



DOOSAN CORPORATION AND ITS SUBSIDIARIES

Consolidated Financial Statements

For the Years Ended December 31, 2022 and 2021

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
Consolidated statements of cash flows	7
Notes to the consolidated financial statements	9



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Independent auditor's report
(English Translation of a Report Originally Issued in Korean)

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, 2022 and 2021, 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, 2022 and 2021, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with International Financial Reporting Standards as adopted by the Republic of Korea ("KIFRS").

Basis for opinion

We conducted our audit in accordance with Korean Standards on Auditing ("KSA"). 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.

Emphasis of Matter

Without qualifying our opinion, we draw attention to Note 41 to the consolidated financial statements. As discussed in Note 41, the consolidated financial statements as of and for the year ended December 31, 2021 had overstated net assets by ₩86,934 million and net profit by ₩7,915 million before adjustment. Therefore, the accompanying consolidated financial statements as of and for the year ended December 31, 2021, presented for comparative purposes, have been restated to reflect such adjustments.

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) Uncertainty in estimating total contract cost

As described in Note 2-(8) to the consolidated financial statements, the Group recognizes revenue from a contracts with customers when control over the goods or services are transferred to the customer. In this regard, the Group measures percentage-of-completion using the input method and recognizes revenue over time depending on the percentage of completion measured. Such accounting policy on revenue recognition applies primarily to Doosan Enerbility Co., Ltd. and its subsidiaries, a segment included in the Group.

The estimated total contract costs and cumulative input costs have influence on the measurement of percentage-of-completion, and management's judgement is required in estimating the total contract costs. Therefore, revenue from contracts with customers is exposed to the risk of overstatement resulting from errors in judgment or intentional mistake, and regarding the risk described above, we have identified the uncertainty in estimating total contract costs of Doosan Enerbility Co., Ltd. and its subsidiaries as a key audit matter.

The main audit procedures we performed for this key audit matter with the involvement of the component auditors are as follows.

- We evaluated the design and operation of internal control procedures related to the determination and modification of estimated total contract costs.
- We conducted a retrospective analysis for a sample of significant projects which are completed during the current period by comparing the actual costs incurring during the current period and the costs estimated at the end of the prior period.
- We made inquiry for projects with significant changes in the estimated total contract costs and inspected documents related thereto.
- We compared the estimated total contract costs of similar projects.
- We made inquiry and conducted analysis on the cause of changes in the percentage-of-completion of construction by reporting period.
- We compared the percentage-of-completion by stage (stated in monthly progress report) and cost-based percentage-of-completion for major projects, and when significant difference is identified, made inquiry and conducted inspections on documents related thereto.
- We inspected materials in development and field of project in progress.

(2) Goodwill impairment testing

As described in Note 13 to the consolidated financial statements, the Group conducted an impairment testing on a cash-generating unit ("CGU") or a group of CGUs to which the goodwill of Doosan Enerbility Co., Ltd. and its subsidiaries is allocated as of December 31, 2022. In order to determine the recoverable amount of a CGU or a group of CGUs, the Group estimated either the value in use or the fair value less costs of disposal, based on the future cash flows estimated on the basis of future financial budgets.

As of December 31, 2022, the carrying amount of goodwill of Doosan Enerbility Co., Ltd. and its subsidiaries is ₩4,688,940 million, accounting for 17.8% of total assets. In addition, the recoverable amount may vary depending on the estimated future cash flow, applicable discount rate and comparable companies selected, all of which are inputs requiring management's judgement, and accordingly have a significant impact on the consolidated financial statements of the Group. Therefore, we have identified the estimation of the recoverable amounts of a CGU (or a group of CGUs) to which the goodwill of Doosan Enerbility Co., Ltd. and its subsidiaries are allocated as a key audit matter.

The main audit procedures we performed for this key audit matter with the involvement of the component auditors are as follows.

- We obtained understanding for and assessed internal control related to goodwill impairment testing.
- We assessed management's experts who participated in estimating the value in use based on their qualification and independence.
- We made inquiry and conducted inspection on valuation models applied by the Group.
- We assessed valuation models applied to the estimation of the value in use of goodwill based on the mathematical accuracy.
- We checked whether the estimated future cash flows are consistent with business plans reported to and approved by management.
- We evaluated inputs utilized such as applicable discount rate and growth rate by comparing them with external benchmarks used by comparable entities in the same industry and past financial information of CGUs (or groups of CGUs).
- We conducted a sensitivity analysis of the discount rate and perpetual growth rate applied by the Group in order to evaluate the effect of changes in major assumptions on the impairment test results.

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 KIFRS, 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 KSA 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 KSA, 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 21, 2023

This audit report is effective as of March 21, 2023, 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, 2022 and 2021

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

Hong Sung Moon
Chief Executive Officer
Doosan Corporation

Doosan Corporation and its subsidiaries
Consolidated statements of financial position
as of December 31, 2022 and 2021
(Korean won)

	Notes	2022	2021
Assets			
Current assets:			
Cash and cash equivalents	4,5,10,35	₩ 2,074,186,431,748	₩ 2,235,104,602,083
Short-term financial instruments	4,5,10,33	160,916,144,934	1,063,646,683,200
Short-term investment securities	4,6,10,33	33,347,906,989	197,197,204,569
Trade receivables	4,7,10,33,34	1,895,477,518,134	1,160,435,476,631
Other receivables	4,7,10,34	332,336,150,780	299,112,446,730
Due from customers for contract work	4,25	1,177,231,442,816	1,654,560,197,702
Current derivative assets	4,9,10	77,099,865,917	30,477,894,846
Current firm commitment assets	9	54,959,871,522	45,877,394,613
Inventories	8,33	2,756,671,475,081	2,049,386,251,750
Assets held for sale	38	4,684,773,519	319,607,727,650
Other current assets		959,403,803,396	821,742,256,757
Total current assets		<u>9,526,315,384,836</u>	<u>9,877,148,136,531</u>
Non-current assets:			
Long-term financial instruments	4,5,10,33	42,975,238,910	40,829,884,045
Long-term investment securities	4,6,10,33	459,348,913,297	508,468,044,157
Investments in associates and joint ventures	11,33	431,385,152,841	740,002,545,613
Property, plant and equipment	3,12,16,33,39	6,273,316,148,740	5,947,261,892,371
Intangible assets	3,13,39	7,890,852,550,074	7,581,751,614,166
Investment properties	3,14,16	458,919,181,837	362,693,422,126
Long-term other receivables	4,7,10,34	136,753,784,735	67,433,353,176
Long-term due from customers for contract work	4,25	105,935,277,325	102,739,503,644
Non-current derivative assets	4,9,10	18,057,362,857	8,683,481,005
Non-current firm commitment assets	9	40,539,228,724	20,892,251,073
Deferred tax assets	3,30	445,453,458,195	251,568,873,347
Deposits	4,10	388,989,192,676	394,800,601,741
Net defined benefit asset	17	14,508,413,601	-
Other non-current assets		82,003,334,563	41,551,819,094
Total non-current assets		<u>16,789,037,238,375</u>	<u>16,068,677,285,558</u>
Total assets		<u>₩ 26,315,352,623,211</u>	<u>₩ 25,945,825,422,089</u>

(Continued)

Doosan Corporation and its subsidiaries
Consolidated statements of financial position
as of December 31, 2022 and 2021 (cont'd)
(Korean won)

	Notes	2022	2021
Liabilities			
Current liabilities:			
Trade payables	4,10,34	₩ 2,692,983,817,753	₩ 2,034,583,209,979
Other payables	4,10,34	939,009,039,833	801,695,337,134
Due to customers for contract work	25	1,738,401,827,087	1,468,213,289,759
Short-term borrowings	4,10,15,32,33	1,862,739,580,080	4,725,060,883,660
Current portion of bonds	4,10,15,32,33	717,884,940,866	690,900,817,693
Current portion of long-term borrowings	4,10,15,32,33	229,800,840,095	463,728,899,773
Current portion of long-term asset-backed loans	4,10,15,32,33	91,731,243,911	115,042,422,078
Current derivative liabilities	4,9,10	75,362,726,315	212,986,357,385
Current firm commitment liabilities	9	16,710,336,818	10,120,811,188
Current tax liabilities	30	166,929,545,726	326,719,612,346
Current provisions	3,18,25	324,263,249,547	328,911,072,602
Current lease liabilities	4,10,16	142,390,772,667	99,478,825,592
Liabilities held for sale	38	-	273,469,051,612
Other current liabilities		480,277,465,729	458,461,416,085
Total current liabilities		<u>9,478,485,386,427</u>	<u>12,009,372,006,886</u>
Non-current liabilities:			
Bonds	4,10,15,32,33	533,982,293,586	1,139,453,849,847
Long-term borrowings	4,10,15,32,33	3,207,531,330,134	1,520,833,919,822
Long-term asset-backed loans	4,10,15,32,33	113,352,929,033	16,434,564,878
Net defined benefit liabilities	3,17	471,756,337,739	578,380,866,156
Long-term other liabilities	4,10	458,315,737,928	686,748,462,300
Non-current derivative liabilities	4,9,10	41,217,731,602	37,802,056,172
Non-current firm commitment liabilities	9	6,307,158,879	5,651,863,540
Non-current provisions	3,18,25	407,111,783,104	326,077,334,698
Deferred tax liabilities	3,30,39	499,652,968,049	483,114,613,720
Non-current lease liabilities	4,10,16	606,746,430,261	591,533,452,731
Other non-current liabilities		193,076,770,412	140,303,729,094
Total non-current liabilities		<u>6,539,051,470,727</u>	<u>5,526,334,712,958</u>
Total liabilities		<u>16,017,536,857,154</u>	<u>17,535,706,719,844</u>
Equity			
Equity attributable to owners of the parent:			
Share capital	1,19	123,738,105,000	123,738,105,000
Capital surplus	19,20	1,604,659,761,919	1,237,398,733,162
Other equity items	21	(1,194,103,960,888)	(1,196,429,122,967)
Accumulated other comprehensive income	6,9,22	586,987,276,977	530,156,333,574
Retained earnings	23	669,450,909,854	1,383,279,055,697
		1,790,732,092,862	2,078,143,104,466
Non-controlling interests	39	8,507,083,673,195	6,331,975,597,779
Total equity		<u>10,297,815,766,057</u>	<u>8,410,118,702,245</u>
Total liabilities and equity		<u>₩ 26,315,352,623,211</u>	<u>₩ 25,945,825,422,089</u>

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, 2022 and 2021
(Korean won)

	Notes	2022	2021
Sales	3,24,25,34	₩ 16,995,760,103,010	₩ 12,851,485,792,017
Cost of sales	26,34	14,157,713,085,775	10,644,568,825,480
Gross profit		2,838,047,017,235	2,206,916,966,537
Selling and administrative expenses	26,27	1,712,018,290,813	1,285,859,565,563
Operating profit		1,126,028,726,422	921,057,400,974
Finance income	10,28	808,125,993,148	749,295,858,031
Finance expenses	10,28	1,379,467,521,129	1,069,387,448,433
Other non-operating income	10,29	169,238,974,296	152,287,096,705
Other non-operating expenses	10,29	666,589,743,487	163,819,333,171
Share of profit (loss) of associates and joint ventures accounted for using the equity method	11	(343,240,353,961)	3,434,868,191
Profit (loss) before income tax expenses		(285,903,924,711)	592,868,442,297
Income tax expenses	30	211,331,877,835	247,354,653,887
Profit (loss) from continuing operations		(497,235,802,546)	345,513,788,410
Profit (loss) from discontinued operations	37	(83,932,915,238)	303,301,710,751
Profit (loss) for the year		₩ (581,168,717,784)	₩ 648,815,499,161
Profit (loss) for the year attributable to:			
Equity holders of the parent		₩ (696,398,841,488)	₩ 203,908,797,021
Non-controlling interests		115,230,123,704	444,906,702,140
Earnings (Losses) per share attributable to the equity holders of the parent	31		
Basic losses per ordinary share from continuing operations		₩ (37,159)	₩ (1,321)
Basic earnings (losses) per ordinary share		₩ (39,132)	₩ 11,446
Diluted losses per ordinary share from continuing operations		₩ (37,159)	₩ (1,321)
Diluted earnings (losses) per ordinary share		₩ (39,132)	₩ 11,446
Basic losses per old-type preferred share from continuing operations		₩ (37,112)	₩ (1,326)
Basic earnings (losses) per old-type preferred share		₩ (39,082)	₩ 11,496
Diluted losses per old-type preferred share from continuing operations		₩ (37,112)	₩ (1,326)
Diluted earnings (losses) per old-type preferred share		₩ (39,082)	₩ 11,496

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, 2022 and 2021

(Korean won)

	Notes	2022	2021
Profit (loss) for the year		₩ (581,168,717,784)	₩ 648,815,499,161
Other comprehensive income	22		
Items not to be subsequently reclassified to profit or loss			
Remeasurements of net defined benefit liabilities	17	91,579,833,333	99,099,086,834
Land revaluation surplus	12	15,965,100,922	200,920,494,599
Gain (loss) on valuation of financial assets (designated) at fair value through other comprehensive income	6	(16,735,136,906)	21,391,099,168
Items to be subsequently reclassified to profit or loss			
Gain on valuation of derivatives designated as cash flow hedges	9	9,495,367,916	8,332,735,493
Gain on foreign operations translation		237,023,153,010	284,244,558,096
Equity changes in equity method	11	(5,231,379,462)	1,842,570,202
Total other comprehensive income		332,096,938,813	615,830,544,392
Total comprehensive income (loss) for the year		₩ (249,071,778,971)	₩ 1,264,646,043,553
Total comprehensive income (loss) attributable to:			
Equity holders of the parent		₩ (618,600,108,039)	₩ 356,271,690,990
Non-controlling interests		369,528,329,068	908,374,352,563

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, 2022 and 2021
(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
Adjustment on the correction of error (net of tax) (see Note 41)	-	-	-	7,893,095,131	(76,946,121,726)	-	(69,053,026,595)
As of January 1, 2021 (adjusted)	123,738,105,000	1,090,773,788,457	(1,194,599,080,502)	488,344,301,737	1,082,362,532,590	6,105,898,267,263	7,696,517,914,545
Total comprehensive income (loss):							
Profit for the year	-	-	-	-	203,908,797,021	444,906,702,140	648,815,499,161
Remeasurements of net defined benefit liabilities	-	-	-	-	27,023,896,769	72,075,190,065	99,099,086,834
Land revaluation surplus	-	-	-	(6,422,990,755)	86,242,246,849	121,101,238,505	200,920,494,599
Gain on valuation of financial assets (designated) at fair value through OCI	-	-	-	6,410,534,098	3,636,537,168	11,344,027,902	21,391,099,168
Gain on valuation of derivatives designated as hedges	-	-	-	2,817,902,897	-	5,514,832,596	8,332,735,493
Gain on foreign operations translation	-	-	-	30,483,786,584	-	253,760,771,512	284,244,558,096
Equity changes in equity method	-	-	-	2,170,980,359	-	(328,410,157)	1,842,570,202
Subtotal	-	-	-	35,460,213,183	320,811,477,807	908,374,352,563	1,264,646,043,553
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)
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	-	-	(792,377,634)	-	-	(2,291,829,823)	(3,084,207,457)
Changes in scope of consolidation	-	-	-	6,351,818,654	-	(1,019,353,279,028)	(1,013,001,460,374)
Changes in share ratio of subsidiaries	-	109,793,530,050	-	-	-	(109,793,530,050)	-
Changes in other equity items	-	22,869,717,727	245,158,338	-	-	35,130,769,008	58,245,645,073
Subtotal	-	146,624,944,705	(1,830,042,465)	6,351,818,654	(19,894,954,700)	(682,297,022,047)	(551,045,255,853)
As of December 31, 2021	₩ 123,738,105,000	₩ 1,237,398,733,162	₩ (1,196,429,122,967)	₩ 530,156,333,574	₩ 1,383,279,055,697	₩ 6,331,975,597,779	₩ 8,410,118,702,245

(Continued)

Doosan Corporation and its subsidiaries
Consolidated statements of changes in equity
for the years ended December 31, 2022 and 2021 (cont'd)
(Korean won)

	Share capital	Capital surplus	Other equity items	Accumulated other comprehensive income	Retained earnings	Non-controlling interests	Total
	₩ 123,738,105,000	₩ 1,237,398,733,162	₩ (1,196,429,122,967)	₩ 530,156,333,574	₩ 1,383,279,055,697	₩ 6,331,975,597,779	₩ 8,410,118,702,245
As of January 1, 2022							
Total comprehensive income (loss):							
Profit (loss) for the year	-	-	-	-	(696,398,841,488)	115,230,123,704	(581,168,717,784)
Remeasurements of net defined benefit liabilities	-	-	-	-	14,762,708,413	76,817,124,920	91,579,833,333
Land revaluation surplus	-	-	-	3,909,210,237	404,933,992	11,650,956,693	15,965,100,922
Gain (Loss) on valuation of financial assets (designated) at fair value through OCI	-	-	-	(14,613,817,090)	519,505,802	(2,640,825,618)	(16,735,136,906)
Gain on valuation of derivatives designated	-	-	-	7,147,334,652	-	2,348,033,284	9,495,367,916
Gain on foreign operations translation	-	-	-	67,311,676,703	-	169,711,476,307	237,023,153,010
Negative equity changes in equity method	-	-	-	(1,842,819,260)	-	(3,588,560,202)	(5,231,379,462)
Subtotal	-	-	-	62,111,585,242	(680,711,693,281)	369,528,329,068	(249,071,778,971)
Transactions with shareholders directly reflected in shareholders' equity and others:							
Cancellation of stock options	-	579,290,167	(579,290,167)	-	-	-	-
Shared-based payment transaction	-	-	3,062,910,345	-	-	192,360,336	3,255,270,681
Payment of dividends	-	-	-	-	(35,772,341,000)	(89,260,367,300)	(125,032,708,300)
Paid-in capital increase of subsidiaries	-	54,930,856,708	-	-	-	891,925,743,794	946,856,600,502
Stock options of subsidiaries	-	158,458,099	(158,458,099)	-	-	-	-
Exercise of stock warrants of subsidiaries	-	35,310,741,422	-	-	-	443,694,233,847	479,004,975,269
Acquisition of treasury stocks in subsidiaries	-	-	-	-	-	(1,566,232,730)	(1,566,232,730)
Disposal of investment in subsidiaries	-	195,675,906,414	-	-	-	371,801,609,502	567,477,515,916
Changes in scope of consolidation	-	14,527,679,214	-	(5,280,641,839)	2,655,888,438	254,870,495,632	266,773,421,445
Changes in share ratio of subsidiaries	-	66,078,096,733	-	-	-	(66,078,096,733)	-
Subtotal	-	367,261,028,757	2,325,162,079	(5,280,641,839)	(33,116,452,562)	1,805,579,746,348	2,136,768,842,783
As of December 31, 2022	₩ 123,738,105,000	₩ 1,604,659,761,919	₩ (1,194,103,960,888)	₩ 586,987,276,977	₩ 669,450,909,854	₩ 8,507,083,673,195	₩ 10,297,815,766,057

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, 2022 and 2021
(Korean won)

	Notes	2022	2021
Cash flows from operating activities			
Cash generated from operating activities:	35		
Profit (loss) for the year		₩ (581,168,717,784)	₩ 648,815,499,161
Adjustments		2,705,166,226,202	1,551,865,636,276
Changes in operating assets and liabilities		(683,021,266,093)	(587,669,126,243)
		1,440,976,242,325	1,613,012,009,194
Interest received		42,347,640,558	40,694,026,256
Interest paid		(372,981,192,097)	(462,866,807,791)
Dividends received		12,032,027,756	8,398,142,411
Income tax paid		(589,191,251,573)	(476,806,872,080)
Net cash flows provided by operating activities		533,183,466,969	722,430,497,990
Cash flows from investing activities			
Cash inflows from investing activities:			
Decrease in short-term financial instruments		1,311,561,995,497	441,249,869,408
Disposal of short-term investment securities		195,068,316,200	766,783,471,786
Decrease in short-term loans		57,417,223,906	88,660,725,879
Decrease in long-term financial instruments		2,041,277,135	105,993,635,775
Disposal of long-term investment securities		81,834,988,136	14,644,365,571
Decrease in long-term loans		5,591,418,915	58,135,724,775
Disposal of investments in subsidiaries		108,898,468,968	206,201,504,800
Disposal of investments in associates and joint ventures		-	18,342,758,666
Disposal of property, plant and equipment		34,730,587,986	90,558,011,190
Disposal of intangible assets		5,445,997,068	3,170,932,796
Disposal of investment properties		15,400,000,000	38,081,395,037
Net cash flows from business transfer		27,045,768,342	-
Disposal of assets held for sale		59,939,399,834	597,057,432,304
Other investing activities		12,586,568,688	45,073,764,452
		1,917,562,010,675	2,473,953,592,439
Cash outflows from investing activities:			
Increase in short-term financial instruments		434,925,421,270	1,120,473,820,124
Acquisition of short-term investment securities		32,660,410,414	339,169,465,606
Increase in short-term loans		81,466,893,705	62,576,485,797
Increase in long-term financial instruments		6,474,641,920	107,481,433,749
Acquisition of long-term investment securities		82,434,731,611	182,486,800,689
Increase in long-term loans		13,562,757,265	184,390,208,243
Acquisition of investment in subsidiaries		413,052,210,489	-
Acquisition of investments in associates and joint ventures		60,489,217,188	157,155,385,000
Acquisition of property, plant and equipment		700,009,377,312	381,998,657,794
Acquisition of intangible assets		241,675,072,635	232,451,006,074
Acquisition of investment properties		1,050,000,000	869,799,610
Decrease in derivative liabilities		142,140,077,479	-
Other investing activities		(1,460,102,958)	-
		(2,208,480,708,330)	(2,769,053,062,686)
Net cash flows used in investing activities		(290,918,697,655)	(295,099,470,247)

(Continued)

Doosan Corporation and its subsidiaries
Consolidated statements of cash flows
for the years ended December 31, 2022 and 2021 (cont'd)
(Korean won)

	Notes	2022	2021
Cash flows from financing activities			
Cash inflows from financing activities:			
Increase in asset-backed loans	₩	206,002,950,000	₩ 112,904,468,504
Issuance of bonds		479,218,732,177	903,206,806,667
Increase in long-term borrowings		3,341,660,494,018	1,331,894,721,582
Increase in lease liabilities in a sales and leaseback		26,397,769,349	-
Exercise of stock warrants of subsidiaries		479,004,975,269	427,610,110,305
Paid-in capital increase of subsidiaries		955,475,986,892	-
Disposal of investment in subsidiaries		567,368,817,876	-
Other financing activities		-	55,097,491,840
		6,055,129,725,581	2,830,713,598,898
Cash outflows from financing activities:			
Net decrease in short-term borrowings		2,793,627,513,230	795,621,868,670
Decrease in asset-backed loans		133,342,886,154	465,979,911,224
Repayment of bonds		1,169,171,339,783	735,161,090,278
Repayment of long-term borrowings		2,112,247,322,259	1,717,072,787,173
Repayment of finance lease liabilities		135,039,085,344	120,044,000,000
Repayment of sale and leaseback liabilities		55,198,209,756	7,977,606,952
Payment of dividends		125,032,708,300	20,815,343,400
Acquisition of treasury stocks in subsidiaries		1,654,175,566	3,084,207,457
Expense of shares issuance of subsidiaries		11,734,717,310	-
Acquisition of investment in subsidiaries		-	709,163,000
Other financing activities		118,648,965	-
		(6,537,166,606,667)	(3,866,465,978,154)
Net cash flows used in financing activities		(482,036,881,086)	(1,035,752,379,256)
Effects of exchange rate changes on cash and cash equivalents		78,853,941,437	153,087,944,616
Decrease in cash due to reclassification of assets held for sale	38	-	(17,515,652,789)
Net decrease in cash and cash equivalents		(160,918,170,335)	(472,849,059,686)
Cash and cash equivalents, beginning of the year		2,235,104,602,083	2,707,953,661,769
Cash and cash equivalents, end of the year		₩ 2,074,186,431,748	₩ 2,235,104,602,083

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, 2022 and 2021

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 referred to as 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, 2022 is ₩123,738 million, including ₩24,447 million of preferred shares.

