩ 2,196,062
Accrued income		110,046	10,356	-	-	-	-	120,402
Financial lease receivables		-	9,419	-	-	-	-	9,419
	₩	2,244,820	₩ 28,590	₩ 35,070	₩ 86	₩ 706	₩ 16,611	₩ 2,325,883

(*1) Trade receivables that are not individually significant and are classified into groups according to their similar characteristics.

As of December 31, 2021 and 2020, allowance for doubtful accounts on other receivables above amounts to ₩609,981 million and ₩1,561,335 million, respectively.

4.3 Liquidity risk

Liquidity risk is the risk that the Group will encounter difficulty in meeting its financial liabilities' obligations related to its financing for its operation.

Based on the establishment of a regular funding plan, the Group prepares for the funding balance of its business activities, investment activities and financing activities for the maturity of financial assets and liabilities. The Group manages the liquidity risks that may occur in the future in advance by securing and maintaining required liquidity.

A summary of the Group's non-derivative liabilities' maturity as of December 31, 2021 and 2020 is as follows (Korean won in millions):

December 31, 2021						
	Book value	Total	Nominal cash flows according to contract			
			Less than 1 year	1-2 years	2-5 years	More than 5 years
Financial liabilities	₩ 12,881,809	₩ 13,065,786	₩ 8,960,684	₩ 1,503,428	₩ 2,290,360	₩ 311,314
Interest on financial liabilities	-	428,811	263,515	76,943	88,054	299
	₩ 12,881,809	₩ 13,494,597	₩ 9,224,199	₩ 1,580,371	₩ 2,378,414	₩ 311,613

December 31, 2020						
	Book value	Total	Nominal cash flows according to contract			
			Less than 1 year	1-2 years	2-5 years	More than 5 years
Financial liabilities	₩ 16,902,160	₩ 17,720,382	₩ 12,624,805	₩ 2,248,750	₩ 2,530,402	₩ 316,425
Interest on financial liabilities	-	722,620	556,580	103,400	62,621	19
	₩ 16,902,160	₩ 18,443,002	₩ 13,181,385	₩ 2,352,150	₩ 2,593,023	₩ 316,444

The above-mentioned maturity analysis is based on an undiscounted cash flow according to the contract, which differs from the carrying amount of non-derivative liabilities presented in the consolidated financial statements. It also includes the interest expenses on financial liabilities to be paid in the future. Apart from the above-mentioned non-derivative liabilities, as of December 31, 2021, financial guarantee liabilities of the Group are explained in Note 32.

4.4 Capital risk

The Group performs capital risk management to maintain its ability to continuously provide profits to shareholders and parties in interest and to maintain optimum capital structure to reduce capital expenses.

The Group manages its capital structure through dividend payments to shareholders, returns capital to shareholders and issues new shares and sells its assets for debt reduction. Debt-to-equity ratio calculated as total liabilities divided by equity is used as an index to manage the Group's capital similar to overall industry practice.

Debt-to-equity ratios as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Total liabilities	₩ 17,512,799	₩ 22,435,432
Total equity	8,497,053	7,765,571
Debt-to-equity ratio	206.10%	288.91%

5. Restricted financial assets

Details of restricted financial assets as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020	Description
Cash and cash equivalents	₩ 6,188	₩ 83,465	Establishment of the right of pledge related financial credit and others
Short-term financial instruments	1,031,080	326,591	National R&D (*1), shared growth fund, establishment of the right of pledge, collaterals for borrowings and PRS guarantee deposits (*2) and others
Long-term financial instruments	37,977	36,205	Financial credit and deposit, establishment of the right of pledge, restricted financial deposit related government bidding and others
	<u>₩ 1,075,245</u>	<u>₩ 446,261</u>	

(*1) Can only be used for the purpose of carrying out specific national R&D tasks.

(*2) Deposits for Price Return Swap signed at the time of shares disposals of Doosan Bobcat Inc.

6. Short-term and long-term investment securities

Details of short-term and long-term investment securities as of December 31, 2021 and 2020 are as follows (Korean won in millions):

		December 31, 2021	December 31, 2020
Short-term investment securities	Financial assets at amortized cost	₩ 107	₩ 178,177
	Financial assets (designated) at fair value through OCI	-	158,702
	Financial assets at fair value through profit or loss	<u>197,197</u>	<u>271,760</u>
		197,304	608,639
Long-term investment securities (*1)	Financial assets at amortized cost	-	15,332
	Financial assets (designated) at fair value through OCI	90,884	70,370
	Financial assets at fair value through profit or loss	<u>417,584</u>	<u>238,431</u>
		508,468	324,133
		<u>₩ 705,772</u>	<u>₩ 932,772</u>

(*1) As of December 31, 2021, some of the long-term investment securities are provided as collateral for project financing (see Note 33).

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

6. Short-term and long-term investment securities (cont'd)

Short-term and long-term investment securities as of December 31, 2021 and 2020 are as follows (Korean won in millions):

			December 31, 2021	December 31, 2020
Financial assets at amortized cost	Beneficiary certificates	NewBestDM 4th Co., Ltd.	₩ -	₩ 79,974
	Debt securities	Government and public bonds and others	107	113,535
			107	193,509
Financial assets (designated) at fair value through OCI	Marketable equity securities	Preferred shares of Solus Advanced Materials Co., Ltd. and others (*1)	26,218	19,429
	Non-marketable equity securities	Sosius-Well to Sea Investment 2nd Private Equity Funds for Corporate Financial Stability and others	64,666	50,941
	Debt securities	ABSTB	-	158,702
			90,884	229,072
Financial assets at fair value through profit or loss	Marketable equity securities	Woori Financial Group Inc. and others	10,196	7,924
	Non-marketable equity securities	SiO2 Medical Products, Inc. and others (*2)	196,372	63,262
	Contributions	Construction Guarantee Cooperative and others	126,378	142,270
	Beneficiary certificates	Emerald Technology Ventures and others	175,571	293,835
	Debt securities	Valuegrowth Co., Ltd. and others (*3)	106,264	2,900
			614,781	510,191
			₩ 705,772	₩ 932,772

(*1) Some of these equity securities were provided as collateral to Korea Development Bank and Korea Exim Bank as of December 31, 2021 (see Note 33).

(*2) The Company acquired convertible preferred shares issued by SiO2 Medical Products, Inc. during the year ended December 31, 2021. Even though the Company has significant influence on the Board of Directors of the investee, shares acquired are classified as financial assets measured at fair value through profit or loss in accordance with KIFRS 1109, as the existing ownership, in substance, does not currently give it access to returns associated with ownership interests.

(*3) Some of the debt securities were provided as collateral to Kodit 2020 the 9th Securitization Specialty Inc and others as of December 31, 2021.

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

	2021						
	Beginning balance	Acquisition	Disposal	Valuation	Others (*1)	Ending balance	
Financial assets (designated) at fair value through OCI	₩ 229,072	₩ 5,406	₩ (275,959)	₩ 23,476	₩ 108,889	₩ 90,884	
Financial assets at fair value through profit or loss	510,191	284,408	(183,343)	38,353	(34,828)	614,781	
	₩ 739,263	₩ 289,814	₩ (459,302)	₩ 61,829	₩ 74,061	₩ 705,665	

(*1) Changes due to exchange rate differences.

6. Short-term and long-term investment securities (cont'd)

		2020					
	Beginning balance	Acquisition	Disposal (*1, 2)	Valuation	Changes in scope of consolidation (see Note 39)	Others	Ending balance
Financial assets (designated) at fair value through OCI (*1, 2)	₩ 296,235	₩ 260,520	₩ (905,165)	₩ 578,307	₩ -	₩ (825)	₩ 229,072
Financial assets at fair value through profit or loss	212,045	911,697	(692,937)	64,944	9,376	5,066	510,191
	<u>₩ 508,280</u>	<u>₩ 1,172,217</u>	<u>₩ (1,598,102)</u>	<u>₩ 643,251</u>	<u>₩ 9,376</u>	<u>₩ 4,241</u>	<u>₩ 739,263</u>

(*1) On December 14, 2020, Solus Advanced Materials Co., Ltd.'s (formerly, Doosan Solus Co., Ltd.) ordinary shares (5,521,220 shares) held by the Company was sold to Sky Lake Long-term Strategic Investment Co., Ltd. (disposal amount: ₩237,035 million). As of the date of disposal, the fair value as of the disposal date was ₩277,717 million. The accumulated gain on valuation of financial assets at fair value through OCI of ₩145,620 million, which was recognized in accumulated other comprehensive income, was reclassified to retained earnings.

(*2) On November 26, 2020, as the Company obtained control over DFC, the ordinary and preferred shares of DFC held by the Company were derecognized from the consolidated financial statements (see Note 39). On the date of derecognition, the fair value of the ordinary and preferred shares was ₩501,079 million. As of the date of derecognition, the accumulated gain on valuation of financial assets at fair value through OCI of ₩300,379 million, which was recognized in accumulated other comprehensive income, was reclassified to retained earnings.

7. Trade and other receivables

Details of trade and other receivables as of December 31, 2021 and 2020 are as follows (Korean won in millions):

		December 31, 2021			
	Gross amount	Present value discount	Provision for impairment	Book value	
Current:					
Trade receivables	₩ 1,423,486	₩ (14)	₩ (223,265)	₩ 1,200,207	
Non-trade receivables	291,937	-	(82,657)	209,280	
Accrued income	36,930	-	(12,588)	24,342	
Short-term loans	138,076	-	(74,805)	63,271	
Current portion of long-term Financial lease receivables	2,456	(217)	-	2,239	
	<u>₩ 1,892,885</u>	<u>₩ (231)</u>	<u>₩ (393,315)</u>	<u>₩ 1,499,339</u>	
		December 31, 2021			
	Gross amount	Present value discount	Provision for impairment	Book value	
Non-current:					
Trade receivables	₩ -	₩ -	₩ -	₩ -	
Non-trade receivables	21,802	(1,553)	(1,142)	19,107	
Long-term loans	484,834	-	(438,789)	46,045	
Financial lease receivables	3,066	(785)	-	2,281	
	<u>₩ 509,702</u>	<u>₩ (2,338)</u>	<u>₩ (439,931)</u>	<u>₩ 67,433</u>	

7. Trade and other receivables (cont'd)

		December 31, 2020			
		Gross amount	Present value discount	Provision for impairment	Book value
Current:					
Trade receivables	₩	3,466,907	₩ (14,435)	₩ (1,196,941)	₩ 2,255,531
Non-trade receivables		476,503	-	(206,698)	269,805
Accrued income		120,402	-	(73,915)	46,487
Short-term loans		311,058	-	(160,488)	150,570
Current portion of long-term Financial lease receivables		2,621	(354)	-	2,267
	₩	4,377,491	₩ (14,789)	₩ (1,638,042)	₩ 2,724,660

		December 31, 2020			
		Gross amount	Present value discount	Provision for impairment	Book value
Non-current:					
Trade receivables	₩	5,062	₩ (37)	₩ (56)	₩ 4,969
Non-trade receivables		12,975	(341)	(5,906)	6,728
Long-term loans		1,395,526	(49,172)	(1,114,328)	232,026
Financial lease receivables		6,798	(1,002)	-	5,796
	₩	1,420,361	₩ (50,552)	₩ (1,120,290)	₩ 249,519

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

		2021				
		Beginning balance	Provision for impaired receivables (reversal)	Write off	Others (*1)	Ending balance
Current:						
Trade receivables	₩	1,196,941	₩ 14,725	₩ (2,879)	₩ (985,522)	₩ 223,265
Non-trade receivables		206,698	6,188	(15,138)	(115,091)	82,657
Accrued income		73,915	529	(10,528)	(51,328)	12,588
Short-term loans		160,488	4,461	(22,047)	(68,097)	74,805
Non-current:						
Trade receivables		56	(33)	(7)	(16)	-
Non-trade receivables		5,906	1,508	-	(6,272)	1,142
Long-term loans		1,114,328	35,568	(143,874)	(567,233)	438,789
	₩	2,758,332	₩ 62,946	₩ (194,473)	₩ (1,793,559)	₩ 833,246

(*1) Changes are caused by transfer to current, non-current, changes in scope of consolidation and foreign exchange difference and others.

7. Trade and other receivables (cont'd)

	2020				
	Beginning balance	Provision for impaired receivables (reversal)	Write off	Others (*1)	Ending balance
Current:					
Trade receivables	₩ 1,254,704	₩ 23,989	₩ (61,731)	₩ (20,021)	₩ 1,196,941
Non-trade receivables	229,780	(50,593)	(50,309)	77,820	206,698
Accrued income	32,020	31,707	(341)	10,529	73,915
Short-term loans	143,838	51,150	(316)	(34,184)	160,488
Non-current:					
Trade receivables	237	-	-	(181)	56
Non-trade receivables	8,934	47	-	(3,075)	5,906
Long-term loans	1,092,158	145,902	(94,765)	(28,967)	1,114,328
	<u>₩ 2,761,671</u>	<u>₩ 202,202</u>	<u>₩ (207,462)</u>	<u>₩ 1,921</u>	<u>₩ 2,758,332</u>

(*1) Changes are caused by transfer to current, non-current, changes in scope of consolidation and foreign exchange difference and others.

Impairment loss (reversal of impairment loss) on impaired trade receivables is included in selling and administrative expenses in the consolidated statements of income, and that on receivables other than impaired trade receivables is included in other non-operating expenses (income).

8. Inventories

Inventories as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021			December 31, 2020		
	Acquisition cost	Valuation allowance	Book value	Acquisition cost	Valuation allowance	Book value
Merchandises	₩ 206,967	₩ (11,252)	₩ 195,715	₩ 347,062	₩ (28,879)	₩ 318,183
Finished goods	461,135	(49,793)	411,342	604,349	(43,480)	560,869
Work in process	369,098	(10,641)	358,457	428,388	(11,313)	417,075
Raw materials	758,795	(31,143)	727,652	792,973	(41,767)	751,206
Materials in transit	308,197	-	308,197	345,133	-	345,133
Supplies	28,640	(2,509)	26,131	27,961	(2,603)	25,358
Others	380	-	380	4,127	-	4,127
	<u>₩ 2,133,212</u>	<u>₩ (105,338)</u>	<u>₩ 2,027,874</u>	<u>₩ 2,549,993</u>	<u>₩ (128,042)</u>	<u>₩ 2,421,951</u>

The amount of write-down of inventories recognized is ₩15,009 million and ₩(-)4,626 million for the years ended December 31, 2021 and 2020, respectively.

9. Derivatives

9.1 Details of derivatives and hedge accounting

Derivative contracts	Purpose	Description
Currency forward contracts	Cash flow hedge	The Group designated the currency forward contracts as hedging instrument to hedge the cash flow risk arising from changes in foreign currency of forecast sales
	Fair value hedge	The Group designated the currency forward contracts as hedging instrument to hedge the risk of exchange rate fluctuations for commitment
	Held for trading	The Group designated the currency forward contracts without hedge accounting as hedging instrument to hedge the cash flow risk
Interest rate swap	Cash flow hedge	The Group designated the interest rate swap as hedging instrument to hedge the cash flow risk arising from changes in interest rate
Currency swap	Cash flow hedge	The Group designated the currency swap as hedging instrument to hedge the future cash flow risk
	Held for trading	The Group designated the currency swap without hedge accounting as hedging instrument to hedge the risk of cash flow fluctuations due to exchange rate fluctuations to pay a fixed interest rate and receive a fixed interest rate in foreign currency on the future interest payment date and principal payment date
Borrowings in foreign currency	Fair value hedge	The Group designated the borrowings in foreign currency as hedging instrument to hedge the risk of change in fair value for firm commitment
Equity forward contracts	Fair value hedge	The Group designated the equity forward contracts as hedging instrument to hedge the fair value risk arising from changes in the fair value of financial assets at fair value through OCI
Others	Held for trading	Changes in fair value are recognized in profit or loss

9.2 Details of gain (loss) on valuation of derivatives

Details of gain (loss) on valuation of derivatives as of December 31, 2021 and 2020 are as follows (Korean won in millions, foreign currency in thousands):

December 31, 2021								
	Buy		Sell		Assets (liabilities)	Gain (loss)	Accumulated other comprehensive income (*1)	Firm commitment assets (liabilities) (*2)
	Currency	Amount	Currency	Amount				
Currency forward contract	KRW	2,235,688	USD	1,966,091	₩ (96,045)	₩ (125,891)	₩ (1,924)	₩ 56,760
	KRW	225,045	EUR	164,330	2,103	1,689	74	(1,061)
	KRW	127,630	JPY	11,211,370	9,055	1,906	375	(4,352)
	KRW	213,437	Other foreign currencies		(4,956)	(4,772)	(246)	2,175
	USD	366,101	KRW	423,902	10,639	15,698	3,561	(2,296)
	EUR	259,550	KRW	354,471	(1,401)	(1,213)	1,112	(17)
	JPY	13,533,707	KRW	165,237	(22,108)	(1,042)	(6,057)	117
	Other foreign currencies		KRW	79,971	1,495	246	1,307	(117)
	Other foreign currencies		Other foreign currencies		(16,796)	46,044	1,561	(261)
Borrowings in foreign currency (*3)	KRW	-	USD	-	-	-	-	49
Currency swap					13,355	31,772	(332)	-
Stock price swap (*4)					(106,968)	(106,968)	-	-
					₩ (211,627)	₩ (142,531)	₩ (569)	₩ 50,997

(*1) The amounts are gain (loss) on valuation of derivatives designated as cash flow hedges before income tax effect.

(*2) The Group recognizes ₩66,770 million and ₩15,773 million for firm commitment assets and liabilities, respectively, considering the amount adjusted for the current year sales in accordance with the application of fair value hedge accounting.

(*3) In order to avoid risk of fair value changes in firm commitment, the Group designated foreign currency long-term borrowings as hedging instruments.

(*4) DHC, the Group's subsidiary, signed the Price Return Swap contract to exchange profits from changes in prices of shares of DBI.

9.2 Details of gain (loss) on valuation of derivatives (cont'd)

December 31, 2020								
	Buy		Sell		Assets (liabilities)	Gain (loss)	Accumulated other comprehensive income (*1)	Firm commitment assets (liabilities) (*2)
	Currency	Amount	Currency	Amount				
Currency forward contract	KRW	2,002,220	USD	1,787,452	₩ 53,978	₩ 73,683	₩ 1,941	₩ (22,858)
	KRW	296,663	EUR	218,520	1,815	888	(76)	(655)
	KRW	132,388	JPY	11,468,220	9,253	2,919	1,000	(3,335)
	KRW	50,479	Other foreign currencies		2,513	2,430	62	(1,263)
	USD	428,842	KRW	482,949	(15,722)	(15,116)	(10,586)	1,906
	EUR	264,230	KRW	357,794	(184)	(1,364)	4,511	44
	JPY	14,548,410	KRW	180,952	(24,613)	(2,705)	(6,381)	130
	Other foreign currencies		KRW	54,232	(2,337)	(13)	(2,272)	7
	Other foreign currencies		Other foreign currencies		(40,768)	1,305	1,703	(328)
Borrowings in foreign currency (*3)	KRW	-	USD	-	-	-	-	36
Interest rate swap					(832)	-	(832)	-
Currency swap					(43,774)	-	6,536	-
Stock price swap (*4)					24,613	24,613	-	-
Stock forward contracts (*5)					-	6,248	-	-
					₩ (36,058)	₩ 92,888	₩ (4,394)	₩ (26,316)

(*1) The amounts are gain (loss) on valuation of derivatives designated as cash flow hedges before income tax effect.

(*2) The Group recognizes ₩15,719 million and ₩42,035 million for firm commitment assets and liabilities, respectively, considering the amount adjusted for the previous year sales in accordance with the application of fair value hedge accounting.

(*3) In order to avoid risk of fair value changes in firm commitment, the Group designated foreign currency long-term borrowings as hedging instruments.

(*4) DHC, the Group's subsidiary, signed the Price Return Swap contract to exchange profits from changes in prices of shares of DBI.

(*5) Apart from gain (loss) on valuation of derivatives, a loss on valuation of fair value hedge derivatives of ₩34,024 million arising from stock forward contracts was recognized as other comprehensive income in the consolidated statements of comprehensive income. During the previous reporting period, the entire amount of accumulated other comprehensive income was reclassified to retained earnings as stock forward contracts and hedged item were derecognized from the consolidated statement of financial position due to their maturity.

9.3 Stock options granted to financial investors

DHC, the Group's subsidiary, acquired preferred shares of Nuscale Power LLC with Nuscale Korea LLC and others("financial investors"). DHC signed a put back option contract, in which can be exercised when contract conditions, such as design certifications and others, are not satisfied, for the shares(USD 74,800 thousand) acquired by external financial investors.

The Group classifies the put back option contract as derivatives, and there is no amount recognized as profit or loss on valuation of derivatives or derivative liabilities.

10. Financial instruments by category

Categories of financial instruments as of December 31, 2021 and 2020 are as follows (Korean won in millions):

December 31, 2021						
	Financial assets at fair value through profit or loss	Financial assets (designated) at fair value through OCI	Other financial assets (*1)	Financial assets at amortized cost	Book value	Fair value
Cash and cash equivalents	₩ -	₩ -	₩ -	₩ 2,235,362	₩ 2,235,362	₩ 2,235,362
Short-term and long-term financial instruments	-	-	-	1,104,109	1,104,109	1,104,109
Short-term and long-term investment securities	614,781	90,884	-	107	705,772	705,772
Trade and other receivables	-	20,496	-	1,546,276	1,566,772	1,566,772
Derivative assets	17,280	-	21,882	-	39,162	39,162
Deposits	-	-	-	394,833	394,833	394,833
Assets held for sales	-	-	148	107,341	107,489	107,489
	<u>₩ 632,061</u>	<u>₩ 111,380</u>	<u>₩ 22,030</u>	<u>₩ 5,388,027</u>	<u>₩ 6,153,498</u>	<u>₩ 6,153,498</u>

December 31, 2021					
	Financial liabilities at fair value through profit or loss	Other financial liabilities (*1)	Financial liabilities at amortized cost	Book value	Fair value
Trade and other payables	₩ -	₩ -	₩ 3,519,341	₩ 3,519,341	₩ 3,519,341
Borrowings, bonds and asset-backed loans	-	-	8,671,456	8,671,456	8,671,456
Lease liabilities	-	-	691,012	691,012	691,012
Derivative liabilities	122,009	128,778	-	250,787	250,787
Financial guarantee liabilities	-	4,019	-	4,019	4,019
Liabilities held for sale	-	23	204,240	204,263	204,263
	<u>₩ 122,009</u>	<u>₩ 132,820</u>	<u>₩ 13,086,049</u>	<u>₩ 13,340,878</u>	<u>₩ 13,340,878</u>

(*1) Include derivative assets designated as effective hedging instruments.

10. Financial instruments by category (cont'd)

December 31, 2020						
	Financial assets at fair value through profit or loss	Financial assets (designated) at fair value through OCI	Other financial assets (*1)	Financial assets at amortized cost	Book value	Fair value
Cash and cash equivalents	₩ -	₩ -	₩ -	₩ 2,707,379	₩ 2,707,379	₩ 2,707,379
Short-term and long-term financial instruments	9,000	-	-	488,711	497,711	497,711
Short-term and long-term investment securities	510,191	229,072	-	193,509	932,772	932,772
Trade and other receivables	-	29,410	-	2,944,769	2,974,179	2,974,179
Derivative assets	30,728	-	65,590	-	96,318	96,318
Deposits	-	-	-	495,024	495,024	495,024
Assets held for sale	870	-	-	162,324	163,194	163,194
	<u>₩ 550,789</u>	<u>₩ 258,482</u>	<u>₩ 65,590</u>	<u>₩ 6,991,716</u>	<u>₩ 7,866,577</u>	<u>₩ 7,866,577</u>

December 31, 2020						
	Financial liabilities at fair value through profit or loss	Other financial liabilities (*1)	Financial liabilities at amortized cost	Book value	Fair value	
Trade and other payables	₩ -	₩ -	₩ 4,176,891	₩ 4,176,891	₩ 4,176,891	
Borrowings, bonds and asset-backed loans	-	-	12,330,666	12,330,666	12,330,666	
Lease liabilities	-	-	542,983	542,983	542,983	
Derivative liabilities	20,260	112,116	-	132,376	132,376	
Financial guarantee liabilities	-	26,406	-	26,406	26,406	
Liabilities held for sale	-	-	129,280	129,280	129,280	
	<u>₩ 20,260</u>	<u>₩ 138,522</u>	<u>₩ 17,179,820</u>	<u>₩ 17,338,602</u>	<u>₩ 17,338,602</u>	

(*1) Include derivative assets designated as effective hedging instruments.

Fair value measurements of financial instruments by fair value hierarchy levels as of December 31, 2021 and 2020 are as follows (Korean won in millions):

December 31, 2021				
	Level 1	Level 2	Level 3	Total
Financial assets:				
Financial assets (designated) at fair value through OCI	₩ 26,218	₩ 20,496	₩ 64,666	₩ 111,380
Financial assets at fair value through profit or loss	10,196	217,657	404,208	632,061
Other financial assets	-	21,882	-	21,882
	<u>36,414</u>	<u>260,035</u>	<u>468,874</u>	<u>765,323</u>
Financial liabilities:				
Financial liabilities at fair value through profit or loss	-	122,009	-	122,009
Other financial liabilities	-	128,779	4,019	132,798
	<u>-</u>	<u>250,788</u>	<u>4,019</u>	<u>254,807</u>
	<u>₩ 36,414</u>	<u>₩ 9,247</u>	<u>₩ 464,855</u>	<u>₩ 510,516</u>

10. Financial instruments by category (cont'd)

	December 31, 2020			
	Level 1	Level 2	Level 3	Total
Financial assets:				
Financial assets (designated)				
at fair value through OCI	₩ 19,429	₩ 188,112	₩ 50,941	₩ 258,482
Financial assets at fair value				
through profit or loss	7,924	303,705	239,160	550,789
Other financial assets	-	65,590	-	65,590
	27,353	557,407	290,101	874,861
Financial liabilities:				
Financial liabilities at fair value				
through profit or loss	-	20,260	-	20,260
Other financial liabilities	-	112,116	-	112,116
	-	132,376	-	132,376
	₩ 27,353	₩ 425,031	₩ 290,101	₩ 742,485

The above table does not include information for those financial instruments, which are not measured at fair value because the carrying amount approximates fair value.

The Group uses the following hierarchy for determining and disclosing the fair value of financial instruments by valuation technique. The level of hierarchy of fair value is as follows:

	Significance of input factor
Level 1:	Unadjusted quoted prices in active markets for identical assets or liabilities
Level 2:	Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly
Level 3:	Inputs that are not based on observable market data (unobservable inputs)

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

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 for fair value of an instrument are observable, the instrument is included in Level 2.

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

Valuation techniques and inputs used for derivatives designated as hedging instruments (Level 2) are as follows:

Valuation technique	Observable inputs	Explanation of input parameters
Discounted cash flow method	Forward exchange rate	It is based on forward exchange rate, disclosed on the market that remaining year is the same till maturity of forward contracts. If the forward exchange rate is not disclosed on the market, it is calculated by using interpolation method.
	Discount rate	It is determined by using yield curve that is disclosed at the end of the reporting year.

10. Financial instruments by category (cont'd)

Assumptions used in the valuation of financial assets at fair value that have been categorized into Level 3 as of December 31, 2021 are as follows:

Financial assets	Valuation techniques	Discount rate	Remarks
Incheon-Gimpo Expressway Co., Ltd.	Expected selling price estimation method	-	Expected selling price
Gyeonggi East-West Road Corporation Co., Ltd.	Dividend discount model	5.35%	Expected dividend cash flow for each financial period
Korea Exim Bank	Expected selling price estimation method	-	Expected selling price
Public Carbon Fund	Expected selling price estimation method	-	Expected selling price
Construction Guarantee Cooperative	Expected selling price estimation method	-	Expected selling price
Machinery Financial Cooperative	Expected selling price estimation method	-	Expected selling price
Plant & Mechanical Contractors Financial Cooperative	Expected selling price estimation method	-	Expected selling price
Engineering Guarantee Insurance	Expected selling price estimation method	-	Expected selling price
Gyeongnam-GNTECH Creative Economy Innovation Fund	Net asset value assessment	-	Net asset value
Emerald Technology Ventures	Expected selling price estimation method	-	Return rate on investment
AI Asilah Desalination Company	Net asset value assessment	-	Net asset value
NuScale Power LLC	Net asset value assessment	-	Net asset value
Valuegrowth Co., Ltd.	Dividend discount model	7.74%	Expected dividend cash flow for each financial period
Others	Expected selling price estimation method and others	-	Expected selling price and others

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

10. Financial instruments by category (cont'd)

In addition, changes in the carrying amount of financial assets at fair value through profit or loss and financial assets (designated) at fair value through OCI that have been categorized into Level 3 of fair value hierarchy for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

		2021						
		Total comprehensive income (loss)						
		January 1, 2021	Profit or loss	Other comprehensive income (loss)	Buy	Sell	Others	December 31, 2021
Financial assets (designated) at fair value through OCI	₩	50,941	₩ -	₩ 16,641	₩ 5,406	₩ (13,945)	₩ 5,623	₩ 64,666
Financial assets at fair value through profit or loss		239,160	26,814	-	177,786	(2,475)	(37,077)	404,208
	₩	290,101	₩ 26,814	₩ 16,641	₩ 183,192	₩ (16,420)	₩ (31,454)	₩ 468,874

		2020						
		Total comprehensive income (loss)						
		January 1, 2020	Profit or loss	Other comprehensive income (loss)	Buy	Sell	Reclassification	December 31, 2020
Financial assets (designated) at fair value through OCI	₩	6,359	₩ -	₩ (4)	₩ 63,028	₩ (18,441)	₩ -	₩ 50,941
Financial assets at fair value through profit or loss		202,456	(11,419)	-	53,342	(10,102)	4,500	239,160
	₩	208,815	₩ (11,419)	₩ (4)	₩ 116,370	₩ (28,543)	₩ 4,500	₩ 290,101

Comprehensive income (loss) by categories of financial instruments for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

		2021						
		Profit or loss (*1)						
		Interest	Dividend	Financial guarantee	Valuation gain/loss (except for derivatives)	Impairment and reversal		
						Impairment loss	Other impairment	Other comprehensive income (*2)
Financial assets:								
Financial assets at amortized cost	₩	50,976	₩ -	₩ -	₩ -	₩ (65,202)	₩ -	₩ -
Financial assets (designated) at fair value through OCI		6,514	590	-	-	-	-	28,220
Financial assets at fair value through profit or loss		1,931	1,344	-	16,374	-	-	-
Other financial assets		-	-	-	-	-	-	-
	₩	59,421	₩ 1,934	₩ -	₩ 16,374	₩ (65,202)	₩ -	₩ 28,220
Financial liabilities:								
Financial liabilities at amortized cost	₩	(454,954)	₩ -	₩ -	₩ -	₩ -	₩ -	₩ -
Others		-	-	(2,885)	-	-	-	-
	₩	(454,954)	₩ -	₩ (2,885)	₩ -	₩ -	₩ -	₩ -

(*1) Profit or loss includes the amounts classified as profit or loss from discontinued operations in consolidated statement of profit or loss.

(*2) Other comprehensive income is before income tax effect.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

10. Financial instruments by category (cont'd)

	2020							
	Profit or loss (*1)							Other comprehensive income (*2)
	Interest	Dividend	Financial guarantee	Valuation gain/loss (except for derivatives)	Impairment loss	Other impairment	Disposal	
Financial assets:								
Financial assets at amortized cost	₩ 46,270	₩ -	₩ -	₩ -	₩ (206,467)	₩ -	₩ (19,585)	₩ -
Financial assets (designated) at fair value through OCI	4,829	32	-	-	-	-	(2,033)	578,307
Financial assets at fair value through profit or loss	454	1,287	-	(16,978)	-	-	997	-
Other financial assets	18	-	-	-	-	-	-	-
	<u>₩ 51,571</u>	<u>₩ 1,319</u>	<u>₩ -</u>	<u>₩ (16,978)</u>	<u>₩ (206,467)</u>	<u>₩ -</u>	<u>₩ (20,621)</u>	<u>₩ 578,307</u>
Financial liabilities:								
Financial liabilities at amortized cost	₩ (553,590)	₩ -	₩ -	₩ -	₩ -	₩ -	₩ (54,935)	₩ -
Others	-	-	(5,170)	-	-	-	-	-
	<u>₩ (553,590)</u>	<u>₩ -</u>	<u>₩ (5,170)</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ (54,935)</u>	<u>₩ -</u>

(*1) Profit or loss includes the amounts classified as profit or loss from discontinued operations in consolidated statement of profit or loss.

(*2) Other comprehensive income is before income tax effect.

Apart from the above financial instruments, comprehensive income(loss) by derivatives for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	2021			2020		
	Profit or loss		Other comprehensive income (*1)	Profit or loss		Other comprehensive loss (*1)
	Valuation	Disposal		Valuation	Disposal	
Derivatives held for trading	₩ (75,353)	₩ 223,232	₩ -	₩ 27,373	₩ (14,989)	₩ -
Derivatives designated as fair value hedges	(134,621)	(2,562)	-	35,267	(3,054)	(44,887)
Derivatives designated as cash flow hedges	67,827	(53,617)	10,993	30,247	(2,048)	(11,536)
	<u>₩ (142,147)</u>	<u>₩ 167,053</u>	<u>₩ 10,993</u>	<u>₩ 92,887</u>	<u>₩ (20,091)</u>	<u>₩ (56,423)</u>

(*1) Other comprehensive income is before income tax effect.

In addition, most of the foreign exchange differences (gain (loss) on foreign currency translations or transactions) from foreign currency transactions other than derivative contracts arise from financial assets (liabilities) at amortized cost.

10. Financial instruments by category (cont'd)

Financial assets and liabilities subject to an enforceable master-netting arrangement or similar agreement as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021			December 31, 2020		
	Gross recognized financial instruments	Gross financial instruments set off	Net amounts presented in the statements of financial position	Gross recognized financial instruments	Gross financial instruments set off	Net amounts presented in the statements of financial position
Financial assets:						
Trade receivables	₩ -	₩ -	₩ -	₩ 6,423	₩ (2,954)	₩ 3,469
Other receivables	-	-	-	36	(36)	-
Derivative assets	25,624	(11,804)	13,820	79,580	(19,332)	60,248
	<u>₩ 25,624</u>	<u>₩ (11,804)</u>	<u>₩ 13,820</u>	<u>₩ 86,039</u>	<u>₩ (22,322)</u>	<u>₩ 63,717</u>
Financial liabilities:						
Trade payables	₩ -	₩ -	₩ -	₩ 25,531	₩ (2,990)	₩ 22,541
Derivative liabilities	124,670	(11,804)	112,866	59,929	(19,332)	40,597
	<u>₩ 124,670</u>	<u>₩ (11,804)</u>	<u>₩ 112,866</u>	<u>₩ 85,460</u>	<u>₩ (22,322)</u>	<u>₩ 63,138</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

11. Investments in associates and joint ventures

Details of investments in associates and joint ventures as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	Location	Ownership interests (%)	Acquisition cost		Book value	
			December 31, 2021	December 31, 2020	December 31, 2021	December 31, 2020
Associates:						
The HS-City Expressway (*2, 4)	Korea	27.29	₩ 9,578	₩ 9,578	₩ -	₩ 3,081
Samcheok Blue Power Co., Ltd. (*1, 3)	Korea	9.00	43,568	43,568	34,764	38,086
Daejung Offshore Wind Power Co., Ltd.	Korea	26.65	3,196	3,196	2,482	2,771
Hychangwon Co., Ltd. (*2, 5)	Korea	21.10	5,000	3,000	4,995	2,810
ReCarbon, Inc. (*3, 8)	USA	11.34	8,151	8,151	7,870	8,052
New Bundang Line Co., Ltd. (*10)	Korea	-	-	62,552	-	-
Kyunggi Railroad Co., Ltd. (*10)	Korea	-	-	7,067	-	-
Neo Trans Co., Ltd. (*10)	Korea	-	-	43	-	21,883
New Seoul Railroad Co., Ltd. (*10)	Korea	-	-	8,794	-	6,826
KIAMCO Kyunggi Railway Investment Private Property Investment Trust (*10)	Korea	-	-	28,167	-	-
Incheon Fuel Cell Co., Ltd. (*10)	Korea	-	-	4,700	-	2,999
Bit Goeul Echo Energy Co., Ltd. (*10)	Korea	-	-	-	-	-
Daesan Green Energy Co., Ltd. (*3, 7)	Korea	10.00	5,100	5,100	2,883	3,085
DEC (*13, 14, 15)	Korea	46.35	317,666	-	317,666	-
Mastern Professional Investment Type Private Security Investment Trust No.98						
Bundang Doosan Tower Reit Co., Ltd.(*3, 6)	Korea	25.45	70,000	70,000	71,983	69,598
The Weve Holdings Ltd.(*12, 13)	Korea	18.60	30,000	-	26,296	-
Protera SAS (*3, 8)	Korea	46.50	120,000	-	120,000	-
Stathera IP Holding Inc. (*3)	France	5.76	591	591	1,517	637
PT. SEGARA AKASA	Canada	15.82	2,875	2,875	3,975	2,839
Prestolite Asia Ltd.	Indonesia	30.02	71	71	50	58
Wise Fashion Co., Ltd. (*3)	Korea	32.31	468	468	2,882	2,717
KDDI Korea Corporation (*3)	Korea	19.34	3,018	3,018	1,945	2,158
Ainstein AI, Inc. (*3)	Korea	17.63	4,176	4,176	3,254	3,655
StructionSite Inc. (*3, 5)	USA	9.09	2,360	2,360	2,291	2,176
Potenit Co., Ltd. (*9)	USA	19.19	7,007	5,310	10,528	4,760
SiO2 Medical Products, Inc. (*3, 11)	Korea	-	-	5,334	-	-
	USA	8.35	-	-	-	-
			632,825	278,119	615,381	178,191
Joint venture:						
Sichuan Kelun-Doosan Biotechnology Company Limited.	China	50.00	2,526	2,526	4,622	3,453
Doosan Babcock BlackCat W.L.L (*4)	Qatar	49.00	243	243	-	640
The Zenith Holdings LLC (*13, 14, 15)	Korea	31.75	120,000	-	120,000	-
Tianjin Lovol Doosan Engine Co., Ltd. (*9)	China	-	-	28,163	-	16,327
Others (Doosan PSI LLC and others) (*9)	USA etc	-	-	718	-	202
			122,769	31,650	124,622	20,622
			₩ 755,594	₩ 309,769	₩ 740,003	₩ 198,813

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

(*2) The Group's investments in investee have been pledged as collateral for the investee's project financing (see Note 33).

(*3) Although the Group has less than 20% of shares in the investee, it is classified as an associate since the Group can exercise voting rights in its Board of Directors' meeting.

(*4) The investee was classified as assets held for sale during the year ended December 31, 2021. (see Note 38).

(*5) The Group additionally acquired the investee during the year ended December 31, 2021.

(*6) The Group lost control over the investee due to the decrease in ownership interests during the year ended December 31, 2021. Accordingly, it was excluded from the scope of consolidation and classified as investments in associates.

11. Investments in associates and joint ventures (cont'd)

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

(*8) The proportion of ownership interests held by the Group was decreased due to unequal paid-in capital increase during the year ended December 31, 2021.

(*9) Due to the sale of DI, the investees were excluded from investments in associates and joint ventures during the year ended December 31, 2021.

(*10) As DEC was excluded from the scope of consolidation during the year ended December 31, 2021, the investees were excluded from the investments in associates.

(*11) The Company acquired convertible preferred shares issued by SiO2 Medical Products, Inc. during the year ended December 31, 2021. Even though the Company has significant influence on the Board of Directors of the investee, shares acquired are classified as financial assets measured at fair value through profit or loss in accordance with KIFRS 1109, as the existing ownership, in substance, does not currently give it access to returns associated with ownership interests(see Note 6).

(*12) For the year ended December 31, 2021, Doosan Property Co., Ltd. (formerly, DBC Co., Ltd.), a subsidiary, invested ₩120,000 million as a second-class member in the Weve Holdings Ltd. Meanwhile, six management-participating private equity investment organizations, external investors including the 2018 QCP 13 Private Equity Investment Limited Partnership, invested ₩138,000 million to the investee as the first member of the Weve Holdings Ltd.

(*13) For the year ended December 31, 2021, DHC, the Group's subsidiary, made investments in-kind of 82,005,761 ordinary shares and 5,649,462 convertible preferred shares of DEC to The Zenith Holdings LLC. as second-class member. Meanwhile, Weve Holdings Ltd., an associate, invested ₩258,000 million to the investee as the first member to the investee.

(*14) As of December 31, 2021, DHC holds 218,450,678 ordinary shares and 15,049,293 convertible preferred shares of DEC.

(*15) As of December 31, 2021, DHC's investments in investee are provided as collateral for DHC's liabilities (see Note 33).

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

11. Investments in associates and joint ventures (cont'd)

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

	2021						
	Beginning balance	Acquisition (disposal)	Dividends	Profit or loss in equity method	Equity changes in equity method	Other (*1)	Ending balance
Associates:							
The HS-City Expressway (*4)	₩ 3,081	₩ -	₩ -	₩ (258)	₩ -	₩ (2,823)	₩ -
Samcheok Blue Power Co., Ltd.	38,086	-	-	(3,322)	-	-	34,764
Daejung Offshore Wind Power Co., Ltd.	2,771	-	-	(289)	-	-	2,482
Hychangwon Co., Ltd. (*2)	2,810	2,000	-	185	-	-	4,995
ReCarbon, Inc.	8,052	-	-	688	(870)	-	7,870
New Bundang Line Co., Ltd. (*3, 4)	-	-	-	-	-	-	-
Kyunggi Railroad Co., Ltd. (*3, 4)	-	-	-	-	-	-	-
Neo Trans Co., Ltd. (*4)	21,883	-	-	4,314	-	(26,197)	-
New Seoul Railroad Co., Ltd. (*4)	6,826	-	-	(635)	-	(6,191)	-
KIAMCO Kyunggi Railway Investment Private Property Investment Trust (*4)	-	-	-	-	-	-	-
Incheon Fuel Cell Co., Ltd. (*4)	2,999	-	-	(331)	-	(2,668)	-
Bit Goeul Echo Energy Co., Ltd. (*4)	-	3,480	-	-	-	(3,480)	-
Daesan Green Energy Co., Ltd. DEC	3,085	-	-	(202)	-	-	2,883
	-	-	-	-	-	317,666	317,666
Mastern Professional Investment Type Private Security Investment Trust No.98	69,598	-	(4,800)	7,185	-	-	71,983
Bundang Doosan Tower Reit Co., Ltd.	-	30,000	(954)	(2,750)	-	-	26,296
The Weve Holdings Ltd.	-	120,000	-	-	-	-	120,000
Protera SAS	637	-	-	(31)	911	-	1,517
Stathera IP Holding Inc.	2,839	-	-	(413)	1,549	-	3,975
PT. SEGARA AKASA	58	-	-	(12)	4	-	50
Prestolite Asia Ltd.	2,717	-	(23)	188	-	-	2,882
Wise Fashion Co., Ltd.	2,158	-	-	(213)	-	-	1,945
KDDI Korea Corporation	3,655	-	(701)	300	-	-	3,254
Ainstein AI, Inc.	2,176	-	-	(77)	-	192	2,291
StructionSite Inc.	4,760	1,697	-	3,297	-	774	10,528
Potenit Co., Ltd.	-	-	-	-	-	-	-
SiO2 Medical Products, Inc.	-	-	-	-	-	-	-
	178,191	157,177	(6,478)	7,624	1,594	277,273	615,381
Joint venture:							
Sichuan Kelun-Doosan Biotechnology Company Limited	3,453	-	(1,301)	1,750	509	211	4,622
Doosan Babcock BlackCat W.L.L	640	-	-	(331)	-	(309)	-
The Zenith Holdings LLC	-	120,000	-	-	-	-	120,000
Tianjin Lovol Doosan Engine Co., Ltd. (*4)	16,327	-	-	(1,929)	-	(14,398)	-
Others (Doosan PSI LLC and others) (*4)	202	-	-	1,632	-	(1,834)	-
	20,622	120,000	(1,301)	1,122	509	(16,330)	124,622
	₩ 198,813	₩ 277,177	₩ (7,779)	₩ 8,746	₩ 2,103	₩ 260,943	₩ 740,003

(*1) Changes due to exchange rate differences and the scope of consolidation.

(*2) Share of profit (loss) of equity method investees was calculated based on the Group's ownership ratio of 37.04% of ordinary shares.

(*3) An additional share of loss of long-term investments of ₩2,237 million was recognized during the year ended December 31, 2021.

(*4) Share of profit (loss) of associates and joint ventures accounted for using the equity method of the above entities are recognized as discontinued operations.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

11. Investments in associates and joint ventures (cont'd)

	2020						
	Beginning balance	Acquisition (disposal)	Dividends	Profit or loss in equity method	Equity changes in equity method	Other (*1)	Ending balance
Associates:							
The HS-City Expressway Samcheok Blue Power Co., Ltd.	₩ 3,806	₩ -	₩ -	₩ (850)	₩ -	₩ 125	₩ 3,081
Daejung Offshore Wind Power Co., Ltd.	42,961	-	-	(4,873)	(2)	-	38,086
Hychangwon Co., Ltd. (*2)	2,617	369	-	(215)	-	-	2,771
ReCarbon, Inc.	-	3,000	-	(190)	-	-	2,810
New Bundang Line Co., Ltd. (*3)	8,222	-	-	(956)	857	(71)	8,052
Kyunggi Railroad Co., Ltd. (*3)	-	-	-	-	-	-	-
Neo Trans Co., Ltd.	-	-	-	-	-	-	-
New Seoul Railroad Co., Ltd.	21,810	-	-	73	-	-	21,883
KIAMCO Kyunggi Railway Investment Private Property Investment Trust	7,219	-	-	(393)	-	-	6,826
Incheon Fuel Cell Co., Ltd.	-	95	-	(95)	-	-	-
Daesan Green Energy Co., Ltd.	4,439	-	-	(1,438)	(2)	-	2,999
Master Professional Investment Type Private Security Investment Trust No.98	-	-	-	275	-	2,810	3,085
Geaenzymes Co	-	70,000	-	(402)	-	-	69,598
Protera SAS	713	(591)	-	(149)	27	-	-
NewWave #5 Start-up Investment (*4)	-	591	-	38	8	-	637
2010 KIF-Neoplux IT Venture Fund (*4)	85	(6)	(79)	-	-	-	-
KoFC-Neoplux R&D-Biz Creation 2013-1 Venture Capital Fund (*4)	18	(17)	-	(1)	-	-	-
Future Creation Neoplux Investment Partnership (*4)	5,317	(1,435)	-	176	-	(4,058)	-
Neoplux Technology Valuation Investment Fund (*4)	5,259	(456)	-	817	-	(5,620)	-
Neoplux Market Frontier Secondary Fund (*4)	8,584	(1,064)	-	440	-	(7,960)	-
Gyeonggi-Neoplux Superman Fund (*4)	8,105	584	-	(77)	-	(8,612)	-
Shinhan-Neoplux Energy Newbiz Fund (*4)	4,187	918	-	(84)	-	(5,021)	-
New Wave 6th investment fund (*4)	2,799	1,090	-	117	-	(4,006)	-
KTC-NP-Growth Champ 2011-2 PEF (*4)	1,786	2,000	-	375	-	(4,161)	-
Neoplux No.3 Private Equity Fund (*4)	6,011	-	(16)	(1,072)	-	(4,923)	-
Stathera IP Holding Inc.	6,979	2,820	(2)	(182)	-	(9,615)	-
PT. SEGARA AKASA	-	2,875	-	(82)	46	-	2,839
Prestolite Asia LTD.	-	71	-	(10)	(3)	-	58
Wise Fashion Co., Ltd.	2,535	-	-	182	-	-	2,717
KDDI Korea Corporation	2,678	-	-	(520)	-	-	2,158
Others	3,617	-	(20)	58	-	-	3,655
	-	7,670	-	-	-	(734)	6,936
	149,747	88,514	(117)	(9,038)	931	(51,846)	178,191

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

11. Investments in associates and joint ventures (cont'd)

	2020						
	Beginning balance	Acquisition (disposal)	Dividends	Profit or loss in equity method	Equity changes in equity method	Other (*1)	Ending balance
Joint venture:							
Sichuan Kelun-Doosan Biotechnology Company Limited	₩ 4,052	₩ -	₩ (1,911)	₩ 1,368	₩ (56)	₩ -	₩ 3,453
Doosan Babcock BlackCat W.L.L	-	-	-	653	-	(13)	640
Haman Industrial Complex	-	-	-	-	-	-	-
Tianjin Lovol Doosan Engine Co., Ltd.	17,787	2,523	-	(4,217)	-	234	16,327
Others (Doosan PSI LLC and others)	2,288	(2,223)	-	358	-	(221)	202
	24,127	300	(1,911)	(1,838)	(56)	-	20,622
	₩ 173,874	₩ 88,814	₩ (2,028)	₩ (10,876)	₩ 875	₩ (51,846)	₩ 198,813

(*1) Changes due to exchange rate differences and the scope of consolidation.

(*2) Share of profit (loss) of equity method investees was calculated based on the Group's ownership ratio of 50% of ordinary shares.

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

(*4) Share of profit (loss) of associates and joint ventures accounted for using the equity method of the above entities are recognized as discontinued operations.