The Company’s ordinary shares as of December 31, 2022 are owned as follows:

	Number of ordinary shares owned	Ownership percentage (%)
Related parties	6,563,486	39.72
Treasury stocks	3,000,866	18.16
Others	6,959,483	42.12
	16,523,835	100.00

In addition, 33.2% of preferred shares are owned by the largest shareholder and others and 54.3% of preferred shares are owned by others.

1.2 Consolidated subsidiaries information

Details of the subsidiaries as of December 31, 2022 and 2021 are as follows:

Subsidiary	Type of business	Location	Ownership ratio of the Group (%) (*1)		Ownership ratio of non-controlling interests (%) (*1)		Financial closing date (*2)
			2022	2021	2022	2021	
Oricom Inc.	Advertising	Korea	62.83	62.83	37.17	37.17	December 31
Hancomm Inc.	Advertising	Korea	100.00	100.00	37.17	37.17	December 31
Doosan Bears Inc.	Sports	Korea	100.00	100.00	-	-	December 31
Doosan Digital Innovation America LLC	IT services	USA	100.00	100.00	-	-	December 31
Doosan Information & Communications Beijing Co., Ltd.	IT services	China	100.00	100.00	-	-	December 31
Doosan Digital Innovation Europe Limited	IT services	UK	100.00	100.00	-	-	December 31
Doosan Business Research Institute	Education and training	Korea	100.00	100.00	-	-	December 31
Doosan Logistics Solution Co., Ltd.	Development and sale of logistics automation facilities	Korea	100.00	100.00	-	-	December 31
Doosan Investment Co., Ltd.	Holding company	Korea	100.00	-	-	-	December 31
Doosan Tesna Inc. (*4)	Testing and engineering of semiconductor manufacturing	Korea	30.78	-	69.22	-	December 31
Doosan Shanghai Chemical Materials Co., Ltd.	Sales of Copper Clad Laminates	China	100.00	100.00	-	-	December 31
Doosan Electro-Materials Singapore Pte Ltd.	Sales of Copper Clad Laminates	Singapore	100.00	100.00	-	-	December 31
Doosan (Hong Kong) Ltd.	Sales of Copper Clad Laminates	China	100.00	100.00	-	-	December 31
Doosan Electro-Materials (Shen Zhen) Limited	Sales of Copper Clad Laminates	China	100.00	100.00	-	-	December 31
Doosan Electro-Materials (Changshu) Co., Ltd.	Manufacturing and sales of Copper Clad Laminates	China	100.00	100.00	-	-	December 31
Doosan Electro-Materials America, LLC	Marketing	USA	100.00	100.00	-	-	December 31
Doosan Electro-Materials Vietnam Company Limited	Manufacturing of Copper Clad Laminates	Vietnam	100.00	100.00	-	-	December 31
HyAxiom, Inc.(formerly, Doosan Fuel Cell America, Inc. (*5)	Manufacturing	USA	100.00	100.00	-	-	December 31

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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
			2022	2021	2022	2021	
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 H2 Innovation Co., Ltd.	R&D of fuel cells and systems for power generation	Korea	100.00	100.00	-	-	December 31
HyAxiom Motors Co., Ltd.	Manufacturing and sales of eco-friendly commercial vehicles	Korea	100.00	-	-	-	December 31
Doosan Robotics Inc.	Manufacturing industrial robots	Korea	90.91	100.00	9.09	-	December 31
Doosan Robotics Americas, LLC	Manufacturing and sales	USA	100.00	-	9.09	-	December 31
Doosan Mobility Innovation Inc	Manufacturing of hydrogen fuel cell power pack	Korea	100.00	100.00	-	-	December 31
Doosan Mobility Innovation (Shenzhen) Co. Ltd.	Wholesale and retail	China	100.00	100.00	-	-	December 31
Doosan Second Real Estate Securitization Specialty Ltd. (*3)	Specialized in securitization	Korea	-	-	-	-	December 31
D-Pay 3rd Co., Ltd. (*3)	Specialized in securitization	Korea	-	-	-	-	December 31
NewstarBears Co., Ltd. (*3)	Specialized in securitization	Korea	-	-	-	-	December 31
Doosan Enerbility Co., Ltd.(formerly, Doosan Heavy Industries & Construction Co., Ltd.) (*4,5)	Manufacturing of turbine and other engine	Korea	30.51	39.26	69.49	60.74	December 31
Doosan Enerbility Vietnam Co., Ltd.(formerly, Doosan Heavy Industries Vietnam Co., Ltd.) (*5)	Manufacturing of machine and other engine	Vietnam	100.00	100.00	69.49	60.74	December 31
Doosan HF Controls Corp.	Manufacturing	USA	100.00	100.00	69.49	60.74	December 31
Doosan HF Controls Asia Co., Ltd.	Manufacturing	Korea	100.00	100.00	69.49	60.74	December 31
PT. Doosan Heavy Industries Indonesia	Manufacturing	Indonesia	83.64	83.64	74.49	67.16	December 31
Doosan Heavy Industries Malaysia Sdn. Bhd.	Dormant corporation	Malaysia	100.00	100.00	69.49	60.74	December 31
Doosan Enerbility Japan Corp. (formerly, Doosan Heavy Industries Japan Corp.) (*5)	Wholesale and retail	Japan	100.00	100.00	69.49	60.74	December 31
Doosan Water UK Ltd.(formerly, Doosan Enpure Ltd.) (*5)	Engineering and service	UK	100.00	100.00	69.49	60.74	December 31
Doosan Power Systems India Private Ltd.	Engineering and service	India	100.00	100.00	69.49	60.74	March 31
Doosan Heavy Industries Muscat LLC	Manufacturing	Oman	70.00	70.00	78.65	72.52	December 31
Doosan Power Systems Arabia Company Limited	Manufacturing service	Saudi Arabia	51.00	51.00	84.44	79.98	December 31
Azul Torre Construction Corporation (*4)	Manufacturing	Philippines	40.00	40.00	87.80	84.30	December 31
Doosan Enerbility America Holdings Inc.(formerly, Doosan Heavy Industries America Holdings Inc.) (*5)	Holding company	USA	100.00	100.00	69.49	60.74	December 31
Doosan Enerbility America LLC(formerly, Doosan Heavy Industries America LLC) (*5)	Wholesale and retail	USA	100.00	100.00	69.49	60.74	December 31
Doosan ATS America, LLC	Engineering and services	USA	100.00	100.00	69.49	60.74	December 31
Doosan Power Service America, LLC	Engineering and services	USA	100.00	100.00	69.49	60.74	December 31
Doosan Turbomachinery Services Holding, Inc.	Holding company	USA	100.00	100.00	69.49	60.74	December 31
Doosan Turbomachinery Services Inc.	Manufacturing	USA	100.00	100.00	69.49	60.74	December 31
Doosan GridTech Inc.	Software and systems engineering	USA	100.00	100.00	69.49	60.74	December 31
Doosan GridTech LLC	Software and systems engineering	USA	100.00	100.00	69.49	60.74	December 31
Doosan GridTech CA LLC	Software and systems engineering	USA	100.00	100.00	69.49	60.74	December 31
Doosan GridTech EPC LLC	Software and systems engineering	USA	100.00	100.00	69.49	60.74	December 31
Doosan GridTech C&I LLC	Software and systems engineering	USA	100.00	100.00	69.49	60.74	December 31
Continuity Energy LLC	Software and systems engineering	USA	100.00	100.00	69.49	60.74	December 31
Doosan Skoda Power s.r.o	Manufacturing	Czech	100.00	100.00	69.49	60.74	December 31
Skoda Power Private Ltd.	Engineering	India	100.00	100.00	69.49	60.74	March 31
DPS UK Pension Company Ltd.	Specialized services	UK	100.00	-	69.49	-	December 31
Doosan Power Systems Pension Trustee Co., Ltd.	Specialized services	UK	100.00	100.00	69.49	60.74	December 31
Doosan Lentjes GmbH	Engineering and services	Germany	100.00	100.00	69.49	60.74	December 31
Doosan Power Systems S.A.	Holding company	Luxembourg	100.00	100.00	69.49	60.74	December 31
Doosan Lentjes Czech s.r.o	Specialized services	Czech	100.00	100.00	69.49	60.74	December 31
Osung Power O&M Co., Ltd.	Engineering and services	Korea	100.00	100.00	69.49	60.74	December 31

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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 (*2)
			2022	2021	2022	2021	
Doosan Ukudu Power, LLC	Engineering and services	USA	100.00	100.00	69.49	60.74	December 31
Doosan Cuvex Co., Ltd. (*6)	Golf and condominium	Korea	100.00	100.00	69.49	38.01	December 31
Doosan Bobcat Inc.	Holding company	Korea	51.07	51.05	84.42	79.96	December 31
Doosan Bobcat Singapore Pte. Ltd.	Holding company	Singapore	100.00	100.00	84.42	79.96	December 31
Doosan Bobcat Korea Co., Ltd.	Sales of construction equipment and others	Korea	100.00	100.00	84.42	79.96	December 31
Doosan Bobcat India Private Ltd.	Manufacturing and sales of construction equipment and others	India	100.00	100.00	84.42	79.96	March 31
Bobcat Corp.	Sales of construction equipment and others	Japan	100.00	100.00	84.42	79.96	December 31
Doosan Bobcat Mexico S.A. de C.V.	Other services	Mexico	100.00	100.00	84.42	79.96	December 31
Doosan Bobcat China Co., Ltd.	Manufacturing and sales of construction equipment and others	China	100.00	100.00	84.42	79.96	December 31
Clark Equipment Co.	Manufacturing and sales of construction equipment and others	USA	100.00	100.00	84.42	79.96	December 31
Bobcat Equipment Ltd.	Sales of construction equipment and others	Canada	100.00	100.00	84.42	79.96	December 31
Doosan Bobcat EMEA s.r.o.	Manufacturing and sales of construction equipment and others	Czech	100.00	100.00	84.42	79.96	December 31
Bobcat Bensheim GmbH.	Sales of construction equipment and others	Germany	100.00	100.00	84.42	79.96	December 31
Doosan Holdings France S.A.S.	Holding company	France	100.00	100.00	84.42	79.96	December 31
CJSC Doosan International Russia	Sales of construction equipment and others	Russia	100.00	100.00	84.42	79.96	December 31
Doosan International UK Ltd.	Sales of construction equipment and others	UK	100.00	100.00	84.42	79.96	December 31
Doosan International South Africa Pty Ltd.	Sales of construction equipment and others	Republic of South Africa	100.00	100.00	84.42	79.96	December 31
Bobcat France S.A.	Manufacturing of construction equipment and others	France	100.00	100.00	84.42	79.96	December 31
Geith International Ltd.	Sales of construction equipment and others	Ireland	100.00	100.00	84.42	79.96	December 31
Doosan Bobcat Global Collaboration Center, Inc.	Other services	USA	100.00	100.00	84.42	79.96	December 31
Doosan Industrial Vehicle Co., Ltd.	Manufacturing and sales of forklifts and others	Korea	100.00	100.00	84.42	79.96	December 31
Doosan Industrial Vehicle Europe N.V.	Sales of forklifts and others	Belgium	100.00	100.00	84.42	79.96	December 31
Doosan Industrial Vehicle U.K. Ltd.	Sales of forklifts and others	UK	100.00	100.00	84.42	79.96	December 31
Doosan Logistics Europe GmbH	Manufacturing and sales of forklifts and others	Germany	100.00	100.00	84.42	79.96	December 31
Doosan Industrial Vehicle America Corp.	Sales of forklifts and others	USA	100.00	100.00	84.42	79.96	December 31
Doosan Equipment South East, LLC	Sales and lease of forklifts	USA	100.00	100.00	84.42	79.96	December 31
Doosan Industrial Vehicle China Co., Ltd.	Manufacturing and sales of forklifts and others	China	100.00	100.00	84.42	79.96	December 31
Genesis Forklift Trucks Limited	Manufacturing of forklifts and others	UK	100.00	100.00	84.42	79.96	December 31
Rushlift Holdings Ltd.	Holding company	UK	100.00	100.00	84.42	79.96	December 31
Doosan Materials Handling UK Ltd.	Holding company	UK	100.00	100.00	84.42	79.96	December 31
Rushlift Ltd.	Sales and lease of forklifts	UK	100.00	100.00	84.42	79.96	December 31
Doosan Fuel Cell Co., Ltd. (*4)	Manufacturing	Korea	30.33	30.33	90.75	88.09	December 31
D20 Capital, LLC	Financial investment	USA	100.00	100.00	69.49	60.74	December 31
D20 Capital FUND I, L.P. (*4)	Financial investment	USA	-	-	100.00	100.00	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) Where the financial closing date of a subsidiary determined pursuant to the local laws are not consistent with that of the Company, adjustments for preparation of the consolidated financial statements have been made to conform to the Company's financial closing date.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

1.2 Consolidated subsidiaries information (cont'd)

(*3) 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.

(*4) 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.

(*5) The subsidiary changed its name during the year ended December 31, 2022.

(*6) Doosan Property Co., Ltd was merged into Doosan Cuvex Co., Ltd., a subsidiary of the Company, during the year ended December 31, 2022.

1.2.1 Changes in the scope of consolidation

Changes in the scope of consolidation for the year ended December 31, 2022 are as follows:

Subsidiary	Change	Description
Doosan Tesna Inc.	Included	Acquisition of shares
Doosan Investment Co., Ltd.	Included	Newly established
Doosan Robotics Americas, LLC	Included	Newly established
HyAxiom Motors Co., Ltd.	Included	Newly established
NewstarBears Co., Ltd.	Included	New borrowing
D-Pay 3rd Co., Ltd.	Included	New borrowing
Doosan Babcock W.L.L	Included	Acquisition of control
DPS UK Pension Company Ltd.	Included	Newly established
Sunny Russel 8th Co., Ltd.	Excluded	Liquidation
D-Pay 2nd Co., Ltd.	Excluded	Liquidation
Doosan Mecatec Co., Ltd.	Excluded	Sale
Doosan Bobcat Chile Compact SpA	Excluded	Sale
Doosan Heavy Industries Vietnam Haiphong Co., Ltd.	Excluded	Sale
Doosan Power Systems Overseas Investments Ltd.	Excluded	Sale
Doosan Power Systems Americas, LLC	Excluded	Sale
Doosan Babcock Ltd.	Excluded	Sale
Doosan Babcock Energy Services (Overseas) Ltd.	Excluded	Sale
Doosan Babcock Energy Polska S.A.	Excluded	Sale
Doosan Babcock Energy Germany GmbH	Excluded	Sale
Doosan Babcock General Maintenance Services, LLC	Excluded	Sale
Doosan Babcock W.L.L.	Excluded	Sale
Doosan Property Co., Ltd.	Excluded	Statutory merger
KDPP 5th Co., Ltd.	Excluded	Borrowing redemption

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

Condensed financial information of the Group's significant subsidiaries as of and for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022				
	Assets	Liabilities	Sales	Profit (loss) for the year	Total comprehensive income (loss)
Doosan Tesna Inc.	₩ 767,017	₩ 457,183	₩ 199,950	₩ 38,640	₩ 36,942
Doosan Electro-Materials (Changshu) Co., Ltd.	156,908	88,742	188,319	5,498	5,498
HyAxiom, Inc.	335,810	409,143	200,565	(115,557)	(115,685)
Doosan Enerbility Co., Ltd.	13,189,540	7,075,909	5,284,439	(1,211,843)	(1,168,590)
Doosan Enerbility Vietnam Co., Ltd.	619,054	201,354	543,328	129,715	129,715
Doosan Power Systems India Private Ltd.	612,229	837,614	309,684	(127,645)	(127,584)
Doosan Skoda Power s.r.o	540,494	121,051	228,718	29,615	32,966
Doosan Lentjes GmbH	243,126	231,110	215,687	(13,306)	7,823
Doosan Cuvex Co., Ltd.	478,362	107,742	69,780	10,083	11,898
Doosan Bobcat Inc. and its subsidiaries	9,248,386	4,223,999	8,621,912	644,056	600,781
Doosan Fuel Cell Co., Ltd.	1,026,930	503,865	312,149	3,864	5,063
	2021				
	Assets	Liabilities	Sales	Profit (loss) for the year	Total comprehensive income (loss)
Doosan Electro-Materials (Changshu) Co., Ltd.	₩ 184,379	₩ 111,179	₩ 213,296	₩ 15,949	₩ 15,949
HyAxiom, Inc.	333,765	296,144	180,639	(18,150)	(19,292)
Doosan Enerbility Co., Ltd.	14,031,871	8,330,287	3,592,882	26,601	188,528
Doosan Enerbility 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 Cuvex Co., Ltd.	323,606	109,291	70,151	9,518	29,109
Doosan Bobcat Inc. and its subsidiaries	8,580,899	4,259,634	5,816,200	385,889	280,150
Doosan Fuel Cell Co., Ltd.	698,855	180,667	381,412	8,695	7,508
Doosan Property Co., Ltd.	154,409	5,074	1,366	47,135	47,029

1.4 Cash flows information

A summarized cash flows information of subsidiaries that non-controlling interests are significant to the Group (or intermediate parent) for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	
	Doosan Enerbility Co., Ltd. and its subsidiaries	Doosan Bobcat Inc. and its subsidiaries
Cash flows from operating activities	₩ (92,617)	₩ 717,695
Cash flows from investing activities	53,857	(124,988)
Cash flows from financing activities	(240,440)	(892,013)
Effect of exchange rate changes on cash and cash equivalents	19,189	46,551
Net decrease in cash and cash equivalent	(260,011)	(252,755)
Cash and cash equivalents, beginning of the year	956,844	951,760
Cash and cash equivalents, end of the year	₩ 696,833	₩ 699,005

Above financial information is based on consolidated financial information of intermediate controlling company. However, financial information of Doosan Enerbility Co., Ltd. and its subsidiaries does not include financial information of Doosan Bobcat Inc. and its subsidiaries.

1.4 Cash flows information (cont'd)

	2021	
	Doosan Enerbility Co., Ltd. and its subsidiaries	Doosan Bobcat Inc. 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 Doosan Enerbility Co., Ltd. and its subsidiaries does not include financial information of Doosan Bobcat Inc. and its subsidiaries.

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, 2022 and 2021 are as follows (Korean won in millions):

	2022	
	Doosan Enerbility Co., Ltd. and its subsidiaries	Doosan Bobcat Inc. and its subsidiaries
Ownership interests held by non-controlling interests (%)	69.5%	84.4%
Cumulative non-controlling interests	₩ 3,721,495	₩ 4,425,411
Net income vested in non-controlling interests	(391,616)	543,712
Dividends paid to non-controlling interests (*1)	-	88,311

(*1) Except for above subsidiaries, Oricom Inc. paid dividends of ₩949 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 Doosan Enerbility Co., Ltd. and its subsidiaries does not include financial information of Doosan Bobcat Inc. and its subsidiaries.

	2021	
	Doosan Enerbility Co., Ltd. and its subsidiaries	Doosan Bobcat Inc. 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) Except for above subsidiaries, Oricom Inc. 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 Doosan Enerbility Co., Ltd. and its subsidiaries does not include financial information of Doosan Bobcat Inc. and its subsidiaries.

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*. The accompanying consolidated financial statements have been translated into English from Korean financial statements. In the event of any differences in interpreting the financial statements or the independent auditor's report thereon, Korean version, which is used for regulatory reporting purposes, shall prevail.

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, 2022 are the same as those adopted in the preparation of the consolidated financial statements for the year ended December 31, 2021, 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 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, 2022.

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

An onerous contract is a contract under which the unavoidable costs of meeting the obligations under the contract (i.e., the costs that the Group cannot avoid because it has the contract) exceed the economic benefits expected to be received under it.

The amendments specify that when assessing whether a contract is onerous or loss-making, an entity needs to include costs that relate directly to a contract to provide goods or services including both incremental costs (e.g., the costs of direct labor and materials) and an allocation of costs directly related to contract activities (e.g., depreciation of equipment used to fulfill the contract and costs of contract management and supervision). 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. These amendments had no material impact on the consolidated financial statements of the Group.