The condensed financial information of associates and joint ventures as of and for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	2021			
	Total assets	Total liabilities	Sales	Profit (loss) for the year
Associates:				
The HS-City Expressway	₩ 160,818	₩ 150,472	₩ 2,739	₩ (945)
Samcheok Blue Power Co., Ltd.	2,301,783	1,620,752	-	(6,226)
Daejung Offshore Wind Power Co., Ltd.	5,335	1,769	-	(1,082)
Hychangwon Co., Ltd.	62,111	33,640	-	(1,521)
ReCarbon, Inc.	39,487	7,024	3,559	(6,159)
Daesan Green Energy Co., Ltd.	264,617	203,921	88,147	(3,310)
DEC	1,858,901	1,303,488	1,398,624	7,263
Master Professional Investment Type Private Security Investment Trust No.98	889,057	604,003	69,596	28,545
Bundang Doosan Tower Reit Co., Ltd.	679,589	524,371	25,934	2,876
The Weve Holdings Ltd.	1,941,110	1,312,620	-	-
Protera SAS	21,128	1,018	-	(2,955)
Stathera IP Holding Inc.	15,463	3,601	9	(2,609)
PT. SEGARA AKASA	167	-	-	(39)
Prestolite Asia Ltd.	13,492	4,571	8,921	294
Wise Fashion Co., Ltd.	1,242	2,361	16,631	(1,191)
KDDI Korea Corporation	25,278	6,817	34,893	1,708
Ainstein AI, Inc.	2,504	1,402	4,082	(846)
Joint ventures:				
Sichuan Kelun-Doosan Biotechnology Company Limited	14,658	5,414	11,293	3,500
Doosan Babcock BlackCat W.L.L	17,963	17,254	16,459	(653)
The Zenith Holdings LLC	1,958,319	1,312,620	-	-

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

11. Investments in associates and joint ventures (cont'd)

	2020			
	Total assets	Total liabilities	Sales	Profit (loss) for the year
Associates:				
The HS-City Expressway	₩ 163,254	₩ 151,963	₩ 11,320	₩ (3,114)
Samcheok Blue Power Co., Ltd.	1,169,343	700,267	-	(5,994)
Daejung Offshore Wind Power Co., Ltd.	6,282	1,634	-	(824)
Hychangwon Co., Ltd.	24,537	3	-	(378)
ReCarbon, Inc.	14,899	6,530	483	(5,848)
New Bundang Line Co., Ltd.	807,389	999,987	76,427	(56,434)
Kyunggi Railroad Co., Ltd.	613,198	746,790	36,379	(44,024)
Neo Trans Co., Ltd.	68,937	17,879	96,394	171
New Seoul Railroad Co., Ltd.	281,548	231,948	-	(2,862)
KIAMCO Kyunggi Railway Investment Private Property Investment Trust	78,718	16	-	4
Incheon Fuel Cell Co., Ltd.	192,213	170,976	-	(949)
Daesan Green Energy Co., Ltd.	275,911	211,476	62,286	15,145
Mastern Professional Investment Type Private Security Investment Trust No.98	881,142	607,723	7,983	(1,581)
Protera SAS	2,371	677	76	(1,172)
Stathera IP Holding Inc.	4,835	153	-	(1,273)
PT. SEGARA AKASA	195	2	-	(29)
Prestolite Asia LTD	11,857	3,448	12,027	563
Wise Fashion Co., Ltd.	1,287	1,303	8,615	(2,436)
KDDI Korea Corporation	27,624	6,891	33,721	324
Joint ventures:				
Sichuan Kelun-Doosan Biotechnology Company Limited	10,213	2,885	10,342	2,979
Doosan Babcock BlackCat W.L.L	7,183	5,904	36,828	2,913
Tianjin Lovol Doosan Engine Co. Ltd.	44,048	6,957	-	(8,435)
Doosan Infracore Liaoning Machinery Sales Co., Ltd.	2,537	1,613	24,731	223

Condensed financial information above does not include associates and joint ventures that ceased to apply the equity method.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

11. Investments in associates and joint ventures (cont'd)

Adjustments from net assets of associates and joint ventures to carrying amount of investments in associates and joint ventures as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021					
	Net assets	Percentage of ownership (%)	Group's shares in net assets	Adjustment amounts		Book value
				Goodwill	Intragroup transactions and others	
Associates:						
The HS-City Expressway	₩ 10,346	27.29	₩ 2,823	₩ -	₩ (2,823)	₩ -
Samcheok Blue Power Co., Ltd.	39,907	9.00	3,592	38,268	(7,096)	34,764
Daejung Offshore Wind Power Co., Ltd.	3,566	26.65	950	1,532	-	2,482
Hychangwon Co., Ltd.	11,601	37.04	4,297	-	698	4,995
ReCarbon, Inc.	32,463	11.34	3,681	4,189	-	7,870
Daesan Green Energy Co., Ltd.	60,696	10.00	6,070	-	(3,187)	2,883
DEC	555,413	46.35	257,434	60,232	-	317,666
Master Professional Investment Type Private Security Investment Trust No.98	285,054	25.45	72,559	-	(575)	71,983
Bundang Doosan Tower Reit Co., Ltd.	155,218	18.60	28,869	-	(2,573)	26,296
The Weve Holdings Ltd.	217,141	46.50	100,971	19,029	-	120,000
Protera SAS	20,111	5.76	1,159	358	-	1,517
Stathera IP Holding Inc.	11,862	15.82	1,877	2,098	-	3,975
PT. SEGARA AKASA	167	30.02	50	-	-	50
Prestolite Asia Ltd.	8,921	32.31	2,882	-	-	2,882
Wise Fashion Co., Ltd.	(1,119)	19.34	(216)	2,161	-	1,945
KDDI Korea Corporation	18,461	17.63	3,254	-	-	3,254
Ainstein AI, Inc.	1,102	9.09	100	2,191	-	2,291
Joint ventures:						
Sichuan Kelun-Doosan Biotechnology Company Limited	9,244	50.00	4,622	-	-	4,622
Doosan Babcock BlackCat W.L.L	709	49.00	347	-	(347)	-
The Zenith Holdings Ltd.	318,137	31.75	101,009	18,991	-	120,000

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

11. Investments in associates and joint ventures (cont'd)

	December 31, 2020					
	Net assets	Percentage of ownership (%)	Group's shares in net assets	Adjustment amounts		Book value
				Goodwill	Intragroup transactions and others	
Associates:						
The HS-City Expressway	₩ 11,291	27.29	₩ 3,081	₩ -	₩ -	₩ 3,081
Samcheok Blue Power Co., Ltd.	469,076	9.00	42,217	8,360	(12,491)	38,086
Daejung Offshore Wind Power Co., Ltd.	4,648	26.65	1,239	1,532	-	2,771
Hychangwon Co., Ltd.	5,622	18.52	2,811	-	(1)	2,810
ReCarbon, Inc.	8,369	16.09	1,347	6,560	145	8,052
New Bundang Line Co., Ltd.	(192,598)	29.03	(55,911)	-	55,911	-
Kyunggi Railroad Co., Ltd.	(133,592)	6.98	(9,328)	-	9,328	-
Neo Trans Co., Ltd.	51,058	42.86	21,883	-	-	21,883
New Seoul Railroad Co., Ltd.	49,600	13.76	6,826	-	-	6,826
KIAMCO Kyunggi Railway Investment Private Property Investment Trust	78,702	35.78	28,162	-	(28,162)	-
Incheon Fuel Cell Co., Ltd.	21,237	20.00	4,247	-	(1,248)	2,999
Daesan Green Energy Co., Ltd.	64,435	10.00	6,444	-	(3,359)	3,085
Master Professional Investment Type Private Security Investment Trust No.98	273,419	25.45	69,598	-	-	69,598
Protera SAS	1,694	8.05	137	500	-	637
Stathera IP Holding Inc.	4,682	15.82	741	2,098	-	2,839
PT. SEGARA AKASA	193	30.02	58	-	-	58
Prestolite Asia Ltd.	8,408	32.31	2,717	-	-	2,717
Wise Fashion Co., Ltd.	(16)	19.34	(3)	2,161	-	2,158
KDDI Korea Corporation	20,733	17.63	3,655	-	-	3,655
Joint ventures:						
Sichuan Kelun-Doosan Biotechnology Company Limited	7,328	50.00	3,664	-	(211)	3,453
Doosan Babcock BlackCat W.L.L	1,279	49.00	627	-	13	640
Tianjin Lovol Doosan Engine Co., Ltd.	37,091	50.00	18,546	-	(2,219)	16,327
Doosan Infracore Liaoning Machinery Sales Co., Ltd.	924	43.00	397	-	(195)	202

The above adjustments do not include associates and joint ventures that ceased to apply the equity method.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

12. Property, plant and equipment

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

	2021					
	Land	Buildings and structures	Machinery	Others	Construction in progress	Total
January 1	₩ 4,148,383	₩ 1,394,896	₩ 882,720	₩ 370,526	₩ 187,203	₩ 6,983,728
Acquisition/capital expenditure	20,766	323,059	59,908	67,225	265,488	736,446
Reclassification (*1)	(33,980)	(18,086)	216,418	(127,564)	(144,954)	(108,166)
Disposal (*2)	(41,590)	(34,434)	(9,633)	(6,941)	(772)	(93,370)
Depreciation	(1,231)	(159,235)	(193,246)	(82,122)	-	(435,834)
Impairment loss	-	(819)	(6,349)	(747)	(186)	(8,101)
Asset revaluation	266,795	-	-	-	-	266,795
Changes in scope of consolidation	(884,514)	(349,215)	(157,077)	(94,152)	2,658	(1,482,300)
Others (*3)	9,745	48,691	24,830	11,746	9,239	104,251
December 31	₩ 3,484,374	₩ 1,204,857	₩ 817,571	₩ 137,971	₩ 318,676	₩ 5,963,449
Acquisition cost	₩ 1,919,083	₩ 2,212,893	₩ 2,834,484	₩ 608,807	₩ 356,846	₩ 7,932,113
Accumulated depreciation and accumulated impairment losses	(1,147)	(1,008,036)	(2,016,913)	(470,836)	(38,170)	(3,535,102)
Accumulated revaluation surplus	1,566,438	-	-	-	-	1,566,438

(*1) It includes land and buildings classified as assets held for sale.

(*2) It includes the amount due to the termination of the lease contract.

(*3) Changes due to exchange rate difference and others.

	2020					
	Land	Buildings and structures	Machinery	Others	Construction in progress	Total
January 1	₩ 4,778,292	₩ 1,468,166	₩ 917,477	₩ 394,626	₩ 394,798	₩ 7,953,359
Acquisition/capital expenditure	5,477	214,109	137,268	124,774	300,668	782,296
Reclassification	(164,207)	(41,304)	71,775	1,510	(130,988)	(263,214)
Disposal	(171,450)	(78,779)	(6,559)	(15,299)	(5,992)	(278,079)
Depreciation	(1,228)	(152,582)	(211,399)	(124,726)	-	(489,935)
Impairment loss (reversal)	-	-	26	-	(36,383)	(36,357)
Asset revaluation	707	-	-	-	-	707
Changes in scope of consolidation (*1)	3,225	13,650	20,627	1,498	3,412	42,412
Reclassification of assets as held for sale (see Note 38)	(259,267)	(18,587)	(27,559)	(6,213)	(334,023)	(645,649)
Others (*2)	(43,166)	(9,777)	(18,936)	(5,644)	(4,289)	(81,812)
December 31	₩ 4,148,383	₩ 1,394,896	₩ 882,720	₩ 370,526	₩ 187,203	₩ 6,983,728
Acquisition cost	₩ 2,502,993	₩ 2,636,003	₩ 3,268,082	₩ 1,226,082	₩ 225,907	₩ 9,859,067
Accumulated depreciation and accumulated impairment losses	(7,825)	(1,241,107)	(2,385,362)	(855,556)	(38,704)	(4,528,554)
Accumulated revaluation surplus	1,653,215	-	-	-	-	1,653,215

(*1) It includes changes due to business transfer.

(*2) Changes due to exchange rate difference and others.

In addition, the Group's land and buildings are partially pledged as collateral for loans from financial institutions (see Note 33).

12. Property, plant and equipment (cont'd)

Changes in right-of-use assets classified as property, plant and equipment for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021				
	Land	Buildings and structures	Machinery	Others	Total
January 1	₩ 16,068	₩ 305,739	₩ 18,405	₩ 28,536	₩ 368,748
Acquisition/capital expenditure	10,062	296,659	9,280	18,027	334,028
Reclassification to property, plant and equipment	-	(559)	(92)	(52)	(703)
Disposal (*1)	-	(12,815)	(2)	(2,055)	(14,872)
Depreciation	(1,231)	(89,779)	(7,136)	(18,351)	(116,497)
Reclassification of assets as held for sale	-	(38,519)	-	(1,793)	(40,312)
Changes in scope of consolidation	(12,546)	(72,486)	(7,008)	(5,918)	(97,958)
Others (*2)	2,944	17,416	1,480	3,810	25,650
December 31	₩ 15,297	₩ 405,656	₩ 14,927	₩ 22,204	₩ 458,084
Acquisition cost	₩ 16,388	₩ 518,945	₩ 24,891	₩ 69,991	₩ 630,215
Accumulated depreciation and accumulated impairment losses	(1,091)	(113,289)	(9,964)	(47,787)	(172,131)

(*1) The amount due to the termination of the lease contract.

(*2) Changes due to exchange rate difference and others.

	2020				
	Land	Buildings and structures	Machinery	Others	Total
January 1	₩ 18,504	₩ 191,181	₩ 19,915	₩ 42,469	₩ 272,069
Acquisition/capital expenditure	1,482	191,596	7,552	19,250	219,880
Reclassification to property, plant and equipment	-	-	-	(17)	(17)
Disposal (*1)	-	(7,449)	-	(1,997)	(9,446)
Depreciation	(1,185)	(70,692)	(8,123)	(29,614)	(109,614)
Changes in scope of consolidation	-	372	-	(51)	321
Reclassification of assets as held for sale	(2,821)	(8)	-	(329)	(3,158)
Others (*2)	88	739	(939)	(1,175)	(1,287)
December 31	₩ 16,068	₩ 305,739	₩ 18,405	₩ 28,536	₩ 368,748
Acquisition cost	₩ 17,961	₩ 412,216	₩ 28,202	₩ 77,980	₩ 536,359
Accumulated depreciation and accumulated impairment losses	(1,893)	(106,477)	(9,797)	(49,444)	(167,611)

(*1) The amount due to the termination of the lease contract.

(*2) Changes due to exchange rate difference and others.

12. Property, plant and equipment (cont'd)

The details of revaluation model, which the Group applies to measurement of the land, are as follows:

The Group choose the revaluation models as the measurement after recognition for land, and the revaluated amount is the fair value of the revaluation date. As of December 31, 2021, the fair value of land assets was determined from the appraisal that was undertaken by independently qualified valuers, the First Appraisal & Consulting Co., Ltd ("FACC") and Mirae & Saehan Appraisal Co., Ltd., on October 31, 2021.

FACC and Mirae & Saehan Appraisal Co., Ltd. are members of Korea Association of Property Appraisers and comprise of certified professionals that have a significant amount of industry experience.

Other comprehensive income recognized in the consolidated statement of comprehensive income related to revaluation model, which the Group applies to measurement of the land is ₩265,066 million as of December 31, 2021.

In addition, if the land were stated at cost, the land would amount to ₩1,917,936 million and ₩2,495,168 million as of December 31, 2021 and 2020, respectively.

Fair value measurements of land assets by fair value hierarchy level as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021			December 31, 2020		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Land	₩ -	₩ -	₩ 3,484,374	₩ -	₩ -	₩ 4,148,383

Valuation technique and inputs used for fair value measurement of land assets (Level 3) are as follows:

Valuation technique	Significant inputs that are not based on observable market data (unobservable inputs)	Correlation between unobservable inputs and fair value arguments
Official Assessed Reference Land Price ("OARLP"): OARLP of similar parcels nearby the subject land and reflating corrections necessary for differences between the subject and the comparable	Fluctuation rate of land price and others Parcel conditions and others Land conditions affecting the sales price and others	Fair value increases (decreases), if rate of land price increases (decreases). Fair value increases (decreases), if correction of parcel conditions and others increases (decreases). Fair value increases (decreases), if correction of land conditions affecting the sales price increases (decreases).
Trade Case Comparison method: When comparing the transaction case of an object that is similar to the target object, fair value is measured through the process of correcting the private information, correcting the timing, comparing the factors of the value formation and others	Private information correction Point-in-time correction Value formation factor	Fair value increases (decreases), if the private information correction increases (decreases). Fair value increases (decreases), if the point-in-time correction increases (decreases). Fair value increases (decreases), if the value forming factor increases (decreases).

Capitalized borrowing costs for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Capitalized borrowing cost	₩ 1,140	₩ 2,117
Capitalization interest rate	3.42% ~ 5.90%	3.40% ~ 3.97%

12. Property, plant and equipment (cont'd)

Classification of depreciation for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	2021	2020
Cost of sales	₩ 301,146	₩ 286,298
Selling and administrative expenses	56,209	62,185
Research and development cost and others	5,148	6,003
Loss from discontinued operations	73,331	135,449
	<u>₩ 435,834</u>	<u>₩ 489,935</u>

Classification of depreciation for the years ended December 31, 2021 and 2020 incurred in right-of-use assets classified as property, plant and equipment is as follows (Korean won in millions):

	2021	2020
Cost of sales	₩ 57,153	₩ 51,416
Selling and administrative expenses	35,619	33,690
Research and development cost and others	586	635
Loss from discontinued operations	23,139	23,873
	<u>₩ 116,497</u>	<u>₩ 109,614</u>

13. Intangible assets

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

	2021				
	Goodwill	Industrial rights	Development costs	Other intangible assets	Total
January 1	₩ 5,548,843	₩ 1,126,611	₩ 1,214,248	₩ 350,666	₩ 8,240,368
Acquisition/capital expenditure	-	1,507	231,879	30,891	264,277
Reclassification	-	532	(4,386)	12,683	8,829
Disposal	-	(10)	-	(3,293)	(3,303)
Amortization	-	(1,765)	(116,490)	(58,541)	(176,796)
Impairment loss (reversal)	-	(9)	(27,779)	(1)	(27,789)
Changes in scope of consolidation	(785,945)	(3,634)	(130,602)	(51,897)	(972,078)
Reclassification of assets as held for sale	-	-	(2)	(3,274)	(3,276)
Others (*1)	196,363	64,430	10,692	9,742	281,227
December 31	₩ 4,959,261	₩ 1,187,662	₩ 1,177,560	₩ 286,976	₩ 7,611,459
Acquisition costs	₩ 4,959,261	₩ 1,359,591	₩ 1,565,966	₩ 570,115	₩ 8,454,933
Accumulated amortization and impairment losses	-	(171,929)	(388,406)	(283,139)	(843,474)

(*1) Changes due to exchange rate difference and others.

	2020				
	Goodwill	Industrial rights	Development costs	Other intangible assets	Total
January 1	₩ 4,686,321	₩ 1,156,203	₩ 1,265,946	₩ 249,319	₩ 7,357,789
Acquisition/capital expenditure	-	4,464	262,671	31,189	298,324
Reclassification	-	1,371	(17,614)	45,946	29,703
Disposal	-	(7)	-	(11,463)	(11,470)
Amortization	-	(2,608)	(128,221)	(64,445)	(195,274)
Impairment loss (reversal)	-	-	(157,284)	(1,796)	(159,080)
Changes in scope of consolidation (*1)	1,018,398	-	2,164	112,820	1,133,382
Reclassification of assets as held for sale (see Note 38)	(84,562)	(151)	(3,981)	(8,386)	(97,080)
Others (*2)	(71,314)	(32,661)	(9,433)	(2,518)	(115,926)
December 31	₩ 5,548,843	₩ 1,126,611	₩ 1,214,248	₩ 350,666	₩ 8,240,368
Acquisition costs	₩ 5,548,843	₩ 1,292,501	₩ 1,998,796	₩ 934,204	₩ 9,774,344
Accumulated amortization and impairment losses	-	(165,890)	(784,548)	(583,538)	(1,533,976)

(*1) Includes changes due to business transfer.

(*2) Changes due to exchange rate difference and others.

The carrying amount of membership with indefinite useful lives in other intangible assets is ₩39,405 million and ₩45,021 million as of December 31, 2021 and 2020, respectively.

In addition, expenditure on research and development, which was recognized as expenses, amounted to ₩174,596 million and ₩157,206 million for the years ended December 31, 2021 and 2020, respectively.

13. Intangible assets (cont'd)

Before impairment test, the carrying amount of goodwill was allocated to CGUs as follows (Korean won in millions):

Company	CGUs	December 31, 2021	December 31, 2020	Description
Doosan Corporation	Industrial Vehicles (*1)	₩ -	₩ 78,854	Manufacturing and sale of forklifts
	Fuel Cell	18,056	17,069	Manufacturing and sale of fuel cell
Oricom	Magazine	1,373	1,373	Advertising services
	Advertisement	9,690	9,690	
Doosan Logistics Solution Co., Ltd.	Logistics automation	12,891	12,891	Manufacturing and sale of logistics automation, maintenance
DHC	Power plant	703,764	666,741	Manufacturing and sale of power plant
DBI	Construction machine	3,114,140	2,966,347	Manufacturing and sale of small and medium size construction machine
	Industrial Vehicles (*1)	80,950	-	Manufacturing and sale of forklifts
DI (*2)	Construction machine	-	717,431	Manufacturing and sale of construction equipment
DEC (*2)	Construction industry	-	60,049	Housing construction and infrastructure construction
DFC	Fuel Cell	1,018,397	1,018,397	Manufacturing and sale of fuel cell
		₩ 4,959,261	₩ 5,548,842	

(*1) As of July 1, 2021, the Industrial vehicles BG was split-off from the Company and sold to DBI; accordingly, goodwill distributed to cash-generating units of the Industrial vehicles BG as of December 31, 2020 was redistributed from the Company to DBI.

(*2) The goodwill has been removed due to changes in the scope of consolidation during the year ended December 31, 2021.

A recoverable amount of CGU is calculated based on fair value less costs to sell, or value in use.

The major assumptions and measurement methods of recoverable amount of CGU as of December 31, 2021 are as follows.

Company	CGUs	Discount rate	Permanent growth rate	Recoverable amount assessment methods
Doosan Corporation	Fuel Cell	11.64%, 17.09%	1.00%	Value in use
Oricom	Magazine	12.60%	1.00%	Value in use
	Advertisement	12.60%	1.00%	Value in use
Doosan Logistics Solution Co., Ltd.	Logistics automation	12.80%	1.00%	Fair value less costs to sell
DHC	Power plant	Estimate active market price by adjustment	Estimate quoted active market price	Fair value less costs to sell
DBI	Construction machine	7.80%	1.50%	Value in use
	Industrial Vehicles	9.72%	1.00%	Value in use
DFC	Fuel Cell	Estimate active market price by adjustment	Estimate quoted active market price	Fair value less costs to sell

The Group uses cash flow projections based on financial budgets approved by the directors covering five-year years for a value in use calculation. The financial budgets are determined based on historical result and expectation of market growth. Cash flows beyond that five-year years have been extrapolated using a '1-1.50%' growth rate, continuing the fifth-year cash flow. Permanent growth rate does not exceed long-term average growth rate of market, and the discount rates used reflect relevant risks specific to the CGUs.

The amount of fair value less costs to sell was determined based on the quoted price in an active market.

The recoverable amount may change according to changes in key assumptions. Accordingly, the Group's management regularly observes relevant turnovers and industrial trends.

13. Intangible assets (cont'd)

Capitalized borrowing costs for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Capitalized borrowing cost	₩ 26,863	₩ 26,696
Capitalization interest rate	3.42% ~ 4.00%	3.40% ~ 3.97%

Classification of amortization for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	2021	2020
Cost of sales	₩ 77,381	₩ 107,036
Selling and administrative expenses	45,443	40,972
Research and development cost and others	2,698	4,760
Loss from discontinued operations	51,274	42,506
	₩ 176,796	₩ 195,274

Development costs as of December 31, 2021 are as follows (Korea won in millions):

Company	Individual assets	December 31, 2021	Remaining Amortization period (*1)
DHC	Large-sized Heavy-Duty Gas Turbine Development for Power Generation	₩ 598,663	-
	Gas Turbine 7F Retrofit	43,967	-
	Mid-sized Gas Turbine Development Phase1	761	7.58 years
	Mid-sized Gas Turbine Development Phase2	30,081	-
	8MW Offshore Wind Power	34,666	-
DBI and its subsidiaries	Development related Compact product (new model and emission regulation) (*2)	38,795	-
	Development related Compact product (new model and emission regulation) (*2)	93,725	3.42 years
	Development related Portable Power product (new model and emission regulation) (*2)	1,885	-
	Development related Portable Power product (new model and emission regulation) (*2)	14,710	3.83 years
	Development related forklifts (new model and emission regulation) (*2)	9,065	-
	Development related forklifts (new model and emission regulation) (*2)	8,730	4.17 years

(*1) If the amortization begins, the remaining amortization year is recorded. If not started, it is marked with '-'.
(*2) Some sub-projects among the development costs began amortization and they are presented separately.

13. Intangible assets (cont'd)

Intangible assets for which an impairment loss has been recognized for the year ended December 31, 2021 are as follows (Korea won in millions):

Company	Classification	Individual assets	Amount of impairment loss		December 31, 2021	Recoverable amount assessment methods
			2021	Accumulated		
DHC (*1)	Development costs	3MW derived Model	₩ 4,162	₩ 4,162	₩ -	Value in use
	Development costs	Wind Power up Solution(step1)	366	366	-	Value in use
	Development costs	Development 5.5MW Class III Wind Turbine Generator	19,009	19,009	-	Value in use
DI (*2)	Development costs	Development for DX12 Engine	1,220	1,220	-	Value in use
DBI	Development costs	Medium Frame GenV and others	257	5,163	-	Fair value less costs to sell
Doosan Corporation	Development costs	Cover Window film	2,765	2,765	-	Value in use
			27,779	32,685	-	
DBI	Industrial Rights - Patents	Forklift control method and others	9	9	-	Fair value less costs to sell
	Other intangible assets	DS Platform(software) and others	1,722	1,722	1,268	Fair value less costs to sell
			1,731	1,731	1,268	
			₩ 29,510	₩ 34,416	₩ 1,268	

(*1) Due to the changes in the business environment, value in use was decreased. Accordingly, the Group recognized impairment loss up to the book value of the development costs.

(*2) Impairment loss from DI classified as loss from discontinued operations in consolidated statement of profit or loss.

Intangible assets recognized for the reversal of impairment loss for the year ended December 31, 2021 are as follows (Korea won in millions):

Company	Classification	Individual asset	Reversal of impairment loss	Recoverable amount assessment methods
DHC	Other intangible assets	Golf membership	₩ 85	Fair value less costs to sell
DI (*1)	Other intangible assets	Golf membership	1,455	Fair value less costs to sell
Doosan Cuvex Co., Ltd	Other intangible assets	Resort membership	11	Fair value less costs to sell
Doosan Bears Inc.	Other intangible assets	Golf membership	170	Fair value less costs to sell
			₩ 1,721	

(*1) Reversal of impairment loss from DI includes the amounts classified as profit or loss from discontinued operations in consolidated statement of profit or loss.

The accounts on the consolidated statements of comprehensive income for which the Group recognizes an impairment loss (reversal) for the years ended December 31, 2021 and 2020 are as follows (Korea won in millions):

	2021	2020
Other non-operating expenses	₩ 28,290	₩ 157,913
Other non-operating income	(266)	(4,420)
Loss(profit) from discontinued operations	(235)	5,587
	₩ 27,789	₩ 159,080

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

13. Intangible assets (cont'd)

Details of annual quantity of allocated emission allowances for the third planning period (2021 ~ 2025) as of December 31, 2021 are as follows (tCO2-eq):

	2021	2022	2023	2024	2025	Total
Free quota emission right	362,203	362,203	362,203	358,811	358,811	1,804,231
Changes in scope of consolidation	(101,677)	(101,677)	(101,677)	(100,725)	(100,725)	(506,481)
	<u>260,526</u>	<u>260,526</u>	<u>260,526</u>	<u>258,086</u>	<u>258,086</u>	<u>1,297,750</u>

Changes in emission allowances and book value as of December 31, 2021 and 2020 are as follows (tCO2-eq, Korea won in millions):

2021 (Quantity)							
	2020	2021	2022	2023	2024	2025	Total
January 1	457,918	362,203	362,203	362,203	358,811	358,811	2,262,149
Cancellation	(5,086)	-	-	-	-	-	(5,086)
Borrowed	(5,000)	5,000	-	-	-	-	-
Carryforward	(4,224)	4,224	-	-	-	-	-
Government submission	(300,762)	-	-	-	-	-	(300,762)
Disposal	(142,846)	-	-	-	-	-	(142,846)
Changes in scope of consolidation	-	(106,677)	(101,677)	(101,677)	(100,725)	(100,725)	(511,481)
December 31	<u>-</u>	<u>264,750</u>	<u>260,526</u>	<u>260,526</u>	<u>258,086</u>	<u>258,086</u>	<u>1,301,974</u>

2021 (Book Value)							
	2020	2021	2022	2023	2024	2025	Total
January 1	₩ 3,000	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 3,000
Cancellation	-	-	-	-	-	-	-
Borrowed	-	-	-	-	-	-	-
Carryforward	-	-	-	-	-	-	-
Government submission	(365)	-	-	-	-	-	(365)
Disposal	(2,635)	-	-	-	-	-	(2,635)
Changes in scope of consolidation	-	-	-	-	-	-	-
December 31	<u>₩ -</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ -</u>

2020 (Quantity)							
	2020	2021	2022	2023	2024	2025	Total
January 1	337,779	362,203	362,203	362,203	358,811	358,811	2,142,010
Cancellation	-	-	-	-	-	-	-
Purchase	100,000	-	-	-	-	-	100,000
Carryforward	(6,898)	-	-	-	-	-	(6,898)
Government submission	-	-	-	-	-	-	-
Disposal	-	-	-	-	-	-	-
Deferred	27,037	-	-	-	-	-	27,037
Reclassified as assets held for sale	-	(101,677)	(101,677)	(101,677)	(100,725)	(100,725)	(506,481)
December 31	<u>457,918</u>	<u>260,526</u>	<u>260,526</u>	<u>260,526</u>	<u>258,086</u>	<u>258,086</u>	<u>1,755,668</u>

13. Intangible assets (cont'd)

	2020 (Book Value)							
	2020	2021	2022	2023	2024	2025	Total	
January 1	₩ -	₩ -	₩ -	₩ -	₩ -	₩ -	₩ -	
Cancellation	-	-	-	-	-	-	-	
Purchase	3,000	-	-	-	-	-	3,000	
Borrowed	-	-	-	-	-	-	-	
Government submission	-	-	-	-	-	-	-	
Disposal	-	-	-	-	-	-	-	
Carryforward	-	-	-	-	-	-	-	
Reclassified as assets held for sale	-	-	-	-	-	-	-	
December 31	₩ 3,000	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 3,000	

Changes in emission liabilities for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
January 1	₩ 1,327	₩ 144
Increase	-	1,327
Decrease	-	(144)
Changes in scope of consolidation	(1,327)	-
December 31	₩ -	₩ 1,327

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

14. Investment properties

Changes in investment properties for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021			2020		
	Land	Building	Total	Land	Building	Total
January 1	₩ 218,892	₩ 169,130	₩ 388,022	₩ 393,568	₩ 113,620	₩ 507,188
Acquisition /capital expenditure	714	54,156	54,870	-	140,650	140,650
Disposal	(6,878)	(5,788)	(12,666)	(337,086)	(141,329)	(478,415)
Valuation (*1)	19,324	(46,425)	(27,101)	3,748	(7,327)	(3,579)
Reclassification of assets as held for sale (see Note 38)	-	-	-	(60)	(90)	(150)
Changes in scope of consolidation	(10,516)	(32,266)	(42,782)	-	-	-
Reclassification	4,325	(2,568)	1,757	158,982	63,463	222,445
Others (*2)	463	130	593	(260)	143	(117)
December 31	₩ 226,324	₩ 136,369	₩ 362,693	₩ 218,892	₩ 169,130	₩ 388,022

(*1) Gain or loss on revaluation of investment properties is included in other non-operating income and expenses in the consolidated statements of profit or loss.

(*2) Changes due to exchange rate difference and others.

The Group's land and buildings included in the above investment properties are pledged as collateral for borrowings from financial institutions (see Note 33).

In addition, lease income related to investment properties amounted to ₩17,154 million and ₩22,263 million for the years ended December 31, 2021 and 2020, respectively.

Changes in right-of-use assets classified as Investment properties for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
January 1	₩ 156,227	₩ 27,729
Acquisition	54,000	135,009
Reclassification	(1,023)	-
Valuation	(41,460)	(6,511)
Changes in scope of consolidation	(34,236)	-
December 31	₩ 133,508	₩ 156,227

Details of fair value model that the Group applies for measurement of investment properties are as follows:

The Group recognizes subsequent measurement of investment properties using fair value. The fair value of investment properties was determined from the appraisal that was undertaken by independently qualified valuers, the First Appraisal & Consulting Co., Ltd ("FACC") and Mirae & Saehan Appraisal Co., Ltd., on November 30, 2021.

FACC and Mirae & Saehan Appraisal Co., Ltd. are members of Korea Association of Property Appraisers, and comprise of certified professionals who have a significant amount of industry experience.

Fair value measurements of investment properties by fair value hierarchy level as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021			December 31, 2020		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Land	₩ -	₩ -	₩ 226,324	₩ -	₩ -	₩ 218,892
Buildings	-	-	136,369	-	-	169,130
	₩ -	₩ -	₩ 362,693	₩ -	₩ -	₩ 388,022

14. Investment properties (cont'd)

Valuation techniques and inputs used for fair value measurement of investment properties (Level 3) are as follows:

Valuation techniques	Significant inputs that are not based on observable market data (unobservable inputs)	Correlation between unobservable inputs and fair value arguments
Official Assessed Reference Land Price ("OARLP"): OARLP of similar parcels nearby the subject land and reflating corrections necessary for differences between the subject and the comparable	Fluctuation rate of land price and others Parcel conditions and others Land conditions affecting the sales price and others	Fair value increases (decreases), if rate of land price increases (decreases). Fair value increases (decreases), if correction of parcel conditions and others increases (decreases). Fair value increases (decreases), if correction of land conditions affecting the sales price increases (decreases).
Trade case comparison method: When comparing the transaction case of an object that is similar to the target object, fair value is measured through the process of correcting the private information, correcting the timing, comparing the factors of the value formation and others	Private information correction Point-in-time correction Value formation factor	Fair value increases (decreases), if the private information correction increases (decreases). Fair value increases (decreases), if point-in-time correction increases (decreases). Fair value increases (decreases), if the value-forming factor increases (decreases).
Estimated cost price approach: Fair value is based on depreciation and replacement costs considered with structure, building materials, construction condition, building equipment, end use, present condition and management condition	Replacement cost	Fair value decreases (increases), if replacement cost increases (decreases).
Discounted cash flow method: Fair value is measured by estimating the appropriate market rent for the remaining lease period from the present time of the evaluation by comparing transaction cases and then discounting it to the present value	Private information correction Point-in-time correction Value formation factor Discount rate	Fair value increases (decreases), if the private information correction increases (decreases). Fair value increases (decreases), if point-in-time correction increases (decreases). Fair value increases (decreases), if the value-forming factor increases (decreases). Fair value increases (decreases), if the discount rate decreases (increases).

15. Bonds and borrowings

15.1 Bonds

Bonds as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	Annual interest rate (%)	December 31, 2021	December 31, 2020
Public issued bonds (*1)	1.00~5.88	₩ 1,593,950	₩ 2,122,200
Private placement bonds	4.30~5.99	210,500	714,100
Convertible bonds	2.81~2.87	23,374	33,900
Bonds with stock warrants	1.00	14,607	122,800
		<u>1,842,431</u>	<u>2,993,000</u>
Less: Adjustment for conversion rights		(1,299)	(2,985)
Less: Adjustment for stock warrants		(201)	(20,766)
Add: Redemption premium		2,370	19,341
Less: Discount on bonds		(12,946)	(19,762)
Less: Current portion of long-term bonds		(690,901)	(835,035)
		<u>₩ 1,139,454</u>	<u>₩ 2,133,793</u>

(*1) Among the above public issued bonds, DBI's ordinary shares held by DHC are provided as collateral in relation to DHC's foreign currency public offering bonds (see Note 33).

15.2 Convertible bonds

Changes in convertible bonds issued by the Group for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

2021				
	January 1	Exercise/ Amortization	Changes in scope of consolidation	December 31
Convertible bonds	₩ 33,900	₩ -	₩ (10,526)	₩ 23,374
Redemption premium	2,326	-	(722)	1,604
Discount on bonds	(188)	58	48	(82)
Adjustment for conversion rights	(2,985)	926	760	(1,299)
Book value	<u>₩ 33,053</u>	<u>₩ 984</u>	<u>₩ (10,440)</u>	<u>₩ 23,597</u>
Consideration for conversion rights (other capital surplus)	₩ 836	₩ -	₩ (76)	₩ 760
2020				
	January 1	Issue/ Repayment	Exercise/ Amortization	December 31
Convertible bonds	₩ -	₩ 33,900	₩ -	₩ 33,900
Redemption premium	-	2,326	-	2,326
Discount on bonds	-	(217)	29	(188)
Adjustment for conversion rights	-	(3,429)	444	(2,985)
Book value	<u>₩ -</u>	<u>₩ 32,580</u>	<u>₩ 473</u>	<u>₩ 33,053</u>
Consideration for conversion rights (other capital surplus)	₩ -	₩ 836	₩ -	₩ 836

15.2 Convertible bonds (cont'd)

Details of the 59th convertible bonds issued by DHC, a subsidiary, are as follows (Korean won in millions):

Issue date (*1)	Maturity date	Coupon rate	Yield on maturity	Exercisable year	Exercise price (Korean won)	Par value	Issue value (*2)	Book value
July 1, 2021	June 8, 2023	2.87%	4.82%	June 8, 2021 ~ May 8, 2023	₩9,190 per share	₩ 1,655	₩ 1,641	₩ 1,667

(*1) Of the 65th convertible bonds issued by DI on June 8, 2020, convertible bonds were succeeded to DHC from spin-off merger between DHC and DI on July 1, 2021.

(*2) Issue value is the par value less the discount on bonds.

① Early redemption

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

② Redemption at maturity

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

③ Exercise price

The conversion price is adjusted when the issuing entity issues capital stocks, before a holder exercises the stock warrants, through paid-in capital increase with or without consideration at a price lower than the market price, stock dividends, or capitalization of reserves, or when there is an issuance of convertible bonds or bonds with stock warrants at a conversion price or exercise price lower than the market price.

Details of the 60th convertible bonds issued by DHC, a subsidiary, are as follows (Korean won in millions):

Issue date (*1)	Maturity date	Coupon rate	Yield on maturity	Exercisable year	Exercise price (Korean won)	Par value	Issue value (*2)	Book value
July 1, 2021	August 8, 2023	2.81%	4.96%	August 3, 2021 ~ July 3, 2023	₩10,840 per share	₩ 21,719	₩ 21,584	₩ 21,930

(*1) Of the 69th convertible bonds issued by DI on August 3, 2020, convertible bonds were succeeded to DHC from spin-off merger between DHC and DI on July 1, 2021.

(*2) Issue value is the par value less the discount on bonds.

① Early redemption

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

② Redemption at maturity

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

③ Exercise price

The conversion price is adjusted when the issuing entity issues capital stocks, before a holder exercises the stock warrants, through paid-in capital increase with or without consideration at a price lower than the market price, stock dividends, or capitalization of reserves, or when there is an issuance of convertible bonds or bonds with stock warrants at a conversion price or exercise price lower than the market price.

15.3 Bonds with stock warrants

Changes in bonds with stock warrants issued by the Group for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021				
	January 1	Issue/ Repayment	Exercise/ Amortization	Changes in scope of consolidation	December 31
Bonds with stock warrants	₩ 122,800	₩ (7,448)	₩ (714)	₩ (100,031)	₩ 14,607
Redemption premium	17,015	(739)	(89)	(15,421)	766
Discount on bonds	(715)	-	277	419	(19)
Adjustment for stock warrants	(20,766)	-	3,257	17,308	(201)
Book value	₩ 118,334	₩ (8,187)	₩ 2,731	₩ (97,725)	₩ 15,153
Consideration for stock warrants (other capital surplus)	₩ 93,101	₩ -	₩ (40,567)	₩ (17,715)	₩ 34,819

	December 31, 2020			
	January 1	Issue/ Repayment	Exercise/ Amortization	December 31
Bonds with stock warrants	₩ 1,057,185	₩ (934,175)	₩ (210)	₩ 122,800
Redemption premium	108,674	(91,626)	(33)	17,015
Discount on bonds	(12,141)	9,375	2,051	(715)
Adjustment for stock warrants	(126,462)	82,653	23,043	(20,766)
Book value	₩ 1,027,256	₩ (933,773)	₩ 24,851	₩ 118,334
Consideration for stock warrants (other capital surplus)	₩ 98,640	₩ -	₩ (5,539)	₩ 93,101

15.3 Bonds with stock warrants (cont'd)

Details of the 48th bond with stock warrants issued by DHC, a subsidiary, are as follows (Korean won in millions):

Issue date	Maturity date	Coupon rate	Yield on maturity	Exercisable year	Exercise price (Korean won)	Par value	Issue value (*1)	Book value
May 4, 2017	May 4, 2022	1.00%	2.00%	From one month after the date of bond issue to one month before maturity	₩14,900 per share	₩ 500,000	₩ 491,546	₩ 15,153

(*1) Issue value is the par value less the discount on bonds.

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. In addition, 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 bond pays interest at an interest rate of 1.00% and, for bonds that do not convert to maturity, the Group will repay 105.2448% of the principal amount of with the yield on maturity(YTM) at an annual rate of 2.00% (3-month compound interest) on May 4, 2022.

③ Exercise price

The exercise price is adjusted when the issuing entity issues capital stocks, before a holder exercises the stock warrants, through paid-in capital increase with or without consideration at a price lower than the market price, stock dividends, or capitalization of reserves, or when there is an issuance of convertible bonds or bonds with stock warrants at a conversion price or exercise price lower than the market price.

④ Exercise of stock warrants

As of December 31, 2021, stock warrants were exercised in the amount pertaining to 22.11% of the principal amount of bond with stock warrants and 0.09% of the principal amount was substituted. The number of shares issued as a result of the stock warrants was 7,412,157 shares.

15.4 Short-term borrowings

Short-term borrowings as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	Creditor	Annual interest rate (%)	December 31, 2021 (*5)	December 31, 2020
Borrowings in Korean won:				
Doosan Corporation (*3)	Woori Bank and others	2.50~5.20	₩ 675,399	₩ 786,100
DHC (*2)	Korea Development Bank and others	2.00~6.39	3,128,420	3,802,627
DI (*1)	Korea Exim Bank and others	-	-	516,994
DEC (*1)	Construction Guarantee Cooperative	-	-	27,039
			3,803,819	5,132,760
Borrowings in foreign currency:				
Doosan Corporation (*3)	Korea Exim Bank and others	1.25~4.25	141,179	159,134
DHC (*2)	Woori Bank and others	0.15~9.65	758,857	590,098
DBI (*1)	Korea Exim Bank and others	1.36~4.98	21,206	-
DI (*1)	Korea Development Bank and others	-	-	405,740
	Disposal of receivables in foreign currency (*4)	-	-	8,106
			921,242	1,163,078
			₩ 4,725,061	₩ 6,295,838

(*1) It includes its own consolidated subsidiaries.

(*2) It includes its own consolidated subsidiaries other than those mentioned in (*1) above.

(*3) It includes its own consolidated subsidiaries other than those mentioned in (*1) and (*2) above.

(*4) In the case of the disposal of financial assets that do not meet the "derecognition of financial assets" requirement, the Group continues to recognize the assets in the consolidated financial statements, and the related amounts received are recognized as short-term borrowings.

(*5) The Group pledges property, plant and equipment as collateral for the above borrowings (see Note 33).

15.5 Long-term borrowings

Long-term borrowings as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	Creditor	Annual interest rate (%)	December 31, 2021 (*4)	December 31, 2020
Borrowings in Korean won:				
Doosan Corporation (*3)	Korea Development Bank and others	-	₩ -	₩ 469,685
DHC (*2)	Korea Exim Bank and others	1.13~4.45	528,026	513,291
DBI (*1)	Korea Development Bank and others	3M GBP LIBOR + 2.50	46,400	-
DI (*1)	Korea Development Bank and others	-	-	214,000
DEC (*1)	Korea Development Bank and others	-	-	75,000
Doosan Cuvex Co., Ltd (*1)	Woori Bank	3.69	20,000	-
			594,426	1,271,976
Borrowings in foreign currency:				
Doosan Corporation (*3)	Kookmin Bank	5.90	4,475	27,660
DHC (*2)	Korea Exim Bank and others	1.00~ 2.50 +0.50 or LIBOR	37,974	424,561
DBI (*1)	USA Institutional investors, banks and others	1.36~8.00	1,358,742	728,461
DI (*1)	Industrial and Commercial Bank of China and others	-	-	15,545
			1,401,191	1,196,227
			1,995,617	2,468,203
Less: present value discounts			(11,054)	(9,093)
Less: current portion of long-term borrowings			(463,729)	(1,263,652)
			₩ 1,520,834	₩ 1,195,458

(*1) It includes its own consolidated subsidiaries.

(*2) It includes its own consolidated subsidiaries other than those mentioned in (*1) above.

(*3) It includes its own consolidated subsidiaries other than those mentioned in (*1) and (*2) above.

(*4) The Group pledges property, plant and equipment as collateral for the above borrowings (see Note 33).

15.6 Asset-backed loans

The Group has transferred some of its future trade receivables and others to the securitization companies to carry out the asset-backed securitizations (ABS). Detail of the long-term asset-backed loans as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	Creditor	Annual interest rate (%)	December 31, 2021	December 31, 2020
Asset-backed loans:				
Doosan Corporation (*3)	Hana Bank and others	4.06~4.50	₩ 82,500	₩ 263,000
DHC (*2)	Korea Development Bank and others	5.28	49,600	287,200
DEC (*1)	Shinyoung Securities and others	-	-	59,814
			132,100	610,014
Less: present value discounts			(623)	(3,124)
Less: short-term asset-backed loans			-	(59,551)
Less: current portion of long-term asset-backed loans			(115,042)	(332,022)
			₩ 16,435	₩ 215,317

(*1) It includes its own consolidated subsidiaries.

(*2) It includes its own consolidated subsidiaries other than those mentioned in (*1) above.

(*3) It includes its own consolidated subsidiaries other than those mentioned in (*1) and (*2) above. In addition, the carrying amount of trade receivables and others recognized in the consolidated financial statements as of December 31, 2021 and 2020 are ₩26,163 million and ₩25,630 million, respectively, as it does not meet the requirement for derecognition of financial instruments in relation to the asset-backed loans (see Notes 32.3, 33).

16. Lease

16.1 Right-of-use assets

Changes in right-of-use assets classified as property, plant and equipment and investment properties for the years ended December 31, 2021 and 2020 are described in Notes 12 and 14. The composition of depreciation expenses by accounts arising from right-of-use assets classified as property, plant and equipment for the years ended December 31, 2021 and 2020 is described in Note 12.

The Group sold Bundang Doosan Tower, located in 155, Jeongjail-ro, Bundang-gu, Seongnam, Gyeonggi-do, to Bundang Doosan Tower Reit Co., Ltd. during the year ended December 31, 2021 at ₩620,000 million. Upon sale of the asset, the Group simultaneously entered into a lease agreement with Bundang Doosan Tower Reit Co., Ltd. for lease of the asset. The net gain of ₩53,486 million from the sale and leaseback transaction was included in other non-operating income and expenses in the consolidated statement of profit or loss.

In addition, the Company sold Doosan Tower, located in 275, Jangchungdan-ro, Jung-gu, Seoul, to Mastern Professional Investment Type Private Security Investment Trust No.98 during the year ended December 31, 2020 at ₩800,000 million. Upon sale of the asset, the Company also entered into a lease agreement with Mastern Professional Investment Type Private Security Investment Trust No.98 for lease of the asset. The net gain of ₩30,866 million from the sale and leaseback transaction was included in other non-operating income and expenses in the consolidated statement of profit or loss.

16.2 Lease liabilities

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

	2021	2020
January 1	₩ 542,983	₩ 302,355
Payment of lease fees	(162,169)	(129,108)
Acquisition of lease assets	425,213	364,721
Cancel contracts	(13,643)	(9,309)
Interest expense	42,125	21,852
Changes in scope of consolidation	(119,811)	343
Reclassification of assets as held for sale (see Note 38)	(41,813)	(360)
Others	18,127	(7,511)
December 31	₩ 691,012	₩ 542,983

The maturity analysis of lease liabilities as of December 31, 2021 and 2020 are as follows (Korean won in millions):

		December 31, 2021				
		Nominal cash flows according to contract				
		Less than 1 year	1 ~ 2 years	2 ~ 5 years	More than 5 years	
Total						
Lease liabilities	₩ 850,571	₩ 122,671	₩ 92,144	₩ 316,670	₩ 319,086	

		December 31, 2020				
		Nominal cash flows according to contract				
		Less than 1 year	1 ~ 2 years	2 ~ 5 years	More than 5 years	
Total						
Lease liabilities	₩ 661,530	₩ 117,791	₩ 89,833	₩ 214,056	₩ 239,850	

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

	2021	2020
Cost of sales	₩ 15,943	₩ 10,083
Selling and administrative expenses	6,085	5,613
Research and development cost and others	7	8
Loss from discontinued operations	3,359	5,449
	₩ 25,394	₩ 21,153

Cash outflows from financing activities due to the repayment of lease liabilities are ₩162,169 million and ₩129,108 million for the years ended December 31, 2021 and 2020, respectively. Cash outflows from operating activities due to short-term and leases of low value fees are ₩25,394 million and ₩21,153 million for the years ended December 31, 2021 and 2020, respectively. Therefore, the total cash outflow of the lease is ₩187,563 million and ₩150,261 million for the years ended December 31, 2021 and 2020, respectively.

16.3 Lease receivables

The maturity analysis of lease receivables as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021				
	Nominal cash flows according to contract				
	Total	Less than 1 year	1 ~ 2 years	2 ~ 5 years	More than 5 years
Lease receivables	₩ 5,522	₩ 2,456	₩ 3,066	₩ -	₩ -

	December 31, 2020				
	Nominal cash flows according to contract				
	Total	Less than 1 year	1 ~ 2 years	2 ~ 5 years	More than 5 years
Lease receivables	₩ 9,419	₩ 2,503	₩ 2,999	₩ 3,365	₩ 552

17. Net defined benefit liabilities

The Group operates a defined benefit plan for employees, and the actuarial valuation of plan assets and the defined benefit liabilities is performed by a reputable actuary using the projected unit credit method.

Details of net defined benefit liabilities as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Present value of defined benefit liabilities	₩ 2,240,998	₩ 2,544,596
Fair value of plan assets	(1,662,617)	(1,798,129)
Net defined benefit liabilities	₩ 578,381	₩ 746,467

Retirement benefits generated by defined benefits retirement pension charged to profit or loss for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Current service costs	₩ 103,134	₩ 114,220
Net interest costs	16,503	20,774
Past service costs and profit or loss on settlement	14,129	1,321
	₩ 133,766	₩ 136,315

Classification of the retirement benefits generated by defined benefits retirement pension recognized in the consolidated statements of profit or loss for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	2021	2020
Cost of sales	₩ 69,644	₩ 69,025
Selling and administrative expenses	43,831	30,454
Research and development cost and others	1,736	3,456
Loss from discontinued operations	18,555	33,380
	₩ 133,766	₩ 136,315

17. Net defined benefit liabilities (cont'd)

Changes in net defined benefit liabilities for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021		
	Defined benefit liabilities	Plan assets	Net defined benefit liabilities
Beginning balance	₩ 2,544,596	₩ (1,798,129)	₩ 746,467
Profit or loss:			
Current service cost	103,134	-	103,134
Interest cost (income)	47,648	(31,145)	16,503
Past service cost	14,129	-	14,129
	164,911	(31,145)	133,766
Remeasurements:			
Return on plan assets (excluding amounts included in interest income)	-	(33,487)	(33,487)
Actuarial gain (loss) from change in demographic assumptions	(1,869)	-	(1,869)
Actuarial gain (loss) from change in financial assumptions	(115,021)	-	(115,021)
Others	6,069	-	6,069
	(110,821)	(33,487)	(144,308)
Transfer in and out	(572)	(195)	(767)
Changes in scope of consolidation	(298,050)	243,512	(54,538)
Contributions by plan participants directly to plan assets	2,965	(29,380)	(26,415)
Contributions by employer directly to plan assets	-	(84,688)	(84,688)
Benefit payments	(193,068)	154,360	(38,708)
Others (*1)	131,037	(83,465)	47,572
Ending balance	₩ 2,240,998	₩ (1,662,617)	₩ 578,381

(*1) Changes due to exchange rate difference and others.

	2020		
	Defined benefit liabilities	Plan assets	Net defined benefit liabilities
Beginning balance	₩ 2,600,437	₩ (1,884,124)	₩ 716,313
Profit or loss:			
Current service cost	114,220	-	114,220
Interest cost (income)	59,209	(38,435)	20,774
Past service cost	1,321	-	1,321
	174,750	(38,435)	136,315
Remeasurements:			
Return on plan assets (excluding amounts included in interest income)	-	(117,582)	(117,582)
Actuarial gain (loss) from change in demographic assumptions	(1,031)	-	(1,031)
Actuarial gain (loss) from change in financial assumptions	176,370	-	176,370
Others	3,553	-	3,553
	178,892	(117,582)	61,310

17. Net defined benefit liabilities (cont'd)

	2020		
	Defined benefit liabilities	Plan assets	Net defined benefit liabilities
Transfer in and out	₩ (1,717)	₩ 251	₩ (1,466)
Changes in scope of consolidation	8,443	(8,505)	(62)
Contributions by plan participants directly to plan assets	3,166	(15,138)	(11,972)
Contributions by employer directly to plan assets	-	(62,391)	(62,391)
Benefit payments	(317,723)	252,935	(64,788)
Reclassification of assets as held for sale (see Note 38)	(31,870)	31,080	(790)
Others (*1)	(69,782)	43,780	(26,002)
Ending balance	₩ 2,544,596	₩ (1,798,129)	₩ 746,467

(*1) Changes due to exchange rate difference and others.

Assumptions used for actuarial valuation as of December 31, 2021 and 2020 are as follows:

	December 31, 2021	December 31, 2020
Discount rate (%)	1.30~6.80	1.00~7.39
Salary growth rate (%)	0.80~6.00	0.00~8.00

Details of plan assets as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Equity securities	₩ 291,863	₩ 303,809
Debt securities	799,210	744,335
Saving deposits and others	571,544	749,985
	₩ 1,662,617	₩ 1,798,129

Plan assets are mostly invested in assets that have a quoted market price in an active market.

The sensitivity analysis for the significant actuarial assumptions as of December 31, 2021 and 2020 is as follows (Korean won in millions):

	Impact on defined benefit obligation			
	December 31, 2021		December 31, 2020	
	Amount	Ratio	Amount	Ratio
Discount rate:				
1% increase	₩ (284,798)	(-)12.71%	₩ (314,566)	(-)12.36%
1% decrease	324,090	14.46%	375,022	14.74%
Salary growth rate:				
1% increase	99,075	4.42%	60,950	2.4%
1% decrease	(93,811)	(-)4.19%	(29,085)	(-)1.14%

The weighted average maturity of defined benefit liabilities as of December 31, 2021 and 2020 is 13.59 years and 13.55 years, respectively. The Group expects to contribute ₩165,590 million for defined benefit plans in 2022.

In addition, the amount recognized for the defined contribution retirement benefit plan is ₩31,321 million and ₩26,029 million as of December 31, 2021 and 2020, respectively.