Amendments to KIFRS 1103 – Reference to the Conceptual Framework

The amendments add an exception to the recognition principle of KIFRS 1103 *Business Combinations* 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 *Provisions, Contingent Liabilities and Contingent Assets* or KIFRS Interpretation 2121 *Levies*, if incurred separately. The exception requires entities to apply the criteria in KIFRS 1037 or KIFRS Interpretation 2121, respectively, instead of the Conceptual Framework, to determine whether a present obligation exists at the acquisition date. The amendments also add a new paragraph to KIFRS 1103 to clarify that contingent assets do not qualify for recognition at the acquisition date. In accordance with the transitional provisions, the Group applies the amendments prospectively, i.e., to business combinations occurring after the beginning of the annual reporting period in which it first applies the amendments (the date of initial application). These amendments had no impact on the consolidated financial statements of the Group.

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

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. In accordance with the transitional provisions, the consolidated entity applies the amendment retrospectively only to property, plant and equipment that are available after the start date of the earliest period (the date of initial application) presented when the amendment is first applied. These amendments had no impact on the consolidated financial statements of the Group.

2.1.1 New and amended standards and interpretations (cont'd)

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 in the parent's consolidated financial statements, 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. These amendments had no impact on the consolidated financial statements of the Group.

KIFRS 1041 *Agriculture – Taxation in fair value measurements*

The amendment removes the requirement in paragraph 22 of KIFRS 1041 that entities exclude cash flows for taxation when measuring the fair value of assets within the scope of KIFRS 1041. These amendments had no impact on the consolidated financial statements of the Group as it did not have assets in scope of KIFRS 1041 as of the reporting date.

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.

Amendments to KIFRS 1008 – *Definition of Accounting Estimates*

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.

Amendments to KIFRS 1001 – *Disclosure of Accounting Policies*

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 Group is currently revisiting their accounting policy information disclosures to ensure consistency with the amended requirements.

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

Amendments to KIFRS 1012– Deferred tax related to Assets and Liabilities arising from a single transaction

The amendments narrow the scope of the initial recognition exception in accordance with KIFRS 1012, so that it no longer applies to transactions that give rise to equal taxable and deductible temporary differences. The amendments should be applied to transactions that occur on or after the beginning of the earliest comparative period presented. In addition, at the beginning of the earliest comparative period presented, a deferred tax asset (provided that sufficient taxable income is available) and a deferred tax liability should also be recognized for all deductible and taxable temporary differences associated with leases and decommissioning obligations. The Group is currently assessing the impact of the amendments.

2.2 Basis of consolidation

The consolidated financial statements comprise the financial statements of the Group as of December 31, 2022. 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 consideration transferred of a business combination is measured as the aggregate of assets transferred in exchange for control of the acquiree, the liabilities issued or borne by the Group, and the fair value of the shares issued at the acquisition date. 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).

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.

2.3 Business combinations (cont'd)

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 constructively 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 subject to impairment testing as part of the investment. If the Group holds interests in the net fair value of identifiable assets, liabilities and contingent liabilities exceeding the cost of purchase after the impairment testing, such interests are 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).

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.

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

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 operation, 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 loses its significant influence on associates or joint ventures due to the sale, 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 shares 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 1109 *Financial assets*.

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

2.8.1 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 Group 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 Group's promise to transfer the good or service to the customer is separately identifiable from other promises in the contract, under the application of KIFRS 1115. 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.

2.8.2 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.

2.8.3 Measurement of progress using input method

The Group signs a contract for EPC plant construction and power generation service which contains purchasing, manufacturing, and installment of power generation related materials such as boilers and turbines and carry out construction work over a long period of time in general. The Group recognizes revenue on the basis of progress of the construction or power generation services measured by using an input method if it determines that a performance obligation under the construction or service contract is satisfied over time, when, and only when, one of the following criteria is met: i) the customer simultaneously receives and consumes the benefits provided to them as soon as the Group performs the obligation, or, ii) the Group creates or enhances an asset that the customer controls as soon as the Group performs the obligation to create or enhance the asset.

In addition, for the purpose of presenting the exact progress of service under the contract in revenue recognized, the Group recognizes revenue at the cost of goods used for settling the obligation, if i) all goods are identical upon the contract inception, ii) the customer is expected to have significant control over the goods before receiving services related to the goods, iii) the cost of goods transferred is significant compared to the total cost expected to incur in settling the obligation, iv) the Group procures the goods from the third parties, and v) there is no significant involvement of the Group in the design and production of the goods.

2.8.4 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.

2.8.5 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 or to customers for contract work

The amount of cumulative accrued costs plus profit recognized (or, less loss recognized) exceeding the progress billing is stated as due from customers for contract work and the amount of progress billing exceeding the cumulative accrued costs plus profit recognized (or, less loss recognized) is stated as due to customers for contract work. The amount received before the completion of 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 been received is included in trade receivables 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 increases 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 2.26 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.

2.12 Foreign currencies (cont'd)

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 reporting 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 reporting 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. 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:

	<u>Estimated useful lives (in years)</u>
Buildings	4-50
Structures	2-40
Machinery	2-20
Other property, plant and equipment	1-20

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, is 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 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 allowances

The Group accounts for greenhouse gas emission allowances and emission liabilities arising under the *Act on the Allocation and Trading of Greenhouse-Gas Emissions Permits*. Details are described below.

2.28.1 Greenhouse gas emission allowances

Greenhouse gas emission allowances consist of those allocated free of charge by the government (“free allocation”) and those purchased for a fee. Free allocations shall be measured and recognized at nil (0), while emission allowances purchased are recognized at the acquisition cost including costs that are directly related to acquisition and incur in regular way. The Group classifies greenhouse gas emission allowances held for settling the obligation defined in relevant laws as intangible assets and states the allowances at cost recognized upon initial recognition less the accumulated impairment losses. The portion of allowances to be delivered to the government within one year from the end of the reporting period is classified as current assets.

Emission allowances held for short-term trading gains are classified as current assets and measured at fair value at the end of each reporting period, while changes in the fair value are recognized in profit or loss. Greenhouse gas emissions allowances are removed when they are no longer available for delivery to the government or sale and future economic benefits are no longer expected.

2.28.2 Emission liabilities

Emissions liabilities are the present obligation to deliver emissions allowances to the government, which are measured at the sum of the carrying amount of emission allowances held by the Group and the estimated expenditure required to settle the obligations for excess emissions. Emissions liabilities are removed when delivered 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 2, 2023 and will be finalized at the annual general meeting of shareholders on March 29, 2023.

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, 2022, the Company holds 30.5% of voting rights of Doosan Enerbility Co., Ltd and 30.8% of voting rights of Doosan Tesna Inc. and Doosan Enerbility Co., Ltd holds 30.3% of voting rights of Doosan Fuel Cell Co., Ltd. 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, 2022 and 2021 is as follows (Korean won in millions):

	December 31, 2022					
	USD	EUR	JPY	GBP	Others	Total
Assets	₩ 1,706,809	₩ 99,995	₩ 9,526	₩ 184,842	₩ 259,348	₩ 2,260,520
Liabilities	(2,070,484)	(303,362)	(77,769)	(77,594)	(235,790)	(2,764,999)
	₩ (363,675)	₩ (203,367)	₩ (68,243)	₩ 107,248	₩ 23,558	₩ (504,479)
	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)
	₩ (185,122)	₩ (399,652)	₩ (32,974)	₩ 7,777	₩ 217,149	₩ (392,822)

4.1.1 Foreign currency risk (cont'd)

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, 2022 and 2021 is as follows (Korean won in millions):

	Impact on	
	profit before income tax expenses	
	2022	2021
10% Increase	₩ (50,448)	₩ (39,282)
10% Decrease	50,448	39,282

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, 2022 and 2021.

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, 2022 and 2021 is as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Financial assets	₩ 420,768	₩ 249,700
Financial liabilities	(2,310,486)	(3,125,417)
	₩ (1,889,718)	₩ (2,875,717)

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, 2022 and 2021 is as follows (Korean won in millions):

	Impact on	
	profit before income tax expenses	
	2022	2021
1% Increase	₩ (18,897)	₩ (28,757)
1% Decrease	18,897	28,757

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.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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 trade and other receivables, 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.

The carrying amount for the financial assets exposed to credit risk as of December 31, 2022 and 2021 are as follows (Korean won in millions). The carrying amount indicates the maximum exposure to credit risk.

	December 31, 2022	December 31, 2021
Cash and cash equivalents	₩ 2,074,186	₩ 2,235,105
Short-term and long-term financial instruments	203,891	1,104,477
Trade and other receivables	2,364,567	1,526,981
Deposits	388,989	394,801
Short-term and long-term investment securities (excluding equity securities):		
Financial assets at fair value through profit or loss	222,506	408,213
Derivative assets	95,157	39,161
	<u>₩ 5,349,296</u>	<u>₩ 5,708,738</u>

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, 2022 and 2021 are as follows (Korean won in millions):

		December 31, 2022								
		Trade receivables								
		Trade receivables assessed for impairment on a collective basis (*2)							Due from customers for contract work	
	Individually assessed trade receivables (*1)	Within due	Less than 3 months	3-6 months	6-12 months	More than 12 months	Total	Total	Total	
Book value	₩ 606,285	₩ 1,308,222	₩ 93,182	₩ 52,459	₩ 15,622	₩ 18,195	₩ 2,093,965	₩ 1,360,337	₩ 3,454,302	
Expected credit loss rate	28.35%	0.75%	1.69%	2.15%	14.45%	65.02%		5.67%		
Expected credit loss	₩ 171,871	₩ 9,822	₩ 1,576	₩ 1,130	₩ 2,258	₩ 11,830	₩ 198,487	₩ 77,170	₩ 275,657	

(*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, 2022 and 2021

4.2 Credit risk (cont'd)

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)	
		Within due	Less than 3 months	3-6 months	6-12 months	More than 12 months	Total		Total
Book value	₩ 623,700	₩ 633,439	₩ 76,255	₩ 18,923	₩ 16,918	₩ 25,534	₩ 1,394,769	₩ 1,816,871	₩ 3,211,640
Expected credit loss rate	33.23%	1.88%	1.24%	3.34%	12.09%	45.17%		3.28%	
Expected credit loss	₩ 207,271	₩ 11,903	₩ 948	₩ 632	₩ 2,046	₩ 11,534	₩ 234,334	₩ 59,571	₩ 293,905

(*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.

Details of other receivables among the financial assets as of December 31, 2022 and 2021 are as follows (Korean won in millions):

December 31, 2022									
	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	₩ 987,151	₩ 27,203	₩ 8,556	₩ 19	₩ 4	₩ 173	₩ 1,023,106		
Accrued income	59,858	630	-	-	-	-	60,488		
Financial lease receivables	-	3,065	-	-	-	-	3,065		
	₩ 1,047,009	₩ 30,898	₩ 8,556	₩ 19	₩ 4	₩ 173	₩ 1,086,659		

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

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	₩ 53,729	₩ 4,318	₩ 306	₩ 287	₩ 156	₩ 936,630		
Accrued income	36,585	345	-	-	-	-	36,930		
Financial lease receivables	-	5,522	-	-	-	-	5,522		
	₩ 914,419	₩ 59,596	₩ 4,318	₩ 306	₩ 287	₩ 156	₩ 979,082		

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

As of December 31, 2022 and 2021, allowance for doubtful accounts on other receivables above amounts to ₩616,694 million and ₩609,980 million, respectively.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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 financial liabilities' maturity as of December 31, 2022 and 2021 is as follows (Korean won in millions):

	December 31, 2022					
	Book value	Nominal cash flows according to contract				
		Total	Less than 1 year	1-2 years	2-5 years	More than 5 years
Principal of non-derivative financial liabilities	₩ 11,596,287	₩ 11,773,931	₩ 6,704,641	₩ 2,313,384	₩ 1,444,146	₩ 1,311,760
Interest from non-derivative financial liabilities	-	798,246	313,386	147,016	241,875	95,969
Derivative financial liabilities	116,580	123,543	79,199	23,043	19,901	1,400
Payment guarantee contract (*1)	-	409,265	409,265	-	-	-
	<u>₩ 11,712,867</u>	<u>₩ 13,104,985</u>	<u>₩ 7,506,491</u>	<u>₩ 2,483,443</u>	<u>₩ 1,705,922</u>	<u>₩ 1,409,129</u>

(*1) The payment guarantee contract is stated at the maximum amount the Group is obliged to pay upon the claim from guaranteed party. (see Note 32).

	December 31, 2021					
	Book value	Nominal cash flows according to contract				
		Total	Less than 1 year	1-2 years	2-5 years	More than 5 years
Principal of non-derivative financial liabilities	₩ 12,881,476	₩ 13,065,454	₩ 8,950,132	₩ 1,512,674	₩ 2,290,360	₩ 312,288
Interest from non-derivative financial liabilities	-	428,811	263,515	76,943	88,054	299
Derivative financial liabilities	250,788	257,560	216,758	18,853	20,618	1,331
Payment guarantee contract (*1)	-	403,870	403,870	-	-	-
	<u>₩ 13,132,264</u>	<u>₩ 14,155,695</u>	<u>₩ 9,834,275</u>	<u>₩ 1,608,470</u>	<u>₩ 2,399,032</u>	<u>₩ 313,918</u>

(*1) The payment guarantee contract is stated at the maximum amount the Group is obliged to pay upon the claim from guaranteed party (see Note 32).

The above-mentioned maturity analysis is based on an undiscounted cash flow according to the contract, which differs from the carrying amount of liabilities presented in the consolidated financial statements. It also includes the interest expenses on financial liabilities to be paid in the future.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Total liabilities	₩ 16,017,537	₩ 17,535,707
Total equity	10,297,816	8,410,119
Debt-to-equity ratio	155.54%	208.51%

5. Restricted financial assets

Details of restricted financial assets as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021	Description
Cash and cash equivalents	₩ 1,815	₩ 6,188	Establishment of the right of pledge related financial credit and others
Short-term financial instruments	141,368	1,031,447	
Long-term financial instruments	41,324	37,977	National R&D (*1), shared growth fund, establishment of the right of pledge, and PRS guarantee deposits (*2) and others
	₩ 184,507	₩ 1,075,612	

(*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.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

6. Short-term and long-term investment securities

Details of short-term and long-term investment securities as of December 31, 2022 and 2021 are as follows (Korean won in millions):

		December 31, 2022	December 31, 2021
Short-term investment securities	Financial assets at fair value through profit or loss	₩ 33,348	₩ 197,197
Long-term investment securities (*1)	Financial assets at fair value through OCI	30,689	50,884
	Financial assets at fair value through profit or loss	428,660	457,584
		<u>459,349</u>	<u>508,468</u>
		<u>₩ 492,697</u>	<u>₩ 705,665</u>

(*1) As of December 31, 2022, some of the long-term investment securities are provided as collateral for project financing (see Note 33).

Short-term and long-term investment securities as of December 31, 2022 and 2021 are as follows (Korean won in millions):

			December 31, 2022	December 31, 2021
Financial assets (designated) at fair value through OCI	Marketable equity securities	Preferred shares of Solus Advanced Materials Co., Ltd. and others	₩ 10,091	₩ 26,218
	Non-marketable equity securities	Sensorview Co., Ltd. and others	20,598	24,666
			<u>30,689</u>	<u>50,884</u>
Financial assets at fair value through profit or loss	Marketable equity securities	NuScale Power LLC and others	73,537	10,196
	Non-marketable equity securities	SiO2 Medical Products, Inc. and others (*1)	165,965	236,372
	Contributions	Construction Guarantee and others	121,779	126,378
	Beneficiary certificates	Pangaea Ventures Fund IV and others	24,230	175,571
	Debt securities	Valuegrowth Co., Ltd. and others (*2)	76,497	106,264
			<u>462,008</u>	<u>654,781</u>
			<u>₩ 492,697</u>	<u>₩ 705,665</u>

(*1) The Company acquired redeemable convertible preference shares issued by TTC House, Inc. during the year ended December 31, 2022 and convertible preferred shares issued by SiO2 Medical Products, Inc. during the year ended December 31, 2021. Although the Company has significant influence on the Board of Directors of the investee with its right to participation, shares acquired are classified as financial assets measured at fair value through profit or loss in accordance with KIFRS 1109, as it is deemed that such preferred shares, in substance, does not currently give the Company any access to gain on the equity investments in the investees.

(*2) Some of debt securities stated above are provided as collateral to Kodit 2020 the 9th Securitization Specialty Inc and others as of December 31, 2022.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

Changes in financial assets at fair value for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022						
	Beginning balance	Acquisition	Disposal	Valuation	Reversal of impairment loss	Others (*1)	Ending balance
Financial assets at fair value through OCI	₩ 50,884	₩ 2,756	₩ (2,583)	₩ (22,966)	₩ -	₩ 2,598	₩ 30,689
Financial assets at fair value through profit or loss	654,781	122,824	(273,127)	(43,058)	19	569	462,008
	<u>₩ 705,665</u>	<u>₩ 125,580</u>	<u>₩ (275,710)</u>	<u>₩ (66,024)</u>	<u>₩ 19</u>	<u>₩ 3,167</u>	<u>₩ 492,697</u>

(*1) It includes changes in scope of consolidation and exchange rate differences.

	2021					
	Beginning balance	Acquisition	Disposal	Valuation	Others (*1)	Ending balance
Financial assets (designated) at fair value through OCI	₩ 189,072	₩ 5,406	₩ (275,959)	₩ 23,476	₩ 108,889	₩ 50,884
Financial assets at fair value through profit or loss	550,191	284,408	(183,343)	38,353	(34,828)	654,781
	<u>₩ 739,263</u>	<u>₩ 289,814</u>	<u>₩ (459,302)</u>	<u>₩ 61,829</u>	<u>₩ 74,061</u>	<u>₩ 705,665</u>

(*1) It includes changes in scope of consolidation and exchange rate differences.

7. Trade and other receivables

Details of trade and other receivables as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022		
	Gross amount	Provision for impairment	Book value
Current:			
Trade receivables	₩ 2,093,965	₩ (198,487)	₩ 1,895,478
Non-trade receivables	267,093	(59,813)	207,280
Accrued income	60,488	(12,588)	47,900
Short-term loans	146,226	(71,350)	74,876
Current portion of long-term financial lease receivables	2,281	-	2,281
	<u>₩ 2,570,053</u>	<u>₩ (342,238)</u>	<u>₩ 2,227,815</u>
Non-current:			
Non-trade receivables	115,478	(21,155)	94,323
Long-term loans	494,219	(451,788)	42,431
Financial lease receivables	-	-	-
	<u>₩ 609,697</u>	<u>₩ (472,943)</u>	<u>₩ 136,754</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

7. Trade and other receivables (cont'd)

	December 31, 2021		
	Gross amount	Provision for impairment	Book value
Current:			
Trade receivables	₩ 1,394,769	₩ (234,334)	₩ 1,160,435
Non-trade receivables	291,935	(82,656)	209,279
Accrued income	36,930	(12,588)	24,342
Short-term loans	138,057	(74,805)	63,252
Current portion of long-term financial lease receivables	2,239	-	2,239
	<u>₩ 1,863,930</u>	<u>₩ (404,383)</u>	<u>₩ 1,459,547</u>
	December 31, 2021		
	Gross amount	Provision for impairment	Book value
Non-current:			
Non-trade receivables	20,249	(1,142)	19,107
Long-term loans	484,834	(438,789)	46,045
Financial lease receivables	2,281	-	2,281
	<u>₩ 507,364</u>	<u>₩ (439,931)</u>	<u>₩ 67,433</u>

Changes in allowance for doubtful accounts for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022				
	Beginning balance	Provision for impaired receivables (reversal)	Write off	Others (*1)	Ending balance
Current:					
Trade receivables	₩ 234,334	₩ (3,113)	₩ (40,421)	₩ 7,687	₩ 198,487
Non-trade receivables	82,656	(2,627)	(6,252)	(13,964)	59,813
Accrued income	12,588	74	-	(74)	12,588
Short-term loans	74,805	(3,308)	-	(147)	71,350
Non-current:					
Non-trade receivables	1,142	5,113	-	14,900	21,155
Long-term loans	438,789	20,872	-	(7,873)	451,788
	<u>₩ 844,314</u>	<u>₩ 17,011</u>	<u>₩ (46,673)</u>	<u>₩ 529</u>	<u>₩ 815,181</u>

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

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

7. Trade and other receivables (cont'd)

	2021				Ending balance
	Beginning balance	Provision for impaired receivables (reversal)	Write off	Others (*1)	
Current:					
Trade receivables	₩ 1,206,954	₩ 14,986	₩ (2,879)	₩ (984,727)	₩ 234,334
Non-trade receivables	206,698	6,188	(15,138)	(115,092)	82,656
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
	<u>₩ 2,768,345</u>	<u>₩ 63,207</u>	<u>₩ (194,473)</u>	<u>₩ (1,792,765)</u>	<u>₩ 844,314</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 profit or loss, and that on receivables other than impaired trade receivables is included in other non-operating expenses (income).

8. Inventories

Inventories as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022			December 31, 2021		
	Acquisition cost	Valuation allowance	Book value	Acquisition cost	Valuation allowance	Book value
Merchandises	₩ 327,771	₩ (10,868)	₩ 316,903	₩ 186,368	₩ (11,252)	₩ 175,116
Finished goods	734,675	(47,769)	686,906	508,281	(49,793)	458,488
Work in process	415,368	(25,958)	389,410	383,746	(10,642)	373,104
Raw materials	1,108,525	(44,839)	1,063,686	749,824	(41,864)	707,960
Materials in transit	271,351	-	271,351	308,220	-	308,220
Supplies	29,248	(2,682)	26,566	28,640	(2,508)	26,132
Others	1,849	-	1,849	366	-	366
	<u>₩ 2,888,787</u>	<u>₩ (132,116)</u>	<u>₩ 2,756,671</u>	<u>₩ 2,165,445</u>	<u>₩ (116,059)</u>	<u>₩ 2,049,386</u>

As of December 31, 2022, some of inventories are provided as collateral for debt of the Group and others (see Note 33).

Impairment losses on valuation of inventories and reversal of allowance for the impairment losses recognized for the years ended December 31, 2022 and 2021, respectively, amounts to ₩16,057 million and ₩(-)23,678 million.

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	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
	Cash flow hedge	The Group designated the currency swap as hedging instrument to hedge the future cash flow risk
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
Stock price swap	Held for trading	A derivative held for trading which settles the differences between the base sales price and the stock price upon settlement
Others	Held for trading	Changes in fair value are recognized in profit or loss

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

9.2 Details of gain (loss) on valuation of derivatives

Details of gain (loss) on valuation of derivatives as of December 31, 2022 and 2021 are as follows (Korean won in millions, foreign currency in thousands):

		December 31, 2022						Accumulated other comprehensive income (*1)	Firm commitment assets (liabilities) (*2)	
		Buy		Sell		Assets (liabilities)	Gain (loss)			
	Currency	Amount	Currency	Amount						
Currency forward contract	KRW	2,542,472	USD	2,064,670	₩ (38,517)	₩ (14,051)	₩	8,203	₩	82,883
	KRW	65,379	EUR	47,060	1,209	1,243		200		(1,819)
	KRW	67,650	JPY	5,822,910	7,715	2,249		1,067		(13,432)
	KRW	344,402	Other foreign currencies		16,888	15,949		1,353		(9,771)
	USD	547,345	KRW	690,472	(4,914)	(8,740)		4,000		12,425
	EUR	165,430	KRW	227,151	(2,852)	(3,673)		823		530
	JPY	11,419,654	KRW	123,786	(9,213)	(10)		(7,323)		502
	Other foreign currencies		KRW	103,363	(4,721)	(2,415)		(3,535)		1,339
	Other foreign currencies		Other foreign currencies			7,995	5,186		4,873	
Currency swap	KRW	-	USD	-	21,295	19,782		508		-
Interest rate swap					691	-		691		-
Stock price swap (*3)					(16,999)	(16,999)		-		-
					₩ (21,423)	₩ (1,479)	₩	10,860	₩	72,482

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

(*2) The Group recognizes ₩95,499 million and ₩23,017 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) Doosan Enerbility Co., Ltd, the Group's subsidiary, signed the Price Return Swap contract to exchange profits from changes in prices of shares of Doosan Bobcat Inc.

		December 31, 2021						Accumulated other comprehensive income (*1)	Firm commitment assets (liabilities) (*2)	
		Buy		Sell		Assets (liabilities)	Gain (loss)			
	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	
Borrowings in foreign currency (*3)	KRW	-	USD	-	-	-		-		49
Currency swap					13,355	31,772		(332)		-
Stock price swap (*4)					(106,968)	(106,968)		-		-
					₩ (106,968)	₩ (142,538)	₩	(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 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.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

(*4) Doosan Enerbility Co., Ltd, the Group's subsidiary, signed the Price Return Swap contract to exchange profits from changes in prices of shares of Doosan Bobcat Inc.

10. Financial instruments by category

Categories of financial instruments as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022					
	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	₩ -	₩ -	₩ -	₩ 2,074,186	₩ 2,074,186	₩ 2,074,186
Short-term and long-term financial instruments	-	-	-	203,891	203,891	203,891
Short-term and long-term investment securities	462,008	30,689	-	-	492,697	492,697
Trade and other receivables	-	63,268	-	2,301,299	2,364,567	2,364,567
Derivative assets	44,557	-	50,600	-	95,157	95,157
Deposits	-	-	-	388,989	388,989	388,989
	<u>₩ 506,565</u>	<u>₩ 93,957</u>	<u>₩ 50,600</u>	<u>₩ 4,968,365</u>	<u>₩ 5,619,487</u>	<u>₩ 5,619,487</u>

	December 31, 2022				
	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	₩ -	₩ -	₩ 3,982,810	₩ 3,982,810	₩ 3,982,810
Borrowings, bonds and asset-backed loans	-	-	6,757,023	6,757,023	6,757,023
Lease liabilities	-	-	749,137	749,137	749,137
Sale and leaseback liabilities	-	-	107,317	107,317	107,317
Derivative liabilities	17,376	99,204	-	116,580	116,580
Financial guarantee liabilities	-	180	-	180	180
	<u>₩ 17,376</u>	<u>₩ 99,384</u>	<u>₩ 11,596,287</u>	<u>₩ 11,713,047</u>	<u>₩ 11,713,047</u>

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

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

10. Financial instruments by category (cont'd)

	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	₩ -	₩ -	₩ -	₩ 2,235,105	₩ 2,235,105	₩ 2,235,105
Short-term and long-term financial instruments	-	-	-	1,104,477	1,104,477	1,104,477
Short-term and long-term investment securities	654,781	50,884	-	-	705,665	705,665
Trade and other receivables	-	20,496	-	1,506,485	1,526,981	1,526,981
Derivative assets	17,280	-	21,881	-	39,161	39,161
Deposits	-	-	-	394,801	394,801	394,801
	<u>₩ 672,061</u>	<u>₩ 71,380</u>	<u>₩ 21,881</u>	<u>₩ 5,240,868</u>	<u>₩ 6,006,190</u>	<u>₩ 6,006,190</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	₩ -	₩ -	₩ 3,519,009	₩ 3,519,009	₩ 3,519,009
Borrowings, bonds and asset-backed loans	-	-	8,671,455	8,671,455	8,671,455
Lease liabilities	-	-	691,012	691,012	691,012
Sale-and-leaseback liabilities	-	-	314,130	314,130	314,130
Derivative liabilities	122,009	128,779	-	250,788	250,788
Financial guarantee liabilities	-	4,019	-	4,019	4,019
	<u>₩ 122,009</u>	<u>₩ 132,798</u>	<u>₩ 13,195,606</u>	<u>₩ 13,450,413</u>	<u>₩ 13,450,413</u>

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

Fair value measurements of financial instruments by fair value hierarchy levels as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022			
	Level 1	Level 2	Level 3	Total
Financial assets:				
Financial assets at fair value through OCI	₩ 10,091	₩ 63,268	₩ 20,598	₩ 93,957
Financial assets at fair value through profit or loss	73,537	47,866	385,162	506,565
Other financial assets	-	50,600	-	50,600
	<u>83,628</u>	<u>161,734</u>	<u>405,760</u>	<u>651,122</u>
Financial liabilities:				
Financial liabilities at fair value through profit or loss	-	17,376	-	17,376
Other financial liabilities	-	99,204	180	99,384
	<u>-</u>	<u>116,580</u>	<u>180</u>	<u>116,760</u>
	<u>₩ 83,628</u>	<u>₩ 45,154</u>	<u>₩ 405,580</u>	<u>₩ 534,362</u>

10. Financial instruments by category (cont'd)

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
Financial assets:				
Financial assets at fair value through OCI	₩ 26,218	₩ 20,496	₩ 24,666	₩ 71,380
Financial assets at fair value through profit or loss	10,196	217,657	444,208	672,061
Other financial assets	-	21,881	-	21,881
	36,414	260,034	468,874	765,322
Financial liabilities:				
Financial liabilities at fair value through profit or loss	-	122,009	-	122,009
Other financial liabilities	-	128,779	4,019	132,798
	-	250,788	4,019	254,807
	₩ 36,414	₩ 9,246	₩ 464,855	₩ 510,515

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.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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, 2022 are as follows:

Financial assets	Valuation techniques	Discount rate	Major assumptions
SiO2 Medical Products, Inc.	Discounted cash flow method	15.75%	Expected cash flow
Sosius-Well to Sea Investment 2nd Private Equity Funds for Corporate Financial Stability	Discounted Cash flow method	12.50%	Expected cash flow
Gyeonggi East-West Road Corporation Co., Ltd.	Dividend discount model	10.38%	Expected dividend cash flow for each financial period
Korea Exim Bank Public Carbon Fund	Expected selling price estimation method	-	Expected selling price
Construction Guarantee	Expected selling price estimation method	-	Expected selling price
Machinery Financial Cooperative	Expected selling price estimation method	-	Expected selling price
Engineering Guarantee Insurance	Expected selling price estimation method	-	Expected selling price
Construction Industry Guarantee	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
Valuegrowth Co., Ltd.	Dividend discount model	9.52%	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, 2022 and 2021

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, 2022 and 2021 are as follows (Korean won in millions):

	2022							December 31, 2022
	January 1, 2022	Total comprehensive income (loss)		Buy	Sell	Reclassification of fair value hierarchy(*1)	Others(*2)	
		Profit or loss	Other comprehensive income (loss)					
Financial assets at fair value through OCI	₩ 24,666	₩ -	₩ (5,396)	₩ 810	₩ (646)	₩ -	₩ 1,164	₩ 20,598
Financial assets at fair value through profit or loss	444,208	(52,394)	-	29,146	(10,929)	(35,692)	10,823	385,162
	<u>₩ 468,874</u>	<u>₩ (52,394)</u>	<u>₩ (5,396)</u>	<u>₩ 29,956</u>	<u>₩ (11,575)</u>	<u>₩ (35,692)</u>	<u>₩ 11,987</u>	<u>₩ 405,760</u>

(*1) During the year ended December 31, 2022, the above financial assets were converted into financial assets traded in the active market and reclassified from level 3 to level 1.

(*2) Others include changes in scope of consolidation and exchange rate differences.

	2021						December 31, 2021
	January 1, 2021	Total comprehensive income (loss)		Buy	Sell	Others(*1)	
		Profit or loss	Other comprehensive income (loss)				
Financial assets at fair value through OCI	₩ 10,941	₩ -	₩ 16,641	₩ 5,406	₩ (13,945)	₩ 5,623	₩ 24,666
Financial assets at fair value through profit or loss	279,160	26,814	-	177,786	(2,475)	(37,077)	444,208
	<u>₩ 290,101</u>	<u>₩ 26,814</u>	<u>₩ 16,641</u>	<u>₩ 183,192</u>	<u>₩ (16,420)</u>	<u>₩ (31,454)</u>	<u>₩ 468,874</u>

(*1) Others include changes in scope of consolidation and exchange rate differences.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

10. Financial instruments by category (cont'd)

Comprehensive income (loss) by categories of financial instruments for the years ended December 31, 2022 and 2021 is as follows (Korean won in millions):

	2022							
	Profit or loss (*1)							
	Interest	Dividend	Financial guarantee	Valuation gain/loss (except for derivatives)	Impairment and reversal		Disposal	Other comprehensive income (*2)
Bad debts expenses					Other impairment			
Financial assets:								
Financial assets at amortized cost	₩ 33,464	₩ -	₩ -	₩ -	₩ (23,835)	₩ -	₩ (139)	₩ -
Financial assets (designated) at fair value through OCI	-	141	-	-	-	-	(4,961)	(22,966)
Financial assets at fair value through profit or loss	273	4,268	-	(43,058)	-	19	3,745	-
Other financial assets	3	-	-	-	-	-	-	-
	<u>₩ 33,740</u>	<u>₩ 4,409</u>	<u>₩ -</u>	<u>₩ (43,058)</u>	<u>₩ (23,835)</u>	<u>₩ 19</u>	<u>₩ (1,355)</u>	<u>₩ (22,966)</u>
Financial liabilities:								
Financial liabilities at amortized cost	₩ (371,202)	₩ -	₩ -	₩ -	₩ -	₩ -	₩ (27,222)	₩ -
Financial guarantee liabilities and others	-	-	(52,561)	-	-	-	-	-
	<u>₩ (371,202)</u>	<u>₩ -</u>	<u>₩ (52,561)</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ (27,222)</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.

	2021							
	Profit or loss (*1)							
	Interest	Dividend	Financial guarantee	Valuation gain/loss (except for derivatives)	Impairment and reversal		Disposal	Other comprehensive income (*2)
Bad debts expenses					Other impairment			
Financial assets:								
Financial assets at amortized cost	₩ 50,976	₩ -	₩ -	₩ -	₩ (65,202)	₩ -	₩ (10,849)	₩ -
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	-	-	4,097	-
Other financial assets	-	-	-	-	-	-	-	-
	<u>₩ 59,421</u>	<u>₩ 1,934</u>	<u>₩ -</u>	<u>₩ 16,374</u>	<u>₩ (65,202)</u>	<u>₩ -</u>	<u>₩ (6,752)</u>	<u>₩ 28,220</u>
Financial liabilities:								
Financial liabilities at amortized cost	₩ (452,823)	₩ -	₩ -	₩ -	₩ -	₩ -	₩ (1,072)	₩ -
Financial guarantee liabilities and others	-	-	(2,885)	-	-	-	-	-
	<u>₩ (452,823)</u>	<u>₩ -</u>	<u>₩ (2,885)</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ -</u>	<u>₩ (1,072)</u>	<u>₩ -</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

10. Financial instruments by category (cont'd)

(*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, 2022 and 2021 is as follows (Korean won in millions):

	2022			2021		
	Profit or loss		Other comprehensive income (*1)	Profit or loss		Other comprehensive income (*1)
	Valuation	Disposal		Valuation	Disposal	
Derivatives held for trading	₩ 13,478	₩ 17,246	₩ -	₩ (75,353)	₩ 223,232	₩ -
Derivatives designated as fair value hedges	25,437	(40)	-	(134,621)	(2,562)	-
Derivatives designated as cash flow hedges	(40,394)	4,699	11,431	67,827	(53,617)	10,993
	<u>₩ (1,479)</u>	<u>₩ 21,905</u>	<u>₩ 11,431</u>	<u>₩ (142,147)</u>	<u>₩ 167,053</u>	<u>₩ 10,993</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.

Financial assets and liabilities subject to an enforceable master-netting arrangement or similar agreement as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022			December 31, 2021		
	Gross recognized financial instruments	Gross financial instruments set off	Net amounts presented in the statements of financial statement	Gross recognized financial instruments	Gross financial instruments set off	Net amounts presented in the statements of financial position
Financial assets:						
Trade receivables	₩ 20,128	₩ (4,452)	₩ 15,676	₩ -	₩ -	₩ -
Derivative assets	86,613	(32,277)	54,336	25,624	(11,804)	13,820
	<u>₩ 106,741</u>	<u>₩ (36,729)</u>	<u>₩ 70,012</u>	<u>₩ 25,624</u>	<u>₩ (11,804)</u>	<u>₩ 13,820</u>
Financial liabilities:						
Other payables	₩ 33,581	₩ (4,452)	₩ 29,129	₩ -	₩ -	₩ -
Derivative liabilities	124,593	(32,277)	92,316	124,671	(11,804)	112,867
	<u>₩ 158,174</u>	<u>₩ (36,729)</u>	<u>₩ 121,445</u>	<u>₩ 124,671</u>	<u>₩ (11,804)</u>	<u>₩ 112,867</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

11. Investments in associates and joint ventures

Details of investments in associates and joint ventures as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	Location	Ownership interests (%)	Acquisition cost		Book value	
			December 31, 2022	December 31, 2021	December 31, 2022	December 31, 2021
Associates:						
KDDI Korea Corporation (*1)	Korea	17.63	₩ 4,176	₩ 4,176	₩ 3,141	₩ 3,254
Wise Fashion Co., Ltd. (*1,2)	Korea	-	-	3,018	-	1,945
PT. SEGARA AKASA	Indonesia	30.02	71	71	38	50
Mastern Professional Investment Type Private Security Investment Trust No.98	Korea	25.45	70,000	70,000	72,084	71,983
SiO2 Medical Products, Inc. (*3)	USA	7.48	-	-	-	-
Versogen, Inc. (*1,4)	USA	10.83	6,063	-	5,789	-
TTC House Inc. (*3,4)	Korea	14.29	-	-	-	-
Protera SAS (*1)	France	5.76	591	591	1,551	1,517
Stathera IP Holding Inc. (*1)	Canada	15.82	2,875	2,875	3,932	3,975
Folletto Robotics Co., Ltd. (*3,4)	Korea	7.36	-	-	-	-
MARCONI Growth No. 1 Private Equity Fund (*5)	Korea	34.38	7,636	-	3,858	-
Samcheok Blue Power Co., Ltd. (*1,6)	Korea	9.00	43,568	43,568	31,876	34,764
Daejung Offshore Wind Power Co., Ltd.	Korea	26.65	3,196	3,196	2,419	2,482
Hychangwon Co., Ltd. (*6,8,9)	Korea	25.74	7,000	5,000	7,013	4,995
Tuwaiq Casting & Forging Company (*1,4)	Saudi Arabia	-	43,926	-	44,674	-
ReCarbon, Inc. (*10)	USA	-	-	8,151	-	7,870
Multi-asset ESG Marine Wind Power General Private Equity Fund No. 1 (*4)	Korea	65.00	8,500	-	8,494	-
Doosan Engineering & Construction Co.,Ltd. (*13)	Korea	46.35	317,666	317,666	173,702	317,666
Daesan Green Energy Co., Ltd. (*1, 7)	Korea	10.00	5,100	5,100	2,476	2,883
Prestolite Asia Ltd.	Korea	32.31	468	468	3,141	2,882
Ainstein AI, Inc. (*1)	USA	9.09	2,360	2,360	2,355	2,291
StructionSite Inc. (*1,11)	USA	-	-	7,007	-	10,528
Bundang Doosan Tower Reit Co., Ltd.(*1)	Korea	18.60	30,000	30,000	21,672	26,296
Joint venture:						
Sichuan Kelun-Doosan Biotechnology Company Limited.	China	50.00	2,526	2,526	4,720	4,622
Doosan Babcock W.L.L (*15)	Qatar	-	-	-	-	-
Weve Holdings Ltd. (*14)	Korea	46.50	120,000	120,000	38,450	120,000
The Zenith Holdings Ltd. (*12)	Korea	31.75	120,000	120,000	-	120,000
			<u>₩ 795,722</u>	<u>₩ 745,773</u>	<u>₩ 431,385</u>	<u>₩ 740,003</u>

(*1) 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.

(*2) During the year ended December 31, 2022, ₩1,945 million of impairment loss on investment in associates was recognized as the dissolution and liquidating procedures of the associates were resolved.

(*3) Even though the Group 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.

(*4) The Group newly acquired the investee during the year ended December 31, 2022

(*5) The entity, an associate of Doosan Tesna Inc., is classified as associate as the Group acquired control over Doosan Tesna Inc. during the year ended December 31, 2022.

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

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

(*8) The Group additionally acquired the investee during the year ended December 31, 2022.

(*9) Ownership interests in the entity present the percentage of the Group's ownership in the entity including preferred stocks, and the entity is classified as associate as the Group holds more than 20% of shares with voting rights in the entity.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

(*10) Due to the sale of Doosan Mecatec Co., Ltd., the investee is excluded from associates for the year ended December 31, 2022. Gains and losses arising from the entity are classified as gains and losses from discontinued operations.

(*11) The Group sold the investee during the year ended December 31, 2022.

(*12) For the year ended December 31, 2021, Doosan Enerbility Co., Ltd, the Group's subsidiary, invested in-kind by transferring 82,005,761 ordinary shares and 5,649,462 redeemable convertible preferred shares in Doosan Engineering & Construction Co.,Ltd. to The Zenith Holdings Ltd. as second-class member. Meanwhile, for the year ended December 31, 2021, Weve Holdings Ltd., the Group's joint venture, also invested ₩258,000 million to the investee as first-class member to the investee.

(*13) As of December 31, 2022, Doosan Enerbility Co., Ltd holds 218,450,678 ordinary shares and 15,049,293 redeemable convertible preferred shares of Doosan Engineering & Construction Co.,Ltd., Doosan Enerbility Co., Ltd's investments in investee are provided as collateral for Doosan Enerbility Co., Ltd's liabilities (see Note 33).

(*14) For the year ended December 31, 2021, Doosan Property Co., Ltd., the Group's subsidiary, invested ₩120,000 million to Weve Holdings Ltd. as second-class member. In addition, six management-participating private equity investment organizations including the 2018 QCP 13 Private Equity Investment Limited Partnership, all of which are external investors, invested ₩138,000 million to the investee as first-class member. Meanwhile, Doosan Property Co., Ltd. is merged into the Group's subsidiary, Doosan Cuvex Co., Ltd. during the year ended December 31, 2022.

(*15) The entity has been excluded from joint ventures as it was included in the consolidated scope due to the Group's control over the entity newly acquired for the year ended December 31, 2022. Subsequently, it is excluded from the consolidated scope due to the sale of Doosan Babcock Ltd., the parent company of Doosan Babcock W.L.L., during the year ended December 31, 2022.