18. Provisions

Changes in provisions for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021				
	Provision for product warranties	Provision for restoration	Provision for construction losses	Other provisions (*2)	Total
January 1	₩ 484,063	₩ 7,337	₩ 129,950	₩ 299,489	₩ 920,839
Increase(decrease)	161,969	1,146	(40,323)	(21,124)	101,668
Utilized	(138,526)	(3,220)	-	(46,796)	(188,542)
Others (*1)	(171,810)	1,488	4,692	(23,112)	(188,742)
December 31	₩ 335,696	₩ 6,751	₩ 94,319	₩ 208,457	₩ 645,223
Current	₩ 114,467	₩ 5,473	₩ 36,410	₩ 172,561	₩ 328,911
Non-current	221,229	1,278	57,909	35,896	316,312

(*1) It includes changes in the amounts from foreign exchange rate, reclassification as liabilities held for sale, the scope of consolidation and others.

(*2) As of December 31, 2021, others include provisions related to guaranteed return on membership fee of ₩54,855 million, related provisions for pending litigations and others.

	2020					
	Provision for product warranties	Provision for restoration	Provision for loss compensation	Provision for construction losses	Other provisions (*2)	Total
January 1	₩ 479,389	₩ 19,194	₩ 778	₩ 12,712	₩ -	₩ 512,073
Increase(decrease)	166,618	3,482	-	123,383	134,442	427,925
Utilized	(163,909)	-	-	(224)	(26,315)	(190,448)
Others (*1)	1,965	(15,339)	(778)	(5,921)	191,362	171,289
December 31	₩ 484,063	₩ 7,337	₩ -	₩ 129,950	₩ 299,489	₩ 920,839
Current	₩ 247,097	₩ 3,220	₩ -	₩ 47,177	₩ 239,424	₩ 536,918
Non-current	236,966	4,117	-	82,773	60,065	383,921

(*1) It includes changes in the amounts from foreign exchange rate, the scope of consolidation and others.

(*2) As of December 31, 2020, others include provisions related to guaranteed return on membership fee of ₩54,855 million, related provisions for pending litigations and others.

The Group recognizes the expected expenses due to quality assurance, exchange and refund, onerous contract defect repair, and subsequent post-service as provisions based on the warranty period and past experience rate.

19. Share capital and share premium

Changes in share capital and share premium for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions, except for share data):

	Number of shares		Share capital			Share premium
	Ordinary shares	Preferred shares	Ordinary shares	Preferred shares	Total	
January 1, 2020	16,523,835	4,889,500	₩ 99,291	₩ 24,447	₩ 123,738	₩ 322,462
December 31, 2020	16,523,835	4,889,500	₩ 99,291	₩ 24,447	₩ 123,738	₩ 322,462
January 1, 2021	16,523,835	4,889,500	₩ 99,291	₩ 24,447	₩ 123,738	₩ 322,462
December 31, 2021	16,523,835	4,889,500	₩ 99,291	₩ 24,447	₩ 123,738	₩ 322,462

The Company's number of shares authorized is 400,000,000 shares with a par value of ₩5,000 per share. The amount of share capital is not the same as total par value of shares issued due to retirement of shares.

The number of shares with the limited voting rights under commercial law are 3,000,866 shares and 3,000,866 shares as of December 31, 2021 and 2020, respectively. In addition, if there is a resolution at the shareholders' meeting that the Company does not pay a certain dividend to the preferred shareholders, the preferred shares are deemed to have the voting right from the next shareholders' meeting until the end of the shareholders' meeting where shareholders resolve to pay dividends to preferred shareholders.

20. Capital surplus

Details of capital surplus as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Share premium	₩ 322,462	₩ 322,462
Revaluation reserves	277,542	277,542
Other capital surplus	637,395	490,770
	₩ 1,237,399	₩ 1,090,774

21. Other equity items

Other capital items as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Treasury stocks	₩ (185,025)	₩ (185,025)
Loss on disposal of treasury stocks	(16,738)	(16,738)
Stock options	1,043	2,104
Loss from capital reduction	(948,311)	(948,311)
Others	(47,398)	(46,629)
	₩ (1,196,429)	₩ (1,194,599)

21.1 Treasury stocks

The Company acquired registered ordinary shares and non-voting preferred shares, and recognized them as other capital items for the stabilization of share price. Changes in treasury stocks for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions, except for share data):

	Number of treasury stocks			Book value of treasury stocks		
	Ordinary shares	Preferred shares	Total	Ordinary shares	Preferred shares	Total
January 1, 2020	3,000,866	612,104	3,612,970	₩ 171,231	₩ 13,794	₩ 185,025
December 31, 2020	3,000,866	612,104	3,612,970	₩ 171,231	₩ 13,794	₩ 185,025
January 1, 2021	3,000,866	612,104	3,612,970	₩ 171,231	₩ 13,794	₩ 185,025
December 31, 2021	3,000,866	612,104	3,612,970	₩ 171,231	₩ 13,794	₩ 185,025

21.2 Share-based payment

The Company granted stock options to its directors several times in the past. Stock options are settled based on the Board of Directors' decision by issuance of new shares, treasury stocks or cash settlement. Vesting condition offers two-year service after the resolution at the shareholders' meeting. The number of granted options as of December 31, 2021 is as follows (Korean won, except for share data):

	Date of grant	Number of granted options	Exercisable period	Exercisable price	Expected fair value at the date of grant
14th	2012.3.30	2,987	2015.3.30 - 2022.3.30	156,200	63,647
15th	2013.3.29	9,600	2016.3.29 - 2023.3.28	128,100	43,353
16th	2014.3.28	11,049	2017.3.28 - 2024.3.27	134,300	39,558

The Company calculated expenses by applying the fair value approach. Assumptions used in determining fair value of stock options are as follows:

	Risk-free interest rate	Expected exercisable period	Expected volatility	Expected dividend yield ratio
14th	3.57%	3.41	62.76%	43.00%
15th	2.45%	3.42	49.22%	46.00%
16th	2.88%	3.60	40.90%	48.00%

Risk-free interest rate is based on a three-year treasury bond yield rate.

21.2 Share-based payment (cont'd)

Changes in stock options for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions, except for share data):

2021						
	Number of ordinary shares to be issued			Valuation amount		
	Beginning	Forfeited	Ending	Beginning	Forfeited	Ending
13th	2,444	(2,444)	-	₩ 166	₩ (166)	₩ -
14th	5,885	(2,898)	2,987	375	(185)	190
15th	16,303	(6,703)	9,600	707	(291)	416
16th	21,646	(10,597)	11,049	856	(419)	437
	<u>46,278</u>	<u>(22,642)</u>	<u>23,636</u>	<u>₩ 2,104</u>	<u>₩ (1,061)</u>	<u>₩ 1,043</u>

2020						
	Number of ordinary shares to be issued			Valuation amount		
	Beginning	Forfeited	Ending	Beginning	Forfeited	Ending
12th	4,258	(4,258)	-	₩ 240	₩ (240)	₩ -
13th	3,168	(724)	2,444	215	(49)	166
14th	6,880	(995)	5,885	438	(63)	375
15th	25,362	(9,059)	16,303	1,100	(393)	707
16th	32,152	(10,506)	21,646	1,272	(416)	856
	<u>71,820</u>	<u>(25,542)</u>	<u>46,278</u>	<u>₩ 3,265</u>	<u>₩ (1,161)</u>	<u>₩ 2,104</u>

The weighted-average of remaining contractual period (from December 31, 2021 to maturity) of stock options is 1.6 years.

22. Accumulated other comprehensive income

Accumulated other comprehensive income as of December 31, 2021 and 2020 is as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Loss on valuation of financial assets (designated) at fair value through OCI	₩ (3,571)	₩ (18,384)
(Negative) equity changes in equity method	(1,099)	(3,441)
Loss on foreign operations translation	(65,008)	(102,202)
Gain on valuation of derivatives designated as hedges	39,477	35,545
Land revaluation surplus	562,430	568,933
	<u>₩ 532,229</u>	<u>₩ 480,451</u>

23. Retained earnings

Retained earnings as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Legal reserves	₩ 67,423	₩ 67,423
Unappropriated retained earnings	1,400,718	1,091,885
	₩ 1,468,141	₩ 1,159,308

The Commercial Code of the Republic of Korea requires the Company to appropriate an amount equal to a minimum of 10% of annual cash dividends declared as a legal reserve until the reserve equals 50% of its issued share capital.

Details of dividends for the year ended December 31, 2021 are as follows (Korean won, except for share data and dividend amount):

	2021		
	Preferred shares (old)	Preferred shares (new)	Ordinary shares
Par value per share	₩ 5,000	₩ 5,000	₩ 5,000
Year end (planned):			
Number of shares issued	3,996,462	893,038	16,523,835
Number of treasury stocks	564,242	47,862	3,000,866
Shares eligible for dividends	3,432,220	845,176	13,522,969
Number of shares eligible for dividends	3,432,220	845,176	13,522,969
Rate of dividend per par value	41%	40%	40%
Dividend per share	₩ 2,050	₩ 2,000	₩ 2,000
Dividend amount (planned) (Korean won in millions)	₩ 7,036	₩ 1,690	₩ 27,046

Details of dividends paid by the Company for the year ended December 31, 2021 are as follows (Korean won, except for share data and dividend amount):

	Preferred shares (old)	Preferred shares (new)	Ordinary shares	Total
Annual dividends for previous year:				
Shares eligible for dividends	3,432,220	845,176	13,522,969	
Number of shares owned by the largest shareholder (*1)	670,126	43,397	7,208,417	
Number of shares eligible for dividends	2,762,094	801,779	6,314,552	
Dividend per share (Korean won)	₩ 2,050	₩ 2,000	₩ 2,000	
	₩ 5,662	₩ 1,604	₩ 12,629	₩ 19,895

(*1) In accordance with a resolution at the Board of Directors' meeting held on February 9, 2021, the Company decided to pay differential dividends to all shareholders, except for those shares owned by Jeongwon Park and other related parties.

24. Operating segment information

The Group is engaged in various businesses, such as heavy industry, machinery manufacturing, apartment construction industry and service industry, key products and services of each segment are as follows:

Operating segment	Main products and services
Electro-Materials BG	Manufacture and sale of copper clad laminates
Mottrol BG (*1)	Manufacture and sale of hydraulic equipment
Industrial Vehicle BG (*2)	Manufacture and sale of forklifts
Digital Innovation BU	Development and maintenance service of information technology system and others
Others (*1)	Advertisement, manufacture and sale of industrial equipment, operations of golf club and condominium, etc.
DHC	NSSS, BOP, Turbine, freshwater and water treatment facilities, plant facilities installment construction, road construction, etc.
DI (*1)	Internal combustion engine, various construction machinery, transportation equipment and parts, etc.
DBI (*2)	Manufacturing and sale of small size construction machine and equipment
DEC (*1)	Apartment construction, etc.
DFC (*3)	Fuel cell and renewable energy business, etc.

(*1) As described in Note 37 to the consolidated financial statements, the operating performance of each segment, such as duty-free, Neoplux, Mottrol, DI, DEC, Doosan Babcock Ltd. and its subsidiaries ("DBL"), is presented as discontinued operations, and accordingly, the consolidated statements of profit or loss for the year ended December 31, 2020, which is presented for comparative purpose, was restated.

(*2) As of July 1, 2021, the Company completed the split-off of the Industrial Vehicle BG and newly established DIV. Accordingly, the Company acquired all of the shares issued by the DIV and sold the shares to DBI on July 6, 2021. As a result, the operations of DIV and its subsidiaries was included in DBI segment, and the comparative operating segment information has been restated.

(*3) As described in Note 39 to the consolidated financial statements, the Group acquired control over DFC during the year ended December 31, 2020 and has newly included as one of the Group's operating segments.

24. Operating segment information (cont'd)

Information on each segment for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	2021				
	Total sales	Inter-segment sales (*2)	Net sales	Operating profit (loss)	Profit (loss) for the year
Electro-Materials BG	₩ 915,667	₩ (20,269)	₩ 895,398	₩ 110,924	₩ 82,599
Digital Innovation BU	256,558	(160,152)	96,406	10,502	5,731
Others (*1)	714,524	(256,728)	457,796	(14,455)	62,842
DHC (*1)	5,856,777	(256,139)	5,600,638	249,265	270,928
DI (*1)	2,708,747	(83,650)	2,625,097	239,694	(11,002)
DBI (*3)	6,315,179	(7,341)	6,307,838	619,047	401,240
DEC (*1)	1,398,625	(29,235)	1,369,390	86,780	163,648
DFC	381,412	(11,271)	370,141	17,990	8,695
	18,547,489	(824,785)	17,722,704	1,319,747	984,681
Adjustment for discontinued operations (*1)	(4,630,814)	112,263	(4,518,551)	(339,379)	(295,922)
Consolidation adjustments	(712,522)	712,522	-	(34,437)	(327,950)
	₩ 13,204,153	₩ -	₩ 13,204,153	₩ 945,931	₩ 360,809

(*1) It includes profit or loss about DI, DEC, DBL segment and profit(loss) from disposal about Mottrol segment classified as discontinued operations.

(*2) It includes the amount of adjustment for discontinued operations of DI, DEC and DBL.

(*3) It includes the business performance of DIV and its subsidiaries.

	2020				
	Total sales	Inter-segment sales (*2)	Net sales	Operating profit (loss)	Profit (loss) for the year
Electro-Materials BG	₩ 816,124	₩ -	₩ 816,124	₩ 97,722	₩ 69,658
Mottrol BG (*1)	662,871	(77,545)	585,326	57,072	8,802
Digital Innovation BU	237,269	(209,787)	27,482	16,671	13,687
Others (*1)	652,707	(42,574)	610,133	(25,280)	(83,393)
DHC (*1)	5,518,524	(229,804)	5,288,720	(542,423)	(1,636,553)
DI (*1)	3,648,796	(238,477)	3,410,319	262,118	57,434
DBI (*3)	5,088,309	(4,877)	5,083,432	433,893	266,256
DEC (*1)	1,891,692	(225,876)	1,665,816	35,393	(203,270)
DFC	109,677	(28,689)	80,988	3,097	1,498
	18,625,969	(1,057,629)	17,568,340	338,263	(1,505,881)
Adjustment for discontinued operations (*1)	(6,667,540)	527,749	(6,139,791)	(346,246)	140,536
Consolidation adjustments	(529,880)	529,880	-	(12,370)	541,989
	₩ 11,428,549	₩ -	₩ 11,428,549	₩ (20,353)	₩ (823,356)

(*1) It includes profit or loss about duty-free, Neoplux, Mottrol, DI, DEC, and DBL segment classified as discontinued operations.

(*2) It includes the amount of adjustment for discontinued operations of the duty-free, Neoplux and Mottrol, DI, DEC and DBL.

(*3) It includes the business performance of DIV and its subsidiaries.

24. Operating segment information (cont'd)

Segment assets and liabilities as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021		December 31, 2020	
	Assets	Liabilities	Assets	Liabilities
Electro-Materials BG	₩ 705,013	₩ 258,625	₩ 457,894	₩ 183,686
Mottrol BG	-	-	524,848	250,976
Industrial Vehicle BG (*1)	-	-	673,389	343,002
Digital Innovation BU	165,596	71,391	136,511	76,054
Others	6,087,444	3,380,729	5,612,488	4,263,564
DHC	17,642,568	11,149,879	14,543,223	10,066,379
DI (*2)	-	-	12,026,886	7,537,888
DBI (*1, 2)	8,580,899	4,259,634	-	-
DEC	-	-	1,550,362	1,253,762
DFC	698,855	180,667	790,188	277,644
	33,880,375	19,300,925	36,315,789	24,252,955
Consolidation adjustments	(7,870,523)	(1,788,126)	(6,114,786)	(1,817,523)
	₩ 26,009,852	₩ 17,512,799	₩ 30,201,003	₩ 22,435,432

(*1) As of December 31, 2021 assets and liabilities of DIV and its subsidiaries are included in the DBI segment.

(*2) As of December 31, 2020 assets and liabilities of DI are included in the DBI segment.

25. Revenues

25.1 Disaggregation of revenues

Details of disaggregation of revenues for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Revenues from contracts with customers:		
Merchandise and finished goods	₩ 7,668,316	₩ 6,267,117
Construction contracts	4,969,110	4,599,022
Others	524,802	474,658
	13,162,228	11,340,797
Others:		
Rental income and others (*1)	41,925	87,752
	₩ 13,204,153	₩ 11,428,549

(*1) It includes hedge gains and losses adjusted from sales in accordance with the application of hedge accounting.

25.1 Disaggregation of revenues (cont'd)

		2021					
		Electro- Materials BG	Digital Innovation BU	Others	DHC (*1)	DI (*1)	DBI (*2)
Geographical market:							
Korea	₩	539,457	₩ 78,086	₩ 374,487	₩ 2,391,401	₩ 1,113,245	₩ 429,944
USA		7,445	4,614	82,918	223,407	236,784	4,350,727
Asia		348,496	10,531	391	1,520,615	870,821	170,979
Middle East		-	-	-	448,345	-	93,709
Europe		-	3,175	-	960,871	404,247	1,121,401
Others		-	-	-	55,999	-	141,078
	₩	895,398	₩ 96,406	₩ 457,796	₩ 5,600,638	₩ 2,625,097	₩ 6,307,838
Timing of revenue recognition:							
Transfer at a point in time	₩	887,218	₩ 8,567	₩ 225,028	₩ 207,341	₩ 2,553,348	₩ 6,233,292
Transfer over time		8,180	87,839	232,768	5,393,297	71,749	74,546
	₩	895,398	₩ 96,406	₩ 457,796	₩ 5,600,638	₩ 2,625,097	₩ 6,307,838
		2021					
		DEC (*1)	DFC	Subtotal	Adjustment for discontinued operations (*1)	Total	
Geographical market:							
Korea	₩	1,333,577	₩ 370,141	₩ 6,630,338	₩ (2,178,652)	₩ 4,451,686	
USA		-	-	4,905,895	(386,304)	4,519,591	
Asia		35,813	-	2,957,646	(920,228)	2,037,418	
Middle East		-	-	542,054	-	542,054	
Europe		-	-	2,489,694	(1,033,367)	1,456,327	
Others		-	-	197,077	-	197,077	
	₩	1,369,390	₩ 370,141	₩ 17,722,704	₩ (4,518,551)	₩ 13,204,153	
Timing of revenue recognition:							
Transfer at a point in time	₩	11,783	₩ 272,964	₩ 10,399,541	₩ (2,564,068)	₩ 7,835,473	
Transfer over time		1,357,607	97,177	7,323,163	(1,954,483)	5,368,680	
	₩	1,369,390	₩ 370,141	₩ 17,722,704	₩ (4,518,551)	₩ 13,204,153	

(*1) It includes the DI, DEC segment and DBL classified as discontinued operations.

(*2) As of July 1, 2021, the Company completed the division of the company by splitting off the industrial Vehicle BG into DIV. Accordingly, the divided company acquired all of the shares issued by the DIV and sold the shares to DBI on July 6, 2021. Meanwhile, the performance of DIV and its subsidiaries was included in DBI segment.

25.1 Disaggregation of revenues (cont'd)

		2020					
		Electro- Materials BG	Mottrol BG (*1)	Digital Innovation BU	Others (*1)	DHC (*1)	DI (*1)
Geographical market:							
Korea	₩	529,268	₩ 276,270	₩ 20,513	₩ 408,863	₩ 2,438,080	₩ 1,223,388
USA		6,591	-	729	201,150	195,607	267,876
Asia		280,265	309,056	1,080	120	1,494,772	1,466,960
Middle East		-	-	-	-	374,170	-
Europe		-	-	5,160	-	746,757	450,524
Others		-	-	-	-	39,334	1,571
	₩	<u>816,124</u>	₩ <u>585,326</u>	₩ <u>27,482</u>	₩ <u>610,133</u>	₩ <u>5,288,720</u>	₩ <u>3,410,319</u>
Timing of revenue recognition:							
Transfer at a point in time	₩	809,530	₩ 583,647	₩ 998	₩ 374,053	₩ 254,891	₩ 3,369,604
Transfer over time		6,594	1,679	26,484	236,080	5,033,829	40,715
	₩	<u>816,124</u>	₩ <u>585,326</u>	₩ <u>27,482</u>	₩ <u>610,133</u>	₩ <u>5,288,720</u>	₩ <u>3,410,319</u>
		2020					
		DBI (*2)	DEC (*1)	DFC	Subtotal	Adjustment for discontinued operations (*1)	Total
Geographical market:							
Korea	₩	400,335	₩ 1,574,565	₩ 80,988	₩ 6,952,270	₩ (3,088,348)	₩ 3,863,922
USA		3,456,205	31,540	-	4,159,698	(299,420)	3,860,278
Asia		150,907	55,811	-	3,758,971	(1,878,125)	1,880,846
Middle East		80,026	-	-	454,196	-	454,196
Europe		906,617	3,900	-	2,112,958	(872,327)	1,240,631
Others		89,342	-	-	130,247	(1,571)	128,676
	₩	<u>5,083,432</u>	₩ <u>1,665,816</u>	₩ <u>80,988</u>	₩ <u>17,568,340</u>	₩ <u>(6,139,791)</u>	₩ <u>11,428,549</u>
Timing of revenue recognition:							
Transfer at a point in time	₩	4,963,269	₩ 34,978	₩ 75,536	₩ 10,466,506	₩ (3,840,390)	₩ 6,626,116
Transfer over time		120,163	1,630,838	5,452	7,101,834	(2,299,401)	4,802,433
	₩	<u>5,083,432</u>	₩ <u>1,665,816</u>	₩ <u>80,988</u>	₩ <u>17,568,340</u>	₩ <u>(6,139,791)</u>	₩ <u>11,428,549</u>

(*1) It includes the duty-free, Neoplux, Mottrol, DI, DEC and DBL segment classified as discontinued operations.

(*2) As of July 1, 2021, the Company completed the division of the company by splitting off the industrial Vehicle BG into DIV. Accordingly, the divided company acquired all of the shares issued by the DIV and sold the shares to DBI on July 6, 2021. Meanwhile, the performance of DIV and its subsidiaries was included in DBI segment.

25.2 Contract balances

Receivables, contract assets and liabilities arising from contracts with customers as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Receivables in trade and other receivables (*1)	₩ 1,450,946	₩ 2,534,765
Contract assets (*2)	1,771,788	1,883,920
Contract liabilities	(1,720,559)	(2,102,542)

(*1) As of December 31, 2021 and 2020, provisions of ₩225,789 million and ₩1,199,059 million are included.

(*2) As of December 31, 2021 and 2020, provisions of ₩59,571 million and ₩82,701 million are included.

Contract assets are amounts unbilled that the Group has a right to receive as consideration in exchange for the goods or services transferred to the customer and are transferred to receivables upon billings. Contract liabilities are advances from customers for construction contracts performed over time and are recognized as revenue as the Group transfers the goods or services to the customer.

The Group recognized assets for the costs it spent to enter into a contract with the customer, such as brokerage fees, which would not have been incurred unless the contract was entered into.

Details of incremental cost of obtaining a contract as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Incremental cost of obtaining a contract recognized as an asset as of December 31, 2021 and 2020	₩ 39,743	₩ 49,919
Amount of amortization recognized as cost of sales for the years ended December 31, 2021 and 2020	12,699	26,087

The incremental cost of obtaining a contract is amortized and recognized as expenses in the same manner as revenue recognized over the progress of the particular contract concerned.

The Group recognized design costs of an asset to be transferred for certain contracts that are not yet approved as an asset as they relate directly to a contract or to an anticipated contract with the customer that the entity can specifically identify, generate or enhance resources of the entity that will be used in satisfying performance obligations in the future, and are expected to be recovered.

Details of costs to fulfill a contract as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Costs to fulfill a contract recognized as assets as of December 31, 2021 and 2020	₩ 152,344	₩ 117,924
Amount of amortization recognized as cost of sales for the years ended December 31, 2021 and 2020	28,125	63,248

The costs to fulfill a contract are amortized and recognized as expenses on a systematic basis consistent with the transfer of the related goods or services to the customers.

25.3 Change in the balance of construction contracts

As a contract that recognizes revenue over time by applying the cost-based input method, changes in the balance of construction contracts for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

		2021			
	Project	Beginning balance	Changes	Recognized construction revenue	Ending balance
DHC and its subsidiaries	Vung Ang II Power Project and others	₩ 14,023,501	₩ 6,849,478	₩ (5,393,950)	₩ 15,479,029
DEC and its subsidiaries	Bumil integrated district 3 and others	7,050,375	(5,669,260)	(1,381,115)	-
Doosan Logistics Solution Co., Ltd.	Coupang Icheon ECH2 FC Automation and others	16,652	95,125	(59,716)	52,061
		21,090,528	1,275,343	(6,834,781)	15,531,090
Inter-company transactions		(100,749)	85,679	15,070	-
Amount attributable to discontinued operation segment		(8,082,717)	6,192,604	1,890,113	-
		<u>₩ 12,907,062</u>	<u>₩ 7,553,626</u>	<u>₩ (4,929,598)</u>	<u>₩ 15,531,090</u>
		2020			
	Project	Beginning balance	Changes	Recognized construction revenue	Ending balance
DHC and its subsidiaries	Fadhili CHP and others	₩ 14,290,419	₩ 4,759,157	₩ (5,026,075)	₩ 14,023,501
DEC and its subsidiaries	Bumil integrated district 3 and others	7,614,476	1,283,400	(1,847,501)	7,050,375
Doosan Logistics Solution Co., Ltd.	Amore Osan GDC shuttle system and others	2,300	27,976	(13,624)	16,652
		21,907,195	6,070,533	(6,887,200)	21,090,528
Inter-company transactions		(256,000)	(16,055)	171,306	(100,749)
Amount attributable to discontinued operation segment		(8,628,833)	(1,766,032)	2,312,148	(8,082,717)
		<u>₩ 13,022,362</u>	<u>₩ 4,288,446</u>	<u>₩ (4,403,746)</u>	<u>₩ 12,907,062</u>

25.4 The effect of changing in accounting estimate that related contracts recognized revenue over a year by applying the cost-based input method

Changes in profit or loss in the current and succeeding reporting years and the amount of due from/to customers for contract work (excluding foreign currency translation effect) resulting from changes in total contract revenue and in total estimated contract costs for construction contracts in progress as of December 31, 2021 are as follows (Korean won in millions):

	2021					
	Provision for construction loss	Changes in total contract amount	Changes in total contract cost	Impact on profit or loss for the current year	Impact on profit or loss for the succeeding year	Changes in due from/to customers for contract work
DHC and its subsidiaries	₩ 94,309	₩ 732,210	₩ 463,545	₩ 237,759	₩ 30,906	₩ 237,759
Doosan Logistics Solution Co., Ltd.	10	49	2,465	(2,354)	(62)	(2,354)
	₩ 94,319	₩ 732,259	₩ 466,010	₩ 235,405	₩ 30,844	₩ 235,405

The impacts on profit or loss for the current year and succeeding year are determined based on total estimated contract costs which are estimated based on the circumstances present from the start of the contract to the end of current year and the estimated contract revenue as of December 31, 2021. The total contract costs and contract revenue may change in the future.