Changes in investment in associates and joint ventures for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022						Ending balance
	Beginning balance	Acquisition (disposal)	Dividends	Profit or loss in equity method	Equity changes in equity method	Other (*1)	
Associates:							
KDDI Korea Corporation	₩ 3,254	₩ -	₩ (228)	₩ 115	₩ -	₩ -	₩ 3,141
Wise Fashion Co., Ltd.	1,945	-	-	-	-	(1,945)	-
PT. SEGARA AKASA	50	-	-	(4)	(8)	-	38
Mastern Professional Investment Type Private Security Investment Trust No.98	71,983	-	(4,800)	4,901	-	-	72,084
SiO2 Medical Products, Inc.	-	-	-	-	-	-	-
Versogen, Inc.	-	6,063	-	(391)	117	-	5,789
TTC House Inc.	-	-	-	-	-	-	-
Protera SAS	1,517	-	-	(107)	141	-	1,551
Stathera IP Holding Inc.	3,975	-	-	(211)	168	-	3,932
Folletto Robotics Co., Ltd.	-	-	-	-	-	-	-
MARCONI Growth No. 1 Private Equity Fund	-	-	-	(75)	(3,703)	7,636	3,858
Samcheok Blue Power Co., Ltd.	34,764	-	-	(2,888)	-	-	31,876
Daejung Offshore Wind Power Co., Ltd.	2,482	-	-	(63)	-	-	2,419
Hychangwon Co., Ltd. (*2)	4,995	2,000	-	19	(1)	-	7,013
Tuwaiq Casting & Forging Company	-	43,926	-	78	670	-	44,674
ReCarbon, Inc (*3)	7,870	-	-	(561)	686	(7,995)	-
Multi-asset ESG Marine Wind Power General Private Equity Fund No. 1	-	8,500	-	(6)	-	-	8,494
Doosan Engineering & Construction Co., Ltd. (*4)	317,666	-	-	(27,339)	-	(116,625)	173,702
Daesan Green Energy Co., Ltd.	2,883	-	-	(407)	-	-	2,476
Prestolite Asia Ltd	2,882	-	-	259	-	-	3,141
Ainstein AI, Inc.	2,291	-	-	(96)	-	160	2,355
StructionSite Inc.	10,528	(7,506)	-	(3,966)	-	944	-
Bundang Doosan Tower Reit Co., Ltd.	26,296	-	(2,635)	(1,989)	-	-	21,672

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

	2022						
	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.	₩ 4,622	₩ -	₩ (1,323)	₩ 1,613	₩ (192)	₩ -	₩ 4,720
Doosan Babcock W.L.L	-	-	-	-	-	-	-
Weve Holdings Ltd. (*4)	120,000	-	-	(78,144)	(3,406)	-	38,450
The Zenith Holdings Ltd. (*4)	120,000	-	-	(120,000)	-	-	-
	<u>₩ 740,003</u>	<u>₩ 52,983</u>	<u>₩ (8,986)</u>	<u>₩ (229,262)</u>	<u>₩ (5,528)</u>	<u>₩ (117,825)</u>	<u>₩ 431,385</u>

(*1) Changes are caused by exchange rate differences, changes in scope of consolidation and impairment losses.

(*2) Share of profit (loss) of equity method investees was calculated based on the Group's ownership ratio of 41.18% of ordinary shares.

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

(*4) Share of profit (loss) of associates and joint ventures in equity method was calculated in accordance with the shareholders' agreement, and as of December 31, 2022, as a result of the impairment test, the Group identified the indication that the book value exceeds the recoverable amount and recognized the impairment loss as other non-operating expenses, accordingly. The impairment loss recognized amounts to ₩116,625 million. Recoverable amount was determined based on the net fair value, which is calculated using the net asset value method.

	2021						
	Beginning balance	Acquisition (disposal)	Dividends	Profit or loss in equity method	Equity changes in equity method	Other (*1)	Ending balance
Associates:							
KDDI Korea Corporation	₩ 3,655	₩ -	₩ (701)	₩ 300	₩ -	₩ -	₩ 3,254
Wise Fashion Co., Ltd.	2,158	-	-	(213)	-	-	1,945
PT. SEGARA AKASA	58	-	-	(12)	4	-	50
Mastern Professional Investment Type Private Security Investment Trust No.98	69,598	-	(4,800)	7,185	-	-	71,983
SiO2 Medical Products, Inc.	-	-	-	-	-	-	-
Protera SAS	637	-	-	(31)	911	-	1,517
Stathera IP Holding Inc.	2,839	-	-	(413)	1,549	-	3,975
Bundang Doosan Tower Reit Co., Ltd.	-	30,000	(954)	(2,750)	-	-	26,296
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. (*4)	8,052	-	-	688	(870)	-	7,870
Doosan Engineering & Construction Co.,Ltd.	-	-	-	-	-	317,666	317,666
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.	3,085	-	-	(202)	-	-	2,883
Prestolite Asia Ltd.	2,717	-	(23)	188	-	-	2,882
Ainstein AI, Inc.	2,176	-	-	(77)	-	192	2,291
StructionSite Inc.	4,760	1,697	-	3,297	-	774	10,528
Potenit Co., Ltd.	-	-	-	-	-	-	-

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

	2021						Ending balance
	Beginning balance	Acquisition (disposal)	Dividends	Profit or loss in equity method	Equity changes in equity method	Other (*1)	
Joint venture:							
Sichuan Kelun-Doosan Biotechnology Company Limited	₩ 3,453	₩ -	₩ (1,301)	₩ 1,750	₩ 509	₩ 211	₩ 4,622
Doosan Babcock W.L.L.	640	-	-	(331)	-	(309)	-
Weve Holdings Ltd.	-	120,000	-	-	-	-	120,000
The Zenith Holdings Ltd.	-	120,000	-	-	-	-	120,000
Tianjin Lovol Doosan Engine Co., Ltd. (*4)	16,327	-	-	(1,929)	-	(14,398)	-
Others (Doosan PSI LLC, etc.) (*4)	202	-	-	1,632	-	(1,834)	-
	<u>₩ 198,813</u>	<u>₩ 277,177</u>	<u>₩ (7,779)</u>	<u>₩ 8,746</u>	<u>₩ 2,103</u>	<u>₩ 260,943</u>	<u>₩ 740,003</u>

(*1) Changes are caused by exchange rate differences and changes in scope of consolidation.

(*2) Share of profit (loss) of associates in equity method was calculated based on a 37.04% of percentage of ordinary shares ownership.

(*3) An additional share of loss of long-term investments of ₩2,237 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, 2022 and 2021 is as follows (Korean won in millions):

	2022			
	Total assets	Total liabilities	Sales	Profit (loss) for the year
Associates:				
KDDI Korea Corporation	₩ 23,773	₩ 5,952	₩ 27,074	₩ 668
PT. SEGARA AKASA	125	-	-	(12)
Mastern Professional Investment Type Private Security Investment Trust No.98	889,649	603,809	57,478	20,340
Versogen, Inc.	16,312	387	1,552	(3,609)
Protera SAS	18,508	2,504	-	(2,981)
Stathera IP Holding Inc.	14,656	3,809	-	(1,075)
MARCONI Growth No. 1 Private Equity Fund	11,232	8	2	(217)
Samcheek Blue Power Co., Ltd.	3,515,861	2,885,218	-	(8,447)
Daejung Offshore Wind Power Co., Ltd.	5,342	2,014	-	(237)
Hychangwon Co., Ltd	80,358	49,733	-	(1,344)
Tuwaiq Casting & Forging Company	338,073	42,217	-	(1,448)
Multi-asset ESG Marine Wind Power General Private Equity Fund No. 1	15,063	6,100	-	(9)
Doosan Engineering & Construction Co., Ltd.	1,783,756	1,442,192	1,190,566	(210,444)
Daesan Green Energy Co., Ltd.	245,826	190,918	101,689	(6,641)
Prestolite Asia Ltd.	13,800	4,080	16,891	799
Ainstein AI, Inc.	3,328	2,780	5,375	(1,177)
Bundang Doosan Tower Reit Co., Ltd.	671,559	524,366	27,319	3,606
Joint ventures:				
Sichuan Kelun-Doosan Biotechnology Company Limited	15,739	6,301	12,229	3,225
Weve Holdings Ltd.	1,911,489	1,459,904	1,190,566	(223,371)
The Zenith Holdings Ltd.	1,951,894	1,459,903	1,190,566	(223,370)

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

	2021			
	Total assets	Total liabilities	Sales	Profit (loss) for the year
Associates:				
KDDI Korea Corporation	₩ 25,278	₩ 6,817	₩ 34,893	₩ 1,708
Wise Fashion Co., Ltd	1,242	2,361	16,631	(1,191)
PT. SEGARA AKASA	167	-	-	(39)
Mastern Professional Investment Type Private Security Investment Trust No.98	889,057	604,003	69,596	28,545
Protera SAS	21,128	1,018	-	(2,955)
Stathera IP Holding Inc.	15,463	3,601	9	(2,609)
Bundang Doosan Tower Reit Co., Ltd.	679,589	524,371	25,934	2,876
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)
Doosan Engineering & Construction Co.,Ltd.	1,858,901	1,303,488	1,398,624	7,263
Daesan Green Energy Co., Ltd.	264,617	203,921	88,147	(3,310)
Prestolite Asia Ltd.	13,492	4,571	8,921	294
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 W.L.L	17,963	17,254	16,459	(653)
Weve Holdings Ltd.	1,941,110	1,312,620	-	-
The Zenith Holdings Ltd.	1,958,319	1,312,620	-	-

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, 2022 and 2021

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, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022					
	Net assets	Percentage of ownership (%)	Group's shares in net assets	Adjustment amounts		Book value
				Goodwill	Intragroup transactions and others	
Associates:						
KDDI Korea Corporation	₩ 17,821	17.63	₩ 3,141	₩ -	₩ -	₩ 3,141
PT. SEGARA AKASA	125	30.02	38	-	-	38
Mastern Professional Investment Type Private Security Investment Trust No.98	285,840	25.45	72,759	-	(676)	72,083
Versogen, Inc.	15,925	10.83	1,725	4,064	-	5,789
Protera SAS	16,005	5.76	922	358	271	1,551
Stathera IP Holding Inc.	10,847	15.82	1,716	2,098	118	3,932
MARCONI Growth No. 1 PrivateEquity Fund	11,225	34.38	3,858	-	-	3,858
Samcheok Blue Power Co., Ltd.(*1)	31,460	9.00	2,831	38,268	(9,223)	31,876
Daejung Offshore Wind Power Co., Ltd.	3,328	26.65	887	1,532	-	2,419
Hychangwon Co., Ltd.(*2)	13,755	41.18	5,664	79	1,270	7,013
Tuwaiq Casting & Forging Company	295,856	15.00	44,378	-	296	44,674
Multi-asset ESG Marine Wind Power General Private Equity Fund No. 1	8,963	65.00	5,826	2,668	-	8,494
Doosan Engineering & Construction Co.,Ltd.	341,564	46.35	158,315	60,232	(44,845)	173,702
Daesan Green Energy Co., Ltd.	54,908	10.00	5,491	-	(3,015)	2,476
Prestolite Asia Ltd.	9,720	32.31	3,141	-	-	3,141
Ainstein AI, Inc.	548	9.09	50	2,305	-	2,355
Bundang Doosan Tower Reit Co., Ltd.	147,193	18.60	27,378	-	(5,706)	21,672
Joint ventures:						
Sichuan Kelun-Doosan Biotechnology Company Limited	9,438	50.00	4,719	-	-	4,719
Weve Holdings Ltd. (*3)	28,905	46.50	13,440	19,029	5,981	38,450
The Zenith Holdings Ltd. (*3)	43,936	31.75	13,950	18,991	(32,941)	-

(*1) Hybrid securities are excluded from the above amount of net assets held by the entity.

(*2) The amount of net assets held by the entity and percentage of ownership in the entity does not include preferred stock shares.

(*3) Goodwill and non-controlling interests of individual entities are excluded from the amount of net assets.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

	December 31, 2021					
	Net assets	Percentage of ownership (%)	Group's shares in net assets	Adjustment amounts		Book value
				Goodwill	Intragroup transactions and others	
Associates:						
KDDI Korea Corporation	₩ 18,461	17.63	3,254	₩ -	₩ -	₩ 3,254
Wise Fashion Co., Ltd.	(1,119)	19.34	(216)	2,161	-	1,945
PT. SEGARA AKASA	167	30.02	50	-	-	50
Mastern Professional Investment Type Private Security Investment Trust No.98						
	285,054	25.45	72,559	-	(576)	71,983
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
Bundang Doosan Tower Reit Co., Ltd.						
	155,218	18.60	28,869	-	(2,573)	26,296
The HS-City Expressway Samcheok Blue Power Co., Ltd. (*1)						
	10,346	27.29	2,823	-	(2,823)	-
	39,907	9.00	3,592	38,268	(7,096)	34,764
Daejung Offshore Wind Power Co., Ltd.						
	3,566	26.65	950	1,532	-	2,482
Hychangwon Co., Ltd. (*2)						
	11,601	37.04	4,297	-	698	4,995
ReCarbon, Inc.						
	32,463	11.34	3,681	4,189	-	7,870
Doosan Engineering & Construction Co.,Ltd.						
	555,413	46.35	257,434	60,232	-	317,666
Daesan Green Energy Co., Ltd.						
	60,696	10.00	6,070	-	(3,187)	2,883
Prestolite Asia Ltd.						
	8,921	32.31	2,882	-	-	2,882
Ainstein AI, Inc.						
	1,102	9.09	100	2,191	-	2,291
Joint ventures:						
Sichuan Kelun-Doosan Biotechnology Company Limited						
	9,244	50.00	4,622	-	-	4,622
Doosan Babcock W.L.L						
	709	49.00	347	-	(347)	-
Weve Holdings Ltd. (*3)						
	217,141	46.50	100,971	19,029	-	120,000
The Zenith Holdings Ltd. (*3)						
	318,137	31.75	101,009	18,991	-	120,000

(*1) Hybrid securities are excluded from the net asset value.

(*2) The amount of net assets held by the entity and percentage of ownership in the entity does not include preferred stock shares.

(*3) Goodwill and non-controlling interests of individual entities are excluded from the amount of net assets.

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, 2022 and 2021

12. Property, plant and equipment

Changes in property, plant and equipment for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022					
	Land	Buildings and structures	Machinery	Others	Construction in progress	Total
January 1	₩ 3,484,374	₩ 1,206,515	₩ 817,516	₩ 137,971	₩ 300,886	₩ 5,947,262
Acquisition/capital expenditure	10,326	162,470	109,454	51,870	502,031	836,151
Transfers (*1)	(42,236)	29,929	242,847	10,972	(457,512)	(216,000)
Disposal (*2)	(9,147)	(18,186)	(9,424)	(6,597)	(23,196)	(66,550)
Depreciation	(1,910)	(134,789)	(269,461)	(50,238)	-	(456,398)
Impairment loss	(3,655)	(641)	(8,290)	(611)	(18,900)	(32,097)
Business combination	29,601	62,752	358,796	3,298	7,246	461,693
Changes in scope of consolidation	(208,550)	(51,984)	(11,586)	(1,068)	(100)	(273,288)
Others (*3)	674	25,108	29,896	1,200	15,665	72,543
December 31	₩ 3,259,477	₩ 1,281,174	₩ 1,259,748	₩ 146,797	₩ 326,120	₩ 6,273,316
Acquisition cost	₩ 1,681,180	₩ 2,383,717	₩ 3,691,510	₩ 622,857	₩ 373,040	₩ 8,752,304
Accumulated depreciation and accumulated impairment losses	(2,124)	(1,102,543)	(2,431,762)	(476,060)	(46,920)	(4,059,409)
Accumulated revaluation surplus	1,580,421	-	-	-	-	1,580,421

(*1) Transfers include some portions of land, buildings and construction-in-progress reclassified to investment properties during the year ended December 31, 2022 and transfers of assets held for sale to other property, plant and equipment.

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

(*3) Others include changes due to exchange rate difference.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

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

	2021					
	Land	Buildings and structures	Machinery	Others	Construction in progress	Total
January 1	₩ 4,148,383	₩ 1,396,607	₩ 882,670	₩ 370,526	₩ 187,473	₩ 6,985,659
Acquisition/capital expenditure	20,766	323,005	59,902	67,225	247,429	718,327
Transfers	(33,980)	(18,086)	216,418	(127,564)	(144,954)	(108,166)
Disposal	(41,590)	(34,434)	(9,633)	(6,941)	(772)	(93,370)
Depreciation	(1,231)	(159,235)	(193,246)	(82,122)	-	(435,834)
Impairment loss (reversal)	-	(819)	(6,349)	(747)	(186)	(8,101)
Asset revaluation	266,795	-	-	-	-	266,795
Changes in scope of consolidation (*1)	(884,514)	(349,215)	(157,077)	(94,152)	2,658	(1,482,300)
Others (*2)	9,745	48,692	24,831	11,746	9,238	104,252
December 31	₩ 3,484,374	₩ 1,206,515	₩ 817,516	₩ 137,971	₩ 300,886	₩ 5,947,262
Acquisition cost	₩ 1,919,083	₩ 2,214,961	₩ 2,834,400	₩ 608,807	₩ 339,056	₩ 7,916,307
Accumulated depreciation and accumulated impairment losses	(1,147)	(1,008,446)	(2,016,884)	(470,836)	(38,170)	(3,535,483)
Accumulated revaluation surplus	1,566,438	-	-	-	-	1,566,438

(*1) Changes in scope of consolidation include land and buildings classified as assets held for sale for the year ended December 31, 2021.

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

(*3) Others include changes due to exchange rate difference.

Changes in right-of-use assets classified as property, plant and equipment for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022				
	Land	Buildings and structures	Machinery	Others	Total
January 1	₩ 15,297	₩ 405,656	₩ 14,927	₩ 22,204	₩ 458,084
Acquisition/capital expenditure	10,294	95,462	9,207	12,644	127,607
Transfers	-	(13,842)	(1,886)	-	(15,728)
Disposal (*1)	(8,317)	(16,593)	(605)	(1,613)	(27,128)
Depreciation	(1,910)	(72,398)	(16,297)	(13,045)	(103,650)
Business combination	-	328	76,759	69	77,156
Changes in scope of consolidation	-	(13,852)	-	(62)	(13,914)
Others (*2)	(15)	6,570	702	432	7,689
December 31	₩ 15,349	₩ 391,331	₩ 82,807	₩ 20,629	₩ 510,116
Acquisition cost	₩ 17,416	₩ 546,085	₩ 129,480	₩ 71,728	₩ 764,709
Accumulated depreciation and accumulated impairment losses	(2,067)	(154,754)	(46,673)	(51,099)	(254,593)

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

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

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

	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
Transfers (*1)	-	(39,078)	(92)	(1,845)	(41,015)
Disposal (*2)	-	(12,815)	(2)	(2,055)	(14,872)
Depreciation	(1,231)	(89,779)	(7,136)	(18,351)	(116,497)
Changes in scope of consolidation	(12,546)	(72,486)	(7,008)	(5,918)	(97,958)
Others (*3)	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) Transfers include land, buildings and others classified as assets held for sale during the year ended December 31, 2021.

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

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

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, 2022, 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 ₩ 1,679,056 million and ₩ 1,917,936 million as of December 31, 2022 and 2021, respectively.

Fair value measurements of land assets by fair value hierarchy level as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022			December 31, 2021		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Land	₩ -	₩ -	₩ 3,259,477	₩ -	₩ -	₩ 3,484,374

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

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	Fair value increases (decreases), if rate of land price increases (decreases).
	Parcel conditions and others	Fair value increases (decreases), if correction of parcel conditions and others increases (decreases).
	Land conditions affecting the sales price and others	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	Fair value increases (decreases), if the private information correction increases (decreases).
	Point-in-time correction	Fair value increases (decreases), if the point-in-time correction increases (decreases).
	Value formation factor	Fair value increases (decreases), if the value forming factor increases (decreases).

Capitalized borrowing costs for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Capitalized borrowing cost	₩ 3,094	₩ 1,140
Capitalization interest rate	3.73%~6.29%	3.42%~5.90%

Classification of depreciation for the years ended December 31, 2022 and 2021 is as follows (Korean won in millions):

	2022	2021
Cost of sales	₩ 388,491	₩ 301,146
Selling and administrative expenses	57,579	56,209
Research and development cost and others	5,396	5,148
Loss from discontinued operations	4,932	73,331
	<u>₩ 456,398</u>	<u>₩ 435,834</u>

Classification of depreciation for the years ended December 31, 2022 and 2021 incurred in right-of-use assets classified as property, plant and equipment is as follows (Korean won in millions):

	2022	2021
Cost of sales	₩ 63,399	₩ 57,153
Selling and administrative expenses	38,352	35,619
Research and development cost and others	617	586
Loss from discontinued operations	1,282	23,139
	<u>₩ 103,650</u>	<u>₩ 116,497</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

13. Intangible assets

Changes in intangible assets for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022				
	Goodwill	Industrial rights	Development costs	Other intangible assets	Total
January 1	₩ 4,959,261	₩ 1,187,662	₩ 1,145,230	₩ 289,599	₩ 7,581,752
Acquisition/capital expenditure	-	5,351	200,544	50,738	256,633
Transfers	-	-	2,185	13,223	15,408
Disposal	-	(34)	-	(6,612)	(6,646)
Amortization	-	(1,546)	(99,215)	(61,043)	(161,804)
Impairment loss	(357,552)	-	(34,922)	(30,214)	(422,688)
Business combination	333,486	-	-	93,678	427,164
Changes in scope of consolidation	(5,700)	-	-	(185)	(5,885)
Others (*1)	135,769	55,755	19,638	(4,243)	206,919
December 31	₩ 5,065,264	₩ 1,247,188	₩ 1,233,460	₩ 344,941	₩ 7,890,853
Acquisition costs	₩ 5,065,264	₩ 1,428,134	₩ 1,805,289	₩ 640,522	₩ 8,939,209
Accumulated amortization and impairment losses	-	(180,946)	(571,829)	(295,581)	(1,048,356)

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

	2021				
	Goodwill	Industrial rights	Development costs	Other intangible assets	Total
January 1	₩ 5,548,843	₩ 1,126,611	₩ 1,190,168	₩ 350,666	₩ 8,216,288
Acquisition/capital expenditure	-	1,507	231,879	30,891	264,277
Transfers	-	532	(4,386)	12,683	8,829
Disposal	-	(10)	-	(3,293)	(3,303)
Amortization	-	(1,765)	(116,490)	(58,541)	(176,796)
Impairment loss	-	(9)	(27,779)	(1)	(27,789)
Changes in scope of consolidation	(785,945)	(3,634)	(130,602)	(51,897)	(972,078)
Transfers to assets held for sale	-	-	(2)	(3,274)	(3,276)
Others (*1)	196,363	64,430	2,442	12,365	275,600
December 31	₩ 4,959,261	₩ 1,187,662	₩ 1,145,230	₩ 289,599	₩ 7,581,752
Acquisition costs	₩ 4,959,261	₩ 1,359,592	₩ 1,534,216	₩ 577,037	₩ 8,430,106
Accumulated amortization and impairment losses	-	(171,930)	(388,986)	(287,438)	(848,354)

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

The carrying amount of membership with indefinite useful lives in other intangible assets is ₩35,076 million and ₩39,405 million as of December 31, 2022 and 2021, respectively.

In addition, expenditure on research and development, which was recognized as expenses, amounted to ₩229,987 million and ₩174,596 million for the years ended December 31, 2022 and 2021, respectively.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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, 2022	December 31, 2021	Description
Doosan	Fuel Cell	18,884	18,056	Manufacturing and sale of fuel cell
Oricom Inc.	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
Doosan Tesna Inc. (*1)	Semiconductor test	333,486	-	Testing and engineering of semiconductor manufacturing
Doosan Enerbility	Power plant	711,814	703,764	Manufacturing and sale of power plant
Doosan Bobcat	Construction machine	3,230,775	3,114,140	Manufacturing and sale of small and medium size construction machine
	Industrial Vehicles	85,506	80,950	Manufacturing and sale of forklifts
Doosan Fuel Cell Co., Ltd.	Fuel Cell	660,845	1,018,397	Manufacturing and sale of fuel cell
		<u>₩ 5,065,264</u>	<u>₩ 4,959,261</u>	

(*1) For the year ended December 31, 2022, the Group recognized goodwill resulting from the business combination with Doosan Tesna Inc. (see note 39).

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, 2022 are as follows.

Company	CGUs	Discount rate	Permanent growth rate	Recoverable amount assessment methods
Doosan	Fuel Cell	13.51%, 15.82%	0.00%, 1.00%	Value in use
Oricom Inc.	Magazine	13.93%	1.00%	Value in use
	Advertisement	10.93%	1.00%	Value in use
Doosan Logistics Solution Co., Ltd.	Logistics automation	12.85%	1.00%	Fair value less costs to sell
Doosan Tesna Inc.	Semiconductor test	11.10%	1.00%	Value in use
Doosan Enerbility	Power plant	Estimate active market price by adjustment	Estimate quoted active market price	Fair value less costs to sell
Doosan Bobcat	Construction machine	10.00%	1.50%	Value in use
	Industrial Vehicles	9.30%	1.00%	Value in use
Doosan Fuel Cell Co., Ltd.	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 period 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.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

13. Intangible assets (cont'd)

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

Capitalized borrowing costs for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Capitalized borrowing cost	₩ 22,907	₩ 26,855
Capitalization interest rate	3.73%	3.42% ~ 4.00%

Classification of amortization for the years ended December 31, 2022 and 2021 is as follows (Korean won in millions):

	2022	2021
Cost of sales	₩ 104,296	₩ 77,381
Selling and administrative expenses	53,067	45,443
Research and development cost and others	2,388	2,698
Loss from discontinued operations	2,053	51,274
	<u>₩ 161,804</u>	<u>₩ 176,796</u>

Development costs as of December 31, 2022 are as follows (Korea won in millions):

Company	Individual assets	December 31, 2022	Remaining Amortization period (*1)
Doosan Enerbility	Large-sized Heavy-Duty Gas Turbine Development for Power Generation	₩ 655,072	-
	Gas Turbine 7F Retrofit	51,635	-
	Mid-sized Gas Turbine Development Phase1	661	6.58 years
	Mid-sized Gas Turbine Development Phase2	37,777	-
	8MW Offshore Wind Power	45,023	-
Doosan Bobcat	Development related Compact product (new model and emission regulation) (*2)	45,993	-
	Development related Compact product (new model and emission regulation) (*2)	94,836	3.21 years
	Development related Portable Power product (new model and emission regulation) (*2)	4,213	-
	Development related Portable Power product (new model and emission regulation) (*2)	11,258	3.07 years
	Development related forklifts (new model and emission regulation) (*2)	6,077	-
	Development related forklifts (new model and emission regulation) (*2)	10,652	3.55 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.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

13. Intangible assets (cont'd)

Intangible assets for which an impairment loss has been recognized for the year ended December 31, 2022 are as follows (Korea won in millions):

Company	Classification	Individual assets	Amount of impairment loss		December 31, 2022	Recoverable amount assessment methods
			2022	Accumulated		
Doosan	Development costs	Others	₩ 39	₩ 39	₩ -	Value in use
Doosan Enerbility	Development costs (*1)	Development of Boiler-USC elemental technologies	3,644	3,644	-	Value in use
		Development of Boiler-USC elemental technologies (I&C)	2,748	2,748	-	Value in use
		Development of large-scale freshwater elemental technologies	2,731	2,731	-	Value in use
		Development of ST-USC elemental technologies	1,924	1,924	-	Value in use
		Others	23,875	23,875	-	Value in use
	Other intangible assets	Golf membership	5,097	8,766	5,658	Fair value less costs to sell
		Reclamation licence and others	24,663	54,812	-	Value in use
			64,682	98,500	5,658	
Doosan Bobcat	Industrial Rights - Patents	Forklift control method and others	-	9	-	Fair value less costs to sell
	Development costs	Medium Frame Gen V and others	-	5,502	-	Fair value less costs to sell
	Other intangible assets	DS Platform(software) and others	413	3,130	-	Fair value less costs to sell
			413	8,641	-	
Doosan Fuel Cell Co., Ltd.	Goodwill	Goodwill	357,552	357,552	660,845	Fair value less costs to sell
Doosan Cuvex Co.,Ltd	Other intangible assets	Condominium membership	2	2	-	Fair value less costs to sell
			<u>₩ 422,688</u>	<u>₩ 464,734</u>	<u>₩ 666,503</u>	

(*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.

For the year ended December 31, 2022, none of reversal of impairment losses is recognized for intangible assets .

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

13. Intangible assets (cont'd)

The accounts on the consolidated statements of comprehensive income for which the Group recognizes an impairment loss (reversal) for the years ended December 31, 2022 and 2021 are as follows (Korea won in millions):

	2022	2021
Other non-operating expenses	₩ 422,688	₩ 28,290
Other non-operating income	-	(266)
Loss (profit) from discontinued operations	-	(235)
	<u>₩ 422,688</u>	<u>₩ 27,789</u>

Details of annual quantity of allocated emission allowances for the third planning period (2021 ~ 2025) as of December 31, 2022 are as follows (tCO2-eq):

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

Changes in emission allowances and book value as of December 31, 2022 and 2021 are as follows (tCO2-eq, Korea won in millions):

	2022 (Quantity)					
	2021	2022	2023	2024	2025	Total
January 1	264,750	260,526	260,526	258,086	258,086	1,301,974
Free allocation succession	210	210	210	208	208	1,046
Cancellation	(519)	-	-	-	-	(519)
Government delivery	(200,301)	-	-	-	-	(200,301)
Disposal	(22,000)	-	-	-	-	(22,000)
Carryforward	(42,140)	42,140	-	-	-	-
December 31	<u>-</u>	<u>302,876</u>	<u>260,736</u>	<u>258,294</u>	<u>258,294</u>	<u>1,080,200</u>

	2021 (Quantity)						
	2020	2021	2022	2023	2024	2025	Total
January 1	292,754	260,526	260,526	260,526	258,086	258,086	1,590,504
Cancellation	(4,211)	-	-	-	-	-	(4,211)
Government delivery	(229,319)	-	-	-	-	-	(229,319)
Disposal	(55,000)	-	-	-	-	-	(55,000)
Carryforward	(4,224)	4,224	-	-	-	-	-
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>

Changes in emission liabilities during the year ended December 31, 2022 are as follows (tCO2-eq, Korean won in millions):

	Quantity	Book value
January 1	-	₩ -
Increase	55,248	1,657
December 31	<u>55,248</u>	<u>₩ 1,657</u>

The estimate of Group's greenhouse gas emissions as of December 31, 2022 is 245,000 tCO2-eq and no emission liabilities are recognized as it is not expected to exceed the free emission permits.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

14. Investment properties

Changes in investment properties for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022				2021		
	Land	Building	Construction in progress	Total	Land	Building	Total
January 1	₩ 226,324	₩ 136,369	₩ -	₩ 362,693	₩ 218,892	₩ 169,130	₩ 388,022
Acquisition /capital expenditure	-	-	-	-	714	54,156	54,870
Disposal	(611)	(5,594)	-	(6,205)	(6,878)	(5,788)	(12,666)
Valuation (*1)	5,298	(13,153)	-	(7,855)	19,324	(46,425)	(27,101)
Changes in scope of consolidation	-	-	-	-	(10,516)	(32,266)	(42,782)
Transfers	35,764	28,293	46,229	110,286	4,325	(2,568)	1,757
Others (*2)	-	-	-	-	463	130	593
December 31	₩ 266,775	₩ 145,915	₩ 46,229	₩ 458,919	₩ 226,324	₩ 136,369	₩ 362,693

(*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.

Some of the above investment properties, superficies and leasehold interest are established by the tenant on the land. (see Note 32).

In addition, lease income related to investment properties amounted to ₩21,421 million and ₩17,154 million for the years ended December 31, 2022 and 2021, respectively.

Changes in right-of-use assets classified as Investment properties for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
January 1	₩ 133,508	₩ 156,227
Acquisition	-	54,000
Transfers	-	(1,023)
Valuation (*1)	(13,035)	(41,460)
Changes in scope of consolidation	-	(34,236)
December 31	₩ 120,473	₩ 133,508

(*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.

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, 2022.

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.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

14. Investment properties (cont'd)

Fair value measurements of investment properties by fair value hierarchy level as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022			December 31, 2021		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Land	₩ -	₩ -	₩ 266,775	₩ -	₩ -	₩ 226,324
Buildings	-	-	145,915	-	-	136,369
Construction in progress	-	-	46,229	-	-	-
	₩ -	₩ -	₩ 458,919	₩ -	₩ -	₩ 362,693

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 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).

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

15. Bonds and borrowings

15.1 Bonds

Bonds as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	Annual interest rate (%)	December 31, 2022	December 31, 2021
Public issued bonds (*1)	1.00~6.50	₩ 982,190	₩ 1,593,950
Private placement bonds (*1)	4.30~9.20	248,500	210,500
Convertible bonds	2.81~2.87	23,374	23,374
Bonds with stock warrants	-	-	14,607
		<u>1,254,064</u>	<u>1,842,431</u>
Less: Adjustment for stock warrants		-	(201)
Less: Adjustment for conversion rights		(491)	(1,299)
Add: Redemption premium		1,604	2,370
Less: Discount on bonds		(3,310)	(12,946)
Less: Current portion of long-term bonds		(717,885)	(690,901)
		<u>₩ 533,982</u>	<u>₩ 1,139,454</u>

(*1) Among the above public issued bonds and private placement bonds, Doosan Bobcat Inc.'s ordinary shares and Doosan Fuel Cell Co., Ltd.'s ordinary shares held by Doosan Enerbility Co., Ltd are provided as collateral in relation to Doosan Enerbility Co., Ltd's foreign currency public offering bonds (see Note 32, 33).

15.2 Convertible bonds

Changes in convertible bonds issued by the Group for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022			
	January 1	Exercise/ Amortization	Changes in scope of consolidation	December 31
Convertible bonds	₩ 23,374	₩ -	₩ -	₩ 23,374
Redemption premium	1,604	-	-	1,604
Discount on bonds	(82)	51	-	(31)
Adjustment for conversion rights	(1,299)	808	-	(491)
Book value	<u>₩ 23,597</u>	<u>₩ 859</u>	<u>₩ -</u>	<u>₩ 24,456</u>
Consideration for conversion rights (other capital surplus)	₩ 760	₩ -	₩ -	₩ 760
	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

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

15.2 Convertible bonds (cont'd)

Details of the 59th convertible bonds issued by Doosan Enerbility Co., Ltd, 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	₩ 8,907 per share	₩ 1,655	₩ 1,641	₩ 1,730

(*1) These bonds are the portion of the 65th convertible bonds issued by Doosan Infracore Co., Ltd. on June 8, 2020, which is succeeded to Doosan Enerbility Co., Ltd. upon the merger after division between Doosan Enerbility Co., Ltd and Doosan Infracore Co., Ltd. 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, before a bondholder exercises the conversion option, issues capital stocks at a price lower than the market price through paid-in capital increase with or without consideration or capitalization of reserves or dividends, 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 Doosan Enerbility Co., Ltd, 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	₩10,506 per share	₩ 21,719	₩ 21,584	₩ 22,726

(*1) Of the 69th convertible bonds issued by Doosan Infracore Co., Ltd. on August 3, 2020, convertible bonds were succeeded to Doosan Enerbility Co., Ltd from division and merger between Doosan Enerbility Co., Ltd and Doosan Infracore Co., Ltd. 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 8, 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.

15.2 Convertible bonds (cont'd)

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, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022				
	January 1	Issue/ Repayment	Exercise/ Amortization	December 31	
Bonds with stock warrants	₩ 14,607	₩ (13,991)	₩ (616)	₩ -	
Redemption premium	766	(734)	(32)	-	
Discount on bonds	(19)	-	19	-	
Adjustment for stock warrants	(201)	-	201	-	
Book value	₩ 15,153	₩ (14,725)	₩ (428)	₩ -	
Consideration for stock warrants (other capital surplus)	₩ 34,819	₩ -	₩ (34,819)	₩ -	

	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

Details of the 48th bond with stock warrants issued by Doosan Enerbility Co., Ltd, 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	₩14,450 per share	₩ 500,000	₩ 491,546	₩ -

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

15.3 Bonds with stock warrants (cont'd)

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, 2022, stock warrants were exercised in the amount pertaining to 98.93% of the principal amount of bond with stock warrants and 0.21% of the principal amount was substituted. The number of shares issued as a result of the stock warrants was 33,985,191 shares.

15.4 Short-term borrowings

Short-term borrowings as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	Creditor	Annual interest rate (%)	December 31, 2022 (*4)	December 31, 2021
Borrowings in Korean won:				
Doosan (*3)	Korea Exim Bank and others	1.59 ~ 7.19	₩ 311,148	₩ 675,399
Doosan Enerbility (*2)	Korea Development Bank and others	2.00 ~ 7.55	948,250	3,128,420
Doosan Fuel Cell Co., Ltd.	Hana Bank and others.	CD(3M)+2.50 ~ Financial bond AA+(3M)+3.25	64,000	-
			1,323,398	3,803,819
Borrowings in foreign currency:				
Doosan (*3)	Korea Exim Bank and others	2.05 ~ 8.50	118,020	141,179
Doosan Enerbility (*2)	Woori Bank and others	2.10 ~ 9.65	367,381	758,857
Doosan Bobcat (*1)	Korea Exim Bank and others	1.36 ~ 6.77	53,941	21,206
			539,342	921,242
			₩ 1,862,740	₩ 4,725,061

(*1) It includes its own consolidated subsidiaries.

(*2) It includes its own consolidated subsidiaries other than those mentioned in (*1) and Doosan Fuel Cell Co., Ltd. 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).

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

15.5 Long-term borrowings

Long-term borrowings as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	Creditor	Annual interest rate (%)	December 31, 2022 (*5)	December 31, 2021
Borrowings in Korean won:				
Doosan (*3)	Shinhan Bank and others	2.58 ~ 6.09	₩ 836,613	₩ -
Doosan Enerbility (*2)	NH investment securities and others	1.10 ~ 6.72	1,272,714	528,026
Doosan Bobcat (*1)	NH Bank and others	3.25 ~ 3M		
Doosan Cuvex Co., Ltd. (*1)	Woori Bank	MOR+1.88	80,000	46,400
Doosan Fuel Cell Co., Ltd.	Korea Development Bank	3.69	20,000	20,000
		Industrial Financial Debenture(1year) + 1.47	30,000	-
			<u>2,239,327</u>	<u>594,426</u>
Borrowings in foreign currency:				
Doosan (*3)	Kookmin Bank	5.90 ~ 6.70	17,650	4,475
Doosan Enerbility (*2)	Canadian Imperial Bank of Commerce	3.13 ~ 1M		
		SOFR+2.63	6,589	37,974
Doosan Bobcat (*1)	USA Institutional investors, banks and others	1.36 ~ 3M		
		SOFR +2.50	1,174,452	1,358,742
			<u>1,198,691</u>	<u>1,401,191</u>
Redeemable convertible preference shares:				
Doosan Corporation (*4)			29,088	-
			<u>3,467,106</u>	<u>1,995,617</u>
Less: present value discounts			(29,774)	(11,054)
Less: current portion of long-term borrowings			<u>(229,801)</u>	<u>(463,729)</u>
			<u>₩ 3,207,531</u>	<u>₩ 1,520,834</u>

(*1) It includes its own consolidated subsidiaries.

(*2) It includes its own consolidated subsidiaries other than those mentioned in (*1) above, Doosan Cuvex Co., Ltd and Doosan Fuel Cell Co., Ltd.

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

(*4) Redeemable convertible preference shares liabilities issued by Doosan Mobility Innovation Inc., a subsidiary, has priority to profit dividends over ordinary shares, has special provisions on conversion and repayment, and is a preferred stock with voting rights. The Group is obliged to repay redeemable convertible preferred shares if the holder requests, and the repayment to the holder is determined at the option of the holder, not at the discretion of the Group. Thus, redeemable convertible preferred shares and put options attached to bonds are classified as liabilities and conversion consideration is classified as capital.

(*5) The Group provide items of property, plant and equipment and others as collateral for the above loans (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). Details of the asset-backed loans as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	Creditor	Annual interest rate (%)	December 31, 2022	December 31, 2021
Asset-backed loans:				
Doosan (*2)	China Bank and others	4.20 ~ 7.24	₩ 205,800	₩ 82,500
Doosan Enerbility (*1)	Korea Development Bank and others	-	-	49,600
			205,800	132,100
Less: present value discounts			(716)	(623)
Less: current portion of long-term asset-backed loans			(91,731)	(115,042)
			₩ 113,353	₩ 16,435

(*1) It includes its own consolidated subsidiaries.

(*2) 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, 2022 and 2021 are ₩25,840 million and ₩26,163 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, 2022 and 2021 are described in Notes 12.2 and 14.2. 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, 2022 and 2021 is described in Note 12.7.

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.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

16.2 Lease liabilities

Changes in lease liabilities for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
January 1	₩ 691,012	₩ 542,983
Payment of lease fees	(175,877)	(162,169)
Acquisition of lease assets	127,607	425,213
Cancel contracts	(27,215)	(13,643)
Interest expense	40,809	42,125
Business combination	77,156	-
Changes in scope of consolidation	(16,885)	(119,811)
Transfers to assets held for sale	-	(41,813)
Others(*1)	32,530	18,127
December 31	<u>₩ 749,137</u>	<u>₩ 691,012</u>

(*1) Others include changes due to exchange rate difference.

The maturity analysis of lease liabilities as of December 31, 2022 and 2021 is as follows (Korean won in millions):

	December 31, 2022				
	Nominal cash flows according to contract				
	Total	Less than 1 year	1 ~ 2 years	2 ~ 5 years	More than 5 years
Lease liabilities	₩ 885,079	₩ 169,825	₩ 145,543	₩ 306,078	₩ 263,633

	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 liabilities	₩ 850,571	₩ 122,671	₩ 92,144	₩ 316,670	₩ 319,086

Classification of expenses for the years ended December 31, 2022 and 2021 incurred in short-term lease and leases of low-value assets that are not included in right-of-use assets is as follows (Korean won in millions):

	2022	2021
Cost of sales	₩ 22,842	₩ 15,943
Selling and administrative expenses	5,003	6,085
Research and development cost and others	1	7
Loss from discontinued operations	208	3,359
	<u>₩ 28,054</u>	<u>₩ 25,394</u>

Cash outflows from financing activities due to the repayment of lease liabilities are ₩ 175,877 million and ₩162,169 million for the years ended December 31, 2022 and 2021, respectively. Cash outflows from operating activities due to short-term and leases of low value fees are ₩28,054 million and ₩25,394 million for the years ended December 31, 2022 and 2021, respectively. Therefore, the total cash outflow of the lease is ₩203,931 million and ₩187,563 million for the years ended December 31, 2022 and 2021, respectively.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

16.3 Lease payments receivable

The maturity analysis of lease payments receivable as of December 31, 2022 and 2021 is as follows (Korean won in millions):

	December 31, 2022				
	Nominal cash flows according to contract				
	Total	Less than 1 year	1 ~ 2 years	2 ~ 5 years	More than 5 years
Lease payments receivable	₩ 2,345	₩ 2,345	₩ -	₩ -	₩ -

	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 payments receivable	₩ 5,522	₩ 2,456	₩ 3,066	₩ -	₩ -

16.4 Sale-and-leaseback liabilities

Details of sale-and-leaseback liabilities as of December 31, 2022 are as follows (Korean won in millions):

	Annual interest rate(%)	December 31, 2022
Doosan (*1)	4.08	₩ 29,970
Doosan Bobcat	3.59	77,347
		107,317
Less: current portion		(27,499)
		₩ 79,818

(*1) The annual interest rate is recalculated annually.

The above sale-and-leaseback liabilities are classified as other payables and long-term other payables in the consolidated financial position statement.

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, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Present value of defined benefit liabilities	₩ 1,746,782	₩ 2,240,998
Fair value of plan assets	(1,289,534)	(1,662,617)
	<u>₩ 457,248</u>	<u>₩ 578,381</u>
Net defined benefit assets	₩ (14,508)	₩ -
Net defined benefit liabilities	471,756	578,381

Retirement benefits generated by defined benefits retirement pension charged to profit or loss for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Current service costs	₩ 93,287	₩ 103,134
Net interest costs	18,355	16,503
Past service costs and profit or loss on settlement (*1)	20,974	14,129
	<u>₩ 132,616</u>	<u>₩ 133,766</u>

(*1) For the year ended December 31, 2022, ₩20,974 million of changes in retirement benefit obligations due to the revision of the executive retirement allowance system of the Group was recognized as past service cost.