As of December 31, 2021, details of contracts that the revenue was recognized based on the percentage-of-completion measured by input method, and contract revenue has been recognized over time, which is more than 5% of sales of the year ended December 31, 2021 are as follows (Korean won in millions):

	Contract date	Contractual completion date (*1)	Percentage-of-completion (%)	Due from customers		Trade receivables (receivables from construction contracts)	
				Accumulated impairment loss		Allowance for doubtful accounts	
				Total	loss	Total	
Shingori #5, 6 facilities construction	2015-06-12	2025-05-28	82.29	₩ 71,347	₩ 385	₩ -	₩ -
Shinhanul #1, 2 NSSS	2009-07-31	2022-05-31	98.77	7,440	40	-	-
UAE BNPP #1, 2 T/G	2010-06-30	2022-03-01	94.42	-	-	-	-
UAE BNPP #1, 2 NSSS	2010-06-30	2021-12-08	97.44	-	-	7,044	959
Shingori #5, 6 NSSS	2014-08-28	2025-03-31	84.26	53,961	291	-	-
UAE BNPP #3, 4 NSSS	2010-06-30	2023-11-30	95.51	25,808	139	1,811	-
UAE BNPP #3, 4 T/G	2011-09-27	2024-06-30	92.69	-	-	-	-
Vinh Tan 4 TPP	2014-02-26	2021-10-31	99.76	21,975	119	22,843	4,569
Song Hau 1	2015-04-10	2022-03-31	94.19	86,581	468	-	-
Fadhili CHP	2016-11-12	2021-10-30	99.96	-	-	13	-
Samcheok #1, 2 EPC	2018-07-24	2024-04-30	59.08	317,889	1,717	-	-
Yanbu ph.3 MSF	2012-12-04	2022-12-31	98.81	-	-	-	-
Yanbu 4 IWP	2021-01-22	2023-11-01	8.69	-	-	-	-
Vung Ang II Power Project	2021-10-26	2025-10-26	1.46	-	-	-	-
Nghi Son 2	2014-12-24	2022-07-10	87.91	66,888	254	31,062	102
Jawa #9, 10	2019-03-20	2025-02-15	22.74	132,889	718	-	-
Jawaharpur	2016-12-22	2023-04-21	82.15	49,224	-	33,645	-
Obra C	2016-12-22	2023-06-20	71.54	-	-	10,476	-

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

26. Breakdown of expenses by nature

Breakdown of expenses by nature for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Changes in inventories	₩ (552,022)	₩ 325,364
Purchases of raw materials and merchandise	6,943,442	4,072,595
Employee benefits expenses	1,930,583	1,960,420
Depreciation and amortization	492,547	512,626
Others	3,443,672	4,577,897
	<u>₩ 12,258,222</u>	<u>₩ 11,448,902</u>

27. Selling and administrative expenses

Selling and administrative expenses for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Salaries	₩ 530,689	₩ 477,114
Retirement benefits	48,614	217,330
Employee benefits	93,464	97,250
Travel expenses	21,252	15,876
Sales commission	33,465	17,142
Taxes and dues	24,730	19,104
Depreciation	56,209	62,185
Insurance expenses	29,936	25,113
Repairing expenses	5,045	5,292
Advertising expenses	51,613	37,456
Packaging expenses	1,864	1,597
Research and development	164,569	147,528
Training expenses	7,868	7,245
Freight expenses	26,494	19,414
Promotional expenses	4,867	6,743
Commission expenses	107,922	82,419
Service contract expenses	9,401	7,353
(Reversal of) bad debt expenses	15,821	20,006
Amortization	45,443	40,972
Expansion expenses of overseas market	10,986	12,697
Warranty expenses	1,537	9,506
Others	4,746	171,918
	<u>₩ 1,296,535</u>	<u>₩ 1,501,260</u>

28. Finance income and expenses

Finance income and expenses for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Finance income:		
Interest income	₩ 26,764	₩ 22,576
Dividend income	1,383	754
Gain on foreign currency transaction	135,124	158,454
Gain on foreign currency translation	126,086	120,080
Gain on derivative transactions	246,321	108,839
Gain on valuation of derivatives	101,457	121,274
Gain on valuation of firm commitment	121,534	10,454
Gain on repayment of borrowings	3,860	-
Financial guarantee income	90	1,130
	<u>762,619</u>	<u>543,561</u>
Finance expenses:		
Interest expense	369,626	397,441
Loss on foreign currency transactions	133,199	188,441
Loss on foreign currency translations	189,230	134,370
Loss on derivative transactions	79,268	127,677
Loss on valuation of derivatives	243,988	28,045
Loss on valuation of firm commitment	7,665	70,281
Loss on repayment of bonds	-	30,646
Loss on repayment of borrowings	989	-
Financial guarantee expense	58,702	53,560
Others	8,113	3,677
	<u>1,090,780</u>	<u>1,034,138</u>
	<u>₩ (328,161)</u>	<u>₩ (490,577)</u>

29. Other non-operating income and expenses

Other non-operating income and expenses for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Other non-operating income:		
Gain on disposal of short-term investment securities	₩ 4,097	₩ 540
Gain on valuation of long-term and short-term investment securities	20,195	3,611
Gain on disposal of property, plant and equipment	9,395	7,105
Gain on disposal of intangible assets	1,203	-
Gain on disposal of assets held for sale	74,947	-
Gain on disposal of investment properties	2,007	41,829
Gain on valuation of investment properties	24,979	6,642
Reversal of impairment loss of property, plant and equipment	43	-
Reversal of impairment loss of intangible asset	266	4,420
Others	15,562	24,914
	<u>152,694</u>	<u>89,061</u>
Other non-operating expenses:		
Loss on disposal of trade receivables	6,596	13,824
Loss on disposal of property, plant and equipment	2,462	3,779
Loss on disposal of intangible assets	12	249
Loss on disposal of investment properties	-	14,165
Impairment loss of property, plant and equipment	8,144	36,383
Impairment loss of intangible assets	28,290	157,913
Impairment loss of assets held for sale	2,487	-
Loss on valuation of investment properties	46,774	3,775
Loss on disposal of investments in subsidiaries	1,116	10,792
Bad debt expenses of others	3,161	13,754
Donations	9,266	10,036
Others	55,917	128,536
	<u>164,225</u>	<u>393,206</u>
	<u>₩ (11,531)</u>	<u>₩ (304,145)</u>

30. Income tax expenses

Details of income tax expenses for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Current income tax on profit for the year	₩ 573,984	₩ 341,482
Deferred tax:		
Origination and reversal of temporary differences	80,444	81,379
Charged or credited directly to equity	(176,320)	(300,117)
Others	(31,034)	(413)
Income tax revenues(expenses) classified as profit or loss from discontinued operations	<u>(197,522)</u>	<u>(120,376)</u>
Income tax expenses	<u>₩ 249,552</u>	<u>₩ 1,955</u>

30. Income tax expenses (cont'd)

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

	2021		
	Beginning balance	Changes	Ending balance
Allowance for doubtful accounts	₩ 484,425	₩ (183,286)	₩ 301,139
Derivatives	(6,710)	33,964	27,254
Property, plant, equipment and Investment properties	(699,005)	109,122	(589,883)
Intangible assets	51,899	(468,710)	(416,811)
Assets and liabilities in foreign currencies	2,717	1,153	3,870
Defined benefit liabilities	232,694	(45,230)	187,464
Others	(236,609)	492,030	255,421
	₩ (170,589)	₩ (60,957)	₩ (231,546)

	2020		
	Beginning balance	Changes	Ending balance
Allowance for doubtful accounts	₩ 457,299	₩ 27,126	₩ 484,425
Derivatives	21,697	(28,407)	(6,710)
Property, plant, equipment and Investment properties	(773,261)	74,256	(699,005)
Intangible assets	42,023	9,876	51,899
Assets and liabilities in foreign currencies	10,554	(7,837)	2,717
Defined benefit liabilities	241,151	(8,457)	232,694
Others	(67,644)	(168,965)	(236,609)
	₩ (68,181)	₩ (102,408)	₩ (170,589)

The Group offsets deferred tax assets and deferred tax liabilities, if the Group has a legally enforceable right to set off current tax assets against current tax liabilities and the deferred tax assets against deferred tax liabilities relating to income taxes levied by the same taxation authority.

Temporary differences, net loss and tax credit carryforwards, which have not been recognized as deferred income tax assets and expired or unused as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020
Deductible temporary differences	₩ 2,683,453	₩ 3,276,600
Net loss carried over	267,994	1,977,790
Carried forward tax credit	168,920	133,309
	₩ 3,120,367	₩ 5,387,699

The probability of realizing deferred tax assets depends on the Group's ability to generate taxable income in future years, economic situation and industry forecast. The Group periodically reviews these matters.

30. Income tax expenses (cont'd)

Temporary differences from investments in subsidiaries, joint ventures and associated investments, which are not recognized as deferred tax assets (liabilities), as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021	December 31, 2020	Remarks
Investments in subsidiaries	₩ (1,066,794)	₩ 1,317,191	Able to control the timing of the reversal of the temporary difference
Investments in associates and joint ventures	1,740,720	5,752	Probable that the temporary difference will not reverse in the foreseeable future
	<u>₩ 673,926</u>	<u>₩ 1,322,943</u>	

A reconciliation of income tax expenses and profit before income tax expenses for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	2021	2020
Profit (loss) before income tax expenses	₩ 610,362	₩ (821,402)
Tax expense by applicable tax rates	227,445	(298,705)
Adjustments:		
Non-taxable income and non-deductible expenses	(75,852)	49,955
Tax credits	(14,194)	(20,245)
Temporary difference not recognized as deferred income tax	(21,718)	198,945
Others	133,871	72,005
Income tax expenses	<u>₩ 249,552</u>	<u>₩ 1,955</u>
Average effective tax rate (Income tax expenses/Profit before income tax expenses)	40.9%	-

31. Earnings (losses) per share

31.1 Basic earnings (losses) per share

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

	2021		
	Continuing	Discontinued	Total
Basic earnings (losses) per ordinary share	₩ (706)	₩ 12,596	₩ 11,890
Basic earnings (losses) per old-type preferred share (*1)	(709)	12,649	11,940

	2020		
	Continuing	Discontinued	Total
Basic earnings (losses) per ordinary share	₩ (26,990)	₩ (4,102)	₩ (31,092)
Basic earnings (losses) per old-type preferred share (*1)	(26,955)	(4,097)	(31,052)

(*1) The Company calculated earnings per share for old-type preferred share due to the nature of the share, which does not have preferred right on dividends and liquidation. Therefore, the share is considered as ordinary share, based on KIFRS 1033 *Earnings per share*.

31.1 Basic earnings (losses) per share (cont'd)

Profit (loss) for the year attributable to the ordinary equity holders of the Company for the years ended December 31, 2021 and 2020 is as follows (Korean won):

	2021		
	Continuing	Discontinued	Total
Profit (loss) for the year attributable to the equity holders of the Company	₩ (1,924,927,440)	₩ 213,749,190,319	₩ 211,824,262,879
Less: Profit (loss) attributable to new-type preferred Shares	(10,049,442,340)	-	(10,049,442,340)
Less: Profit (loss) attributable to old-type preferred shares	2,432,081,017	(43,414,004,886)	(40,981,923,869)
Profit (loss) for the year attributable to the ordinary equity holders of the Company	₩ (9,542,288,763)	₩ 170,335,185,433	₩ 160,792,896,670

	2020		
	Continuing	Discontinued	Total
Profit (loss) for the year attributable to the equity holders of the Company	₩ (483,776,951,434)	₩ (69,531,421,174)	₩ (553,308,372,608)
Less: Profit (loss) attributable to new-type preferred Shares	26,278,094,854	-	26,278,094,854
Less: Profit (loss) attributable to old-type preferred shares	92,515,366,927	14,060,636,109	106,576,003,036
Profit (loss) for the year attributable to the ordinary equity holders of the Company	₩ (364,983,489,653)	₩ (55,470,785,065)	₩ (420,454,274,718)

The weighted-average number of ordinary shares and old-type preferred shares outstanding used in basic earnings per share calculation for the years ended December 31, 2021 and 2020 are as follows:

	2021		2020	
	Ordinary shares	Old-type preferred shares	Ordinary shares	Old-type preferred shares
Beginning outstanding shares	13,522,969	3,432,220	13,522,969	3,432,220
Weighted-average number of shares outstanding	13,522,969	3,432,220	13,522,969	3,432,220

31.2 Diluted earnings (losses) per share

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

	2021		
	Continuing	Discontinued	Total
Diluted earnings (losses) per ordinary share	₩ (706)	₩ 12,596	₩ 11,890
Diluted earnings (losses) per old-type preferred share	(709)	12,649	11,940

	2020		
	Continuing	Discontinued	Total
Diluted earnings (losses) per ordinary share	₩ (26,990)	₩ (4,102)	₩ (31,092)
Diluted earnings (losses) per old-type preferred share	(26,955)	(4,097)	(31,052)

31.2 Diluted earnings (losses) per share (cont'd)

Diluted profit (loss) for the year attributable to the ordinary equity holders of the parent for the years ended December 31, 2021 and 2020 is as follows (Korean won):

	2021		
	Continuing	Discontinued	Total
Profit (loss) for the year attributable to the ordinary equity holders of the Company	₩ (9,542,288,763)	₩ 170,335,185,432	₩ 160,792,896,669
Adjustment	-	-	-
Diluted profit (loss) for the year attributable to the ordinary equity holders of the Company	₩ (9,542,288,763)	₩ 170,335,185,432	₩ 160,792,896,669

	2020		
	Continuing	Discontinued	Total
Profit (loss) for the year attributable to the ordinary equity holders of the Company	₩ (364,983,489,653)	₩ (55,470,785,066)	₩ (420,454,274,719)
Adjustment	-	-	-
Diluted profit (loss) for the year attributable to the ordinary equity holders of the Company	₩ (364,983,489,653)	₩ (55,470,785,066)	₩ (420,454,274,719)

Diluted weighted-average number of ordinary shares outstanding for the years ended December 31, 2021 and 2020 is as follows:

	2021	2020
Weighted-average number of ordinary shares outstanding	13,522,969	13,522,969
Exercise of stock options	-	-
Diluted weighted-average number of ordinary shares outstanding	13,522,969	13,522,969

As there are no potential ordinary shares for old-type preferred share, diluted earnings (losses) per share for old-type preferred share are equal to basic earnings per share for old-type preferred share.

31.3 Conditions for preferred shares dividends

	Par value (Korean won)	Number of shares issued
Old-type preferred shares (*1)	₩ 5,000	3,996,462
New-type preferred shares (*2)	5,000	893,038

(*1) Cash dividends available to ordinary shares plus 1%

(*2) The Company should distribute 2% of par value of preferred shares annually. In case the Company distributes more than 2% of par value for ordinary shares, preferred shares are participated in dividends for the exceeded dividends.

32. Contingencies and commitments

32.1 Notes, bills and checks offered in security

As of December 31, 2021, the Group provided 1 blank notes and 7 blank checks as collateral against financial institutions for the Group's debt, guarantees to fulfill a contract, payment guarantees and funding arrangement.

32.2 Financial covenant

32.2.1 The Company

The subscription agreement of unsecured bonds issued by the Company requires the Company to maintain a debt-to-equity ratio less than 700%, limit the establishment of collateral rights within 500% of its own equity and limit disposal of an asset within 100% of total asset based on the Company's financial statements. If the Company fails to meet certain requirements mentioned above, an acceleration clause would be invoked for the immediate payment. As of December 31, 2021, the amount of bonds required to meet aforementioned debt covenant is ₩452,000 million.

As of December 31, 2021, the total amount of ₩162,500 million including long-term and short-term borrowings and asset-backed loans borrowed from Hana Bank, etc., is required to maintain BBB0 of credit rating. If the Company fails to maintain credit rating, an acceleration clause would be invoked.

32.2.2 DHC

As of December 31, 2021, asset-backed loans of ₩49,600 million for KDPP 5th Co., Ltd. is required to maintain a domestic effective credit rating to be maintained BB+ or higher, and if the DHC fails to maintain credit rating, it is the reason for early payment.

As of December 31, 2021, DHC issued foreign currency-denominated bonds for USD 600,000 thousand (two bonds of USD 300,000 thousand, respectively). The issued foreign currency-denominated bond has an early redemption clause for when and if DHC's guarantor, Korea Development Bank, becomes privatized. In addition, DHC has provided its 11,362,886 shares and 13,884,989 shares of DBI to lender as collateral for above bonds, respectively. If they do not meet the base price, additional shares or deposits equivalent to the difference should be provided as collateral. The bonds have been succeeded to DHC as of July 1, 2021, through a division and merger with DI (currently, Hyundai Doosan Infracore Co., Ltd.).

As of December 31, 2021, DHC has provided 8,595,047 shares of DBI as collateral for borrowings of ₩160,000 million from Korea Development Bank and 4 other financial institution. The share or deposit should be provided additionally as collateral when the contracted mortgage ceiling ratio is not met in relation to the above borrowings. In addition, if the long-term credit rating given by two or more of the three domestic credit rating agencies (Nice Investors Service Co., Ltd., Korea Investors Service Inc and Korea Ratings Corporation) of DHC is below BB0, it includes arrangements that constitute trigger clause for the financial institutions to collect the loans before the maturity. The borrowings have been succeeded to DHC as of July 1, 2021, through a division and merger with DI (currently, Hyundai Doosan Infracore Co., Ltd.).

As of December 31, 2021, DHC has provided 3,650,000 shares of DBI as collateral for its borrowings of ₩100,000 million from Standard Chartered Bank Korea Ltd. If contractual ratio of collateral limit amount of the borrowings is not fulfilled, DHC should provide additional shares or deposits as collaterals or make early redemption of part of the borrowings. The borrowings have been succeeded to DHC as of July 1, 2021, through a division and merger with DI (currently, Hyundai Doosan Infracore Co., Ltd.).

32.2.2 DHC (cont'd)

As of December 31, 2021, the 59th and the 60th convertible bond ₩23,374 million issued by DHC include an agreement that constitutes trigger clause for the financial institutions to collect the loans before the maturity when classified below the BB0 rating. The bonds have been succeeded to DHC as of July 1, 2021, through a division and merger with DI(currently, Hyundai Doosan Infracore Co., Ltd.).

As of December 31, 2021, ₩490,000 million of short-term loan agreement between DHC and NH Investment and Securities Co., Ltd. and 2 other financial institutions includes an agreement of making early redemption within two business days from the date DHC increases in paid-in capital through issuance of shares. Meanwhile, as of December 31, 2021, the short-term loan agreement has been terminated due to the repayment.

As of December 31, 2021, DHC's borrowing of ₩31,990 million from Korea Development Bank 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. Meanwhile, as of December 31, 2021, the covenant has been terminated by full redemption of emergency operation fund.

As of December 31, 2021, DHC's short-term borrowing of ₩30,000 million from Hana Bank includes a clause to repay of ₩13,000 million immediately after redemption of ₩3,000,000 million of emergency operation fund from Korea Development Bank and others. If DHC fails to meet the requirement mentioned above, an acceleration clause would be invoked for the immediate payment. Meanwhile, as of December 31, 2021, the covenant has been terminated by full redemption of ₩13,000 million from Hana Bank after full redemption of emergency operation fund.

As of December 31, 2021, ₩14,607 million of the 48th bonds with stock warrants issued by DHC, a subsidiary, includes an agreement on the condition that the debt to equity ratio is kept below 500%.

32.3 Transferred trade receivables

The carrying amount of the receivables recognized in the statement of financial position as of December 31, 2021, is ₩26,163 million, as it does not meet the requirement to remove financial instruments in relation to the liquidity obligation of the Company (see Note 15, 33).

32.4 Litigation in progress

Details of major lawsuits as a defendant with claims against the Group are as follows (Korean won in millions):

	Claim	Claimed amount
Doosan Corporation	Claims for damages and others	₩ 5,526
DHC and its subsidiaries	Claims for damages of Magok Doosan The Land Park and others	62,186
DBI and its subsidiaries	Claims for damages and others	29,049
		<u>₩ 96,761</u>

The outcome of lawsuits cannot be estimated reliably as of December 31, 2021.

32.5 Technical contract

The Group has technical license agreements with Mitsubishi Hitachi Power Systems, Ltd. and others for the year ended December 31, 2021 and the Group paid ₩14,144 million and ₩9,908 million for the years ended December 31, 2021 and 2020, respectively, as license fee.

32.6 Credit lines for borrowings

The Group has credit lines of borrowing, bank overdraft and others amounting to ₩8,417,967 million from various financial institutions as of December 31, 2021.

32.7 Guarantees of payment

Guarantees of payment provided by the Group as of December 31, 2021 are as follows (Korean won in millions):

Provided by	Provided to	Guarantee amounts
DHC	The complex of Ungcheon-dong, Yeosu projects' customers	₩ 180,742
DBI	End customer	206,716
DFC	Employee stockholders association	16,412
		<u>₩ 403,870</u>

In addition to the above, according to the spin-off during 2019, in accordance with Article 530-9, Paragraph 1 of *the Commercial Act*, the succeeding company after division (the Company) and the newly incorporated company (DFC and Solus Advanced Materials Co., Ltd. (formerly, Doosan Solus Co., Ltd.)) will be repaid in solidarity with respect to the debts of the Company before the division.

32.7 Guarantees of payment (cont'd)

Guarantees of payment provided by third parties to the Group as of December 31, 2021 are as follows (Korean won in millions):

Provided to	Provided by	December 31, 2021
Doosan Corporation	Korea Development Bank	₩ 12,251
	Seoul Guarantee Insurance	41,620
	Korea Software Financial Cooperative (*1)	2,365
	Woori Bank and others	25,596
	Machinery Financial Cooperative	8,923
Oricom	Seoul Guarantee Insurance	384
Doosan Bears Inc.	Seoul Guarantee Insurance	10,411
Hancomm Inc.	Seoul Guarantee Insurance	2,159
Doosan Logistics Solutions Co., Ltd.	Hana Bank	1,573
	Seoul Guarantee Insurance	22,378
Doosan Property Co., Ltd. (formerly, DBC Co., Ltd.)	Seoul Guarantee Insurance	125
Doosan Robotics Inc.	Seoul Guarantee Insurance	387
Doosan Business Research Institute	Seoul Guarantee Insurance	280
Doosan Mobility Innovation Inc	Seoul Guarantee Insurance	725
DHC	Korea Exim Bank	284,466
	Machinery Financial Cooperative	2,090,092
	Seoul Guarantee Insurance	471,688
	Construction Guarantee Cooperative	2,549,320
	Construction Industry Guarantee	814,373
	Hana Bank	84,887
	Engineering Guarantee Insurance	266,724
	Korea Federation of Small and Medium Business	39,452
	Woori Bank	166,253
	Korea Trade Insurance Corporation	292,556
	Korea Development Bank (*2)	748,408
	Kwangju Bank	757
	Kyongnam Bank	2,253
	Kookmin Bank	745
	Shinhan Bank	2,311
	Others	933,497
DBI	Machinery Financial Cooperative	4,508
	Seoul Guarantee Insurance	880
	Woori Bank	3,468
DFC	Machinery Financial Cooperative	90,156
	Seoul Guarantee Insurance	114,139
		<u>₩ 9,090,110</u>

(*1) In connection with this, as of December 31, 2021, equity share of ₩86 million is provided as collateral.

(*2) As a subsidiary, DHC is provided with payment guarantees for foreign bonds of USD 600,000 thousand (two bonds of USD 300,000 thousand, respectively) from Korea Development Bank.

32.8 Covenant related to consolidated structured entities

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

	Financial support for structured entities	Book value of liabilities regarding structured entities' interests	The maximum exposure amount of the Group to structured entities' losses
DHC:			
KDPP 5th Co., Ltd. (*1)	The duty to replenishment of principal and interest of borrowings and others	₩ 49,600	₩ 64,480
Doosan Corporation:			
D-Pay 2nd Co., Ltd. (*2)		82,500	99,000

(*1) KDPP 5th Co., Ltd. was established for the purpose of securitizing future construction receivables belongs to DHC, a subsidiary of the Group. It is mainly financed by issuing ABCPs and others from financial institutions. Based on the book value presented in its financial statements, underlying amounted to ₩49,600 million as of December 31, 2021.

(*2) D-Pay 2nd Co., Ltd. was established for the purpose of securitizing future accounts receivable of Electro-Materials BG of Doosan corporation. It is mainly financed by issuing ABLs from financial institutions. Based on the book value presented in its financial statements, underlying amounted to ₩82,500 million as of December 31, 2021.

32.9 Other commitments

The Company sold Doosan Tower, located in 275, Jangchungdan-ro, Jung-gu, Seoul, during the year ended December 31, 2020, and has been responsible for leasing offices and shopping malls of Doosan Tower for five years after the sale. Meanwhile, if the lessor notifies the Company for extending the lease term of Doosan Tower within 6 months from the 4th year of the commencement date of the lease term, the Company's obligation on lease agreement will be extended on the same terms once for 5 years.

The Company entered into an agreement with the Pangaea Ventures Fund IV, L.P. (total amount of investment commitment: USD 5,000 thousand), and the remaining investment commitment is USD 1,312 thousand as of December 31, 2021.

Doosan Property Co., Ltd. (formerly DBC Co., Ltd.), a subsidiary, contracted on selling Bundang Doosan Tower, located in 155, Jeongjail-ro, Bundang-gu, Seongnam, Gyeonggi-do to Bundang Doosan Tower REIT Co., Ltd. as of January 8, 2021. As of the same day, the Company agreed on a five-year lease contract with DHC, DBI, and Hyundai Doosan Infracore Co., Ltd. (formerly Doosan Infracore Co., Ltd.) after the sale of Bundang Doosan Tower. In this regard, the Company has been responsible for a part of Bundang Doosan Tower for five years after the sale. Meanwhile, if the Company fails to meet certain conditions, lease agreement will be extended on the same terms once for 5 years.

The Group accounts for the aforementioned joint lease contract as joint operation in which the parties jointly control the lease arrangement and have the right to assets and liabilities of the leased asset in accordance with KIFRS 1111 'Joint Arrangements'. As of December 31, 2021, the Group's ownership interests are 78.9%.

As of December 31, 2021, DHC, a subsidiary, has signed 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 and Yeosu Woongcheon Complex Project, and Suncheon Urban Development Project.