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, 2022 and 2021 is as follows (Korean won in millions):

	2022	2021
Cost of sales	₩ 71,673	₩ 69,644
Selling and administrative expenses	56,755	43,831
Research and development cost and others	2,969	1,736
Loss from discontinued operations	1,219	18,555
	<u>₩ 132,616</u>	<u>₩ 133,766</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

17. Net defined benefit liabilities (cont'd)

Changes in net defined benefit liabilities(assets) for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022		
	Defined benefit obligations	Plan assets	Net defined benefit liabilities(assets)
Beginning balance	₩ 2,240,998	₩ (1,662,617)	₩ 578,381
Profit or loss:			
Current service cost	93,287	-	93,287
Interest cost (income)	57,852	(39,497)	18,355
Past service cost	20,974	-	20,974
	<u>172,113</u>	<u>(39,497)</u>	<u>132,616</u>
Remeasurements:			
Return on plan assets (excluding amounts included in interest income)	-	413,473	413,473
Actuarial gain (loss) from change in demographic assumptions	(1,391)	-	(1,391)
Actuarial gain (loss) from change in financial assumptions	(630,885)	-	(630,885)
Others	72,761	-	72,761
	<u>(559,515)</u>	<u>413,473</u>	<u>(146,042)</u>
Transfer in and out	(575)	5,174	4,599
Changes in scope of consolidation	(6,419)	16,008	9,589
Contributions by plan participants directly to plan assets	1,480	(20,328)	(18,848)
Contributions by employer directly to plan assets	-	(96,047)	(96,047)
Benefit payments	(123,514)	94,647	(28,867)
Others (*1)	22,214	(347)	21,867
Ending balance	<u>₩ 1,746,782</u>	<u>₩ (1,289,534)</u>	<u>₩ 457,248</u>

(*1) Others include changes due to exchange rate difference.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

17. Net defined benefit liabilities (cont'd)

	2021		
	Defined benefit obligations	Plan assets	Net defined benefit liabilities/assets
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) Others include changes due to exchange rate difference.

Assumptions used for actuarial valuation as of December 31, 2022 and 2021 are as follows:

	December 31, 2022	December 31, 2021
Discount rate (%)	2.00~7.44	1.30~6.80
Salary growth rate (%)	0.80~6.00	0.80~6.00

Details of plan assets as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Equity securities	₩ 156,812	₩ 291,863
Debt securities	570,221	799,210
Saving deposits and others	562,501	571,544
	₩ 1,289,534	₩ 1,662,617

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

17. Net defined benefit liabilities (cont'd)

The sensitivity analysis for the significant actuarial assumptions as of December 31, 2022 and 2021 is as follows (Korean won in millions):

	Impact on defined benefit obligations			
	December 31, 2022		December 31, 2021	
	Amount	Ratio	Amount	Ratio
Discount rate:				
1% increase	₩ (139,443)	(-7.98%	₩ (284,798)	(-12.71%
1% decrease	223,658	12.8%	324,090	14.46%
Salary growth rate:				
1% increase	153,162	8.77%	99,075	4.42%
1% decrease	(114,722)	(-6.57%	(93,811)	(-4.19%

The weighted average maturity of defined benefit obligations as of December 31, 2022 and 2021 is 10.39 years and 13.59 years, respectively. The Group expects to contribute ₩247,767 million for defined benefit plans in 2022.

In addition, the amount recognized for the defined contribution retirement benefit plan is ₩49,590 million and ₩31,321 million as of December 31, 2022 and 2021, respectively.

18. Provisions

Changes in provisions for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022				
	Provision for product warranties	Provision for restoration	Provision for construction losses	Other provisions (*2)	Total
January 1	₩ 335,697	₩ 6,750	₩ 94,319	₩ 218,222	₩ 654,988
Increase(decrease)	175,837	1,213	10,671	47,814	235,535
Utilized	(97,949)	-	-	(55,397)	(153,346)
Others (*1)	12,460	-	(5,401)	(12,861)	(5,802)
December 31	₩ 426,045	₩ 7,963	₩ 99,589	₩ 197,778	₩ 731,375
Current	₩ 125,574	₩ -	₩ 64,054	₩ 134,635	₩ 324,263
Non-current	300,471	7,963	35,535	63,143	407,112

(*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, 2022, other provisions include those related to guaranteed return on membership fee of ₩54,855 million, and related to provisions for pending litigations and others

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

18. Provisions (cont'd)

	2021				
	Provision for product warranties	Provision for restoration	Provision for construction losses	Other provisions (*2)	Total
January 1	₩ 483,671	₩ 3,220	₩ 129,950	₩ 309,038	₩ 925,879
Increase(decrease)	161,968	5,476	(40,323)	(20,909)	106,212
Utilized	(138,526)	(3,220)	-	(46,796)	(188,542)
Others (*1)	(171,416)	1,274	4,692	(23,111)	(188,561)
December 31	₩ 335,697	₩ 6,750	₩ 94,319	₩ 218,222	₩ 654,988
Current	₩ 114,468	₩ 5,473	₩ 36,410	₩ 172,560	₩ 328,911
Non-current	221,229	1,277	57,909	45,662	326,077

(*1) It includes changes in the amounts from foreign exchange rate, 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.

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, 2022 and 2021 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, 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
January 1, 2022	16,523,835	4,889,500	₩ 99,291	₩ 24,447	₩ 123,738	₩ 322,462
December 31, 2022	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 voting rights under limitation pursuant to *Commercial Code* of the Republic of Korea is 3,000,866 shares and 3,000,866 shares as of December 31, 2022 and 2021, respectively. The number of shares with the voting rights under limitation pursuant to *Monopoly Regulation and Fair Trade Act* is 510,231 shares as of December 31, 2022. In addition, although the preferred shares in the Company do not contain voting right, 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 voting rights from the subsequent shareholders' meeting until the end of the shareholders' meeting where shareholders resolute to pay dividends to such preferred shareholders.

20. Capital surplus

Details of capital surplus as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Share premium	₩ 322,462	₩ 322,462
Revaluation reserves	277,542	277,542
Other capital surplus	1,004,656	637,395
	<u>₩ 1,604,660</u>	<u>₩ 1,237,399</u>

21. Other equity items

Other capital items as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Treasury stocks	₩ (185,025)	₩ (185,025)
Loss on disposal of treasury stocks	(16,738)	(16,738)
Stock options	3,527	1,043
Loss from capital reduction	(948,311)	(948,311)
Others	(47,557)	(47,398)
		(1,196,429)
	<u>₩ (1,194,104)</u>	<u>₩ ()</u>

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, 2022 and 2021 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, 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
January 1, 2022	3,000,866	612,104	3,612,970	₩ 171,231	₩ 13,794	₩ 185,025
December 31, 2022	3,000,866	612,104	3,612,970	₩ 171,231	₩ 13,794	₩ 185,025

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

21.2 Share-based payment

21.2.1 Stock option

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, 2022 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
15th	2013.3.29	5,252	2016.3.29 - 2023.3.28	₩ 128,100	₩ 43,353
16th	2014.3.28	5,976	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
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.

Changes in stock options for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions, except for share data):

	2022					
	Number of ordinary shares to be issued			Valuation amount		
	Beginning	Forfeited	Ending	Beginning	Forfeited	Ending
14th	2,987	(2,987)	-	₩ 190	₩ (190)	₩ -
15th	9,600	(4,348)	5,252	416	(188)	228
16th	11,049	(5,073)	5,976	437	(201)	236
	<u>23,636</u>	<u>(12,408)</u>	<u>11,228</u>	<u>₩ 1,043</u>	<u>₩ (579)</u>	<u>₩ 464</u>
	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>

The weighted-average of remaining contractual period (from December 31, 2022 to maturity) of stock options is 0.8 years.

21.2.2 Restricted Stock Unit

During the year ended December 31, 2022, the Company granted Restricted Stock Unit ("RSU") to the executives of the Company by a resolution of the Board of Directors. The RSUs granted by the Company during the year ended December 31, 2022 are ordinary shares of the Company, grant date of which is March 8, 2022, and the total number of shares granted is 83,912 shares. The holders may vest the RSU if they have served for three years or more (in case of those retiring after providing two years of service or more, shares are granted in proportion to the number of days of the retiree's tenure for three years on the stock grant date). The fair value of the RSUs granted during the year ended December 31, 2022 upon the grant date is ₩114,000.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

22. Accumulated other comprehensive income

Accumulated other comprehensive income as of December 31, 2022 and 2021 is as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Loss on valuation of financial assets at fair value through OCI	₩ (18,185)	₩ (3,571)
(Negative) equity changes in equity method	(2,735)	(1,099)
Loss on foreign operations translation	(2,265)	(67,081)
Gain on valuation of derivatives designated as hedges	46,624	39,477
Land revaluation surplus	563,548	562,430
	<u>₩ 586,987</u>	<u>₩ 530,156</u>

23. Retained earnings

Retained earnings as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Legal reserves	₩ 67,423	₩ 67,423
Unappropriated retained earnings	602,028	1,315,856
	<u>₩ 669,451</u>	<u>₩ 1,383,279</u>

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, 2022 are as follows (Korean won, except for share data and dividend amount):

	2022		
	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, 2022 are as follows (Korean won in millions, 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 eligible for dividends	3,432,220	845,176	13,522,969	
Dividend per share (Korean won)	₩ 2,050	₩ 2,000	₩ 2,000	
	<u>₩ 7,036</u>	<u>₩ 1,690</u>	<u>₩ 27,046</u>	<u>₩ 35,772</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

24. Operating segment information

As of December 31, 2022, the composition of the group's sales division and the main products and services by sales division are as follows:

Operating segment	Main products and services
Electro-Materials BG	Manufacture and sale of copper clad laminates
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, semiconductor test, and others.
Doosan Enerbility (*1)	NSSS, BOP, Turbine, freshwater and water treatment facilities, plant facilities installment construction, road construction, etc.
Doosan Bobcat	Manufacturing and sale of small size construction machine and equipment
Doosan Fuel Cell	Fuel cell and renewable energy business and others

(*1) As described in Note 37 to the consolidated financial statements, the operating performance of each segment, such as Mottrol segment, Doosan Infracore segment, Doosan Engineering & Construction segment, Doosan Babcock Ltd. and its subsidiaries ("DBL"), Doosan Mecatec Co., Ltd. and its subsidiaries ("Doosan Mecatec") is presented as discontinued operations, and accordingly, the consolidated statements of profit or loss for the year ended December 31, 2021, which is presented for comparative purpose, was restated.

Information on each segment for the years ended December 31, 2022 and 2021 is as follows (Korean won in millions):

	2022				
	Total sales	Inter-segment sales (*2)	Net sales	Operating profit (loss)	Profit (loss) for the year
Electro-Materials BG	₩ 950,383	₩ (58,959)	₩ 891,424	₩ 86,093	₩ 43,314
Digital Innovation BU	275,517	(178,588)	96,929	16,483	19,139
Others	986,613	(284,048)	702,565	(100,442)	(14,207)
Doosan Enerbility (*1)	7,605,462	(506,256)	7,099,206	167,236	(714,717)
Doosan Bobcat	8,621,912	(7,550)	8,614,362	1,071,607	644,056
Doosan Fuel Cell	312,148	(45,346)	266,802	7,222	3,864
	<u>18,752,035</u>	<u>(1,080,747)</u>	<u>17,671,288</u>	<u>1,248,199</u>	<u>(18,551)</u>
Adjustment for discontinued operations (*1)	(678,763)	3,235	(675,528)	(2,524)	83,933
Consolidation adjustments	(1,077,512)	1,077,512	-	(119,646)	(562,618)
	<u>₩ 16,995,760</u>	<u>₩ -</u>	<u>₩ 16,995,760</u>	<u>₩ 1,126,029</u>	<u>₩ (497,236)</u>

(*1) It includes profit or loss about DBL, Doosan Mecatec classified as discontinued operations.

(*2) It includes the amount of adjustment for discontinued operations of Doosan Mecatec.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

24. Operating segment information (cont'd)

	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)	712,434	508,426	1,220,860	(5,462)	30,807
Doosan Enerbility (*1)	5,856,777	(1,067,570)	4,789,207	225,330	295,048
Doosan Infracore (*1)	2,708,747	(83,651)	2,625,096	239,693	(11,015)
Doosan Bobcat	6,315,179	(7,341)	6,307,838	619,047	401,240
Doosan Engineering & Construction (*1)	1,398,625	(29,235)	1,369,390	86,780	163,662
Doosan Fuel Cell	381,412	(28,204)	353,208	19,089	8,695
	<u>18,545,399</u>	<u>(887,996)</u>	<u>17,657,403</u>	<u>1,305,903</u>	<u>976,767</u>
Adjustment for discontinued operations (*1)	(4,924,956)	119,039	(4,805,917)	(350,409)	(303,302)
Consolidation adjustments	(768,957)	768,957	-	(34,437)	(327,951)
	<u>₩ 12,851,486</u>	<u>₩ -</u>	<u>₩ 12,851,486</u>	<u>₩ 921,057</u>	<u>₩ 345,514</u>

(*1) It includes profit or loss about Mottrol segment, Doosan Infracore segment, Doosan Engineering & Construction segment, DBL, and Doosan Mecatec classified as discontinued operations.

(*2) It includes the amount of adjustment for discontinued operations of the Doosan Infracore, Doosan Engineering & Construction segment and Doosan Mecatec.

Segment assets and liabilities as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022		December 31, 2021	
	Assets	Liabilities	Assets	Liabilities
Electro-Materials BG	₩ 706,330	₩ 224,172	₩ 705,013	₩ 258,625
Digital Innovation BU	130,337	62,331	165,596	71,391
Others	7,164,340	3,924,729	6,054,090	3,446,395
Doosan Enerbility	15,901,517	9,383,327	17,642,568	11,149,879
Doosan Bobcat	9,248,386	4,223,999	8,580,899	4,259,634
Doosan Fuel Cell	1,026,930	503,865	698,855	180,667
	<u>34,177,840</u>	<u>18,322,423</u>	<u>33,847,021</u>	<u>19,366,591</u>
Consolidation adjustments	(7,862,487)	(2,304,886)	(7,901,196)	(1,830,885)
	<u>₩ 26,315,353</u>	<u>₩ 16,017,537</u>	<u>₩ 25,945,825</u>	<u>₩ 17,535,706</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

25. Revenues

25.1 Disaggregation of revenues

Details of disaggregation of revenues for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Revenues from contracts with customers:		
Merchandise and finished goods	₩ 9,954,742	₩ 7,574,389
Construction contracts	6,300,043	4,677,529
Others	748,346	554,542
	<u>17,003,131</u>	<u>12,806,460</u>
Others:		
Rental income and others (*1)	(7,371)	45,026
	<u>₩ 16,995,760</u>	<u>₩ 12,851,486</u>

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

	2022					
	Electro- Materials BG	Digital Innovation BU	Others	Doosan Enerbility (*1)	Doosan Bobcat	Doosan Fuel Cell
Geographical market:						
Korea	₩ 544,018	₩ 79,100	₩ 656,496	₩ 2,735,745	₩ 386,088	₩ 266,802
USA	7,993	4,355	45,729	395,239	6,406,036	-
Asia	339,413	4,290	340	2,027,813	197,804	-
Middle East	-	-	-	959,179	121,780	-
Europe	-	9,184	-	965,564	1,264,402	-
Others	-	-	-	15,666	238,252	-
	<u>₩ 891,424</u>	<u>₩ 96,929</u>	<u>₩ 702,565</u>	<u>₩ 7,099,206</u>	<u>₩ 8,614,362</u>	<u>₩ 266,802</u>
Timing of revenue recognition:						
Transfer at a point in time	₩ 890,867	₩ 7,487	₩ 237,876	₩ 188,506	₩ 8,586,076	₩ 147,326
Transfer over time	557	89,442	464,689	6,910,700	28,286	119,476
	<u>₩ 891,424</u>	<u>₩ 96,929</u>	<u>₩ 702,565</u>	<u>₩ 7,099,206</u>	<u>₩ 8,614,362</u>	<u>₩ 266,802</u>

	2022		
	Subtotal	Adjustment for discontinued operations (*1)	Total
Geographical market:			
Korea	₩ 4,668,249	₩ (8,800)	₩ 4,659,449
USA	6,859,352	(31,984)	6,827,368
Asia	2,569,660	(28,274)	2,541,386
Middle East	1,080,959	(91,251)	989,708
Europe	2,239,150	(500,208)	1,738,942
Others	253,918	(15,011)	238,907
	<u>₩ 17,671,288</u>	<u>₩ (675,528)</u>	<u>₩ 16,995,760</u>
Timing of revenue recognition:			
Transfer at a point in time	₩ 10,058,138	₩ 5	₩ 10,058,143
Transfer over time	7,613,150	(675,533)	6,937,617
	<u>₩ 17,671,288</u>	<u>₩ (675,528)</u>	<u>₩ 16,995,760</u>

(*1) It includes the revenues of DBL and Doosan Mecatec classified as discontinued operations.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

25.1 Disaggregation of revenues (cont'd)

	2021					
	Electro- Materials BG	Digital Innovation BU	Others	Doosan Enerbility (*1)	Doosan Infracore (*1)	Doosan Bobcat
Geographical market:						
Korea	₩ 539,457	₩ 78,086	₩ 661,854	₩ 2,104,036	₩ 1,113,244	₩ 429,944
USA	7,445	4,614	34,549	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	524,066	436,805	404,247	1,121,401
Others	-	-	-	55,999	-	141,078
	<u>₩ 895,398</u>	<u>₩ 96,406</u>	<u>₩ 1,220,860</u>	<u>₩ 4,789,207</u>	<u>₩ 2,625,096</u>	<u>₩ 6,307,838</u>
Timing of revenue recognition:						
Transfer at a point in time	₩ 887,218	₩ 8,567	₩ 171,306	₩ 212,696	₩ 2,553,347	₩ 6,233,292
Transfer over time	8,180	87,839	1,049,554	4,576,511	71,749	74,546
	<u>₩ 895,398</u>	<u>₩ 96,406</u>	<u>₩ 1,220,860</u>	<u>₩ 4,789,207</u>	<u>₩ 2,625,096</u>	<u>₩ 6,307,838</u>

	2021				
	Doosan Engineering & Construction (*1)	Doosan Fuel Cell	Subtotal	Adjustment for discontinued operations (*1)	Total
Geographical market:					
Korea	₩ 1,333,577	₩ 353,208	₩ 6,613,406	₩ (2,183,036)	₩ 4,430,370
USA	-	-	4,857,526	(418,778)	4,438,748
Asia	35,813	-	2,957,646	(967,206)	1,990,440
Middle East	-	-	542,054	(77,067)	464,987
Europe	-	-	2,489,694	(1,104,966)	1,384,728
Others	-	-	197,077	(54,864)	142,213
	<u>₩ 1,369,390</u>	<u>₩ 353,208</u>	<u>₩ 17,657,403</u>	<u>₩ (4,805,917)</u>	<u>₩ 12,851,486</u>
Timing of revenue recognition:					
Transfer at a point in time	₩ 11,784	₩ 256,031	₩ 10,334,241	₩ (2,561,736)	₩ 7,772,505
Transfer over time	1,357,606	97,177	7,323,162	(2,244,181)	5,078,981
	<u>₩ 1,369,390</u>	<u>₩ 353,208</u>	<u>₩ 17,657,403</u>	<u>₩ (4,805,917)</u>	<u>₩ 12,851,486</u>

(*1) It includes the revenues of Doosan Infracore, Doosan Engineering & Construction segment, DBL and Doosan Mecatec classified as discontinued operations.

25.2 Contract balances

Receivables, contract assets and liabilities arising from contracts with customers as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Receivables in trade and other receivables (*1)	₩ 2,149,271	₩ 1,411,174
Contract assets (*2)	1,321,555	1,771,788
Contract liabilities	(2,106,826)	(1,716,889)

(*1) As of December 31, 2022 and 2021, provisions of ₩201,011 million and ₩236,858 million are included.

(*2) As of December 31, 2022 and 2021, provisions of ₩77,170 million and ₩59,571 million are included.

25.2 Contract balances (cont'd)

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, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Incremental cost of obtaining a contract recognized as an asset as of December 31, 2022 and 2021	₩ 25,403	₩ 39,743
Amount of amortization recognized as cost of sales for the years ended December 31, 2022 and 2021	25,045	12,699

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, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Costs to fulfill a contract recognized as assets as of December 31, 2022 and 2021	₩ 143,481	₩ 152,344
Amount of amortization recognized as cost of sales for the years ended December 31, 2022 and 2021	92,614	28,125

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, 2022 and 2021 are as follows (Korean won in millions):

		2022			
Project		Beginning balance	Changes	Recognized construction revenue	Ending balance
Doosan Corporation	Installation of New Renewable Energy System for Housing Reconstruction and Maintenance Project in Jamsil Jinju Apartment	₩ -	₩ 13,979	₩ (3,985)	₩ 9,994
Doosan Enerbility	Vung Ang II Power Project and others	15,479,029	5,438,164	(6,914,217)	14,002,976
Doosan Logistics Solution Co., Ltd.	Coupang Icheon ECH2 FC Automation and others	52,061	30,061	(70,656)	11,466
		15,531,090	5,482,204	(6,988,858)	14,024,436
Inter-company transactions		-	(745)	359	(386)
Amount attributable to discontinued operation segment		(1,313,209)	634,873	678,336	-
		₩ 14,217,881	₩ 6,116,332	₩ (6,310,163)	₩ 14,024,050

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

25.3 Change in the balance of construction contracts (cont'd)

		2021			
Project		Beginning balance	Changes	Recognized construction revenue	Ending balance
Doosan Enerbility	Vung Ang II Power Project and others	₩ 14,023,501	₩ 6,906,874	₩ (5,451,346)	₩ 15,479,029
Doosan Engineering & Construction	Bumil integrated district 3 and others	7,050,375	(5,669,260)	(1,381,115)	-
Doosan Logistics Solution Co., Ltd.	Coupage Icheon ECH2 FC Automation and others	16,295	95,482	(59,716)	52,061
		21,090,171	1,333,096	(6,892,177)	15,531,090
Inter-company transactions		(100,749)	85,679	15,070	-
Amount attributable to discontinued operation segment		(8,363,312)	4,854,536	2,195,567	(1,313,209)
		₩ 12,626,110	₩ 6,273,311	₩ (4,681,540)	₩ 14,217,881

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, 2022 are as follows (Korean won in millions):

		2022					
		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
Doosan Enerbility		₩ 99,573	₩ 996,623	₩ 855,952	₩ 193,834	₩ (53,163)	₩ 193,834
Doosan Logistics Solution Co., Ltd.		17	3,090	7,494	(4,167)	(237)	(4,167)
		₩ 99,590	₩ 999,713	₩ 863,446	₩ 189,667	₩ (53,400)	₩ 189,667

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, 2022. The total contract costs and contract revenue may change in the future.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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

As of December 31, 2022, 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, 2022 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)	
				Total	Accumulated impairment loss	Total	Allowance for doubtful accounts
Shinhanul #1, 2 NSSS	2009-07-31	2023-09-30	97.55	W -	W -	W -	W -
UAE BNPP #1, 2 T/G	2010-06-30	2022-03-01	95.48	-	-	-	-
UAE BNPP #1, 2 NSSS	2010-06-30	2022-07-31	97.16	-	-	-	-
UAE BNPP #3, 4 NSSS	2010-06-30	2024-06-30	96.93	20,018	154	-	-
UAE BNPP #3, 4 T/G	2011-09-27	2024-06-30	93.01	506	4	-	-
Yanbu ph.3 MSF	2012-12-04	2022-12-31	99.72	-	-	-	-
Vinh Tan 4 TPP	2014-02-26	2021-10-31	99.64	20,082	155	24,403	4,881
Sae-ul #3, 4 NSSS(*2)	2014-08-28	2025-03-31	89.06	73,922	569	-	-
Nghi Son 2	2014-12-24	2022-07-10	98.56	-	-	26,928	-
Song Hau 1	2015-04-10	2022-03-31	96.20	-	-	-	-
Sae-ul #3, 4 facilities construction(*2)	2015-06-12	2025-05-28	86.27	93,157	717	-	-
Jawaharpur	2016-12-22	2023-06-30	90.91	57,419	-	11,387	237
Obra C	2016-12-22	2023-06-30	83.53	23,027	-	19,939	127
Samcheok #1, 2 EPC	2018-07-24	2024-04-30	81.98	99,544	766	-	-
Jawa #9, 10	2019-03-20	2025-02-15	60.85	150,112	1,156	2,972	9
Guam Ukudu CCPP	2020-12-18	2024-10-31	35.53	25,340	195	8,193	63
Yanbu 4 IWP	2021-01-22	2023-11-01	59.17	-	-	29,589	228
Vung Ang II Power Project	2021-10-26	2025-10-26	19.32	-	-	36,985	285
Tuwaiq Casting & Forging Facility Project	2022-02-10	2025-01-15	12.82	-	-	32,430	250
Shuaibah 3 IWP	2022-08-19	2025-05-20	4.02	-	-	9,488	73
El-Dabaa NPP	2022-11-09	2029-04-08	0.03	460	4	-	-

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

(*2) During the year ended December 31, 2022, Shin-gori Units 5 and 6 has changed its name to Saeul Units 3 and 4.