DHC, the investor of Samcheok Blue Power Co., Ltd. which is responsible for the EPC construction project of Samcheok #1, 2 TPP, is obliged to make an additional investment of ₩77,740 million in September 2023 in accordance with the investor agreement. To fulfill this obligation, DHC 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, ₩39,715 million accumulated under the agreement is included in non-current deposits.

32.9 Other commitments (cont'd)

DHC, a subsidiary, is providing payment guarantee to the client with respect to the implementation of the Sharqiyah EPC project. The credit rating of the DHC evaluated by the Korea Credit Rating Agency must be maintained at the BBB or higher. If DHC fails to maintain the condition, DHC is obliged 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 provision has been suspended considering the various circumstances and changes in DHC's business environment.

D20 Capital FUNDI, L.P., a subsidiary, entered into investment agreements with ZIGG CAPITALI, L.P. and eight other funds, with a total remaining investment agreement of USD 3,438 thousand.

As of December 31, 2021, Doosan Heavy Industries Vietnam Haiphong Co., Ltd., a subsidiary of Doosan Mecatec Co., Ltd., did not recognize provisions. Because it could not measure the costs and outflow of resources after the termination of the land permit for the lease of factory land with Haiphong Department of Natural and Resources.

Doosan Mecatec Co., Ltd., a subsidiary, sold its real estate in Changwon, Gyeongnam (Changwon Plant 1) to Korea Asset Management Corporation and has been using it through a lease agreement for 5 years from December 2020. Doosan Mecatec Co., Ltd. may exercise the priority purchase right at the market price from one year after the date of the lease contract to 3 months before the expiry of the contract period. If the priority purchase right is not exercised within the exercise period, Korea Asset Management Corporation may request a repurchase. The Group judged that both risks and rewards could not be eliminated and the transaction was marked as a financial transaction.

Clark Equipment Co. and Doosan Bobcat EMEA s.r.o, the two subsidiaries, have signed a Supply Chain Financing contract, and it is recognized as trade payables.

Daesan Green Energy Co., Ltd., an associate of DFC, has signed a loan agreement with financial institutions such as the Korea Development Bank and others. In this regard, the investors of Daesan Green Energy Co., Ltd. (DFC and other shareholders) have signed an investor agreement between the financial institutions. Each investor is obligated to replenish the funds according to the share of the investment if the net operating cash inflow of Daesan Green Energy Co., Ltd. does not meet the risk sharing standard. If DFC is obligated to provide expenses for the performance of settlement obligations, etc. in accordance with the settlement procedure agreement concluded between the investors and Daesan Green Energy Co., Ltd., it should be carried out in a way that provides cash, executes subordinated loans, or does not receive payments.

As of December 31, 2021, if DHC sells DEC's ordinary shares (53.65%) held by The Zenith Holdings LLC, it will compensate investors for the shortfall within the return on DEC's ordinary shares (46.35%) held by DHC if the final distribution falls short of the principal invested by investors (The representative PEF 2018 QCP 13 private equity investment joint venture is excluded).

Doosan Bears Inc., a subsidiary, sold its real estate (Icheon Bears Park) in Icheon, Gyeonggi Province to Korea Asset Management Corporation and has been using it through a lease agreement for 5 years from November 2020. Doosan Bears Inc. may exercise the priority purchase right at the market price from one year after the date of the lease contract to 3 months before the expiry of the contract period. If the priority purchase right is not exercised within the exercise period, Korea Asset Management Corporation may request a repurchase. The Group judged that both risks and rewards could not be eliminated and the transaction was marked as a financial transaction.

33. Pledged assets

The Group pledged certain assets as collateral for its long-term and short-term borrowings as of December 31, 2021 as follows.

As of December 31, 2021, DHC, a subsidiary of the Group, provided deposits and shares (₩208,294 million in collateral) held by DHC as collateral to Korea Exim Bank regarding local business funds borrowed by its subsidiaries Doosan Power Systems S.A and Doosan Power System Arabia Company Limited.

As of December 31, 2021, DHC, a subsidiary of the Group, also has confirmed its responsibility in connection with the construction project for the Samcheok Thermal Power Plant Unit 1 and 2 and provides 1,193,066 shares (₩43,568 million in collateral) as collateral.

As of December 31, 2021, DHC, a subsidiary of the Group, has provided part of its land, buildings and machinery of ₩420,000 million located in Changwon factory and all of its shares of Doosan Power Systems S.A. (GBP 293 million as collateral), in relation to the export guarantee insurance limit contract for up to ₩347,000 million, which is entered into with Korea Trade Insurance Corporation.

As of December 31, 2021, DHC, a subsidiary of the Group, entered into an emergency operation fund of ₩3,000,000 million with Korea Development Bank and Korea Exim Bank (the "State-owned banks"). In relation to the emergency operation fund agreement, the Group has provided its assets as collateral to state-owned banks. As of December 31, 2021, the carrying amount of the borrowings is ₩31,990 million. The total assets that the Group has provided as collateral include investments in subsidiaries such as DHC and associates, equity instruments measured at fair value through OCI, property, plant and equipment, short-term financial instruments, treasury stocks, and assets held by DHC, including investments in subsidiaries, investments in associates and property, plant and equipment. The total carrying amount of assets provided as collateral by the Company and DHC is ₩5,904,743 million as of December 31, 2021.

In addition, Jeongwon Park and other related parties have provided 7,208,417 ordinary shares and 713,523 preferred shares of the Company and 1,315,215 preferred shares of Solus Advanced Materials Co., Ltd. as collateral for the above borrowing agreements.

If in case the borrower fails to repay or is requested by the lender for repayment due to accelerated clause, Korea Development Bank and the Korea Exim bank, the lenders in the borrowing agreements, may exercise its collateral rights to dispose, transfer, and delegate voting right.

In addition, DHC fully repaid the borrowings from state-owned banks as of February 28, 2022, and the related agreement for providing collaterals has been terminated.

Clark Equipment Co., a subsidiary of DBI, borrowed USD 1,345,000 thousand and entered into a borrowing agreement with the limit of USD 150,000 thousand on May 18, 2017 and issued a bond of USD 300,000 thousand as of May 29, 2020. The amount of agreement is USD 300,000 thousand. As of June 8, 2021, DHC have borrowed USD 500,000 thousand and entered into a borrowing agreement with the limit of USD 50,000 thousand. DBI as collaterals, provided all shares in Clack Equipment Co., Doosan Bobcat EMEA s.r.o., Doosan Bobcat Global Collaboration Center, Inc. and Doosan Bobcat Singapore Pte. Ltd. and provided major property, plant and equipment and intangible assets of Clack Equipment Co., and its subsidiaries. The carrying amount of related borrowings and bonds as of December 31, 2021 are USD 1,426,363 thousand and total amount in collateral USD 1,531,907 thousand.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

33. Pledged assets (cont'd)

The Group pledged certain assets as collateral for its financial liabilities as of December 31, 2021 as follows (Korean won in millions):

Provided by	Pledged assets	Institution	Financial liabilities	Pledged amount
Doosan Corporation	Short-term financial instruments, property, plant and equipment, investment properties and others	Korea Development Bank and others	₩ 169,990	₩ 414,545
DHC and its subsidiaries	Short-term financial instruments	Hana Bank	41,493	45,642
	Property, plant and equipment (*1)	Korea Development Bank and others	1,328,134	1,836,630
	Cash and cash equivalents	Bank for Investment and Development of Vietnam and others	21,431	2,083
	Investments in subsidiaries and equity share (*1)	Korea Development Bank and others	1,140,977	1,555,368
	Inventories	Korea Exim Bank	15,900	19,500
DBI and its subsidiaries	Property, plant and equipment	Shinhan Bank and others	47,863	52,177
	Inventories	Wells Fargo Bank	34	110,228
Doosan Cuvex Co., Ltd	Beneficiary certificates (*2)	Woori Bank	20,000	24,152
			<u>₩ 2,785,822</u>	<u>₩ 4,060,325</u>

(*1) As of December 31, 2021, DHC has provided 51,176,250 shares of DBI and land as collateral regarding its bonds and borrowing agreement.

(*2) This is a real estate security beneficiary certificates for property, plant and equipment.

In addition, collateral is established for ₩26,163 million, including trade receivables recognized in the consolidated financial statements, in relation to the Company's liquidated debt (see Notes 15 and 32.3).

Details of collateral provided by the Group for third parties are as follows (Korean won in millions):

Provided by	Pledged assets	Book value	Institution	Provided to
DHC	Long-term investment securities	₩ 12,526	Kookmin Bank and others	Gyeonggi East-West Road Corporation Co., Ltd. and others
	Investments in associates	7,818	Kyongnam Bank and others	Hychangwon Co., Ltd. and others
DFC	Investments in associates	2,883	Korea Development Bank and others	Daesan Green Energy Co., Ltd.
		<u>₩ 23,227</u>		

34. Related party transactions

The details related to the disclosure of related parties as of December 31, 2021 and 2020 are as follows:

	December 31, 2021	December 31, 2020	Remarks
Associates	The HS-City Expressway	The HS-City Expressway	-
	Samcheok Blue Power Co., Ltd.	Samcheok Blue Power Co., Ltd.	-
	Daejung Offshore Wind Power Co., Ltd.	Daejung Offshore Wind Power Co., Ltd.	-
	Hychangwon Co., Ltd.	Hychangwon Co., Ltd.	-
	ReCarbon, Inc.	ReCarbon, Inc.	-
	-	New Bundang Line Co., Ltd.	-
	-	Gyeonggi Railway Co., Ltd.	-
	-	Neo Trans Co., Ltd.	-
	-	New Seoul Railroad Co., Ltd.	-
	-	KIAMCO Gyeonggi Railway Investment	-
	-	Private Equity Investment Trust	-
	-	Incheon Fuel Cell Co., Ltd.	-
	Daesan Green Energy Co., Ltd.	Daesan Green Energy Co., Ltd.	-
	DEC	-	-
	Master Professional Investment Type	Master Professional Investment Type	-
	Private Security Investment Trust	Private Security Investment Trust	-
	No.98	No.98	-
	Bundang Doosan Tower Reit Co., Ltd.	-	-
	The Weve Holdings Ltd.	-	-
	Protera SAS	Protera SAS	-
	Stathera IP Holding Inc.	Stathera IP Holding Inc.	-
	PT. SEGARA AKASA	PT. SEGARA AKASA	-
	Prestolite Asia Ltd.	Prestolite Asia Ltd.	-
	Wise Fashion, Co., Ltd.	Wise Fashion, Co., Ltd.	-
	KDDI Korea Corporation	KDDI Korea Corporation	-
	Ainstein AI, Inc.	Ainstein AI, Inc.	-
	StructionSite Inc.	StructionSite Inc.	-
	-	Potenit Co., Ltd.	-
	SiO2 Medical Products, Inc.	-	-
Joint ventures	Sichuan Kelun-Doosan Biotechnology	Sichuan Kelun-Doosan Biotechnology	-
	Company Limited	Company Limited	-
	Doosan Babcock BlackCat W.L.L.	Doosan Babcock BlackCat W.L.L.	-
	The Zenith Holdings LLC	-	-
	-	Doosan PSI LLC	-
	-	Doosan Infracore Liaoning Machinery	-
Other related parties	-	Sales Co., Ltd	-
	-	Tianjin Lovol Doosan Engine Co., Ltd.	-
	Valuegrowth Co., Ltd.	-	(*1)
	Doosan Yonkang Foundation	Doosan Yonkang Foundation	(*2)
	Chung-Ang University	Chung-Ang University	(*2)
	Doosan Credit Union	Doosan Credit Union	(*2)
	The Path With you	The Path With you	
	(formerly, Dongdaemun Future	(formerly, Dongdaemun Future	(*2,3)
	Foundation) and others	Foundation) and others	

(*1) DEC and its subsidiaries has been classified to other related parties since DEC was excluded from the scope of consolidation scope during the year ended December 31, 2021.

(*2) It is not included in the scope of related parties of KIFRS 1024 but includes entities that belong to the same large-scale enterprise group under the *Monopoly Regulation and Fair Trade Act*.

(*3) During the year ended December 31, 2021, Dongdaemun Future Foundation changed its name to 'The Path With you'.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

34. Related party transactions (cont'd)

Significant transactions for the years ended December 31, 2021 and 2020, between the Group and related parties are as follows (Korean won in millions):

Related parties	2021					
	Sales	Other income	Others (disposal of assets and other)	Purchases	Other expenses	Others (acquisition of assets and other)
Associates:						
The HS-City Expressway	₩ 16	₩ -	₩ -	₩ -	₩ -	₩ -
Samcheok Blue Power Co., Ltd. (*1)	529,661	-	-	-	-	-
Neo Trans Co., Ltd. (*1)	8,685	-	-	-	649	-
New Seoul Railroad Co., Ltd. (*1)	51,399	-	-	-	-	-
Hychangwon Co., Ltd.	9,766	-	-	-	-	-
Daesan Green Energy Co., Ltd.	14,500	-	-	-	43	-
Incheon Fuel Cell Co., Ltd. (*1)	46,544	-	-	-	-	-
Master Professional Investment Type Private Security Investment Trust No.98	31	-	-	55	14,012	-
Bundang Doosan Tower Reit Co., Ltd.	-	-	620,000	-	18,681	232,909
PT. SEGARA AKASA	1	-	-	-	-	-
Bit Goeul Echo Energy Co., Ltd. (*1)	33,052	-	-	-	-	-
DEC	50,732	504	-	244	854	11,487
	744,387	504	620,000	299	34,239	244,396
Joint ventures:						
Tianjin Lovol Doosan Engine Co. Ltd.	547	-	-	1,444	613	-
Doosan Infracore Liaoning Machinery Sales Co., Ltd.	14,960	-	-	-	-	-
	15,507	-	-	1,444	613	-
Other related parties:						
Doosan Yonkang Foundation	1,539	-	55,430	496	2,715	48
Chung-Ang University	59	-	-	709	10,830	-
Doosan Credit Union	174	-	-	-	464	-
The Path With you (formerly, Dongdaemun Future Foundation)	187	-	-	-	166	-
Valuegrowth Co., Ltd.	657	-	-	-	-	-
Others	-	129	-	-	-	-
	2,616	129	55,430	1,205	14,175	48
	₩ 762,510	₩ 633	₩ 675,430	₩ 2,948	₩ 49,027	₩ 244,444

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

34. Related party transactions (cont'd)

2020						
Related parties	Sales	Other income	Others (disposal of assets and other)	Purchases	Other expenses	Others (acquisition of assets and other)
Associates:						
The HS-City Expressway	₩ 32	₩ -	₩ -	₩ -	₩ -	₩ -
Samcheok Blue Power Co., Ltd. (*1)	363,955	-	-	-	-	-
Neo Trans Co., Ltd. (*1)	8,549	-	-	-	204	-
New Seoul Railroad Co., Ltd. (*1)	53,998	-	-	-	-	-
Hychangwon Co., Ltd.	21	238	-	-	-	-
KoFC-Neoplux R&D-Biz Creation 2013-1 Venture Capital Fund	280	29	-	-	-	-
Future-Creation Neoplux Venture Capital Fund	420	46	-	-	-	-
Neoplux Technology Valuation Investment Fund	636	-	-	-	-	-
Neoplux Market Frontier Secondary Fund	1,214	-	-	-	-	-
Gyeonggi-Neoplux Superman Fund	570	-	-	-	-	-
Shinhan-Neoplux Energy Newbiz Fund	945	-	-	-	-	-
New Wave 6th Investment Union	864	-	-	-	-	-
KTC-NP-Growth Champ 2011-2 PEF	86	23	-	-	-	-
Neoplux No.3 Private Equity Fund	2,198	-	-	-	-	-
Daesan Green Energy Co., Ltd.	1,208	-	-	-	4	-
Incheon Fuel Cell Co., Ltd. (*1)	142,135	-	-	-	-	-
Mastern Professional Investment Type Private Security Investment Trust No.98	-	-	800,000	-	4,650	248,417
Potenit Co., Ltd.	5	-	-	-	-	-
	577,116	336	800,000	-	4,858	248,417
Joint ventures:						
Tianjin Lovol Doosan Engine Co. Ltd.	23	649	-	514	-	77
Doosan Infracore Liaoning Machinery Sales Co., Ltd.	26,256	-	-	-	-	-
	26,279	649	-	514	-	77
Other related parties:						
Doosan Yonkang Foundation	1,585	5	-	2,207	810	2,316
Chung-Ang University	86	-	-	994	9,770	-
Doosan Credit Union	168	-	-	-	-	-
The Path With you (formerly, Dongdaemun Future Foundation)	98	-	-	-	6	-
DFC	1,177	48	-	40,427	320	-
Solus Advanced Materials Co., Ltd. and its subsidiaries	2,908	2,866	-	14,335	-	-
Others	-	140	-	-	-	-
	6,022	3,059	-	57,963	10,906	2,316
	₩ 609,417	₩ 4,044	₩ 800,000	₩ 58,477	₩ 15,764	₩ 250,810

(*1) It was excluded from related parties during the year ended December 31, 2021, and the amount is the transaction details before being excluded from related parties.

The transaction details above include carrying amount classified as the profit or loss from discontinued operations on consolidated statements of profit or loss.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

34. Related party transactions (cont'd)

Significant balances related to the transactions between the Group and related parties as of December 31, 2021 and 2020 are as follows (Korean won in millions):

December 31, 2021						
Related parties	Trade receivables	Other receivables	Loans	Trade payables	Other payables	Lease liabilities
Associates:						
Hychangwon Co., Ltd.	₩ 12,210	₩ -	₩ -	₩ -	₩ 46,428	₩ -
Daesan Green Energy Co., Ltd.	3,625	-	-	-	4	-
Samcheok Blue Power Co., Ltd.	-	317,889	-	-	-	-
Mastern Professional Investment Type Private Security Investment Trust No.98	-	32,200	-	-	2,996	235,512
Bundang Doosan Tower Reit Co., Ltd.	-	19,375	-	-	-	191,424
DEC	10,049	16,595	-	124	20,452	-
	25,884	386,059	-	124	69,880	426,936
Joint ventures:						
Sichuan Kelun-Doosan Biotechnology Co., Ltd.	-	1,238	-	-	-	-
	-	1,238	-	-	-	-
Other related parties:						
Doosan Yonkang Foundation	120	2,686	-	-	435	232
Chung-Ang University	26	-	-	22	348	-
Doosan Credit Union	14	2	-	-	84	-
Valuegrowth Co., Ltd.	57	-	-	-	-	-
	217	2,688	-	22	867	232
	₩ 26,101	₩ 389,985	₩ -	₩ 146	₩ 70,747	₩ 427,168

December 31, 2020						
Related parties	Trade receivables	Other receivables	Loans	Trade payables	Other payables	Lease liabilities
Associates:						
New Bundang Line Co., Ltd.	₩ 11,023	₩ -	₩ 32,574	₩ -	₩ -	₩ -
Gyeonggi Railway Co., Ltd.	-	-	40,757	-	-	-
Neo Trans Co., Ltd.	946	-	-	-	202	-
Incheon Fuel Cell Co., Ltd.	963	-	-	-	-	-
Potenit Co., Ltd.	47	-	-	-	-	-
Mastern Professional Investment Type Private Security Investment Trust No.98	-	32,200	-	-	2,952	253,809
	12,979	32,200	73,331	-	3,154	253,809
Joint ventures:						
Tianjin Lovol Doosan Engine Co., Ltd.	-	-	-	67	-	-
Doosan Infracore Liaoning Machinery Sales Co., Ltd.	3,529	-	-	-	-	-
	3,529	-	-	67	-	-
Other related parties:						
Doosan Yonkang Foundation	108	1,545	-	-	404	1,849
Chung-Ang University	28	-	-	35	564	-
Doosan Credit Union	14	-	-	-	85	-
The Path With you (formerly, Dongdaemun Future Foundation)	6	-	-	-	-	-
	156	1,545	-	35	1,053	1,849
	₩ 16,664	₩ 33,745	₩ 73,331	₩ 102	₩ 4,207	₩ 255,658

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

34. Related party transactions (cont'd)

Fund and equity transactions for the years ended December 31, 2021 and 2020, between the Group and related parties are as follows (Korean won in millions):

Related parties	2021							
	Loan		Lease liabilities		Contribution		Dividend	
	Loans	Repayment	Increase	Decrease	Received	Provided	Income	Paid
Associates:								
New Bundang Line Co., Ltd.	₩ -	₩ -	₩ -	₩ -	₩ -	₩ (62,552)	₩ -	₩ -
Gyeonggi Railway Co., Ltd.	10,000	-	-	-	-	(7,067)	-	-
Hychangwon Co., Ltd.	-	-	-	-	-	2,000	-	-
Neo Trans Co., Ltd.	-	-	-	-	-	(43)	-	-
New Seoul Railroad Co., Ltd.	-	-	-	-	-	(8,794)	-	-
KIAMCO Kyunggi Railway Investment Private Property Investment Trust	-	-	-	-	-	(28,167)	-	-
Incheon Fuel Cell Co., Ltd.	-	-	-	-	-	(4,700)	-	-
Master Professional Investment Type Private Security Investment Trust No.98	-	-	-	32,308	-	-	4,800	-
Bundang Doosan Tower Reit Co., Ltd.	-	-	246,863	22,321	-	29,700	954	-
The Weve Holdings Ltd.	-	-	-	-	-	120,000	-	-
Prestolite Asia Ltd.	-	-	-	-	-	-	23	-
KDDI Korea Corporation	-	-	-	-	-	-	701	-
StructionSite Inc.	-	-	-	-	-	1,697	-	-
Potenit Co., Ltd.	-	-	-	-	-	(5,334)	-	-
SiO2 Medical Products, Inc.	-	-	-	-	-	119,974	-	-
Joint ventures:								
Sichuan Kelun-Doosan Biotechnology Co., Ltd.	-	-	-	-	-	-	1,301	-
The Zenith Holdings LLC	-	-	-	-	-	120,000	-	-
Tianjin Lovol Doosan Engine Co., Ltd.	-	-	-	-	-	(28,163)	-	-
Doosan Infracore Liaoning Machinery Sales Co., Ltd	-	-	-	-	-	(718)	-	-
Other related parties:								
Doosan Yonkang Foundation	-	-	249	1,783	-	-	-	3,150
The Path With you (formerly, Dongdaemun Future Foundation)	-	-	-	-	-	-	-	170
	₩ 10,000	₩ -	₩ 247,112	₩ 56,412	₩ -	₩ 247,833	₩ 7,779	₩ 3,320

Related parties	2020							
	Loan		Lease liabilities		Contribution		Dividend	
	Loans	Repayment	Increase	Decrease	Received	Provided	Income	Paid
Associates:								
Daejung Offshore Wind Power Co., Ltd.	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 369	₩ -	₩ -
Hychangwon Co., Ltd.	-	-	-	-	-	3,000	-	-
Gyeonggi Railway	4,236	-	-	-	-	-	-	-
KIAMCO Gyeonggi Railway Investment Private Equity Investment Trust	-	-	-	-	-	95	-	-
Incheon Fuel Cell Co., Ltd.	20,500	20,500	-	-	-	-	-	-
Master Professional Investment Type Private Security Investment Trust No.98	-	-	258,309	8,315	-	70,000	-	-
Geaenzymes	-	-	-	-	-	(591)	-	-
Protera SAS	-	-	-	-	-	591	-	-
NewWave #5 Start-up Investment	-	-	-	-	-	(6)	79	-
2010 KIF-Neoplux IT Venture Fund	-	-	-	-	-	(17)	-	-
KoFC-Neoplux R&D-Biz Creation 2013-1 Venture Capital Fund	-	-	-	-	-	(1,435)	-	-

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

34. Related party transactions (cont'd)

Related parties	2020							
	Loan		Lease liabilities		Contribution		Dividend	
	Loans	Repayment	Increase	Decrease	Received	Provided	Income	Paid
Associates:								
Future-Creation Neoplux Venture Capital Fund	-	-	-	-	-	(456)	-	-
Neoplux Technology Valuation Investment Fund	-	-	-	-	-	(1,064)	-	-
Neoplux Market Frontier Secondary Fund	-	-	-	-	-	584	-	-
Gyeonggi-Neoplux Superman Fund	-	-	-	-	-	918	-	-
Shinhan-Neoplux Energy Newbiz Fund	-	-	-	-	-	1,090	-	-
New Wave 6th Investment Union	-	-	-	-	-	2,000	-	-
KTC-NP Growth Champ 2011-2 Private Equity Fund	-	-	-	-	-	-	16	-
Neoplux No.3 Private Equity Fund	-	-	-	-	-	2,820	2	-
Stathera IP Holding Inc.	-	-	-	-	-	2,875	-	-
PT. SEGARA AKASA	-	-	-	-	-	71	-	-
KDDI Korea Corporation	-	-	-	-	-	-	20	-
Others	-	-	-	-	-	7,670	-	-
Joint ventures:								
Sichuan Kelun-Doosan Biotechnology Co., Ltd.	-	-	-	-	-	-	1,911	-
Tianjin Lovol Doosan Engine Co., Ltd.	-	-	-	-	-	2,523	-	-
Others	-	-	-	-	-	(2,223)	-	-
Other related parties:								
Solus Advanced Materials Co., Ltd.	-	-	-	-	-	(277,717)	-	-
Doosan Yonkang Foundation	-	-	2,246	1,862	-	-	-	2,049
The Path With you (formerly, Dongdaemun Future Foundation)	-	-	-	-	-	-	-	111
	<u>₩ 24,736</u>	<u>₩ 20,500</u>	<u>₩ 260,555</u>	<u>₩ 10,177</u>	<u>₩ -</u>	<u>₩ (188,903)</u>	<u>₩ 2,028</u>	<u>₩ 2,160</u>

The transaction details above include carrying amount classified as profit or loss from discontinued operations on consolidated statements of profit or loss.

The Group provides guarantees of payment and others for related parties as of December 31, 2021 (see Notes 32 and 33).

Compensation to key management personnel of the Group for the years ended December 31, 2021 and 2020 is as follows (Korean won in millions):

	2021	2020
Employee benefits	₩ 51,971	₩ 70,745
Retirement benefits	24,463	4,767
	<u>₩ 76,434</u>	<u>₩ 75,512</u>

35. Cash flow statement

The adjustments and changes in cash generated from operating activities in the consolidated statements of cash flows for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021	2020
Adjustments for:		
Bad debt expenses	₩ 17,863	₩ 44,866
Loss from valuation of inventories	14,440	8,309
Depreciation	435,834	489,935
Amortization	176,796	195,274
Retirement benefits	133,766	136,315
Interest income	(59,421)	(51,571)
Dividend income	(1,934)	(1,319)
Gain on foreign currency translation	(157,451)	(156,764)
Gain on valuation of derivatives	(101,842)	(121,274)
Gain on valuation of firm commitment	(121,534)	(10,454)
Financial guarantee income	-	(1,410)
Interest expense	454,977	553,590
Loss on foreign currency translation	220,186	183,783
Loss on valuation of derivatives	251,845	28,386
Loss on valuation of firm commitment	7,665	70,281
Loss on repayment of bonds	84	54,924
Financial guarantee expenses	2,885	6,579
Increase in provision	101,668	427,925
Gain on disposal of short-term investment securities	(4,097)	(540)
Gain on disposal of long-term investment securities	-	(1,467)
Gain on valuation of short-term investment securities	(30,102)	(7,422)
Gain on disposal of property, plant and equipment	(16,337)	(8,337)
Gain on disposal of intangible assets	(1,203)	(929)
Gain on disposal of investment properties	(2,027)	(41,829)
Loss on disposal of trade receivables	10,849	19,585
Gain on valuation of investment properties	(19,324)	(6,791)
Impairment loss on property, plant and equipment	8,101	36,357
Impairment loss on intangible assets	27,789	159,080
Loss on disposal of long-term investment securities	-	3,043
Loss on disposal of property, plant and equipment	2,719	6,993
Loss on disposal of intangible assets	1,335	273
Loss on disposal of investment properties	-	14,190
Loss on valuation of investment properties	46,425	10,370
Loss on land revaluation	289	272
Impairment loss on investments in associates	-	95
Loss on disposal of investments in subsidiaries	1,116	10,792
Other bad debt expenses	47,339	178,799
Share of loss(gain) of associates and joint ventures accounted for using the equity method	(3,212)	15,026
Income tax expenses	447,074	122,331
Gain(loss) from disposal of discontinued operations and impairment loss	(267,056)	(7,941)
Gain on disposal of assets held for sale and Impairment loss on assets held for sale	(69,526)	-
Other expenses	(413)	70,681
	₩ 1,555,566	₩ 2,430,006

35. Cash flow statement (cont'd)

	2021	2020
Changes in operating assets and liabilities:		
Trade receivables	₩ (169,651)	₩ 13,209
Other receivables	(193,038)	34,563
Due from customers for contract work	(83,923)	84,456
Derivative assets (liabilities)	53,297	(45,405)
Inventories	(518,149)	365,541
Other current assets	(16,065)	119
Long-term other receivables	3,415	(23,689)
Other non-current assets	103,716	(199,242)
Trade payables	534,625	(639,600)
Other payables	54,583	(191,236)
Due to customers for contract work	181,298	191,674
Provisions	(160,155)	(171,050)
Other current liabilities	(74,294)	(2,020)
Long-term other payables	17,123	24,241
Other non-current liabilities	(154,924)	(20,193)
Retirement benefits paid	(38,708)	(64,796)
Plan assets	(111,103)	(74,360)
Other assets and liabilities related to operating activities	(2,452)	(1,120)
	<u>₩ (574,405)</u>	<u>₩ (718,908)</u>

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

	2021	2020
Reclassification of construction in progress to property, plant and equipment and others	₩ 142,169	₩ 130,988
Reclassification of assets and liabilities held for sale (see Note 38)	46,139	807,053
Decrease of assets and liabilities due to division (see Note 36)	-	99,598

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

35. Cash flow statement (cont'd)

Details of changes in liabilities arising from financing activities for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

2021								
	January 1	Cash flows from financing activities	Changes in scope of consolidation	Reclassification of assets as held for sale (see Note 38)	Fluctuation of foreign exchange rate	Reclassification of current portion	Others	December 31
Short-term borrowings	₩ 6,295,838	₩ (795,622)	₩ (854,860)	₩ (51,799)	₩ 71,786	₩ -	₩ 59,718	₩ 4,725,061
Current portion of long-term borrowings	1,263,651	(1,697,738)	(67,166)	-	55,633	993,776	(84,427)	463,729
Asset-backed loan	59,551	65,152	(126,163)	-	(1)	-	1,461	-
Current portion of long-term asset-backed loan	332,022	(334,138)	-	-	(1)	115,969	1,190	115,042
Current portion of bonds	835,035	(735,161)	(222,261)	-	16,800	795,027	1,461	690,901
Current portion of lease liabilities	98,838	(95,318)	(29,335)	(6,384)	1,976	106,771	22,931	99,479
Long-term borrowings	1,195,458	1,312,560	(51,909)	(1,201)	46,153	(993,776)	13,549	1,520,834
Long-term asset-backed loan	215,317	(84,089)	-	-	1	(115,969)	1,175	16,435
Bonds	2,133,793	903,207	(1,184,489)	-	58,773	(795,027)	23,197	1,139,454
Non-current lease liabilities	444,146	(24,726)	(90,475)	(35,429)	17,882	(106,771)	386,906	591,533
Sales & leaseback liabilities (*1)	307,060	(7,978)	-	-	-	-	15,048	314,130

(*1) It is included in other current or non-current liabilities in the consolidated statement of financial position.

2020								
	January 1	Cash flows from financing activities	Changes in scope of consolidation	Reclassification of assets as held for sale (see Note 38)	Fluctuation of foreign exchange rate	Reclassification of current portion	Others	December 31
Short-term borrowings	₩ 4,614,068	₩ 1,973,842	₩ (9,000)	₩ (27,010)	₩ (110,259)	₩ -	₩ (145,803)	₩ 6,295,838
Current portion of long-term borrowings	1,109,271	(968,697)	-	-	(355)	1,123,606	(174)	1,263,651
Asset-backed loan	381,574	(283,500)	-	-	-	-	(38,523)	59,551
Current portion of long-term asset-backed loan	227,845	(236,800)	-	-	-	339,981	996	332,022
Current portion of bonds	2,423,498	(2,500,174)	98,886	-	(1,801)	743,971	70,655	835,035
Current portion of lease liabilities	86,441	(72,278)	(240)	(247)	1,014	82,099	2,049	98,838
Long-term borrowings	2,258,814	138,020	-	-	(58,657)	(1,123,606)	(19,113)	1,195,458
Long-term asset-backed loan	292,290	261,003	-	-	-	(339,981)	2,005	215,317
Bonds	1,133,833	1,791,295	-	-	(52,650)	(743,971)	5,286	2,133,793
Non-current lease liabilities	215,914	(34,978)	583	(113)	(6,226)	(82,099)	351,065	444,146

36. Division

The Company decided to sell the Mottrol segment in accordance with the Board's resolution of September 4, 2020 and the key decision is as follows:

	Contents
Subject held for sale	All of the shares issued by the newly incorporated company held by the Company through the split-off of Mottrol segment
Buyer	Sosius-Well to Sea Investment Co., Ltd. ("Sosius-Well to Sea consortium")

As of September 4, 2020, the Company contracted with Sosius-Well to Sea consortium for the sale of the shares. In accordance with the resolution of the shareholders' meeting dated October 20, 2020, the Company completed the division of the company on December 1, 2020, by dividing the Mottrol segment into Mottrol Co., Ltd.

The details of the split-off are as follows:

	Divided company	Newly incorporated company
Company name	Doosan Corporation	Mottrol Co., Ltd.
Main business	Other businesses except for the divided segment	Manufacturing and sale of hydraulic components, etc. and defense industry

The assets and liabilities of the Mottrol segment transferred to the newly incorporated entity were classified as assets and liabilities held for sale in the consolidated financial statements as of December 31, 2020 (see Note 38).

According to the split-off, the divided company acquired all of the shares issued by the newly incorporated company. In addition, the sale of the shares was completed as of January 4, 2021 (sales price: ₩450,230 million).

Under Article 530-9 paragraph 2 of the *Commercial Act*, neither the divided company nor the newly incorporated company is jointly and severally liable to pay the debt arisen before the split-off. The newly incorporated company will only bear the liabilities that it is to assume under a division plan, among the liabilities of the divided company. The divided company survives the division shall only be responsible for the liabilities not born by the newly incorporated company.

The performance of the Mottrol segment carried forward to the newly incorporated company is indicated as a discontinued operation, and the comparative consolidated statements of profit or loss for the previous year has been restated (see Note 37).

37. Discontinued operations

Details of discontinued operations for the years ended December 31, 2021 and 2020 are as follows:

		2021				
	Mottrol segment		DI segment	DEC segment	DBL	
Main business	Manufacturing and sales of hydraulic components, etc. and defense industry		Manufacturing and sale of construction equipment	Construction	Engineering and service	
Method	Transfer of business (see Note 36)		Transfer of business (*1)	Loss of control (*2)	Transfer of business (*5)	
		2020				
	Duty-free segment	Neoplux segment	Mottrol segment	DI segment	DEC segment	DBL
Main business	Sales of duty-free goods	Start-up investment and others	Manufacturing and sales of hydraulic components, etc. and defense industry	Manufacturing and sale of construction equipment	Construction	Engineering and service
Method	Transfer of business (*3)	Transfer of business (*4)	Transfer of business (see Note 36)	Transfer of business (*1)	Loss of control (*2)	Transfer of business (*5)

(*1) In a resolution of the Board of Directors on February 5, 2021, DHC, a subsidiary, decided to sell all of the shares acquired by DI's division. As of August 19, 2021, the sale of the shares was completed (sales price: ₩ 850,000 million).

(*2) As of December 21, 2021, DHC, a subsidiary, invested 82,005,761 ordinary shares and 5,649,462 convertible preferred shares of DEC in The Zenith Holdings Ltd. in accordance with the resolution of the Board of Directors on November 19, 2021. In addition, as of December 21, 2021, DEC completed a paid-in capital increase of 182,615,048 ordinary shares through a third-party allocation method. As a result, the Group lost control of DEC during the year ended December 31, 2021.

(*3) The Company has decided to suspend the duty-free segment in accordance with a resolution at the Board of Directors' meeting on October 29, 2019. On December 30, 2019, the Company entered into a contract with Hyundai Department Store Duty Free Co., Ltd. to sell part of its inventories and property, plant and equipment and intangible assets in its duty-free segment, and the sale was completed on February 13, 2020 with a total sale price of ₩33,700 million.

(*4) In accordance with a resolution at the Board of Directors' meeting on August 20, 2020, the Company decided to sell the entire 24,413,230 shares of Neoplux Co., Ltd., and the sale was completed on September 29, 2020 with a total sale price of ₩71,100 million.

(*5) DHC, a subsidiary, has decided to sell its subsidiary Doosan Babcock Ltd. In accordance with a resolution at the Board of Director's meeting in October 2021. Accordingly, assets and liabilities attributable to DBL were classified as assets held for sale and liabilities held for sale as of December 31, 2021.

37. Discontinued operations (cont'd)

With regard to discontinued operations that occurred during the year ended December 31, 2021, assets and liabilities removed from the Consolidated Statement as follows (Korean won in millions):

	2021			
	Mottrol segment	DI segment	DEC segment	Total
Assets				
Cash and cash equivalents	₩ 26,929	₩ 809,602	₩ 115,929	₩ 952,460
Trade receivables and other receivables	135,395	1,404,236	420,663	1,960,294
Due from customers for contract work	-	-	153,389	153,389
Inventory	93,351	952,399	6,878	1,052,628
Investments in associates and joint ventures	-	15,802	38,536	54,338
Property, plant and equipment	117,316	1,206,262	270,506	1,594,084
Intangible assets	97,080	910,121	61,957	1,069,158
Other assets	20,180	458,823	475,198	954,201
	<u>₩ 490,251</u>	<u>₩ 5,757,245</u>	<u>₩ 1,543,056</u>	<u>₩ 7,790,552</u>
Liabilities				
Trade and other payables	₩ 77,931	₩ 1,045,732	₩ 328,322	₩ 1,451,985
Due to customers for contract work	-	-	423,205	423,205
Bonds and borrowings	27,010	2,323,216	183,632	2,533,858
Lease liabilities	360	59,002	60,809	120,171
Other liabilities	82,251	655,277	176,366	913,894
	<u>₩ 187,552</u>	<u>₩ 4,083,227</u>	<u>₩ 1,172,334</u>	<u>₩ 5,443,113</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2021 and 2020

37. Discontinued operations (cont'd)

Details of profit or loss from discontinued operations for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021						
	Mottrol segment		DI segment	DEC segment	DBL	Total	
Sales	₩ -	₩	2,625,096	₩ 1,369,390	₩ 524,065	₩ 4,518,551	
Cost of sales	-		2,064,175	1,218,589	456,197	3,738,961	
Selling and administrative expenses	-		321,228	64,020	54,963	440,211	
Operating profit(loss)	-		239,693	86,781	12,905	339,379	
Non-operating profit(loss)	-		(31,244)	(80,210)	(1,537)	(112,991)	
Profit(loss) before income tax expenses	-		208,449	6,571	11,368	226,388	
Income tax expenses(benefits)	-		277,272	556	(5,372)	272,456	
	-		(68,823)	6,015	16,740	(46,068)	
Profit(loss) from disposal of discontinued operations before income tax expenses	172,628		48,665	45,763	-	267,056	
Tax expenses(benefits) related to disposal of discontinued operations	46,093		(9,154)	(111,873)	-	(74,934)	
Profit(loss) from disposal of discontinued operations	126,535		57,819	157,636	-	341,990	
Profit(loss) from discontinued operations	₩ 126,535	₩	(11,004)	₩ 163,651	₩ 16,740	₩ 295,922	
Profit/loss attributable to:							
Equity holders of the Company	₩ 126,535	₩	16,394	₩ 64,249	₩ 6,572	₩ 213,750	
Non-controlling interests	-		(27,398)	99,402	10,168	82,172	
	2020						
	Duty-free segment	Neoplux segment	Mottrol segment	DI segment	DEC segment	DBL	Total
Sales	₩ 4,660	₩ 9,024	₩ 585,326	₩ 3,410,318	₩ 1,665,816	₩ 464,647	₩ 6,139,791
Cost of sales	1,832	1,681	471,453	2,652,651	1,525,302	415,589	5,068,508
Selling and administrative expenses	9,783	6,562	56,801	495,548	105,122	51,221	725,037
Operating profit(loss)	(6,955)	781	57,072	262,119	35,392	(2,163)	346,246
Non-operating profit(loss)	404	(4)	(1,498)	(150,421)	(223,866)	1,037	(374,348)
Profit(loss) before income tax expenses	(6,551)	777	55,574	111,698	(188,474)	(1,126)	(28,102)
Income tax expenses(benefits)	(1,585)	3,863	46,772	54,263	14,797	344	118,454
	(4,966)	(3,086)	8,802	57,435	(203,271)	(1,470)	(146,556)
Profit(loss) from disposal of discontinued operations and impairment loss before income tax expenses	(287)	8,228	-	-	-	-	7,941
Tax expenses(benefits) related to disposal of discontinued operations and Impairment loss	(70)	1,991	-	-	-	-	1,921
Profit(loss) from disposal of discontinued operations and impairment loss	(217)	6,237	-	-	-	-	6,020
Profit(loss) from discontinued operations	₩ (5,183)	₩ 3,151	₩ 8,802	₩ 57,435	₩ (203,271)	₩ (1,470)	₩ (140,536)
Profit/loss attributable to:							
Equity holders of the Company	₩ (5,183)	₩ 3,240	₩ 8,802	₩ 9,499	₩ (85,273)	₩ (617)	₩ (69,532)
Non-controlling interests	-	(89)	-	47,936	(117,998)	(853)	(71,004)

37. Discontinued operations (cont'd)

Cash flows from discontinued operations for the years ended December 31, 2021 and 2020 are as follows (Korean won in millions):

	2021				
	Mottrol segment	DI segment	DEC segment	DBL	Total
Net cash flows from operating activities	₩ -	₩ (168,758)	₩ 97,274	₩ (4,276)	₩ (75,760)
Net cash flows from investing activities (*1)	441,075	684,894	(102,958)	5,460	1,028,471
Net cash flows from financing activities	-	262,139	24,977	(6,998)	280,118
Effect of exchange rate changes	-	89,373	2	8,369	97,744
	<u>₩ 441,075</u>	<u>₩ 867,648</u>	<u>₩ 19,295</u>	<u>₩ 2,555</u>	<u>₩ 1,330,573</u>

(*1) Net cash flows of investing activities include cash flows include cash flow of the disposal of discontinued operations.

	2020							
	Duty-free segment	Neoplux segment	Mottrol segment	DI segment	DEC segment	DBL	Total	
Net cash flows from operating activities	₩ (5,286)	₩ 1,120	₩ (21,462)	₩ 269,949	₩ (55,269)	₩ 81,230	₩	270,282
Net cash flows from investing activities (*1)	33,664	66,630	1,523	(120,782)	375,618	(7,595)		349,058
Net cash flows from financing activities	-	3,158	(24,221)	169,033	(254,695)	(65,864)		(172,589)
Effect of exchange rate changes	-	-	897	(23,998)	(9)	(1,825)		(24,935)
	₩ 28,378	₩ 70,908	₩ (43,263)	₩ 294,202	₩ 65,645	₩ 5,946	₩	421,816

(*1) Net cash flows of investing activities include cash flows include cash flow of the disposal of discontinued operations.

38. Assets held for sale and liabilities held for sale

Details of assets held for sale and liabilities held for sale as of December 31, 2021 and 2020 are as follows (Korean won in millions):

	December 31, 2021			
	Doosan Bobcat Chile Compact SpA (*1)	DBL (*5)	Others (*2,3,4)	Total
Assets held for sale (*1):				
Cash and cash equivalents	₩ 4,516	₩ 13,000	₩ -	₩ 17,516
Trade receivables and other receivables	2,606	92,036	-	94,642
Inventory	4,538	740	-	5,278
Property, plant and equipment (*2, 3)	1,234	49,829	32,992	84,055
Other assets (*4)	924	114,370	2,823	118,117
	13,818	269,975	35,815	319,608
Liabilities held for sale:				
Trade and other payables	2,378	110,626	-	113,004
Long-term Borrowings	1,201	51,799	-	53,000
Other liabilities	48	107,417	-	107,465
	₩ 3,627	₩ 269,842	₩ -	₩ 273,469

(*1) Doosan Bobcat Singapore Pte. Ltd., the Group's subsidiary, has decided to sell its equity in Doosan Bobcat Chile Compact SpA in accordance with a resolution of its Board of Directors on December 22, 2021. Accordingly, assets and liabilities attributable to Doosan Bobcat Chile Compact SpA were classified as assets held for sale and liabilities held for sale as of December 31, 2021. The sale was completed as of January 4, 2022.

(*2) During the year ended December 31, 2021, the Group classified ₩30,400 million of land and buildings in Songlim-dong, Incheon as assets held for sale and recognized impairment loss of ₩1,568 million.

(*3) During the year ended December 31, 2021, the Group classified ₩2,592 million of heavy equipment related to the construction equipment rental business of its subsidiary DHC, as assets held for sale, and recognized impairment loss of ₩919 million.

(*4) During the year ended December 31, 2021, DHC, a subsidiary, classified ₩2,823 million in Investments in associates as assets held for sale as it decided to sell all of its equity in The HS-City Expressway. There is no impairment loss recognized during the year ended December 31, 2021.

(*5) DHC, a subsidiary, confirmed the sale plan of its subsidiary DBL at a board meeting in October 2021. As of December 31, 2021, DBL's assets and liabilities were classified as assets and liabilities held for sale.

38. Assets held for sale (cont'd)

	December 31, 2020			
	Mottrol segment (*2)	DBC (*3)	Others (*4)	Total
Assets held for sale (*1):				
Cash and cash equivalents	₩ 26,929	₩ -	₩ -	₩ 26,929
Trade receivables and other receivables	135,395	-	-	135,395
Inventory	93,351	-	-	93,351
Property, plant and equipment	117,316	516,838	11,495	645,649
Intangible assets	97,080	-	-	97,080
Investment property	150	-	-	150
Other assets	20,030	-	-	20,030
	490,251	516,838	11,495	1,018,584
Liabilities held for sale:				
Trade and other payables	77,931	23,979	-	101,910
Borrowings	27,010	-	-	27,010
Lease liabilities	360	-	-	360
Net defined benefit liabilities	790	-	-	790
Other liabilities	81,461	-	-	81,461
	₩ 187,552	₩ 23,979	₩ -	₩ 211,531

(*1) No impairment loss was recognized due to the reclassification of asset held for sale for the year ended December 31, 2020.

(*2) As described in Note 36 to the consolidated financial statements, the Group determined the sale of the Mottrol segment in accordance a resolution at the Board of Directors' meeting on September 4, 2020 and the annual shareholders' meeting on October 20, 2020. Mottrol Co., Ltd. and Doosan Mottrol (Jiangyin) Co., Ltd.'s assets and liabilities were classified as assets and liabilities held for sale. In addition, the deal was closed as of January 4, 2021.

(*3) DBC Co., Ltd., a subsidiary, established a real estate investment company in accordance with a resolution of the Board of Directors' meeting on October 29, 2020 and signed a contract to sell Bundang Doosan Tower to Bundang Doosan Tower Real Estate Investment Company (tentative name) in accordance with a resolution of the Board of Directors' meeting on January 8, 2021. As of December 31, 2020, the related assets acquired, and liabilities assumed from sale of Bundang Doosan Tower were reclassified as assets and liabilities held for sale in the consolidated financial statements. In addition, the transaction was completed on January 15, 2021.

(*4) As the sales contract was concluded during the year ended December 31, 2020, buildings and others owned by Doosan Bobcat China Co., Ltd., a subsidiary, were reclassified as assets held for sale in consolidated financial statements. The disposal was completed on December 15, 2021.

39. Business Combination of DFC

The Company has 10,016,672 ordinary shares and 2,039,091 preferred shares of DFC As of December 31, 2020. In addition, as of November 26, 2020, 12,763,557 shares of DFC, which were held a 13 related parties, including Jeongwon Park, were donated to DHC to improve the financial structure of its subsidiary. As a result, the Group obtained control of DFC.

The Group has elected to measure the non-controlling interests at the proportionate share of the current equity instrument of the amounts recognized for DFC's identifiable net assets as of the acquisition date. As of the acquisition date, the fair values of DFC's identifiable assets and liabilities are as follows (Korean won in millions):

Assets	Book amount	Liabilities	Book amount
Cash and cash equivalents	₩ 64,601	Trade and other payables	₩ 82,834
Long-term and short-term investment securities	9,376	Bonds	98,886
Trade receivables and other receivables	134,938	Lease liabilities	1,180
Inventory	163,480	Other liabilities	159,037
Investments in associates and joint ventures	2,810		
Property, plant and equipment	42,245		
Intangible assets	115,392		
Other assets	49,948		
Assets total	₩ 582,790	Liabilities total	₩ 341,937
① Fair value of net assets (total assets – total liabilities)			240,853
② Non-controlling interests			157,646
③ The acquisition date fair value of the interest in the acquiree of the Group (*1)			1,101,604
Goodwill due to acquisition (②+ ③-①)			₩ 1,018,397

(*1) The acquisition date fair value of the interest previously held by the Group in the acquiree is ₩501,079 million (see Note 6).

The fair value of DFC's identifiable assets and liabilities as of the acquisition date mentioned above is based on the fair value assessment completed during the year ended December 31, 2021. The adjustment of provisional amount for each account in the consolidated financial statement affected by the adjustment for the year ended December 31, 2021 is as follows:

	2020		
	Provisional value	Fair value assessment adjustments during the year ended December 31, 2021	Fair value
Assets			
Property, plant and equipment	₩ 41,015	₩ 1,230	₩ 42,245
Intangible assets	3,657	111,735	115,392
Goodwill resulting from acquisition	1,047,983	(29,586)	1,018,397
Liabilities			
Deferred tax liabilities	₩ -	₩ 27,338	₩ 27,338
Capital			
Non-controlling interests	₩ 101,605	₩ 56,041	₩ 157,646

The Group revised the comparatively presented consolidated financial statements at the end of the previous year to reflect the impact of the above adjustment.

DFC's sales and profit for the year after the acquisition date recorded in the consolidated statements of profit or loss were ₩109,677 million and ₩1,158 million, respectively.

40. Uncertainty of the impact of COVID-19

In order to prevent the spread of COVID-19, a various prevention and control measures, including restrictions on travelling are being implemented worldwide, and as a result, the global economy has been extensively affected. In addition, governments are implementing various support measures to cope with COVID-19.

The Group primarily engages several businesses, such as heavy industry, machinery manufacturing, apartment construction and others. The line items affected by COVID -19 pandemic are mainly the collectability of trade receivables (Notes 4 and 7), impairment of inventories, property, plant and equipment and intangible assets (Notes 8, 12 and 13), and recognition of provisions (Note 18). The Group has prepared the consolidated financial statements by reasonably estimating the impact of COVID -19 on the Group. However, there are significant uncertainties in estimating the timing for endpoint of COVID -19 and the impact of COVID-19 on the Group.

41. Financial structure improvement plan

DHC and its subsidiaries have faced financial problems arising from accumulated losses incurred since 2014, which is largely due to steadily deteriorating management performance over several years due to economic slowdown in the global developing market and changes in external environment. In order to overcome such management crisis, DHC, the Group's subsidiary, established a business rationalization plan to improve its profitability, including manpower restructuring and others, and step-by-step process financial structure improvement plan to reduce borrowings through capital expansion and others.

DHC received financial support (approximately ₩3,000,000 million) from Korea Development Bank and Korea Exim Bank (the "State-owned banks") in the first half of 2020, in order to raise short-term liquidity. Accordingly, DHC, the Group's subsidiary, and related parties, including Jeongwon Park, provided their major assets as collateral to the state-owned banks, and entered into agreements with the state-owned banks to implement DHC's financial structure improvement plan in June 2020. The agreement includes a plan to repay debts to the state-owned banks by raising more than ₩3,000,000 million in funds through its self-supporting efforts, including the sale of non-core assets. DHC raised funds through paid-in capital increase in December 2020, sale of DI business division in August 2021 and paid-in capital increase in February 2022 to implement the financial structure improvement plan.

In addition, DHC has fully repaid the debt of the state-owned banks as of February 28, 2022, and the related agreement for providing collaterals has been terminated.

42. Events after the reporting year

In accordance with a resolution of the Board of Directors on March 8, 2022, the Company decided to acquire 2,909,292 ordinary shares, 2,320,672 convertible preferred shares, and bonds with stock warrants (number of shares to be issued under the exercise of new shares: 2,246,989) in Tesna Co., Ltd. held by AITRI LLC. and signed a stock transfer agreement. The total acquisition amount is ₩460,000 million, and the expected closing date of the transaction is April 29, 2022. Meanwhile, for the purpose of acquiring and holding the stocks, the Company newly established Doosan Investment Co., Ltd. as a subsidiary.