26. Expenses by nature

Breakdown of expenses by nature for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Changes in inventories	W (707,285)	W 372,729
Purchases of raw materials and merchandise	8,970,461	6,816,173
Employee benefits expenses	2,231,279	1,875,283
Depreciation and amortization	611,217	488,025
Others	4,764,059	2,378,218
	W 15,869,731	W 11,930,428

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

27. Selling and administrative expenses

Selling and administrative expenses for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Salaries	₩ 618,257	₩ 524,428
Retirement benefits	61,171	47,158
Employee benefits	107,757	92,496
Share-based payment expenses	6,531	-
Travel expenses	44,365	21,077
Sales commission	36,146	33,465
Taxes and dues	25,553	24,573
Depreciation	63,973	55,628
Insurance expenses	43,384	29,831
Repairing expenses	6,442	5,045
Advertising expenses	80,175	51,605
Packaging expenses	674	1,864
Research and development	223,099	168,866
Training expenses	14,707	7,798
Freight expenses	31,122	25,405
Promotional expenses	4,432	4,867
Commission expenses	154,378	105,913
Service contract expenses	7,115	9,348
(Reversal of) bad debt expenses	18,159	14,212
Amortization	53,067	45,419
Expansion expenses of overseas market	13,160	10,986
Warranty expenses	24,466	1,473
Others	73,885	4,403
	₩ 1,712,018	₩ 1,285,860

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

28. Finance income and expenses

Finance income and expenses for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Finance income:		
Interest income	₩ 33,083	₩ 27,457
Dividend income	3,864	1,383
Gain on foreign currency transaction	331,640	131,874
Gain on foreign currency translation	136,958	121,292
Gain on derivative transactions	139,557	245,675
Gain on valuation of derivatives	95,346	100,135
Gain on valuation of firm commitment	67,459	117,275
Financial guarantee income	219	345
Gain on repayment of borrowings	-	3,860
	808,126	749,296
Finance expenses:		
Interest expense	364,849	365,226
Loss on foreign currency transactions	373,178	131,822
Loss on foreign currency translations	306,745	187,512
Loss on derivative transactions	100,947	76,200
Loss on valuation of derivatives	96,825	240,395
Loss on valuation of firm commitment	54,165	7,665
Loss on repayment of bonds	16,547	-
Loss on repayment of borrowings	10,675	989
Financial guarantee expense	52,781	57,684
Others	2,756	1,894
	1,379,468	1,069,387
	₩ (571,342)	₩ (320,091)

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

29. Other non-operating income and expenses

Other non-operating income and expenses for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022		2021
Other non-operating income:			
Gain on disposal of short-term investment securities	₩ 3,660	₩	4,097
Gain on disposal of long-term investment securities	2,071		-
Gain on valuation of long-term and short-term investment securities	24,456		20,158
Gain on disposal of property, plant and equipment	3,908		9,385
Gain on disposal of intangible assets	915		1,177
Gain on disposal of assets held for sale	18,524		74,947
Gain on disposal of investment properties	2,347		2,007
Gain on valuation of investment properties	5,399		24,979
Reversal of impairment loss of property, plant and equipment	-		43
Reversal of impairment loss of intangible asset	-		266
Reversal of impairment loss of long-term investment securities	19		-
Others	107,940		15,228
	<u>169,239</u>		<u>152,287</u>
Other non-operating expenses:			
Loss on disposal of short-term investment securities	1,446		-
Loss on disposal of long-term investment securities	548		-
Loss on valuation of long-term and short-term investment securities	64,685		3,090
Loss on disposal of trade receivables	7,840		6,590
Loss on disposal of property, plant and equipment	4,463		2,381
Loss on disposal of intangible assets	1,134		12
Loss on disposal of investment properties	864		-
Loss on disposal of investments in subsidiaries	-		1,116
Loss on disposal of assets held for sale	5,206		2,934
Impairment loss of property, plant and equipment	30,572		8,171
Impairment loss of intangible assets	422,688		28,630
Impairment loss of assets held for sale	340		2,487
Loss on valuation of investment properties	13,254		46,774
Bad debt expenses of others	13,230		3,161
Donations	17,762		9,222
Others	82,558		49,251
	<u>666,590</u>		<u>163,819</u>
	<u>₩ (497,351)</u>	₩	<u>(11,532)</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

30. Income tax expenses

Details of income tax expenses for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Current income tax charge on profit for the year	₩ 439,233	₩ 573,984
Deferred tax:		
Origination and reversal of temporary differences	(184,628)	80,444
Charged or credited directly to equity	(96,587)	(176,320)
Others	43,326	(31,835)
Income tax expenses (benefit) classified as loss (profit)		
from discontinued operations	9,988	(198,918)
Income tax expenses	<u>₩ 211,332</u>	<u>₩ 247,355</u>

Changes in deferred tax assets and liabilities for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022		
	Beginning balance	Changes	Ending balance
Allowance for doubtful accounts	₩ 301,139	₩ 9,354	₩ 310,493
Derivatives	27,254	(41,603)	(14,349)
Property, plant, equipment and Investment properties	(589,883)	32,348	(557,535)
Intangible assets	(416,811)	(25,052)	(441,863)
Assets and liabilities in foreign currencies	3,870	7,667	11,537
Defined benefit liabilities	187,464	(44,088)	143,376
Others	255,421	238,334	493,755
	<u>₩ (231,546)</u>	<u>₩ 176,960</u>	<u>₩ (54,586)</u>
	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	(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
	<u>₩ (170,589)</u>	<u>₩ (60,957)</u>	<u>₩ (231,546)</u>

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, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Deductible temporary differences	₩ 3,142,021	₩ 2,683,453
Net loss carried over	44,856	267,994
Carried forward tax credit	52,691	168,920
	<u>₩ 3,239,568</u>	<u>₩ 3,120,367</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

30. Income tax expenses (cont'd)

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.

Temporary differences from investments in subsidiaries, joint ventures and associated investments, which are not recognized as deferred tax assets (liabilities), as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021	Remarks
Investments in subsidiaries	₩ (724,298)	₩ (1,066,794)	Able to control the timing of the reversal of the temporary difference
Investments in associates and joint ventures	961,467	1,740,720	Probable that the temporary difference will not reverse in the foreseeable future
	<u>₩ 237,169</u>	<u>₩ 673,926</u>	

A reconciliation of income tax expenses and profit before income tax expenses for the years ended December 31, 2022 and 2021 is as follows (Korean won in millions):

	2022	2021
Profit (loss) before income tax expenses	₩ (285,904)	₩ 592,868
Tax expense by applicable tax rates	90,895	225,248
Adjustments:		
Non-taxable income and non-deductible expenses	57,005	(75,852)
Tax credits	(47,448)	(14,194)
Temporary difference not recognized as deferred income tax	89,183	(21,718)
Others	21,697	133,871
Income tax expenses	<u>₩ 211,332</u>	<u>₩ 247,355</u>
Average effective tax rate (Income tax expenses/Profit before income tax expenses)	-	41.7%

31. Earnings (losses) per share

31.1 Basic earnings (losses) per share

Basic earnings (losses) per share for the years ended December 31, 2022 and 2021 are as follows (Korean won):

	2022		
	Continuing	Discontinued	Total
Basic earnings (losses) per ordinary share	₩ (37,159)	₩ (1,973)	₩ (39,132)
Basic earnings (losses) per old-type preferred share (*1)	(37,112)	(1,970)	(39,082)
	2021		
	Continuing	Discontinued	Total
Basic earnings (losses) per ordinary share	₩ (1,321)	₩ 12,767	₩ 11,446
Basic earnings (losses) per old-type preferred share (*1)	(1,326)	12,822	11,496

(*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*.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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, 2022 and 2021 is as follows (Korean won):

	2022		
	Continuing	Discontinued	Total
Profit (loss) for the year attributable to the equity holders of the Company	₩ (662,955,184,798)	₩ (33,443,656,690)	₩ (696,398,841,488)
Less: Profit (loss) attributable to new-type preferred Shares	33,073,739,148	-	33,073,739,148
Less: Profit (loss) attributable to old-type preferred shares	127,376,227,430	6,763,061,287	(134,139,288,717)
Profit (loss) for the year attributable to the ordinary equity holders of the Company	<u>₩ (502,505,218,220)</u>	<u>₩ (26,680,595,403)</u>	<u>₩ (529,185,813,623)</u>
	2021		
	Continuing	Discontinued	Total
Profit (loss) for the year attributable to the equity holders of the Company	₩ (12,738,049,763)	₩ 216,646,846,784	₩ 203,908,797,021
Less: Profit (loss) attributable to new-type preferred Shares	(9,673,609,498)	-	(9,673,609,498)
Less: Profit (loss) attributable to old-type preferred shares	4,552,560,044	(44,008,244,410)	(39,455,684,366)
Profit (loss) for the year attributable to the ordinary equity holders of the Company	<u>₩ (17,859,099,217)</u>	<u>₩ 172,638,602,374</u>	<u>₩ 154,779,503,157</u>

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, 2022 and 2021 are as follows:

	2022		2021	
	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	<u>13,522,969</u>	<u>3,432,220</u>	<u>13,522,969</u>	<u>3,432,220</u>

31.2 Diluted earnings (losses) per share

Diluted earnings (losses) per share for the years ended December 31, 2022 and 2021 are as follows (Korean won):

	2022		
	Continuing	Discontinued	Total
Diluted earnings (losses) per ordinary share	₩ (37,159)	₩ (1,973)	₩ (39,132)
Diluted earnings (losses) per old-type preferred share	(37,112)	(1,970)	(39,082)
	2021		
	Continuing	Discontinued	Total
Diluted earnings (losses) per ordinary share	₩ (1,321)	₩ 12,767	₩ 11,446
Diluted earnings (losses) per old-type preferred share	(1,326)	12,822	11,496

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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, 2022 and 2021 is as follows (Korean won):

	2022		
	Continuing	Discontinued	Total
Profit (loss) for the year attributable to the ordinary equity holders of the Company	₩ (502,505,218,220)	₩ (26,680,595,403)	₩ (529,185,813,623)
Adjustment	-	-	-
Diluted profit (loss) for the year attributable to the ordinary equity holders of the Company	<u>₩ (502,505,218,220)</u>	<u>₩ (26,680,595,403)</u>	<u>₩ (529,185,813,623)</u>
	2021		
	Continuing	Discontinued	Total
Profit (loss) for the year attributable to the ordinary equity holders of the Company	₩ (17,859,099,217)	₩ 172,638,602,374	₩ 154,779,503,157
Adjustment	-	-	-
Diluted profit (loss) for the year attributable to the ordinary equity holders of the Company	<u>₩ (17,859,099,217)</u>	<u>₩ 172,638,602,374</u>	<u>₩ 154,779,503,157</u>

Diluted weighted-average number of ordinary shares outstanding for the years ended December 31, 2022 and 2021 is as follows:

	2022	2021
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	<u>13,522,969</u>	<u>13,522,969</u>

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, 2022, Doosan Enerbility Co., Ltd., a subsidiary, has signed a financing agreement of ₩5,256 million with Gyeonggi East-West Beltway Co. in connection with the construction of Bongdam-Songsan Expressway, and provided 3 blank checks as collateral.

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 below 700%, establish collateral rights within 500% of its own equity and limit disposal of an asset within 100% of total asset stated in the Company's consolidated financial statements. If the Company fails to meet certain requirements mentioned above, an acceleration clause included in the subscription agreement would be invoked for the immediate payment. As of December 31, 2022, the amount of bonds required to meet aforementioned debt covenant is ₩297,000 million.

As of December 31, 2022, the total amount of ₩227,000 million including short-term borrowings and asset-backed loans borrowed from China Bank and others is subject to commitment requiring the Company to maintain BBB0 of credit rating during the term of the borrowing agreement. If the Company fails to maintain the credit rating, an acceleration clause included in the borrowing agreement would be invoked.

₩400,000 million long-term loan borrowed from New Star Eneo Ville The 1st Co., Ltd. includes is subject to commitment requiring the Company to maintain a credit rating of BBB- or higher during the term of the borrowing agreement. If the Company fails to maintain the credit rating, an acceleration clause would be invoked. The borrowings are secured by 37,180,000 ordinary shares in Doosan Enerbility Co., Ltd. held by the Company, and additional collateral must be provided in the event of failure to meet the pledged collateral maintenance ratio.

32.2.2 Doosan Enerbility Co., Ltd.

As of December 31, 2022, USD 300,000 thousand of foreign currency bonds issued by Doosan Enerbility Co., Ltd., a subsidiary, contains a put option which can be exercised when and if Doosan Enerbility Co., Ltd.'s guarantor, Korea Development Bank, becomes privatized. In addition, Doosan Enerbility Co., Ltd. has provided its 13,884,989 shares in Doosan Bobcat Inc. to lender as collateral for above bonds. If the price of the shares drops below the base price, additional shares or deposits equivalent to the difference should be provided as collateral.

As of December 31, 2022, Doosan Enerbility Co., Ltd., a subsidiary, has provided its 2,954,548 shares in Doosan Bobcat Inc. as collateral for borrowings of ₩55,000 million from Korea Development Bank and 2 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 Doosan Enerbility Co., Ltd. receives the long-term credit rating lower than BB0 level from two or more domestic credit rating agencies out of three agencies (i.e., Nice Investors Service Co., Ltd., Korea Investors Service Inc. and Korea Ratings Corporation), an acceleration clause included in the borrowing agreement would be invoked.

As of December 31, 2022, Doosan Enerbility Co., Ltd., a subsidiary, has provided 11,100,000 shares of Doosan Bobcat Inc. as collateral for borrowings of ₩250,000 million from Korea Development Bank and 3 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 Doosan Enerbility Co., Ltd. is below BB0, it includes arrangements that constitute trigger clause for the financial institutions to collect the loans before the maturity.

32.2.2 Doosan Enerbility Co., Ltd. (cont'd)

As of December 31, 2022, Doosan Enerbility Co., Ltd. has provided 3,650,000 shares of Doosan Bobcat Inc. 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, Doosan Enerbility Co., Ltd. should provide additional shares or deposits as collaterals or make early redemption of part of the borrowings.

As of December 31, 2022, ₩23,374 million of the 59th and the 60th convertible bonds issued by Doosan Enerbility Co., Ltd., a subsidiary, include an acceleration clause that shall be invoked when the entity fails to maintain its credit rating at BB0 or above.

As of December 31, 2022, ₩160,000 million of the 73rd and 74th public bonds issued by Doosan Enerbility Co., Ltd., a subsidiary, include an acceleration clause that shall be invoked when the entity fails to maintain its debt-to-equity ratio below 700%.

As of December 31, 2022, 4,800,000 shares in Doosan Bobcat Inc. held by Doosan Enerbility Co., Ltd., a subsidiary, are provided as collateral for ₩80,000 million of loan agreement signed with Korea Securities Finance Co., Ltd. and if the entity fails to meet the pledged collateral limit ratio defined in the above borrowing agreement, additional shares equivalent to the difference must be provided as collateral, or otherwise, a portion of loans must be repaid earlier.

As of December 31, 2022, 600,000 shares of Doosan Bobcat Inc. held by Doosan Enerbility Co., Ltd., a subsidiary, are provided as collateral for the short-term loan of ₩10,000 million borrowed from Shinhan Investment & Securities Co., Ltd., and if the entity fails to meet the pledged collateral limit ratio defined in the above borrowing agreement, additional shares equivalent to the difference must be provided as collateral, or otherwise, a portion of loans must be repaid earlier.

As of December 31, 2022, Doosan Enerbility Co., Ltd., a subsidiary, has provided 5,500,000 shares in Doosan Bobcat Inc. and 20,780,229 shares in Doosan Fuel Cell Co., Ltd. as collateral for borrowings of ₩500,000 million from NH Investment and ₩100,000 million of the 72nd Private placement bonds. If the entity fails to meet the pledged collateral limit ratio defined in the applicable agreement, additional shares or deposits equivalent to the difference must be provided as collateral. In addition, if Doosan Enerbility Co., Ltd. receives the long-term credit rating lower than BB+ level or the short-term credit rating lower than B+ level from one or more domestic credit rating agencies out of three agencies (i.e., Nice Investors Service Co., Ltd., Korea Investors Service Inc. and Korea Ratings Corporation), or otherwise, fails to obtain any effective credit rating, an acceleration clause included in the applicable agreement would be invoked.

As of December 31, 2022, 2,000,000 shares in Doosan Fuel Cell Co., Ltd. held by Doosan Enerbility Co., Ltd. are provided as collateral for ₩50,000 million of borrowings from Standard Chartered Bank of Korea, and If the entity fails to meet the pledged collateral limit ratio defined in the above borrowing agreement, additional shares or deposits equivalent to the difference must be provided as collateral, or otherwise, a portion of loans must be repaid earlier.

32.3 Discounted trade receivables

As of December 31, 2022, in relation to the asset-backed loans, the Group recognizes financial instruments including trade receivables which do not meet the criteria for the derecognition of financial instruments at the carrying amount of ₩25,840 million (2021: ₩26,163 million) in the consolidated statement of financial position (see Note 15 and 33).

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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	Claims for damages and others	₩ 4,653
Doosan Enerbility	Claims for damages of Magok Doosan The Land Park and others	98,736
Doosan Bobcat	Claims for damages and others	3,023
Doosan Cuvex Co., Ltd	Claims for damages and others	60
		₩ 106,472

The outcome of lawsuits cannot be estimated reliably as of December 31, 2022.

32.5 Technical contract

The Group has technical license agreements with Mitsubishi Hitachi Power Systems, Ltd. and others for the year ended December 31, 2022 and the Group paid ₩21,501 million and ₩14,144 million for the years ended December 31, 2022 and 2021, respectively, as license fee.

32.6 Credit lines for borrowings

The Group has credit lines of borrowing, bank overdraft and others amounting to ₩5,735,345 million from various financial institutions as of December 31, 2022.

32.7 Guarantees of payment

Guarantees of payment provided by the Group as of December 31, 2022 are as follows (Korean won in millions):

Provided by	Provided to	Guarantee amounts
Doosan Enerbility	The complex of Ungcheon-dong, Yeosu projects' customers and others	₩ 203,956
	Employee stockholders association	16,987
Doosan Bobcat	End customer and others	166,987
Doosan Fuel Cell Co., Ltd.	Employee stockholders association	10,876
		₩ 398,806

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 (Doosan Fuel Cell Co., Ltd. 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.

Details of payment guarantees provided by the Group to related parties as of December 31, 2022 are as follows (Korean won in millions):

Provided by	Provided to	Guarantee amounts
Doosan Enerbility Co., Ltd.	Doosan Engineering & Construction Co.,Ltd.	₩ 10,459

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

32.7 Guarantees of payment (cont'd)

Guarantees of payment provided by third parties to the Group as of December 31, 2022 are as follows (Korean won in millions):

Provided to	Provided by	December 31, 2022
Doosan Corporation	Korea Development Bank and others	₩ 17,211
	Seoul Guarantee Insurance	44,746
	Korea Software Financial Cooperative (*1)	7,233
	Woori Bank and others	25,934
	Machinery Financial Cooperative	12,265
	Oricom Inc.	Seoul Guarantee Insurance
Doosan Bears Inc.	Seoul Guarantee Insurance	5,323
Hancomm Inc.	Seoul Guarantee Insurance	1,522
Doosan Logistics Solutions Co., Ltd.	Seoul Guarantee Insurance	5,183
	Hana Bank	1,682
Doosan Tesna Inc.	Seoul Guarantee Insurance	59
Doosan Robotics Inc.	Seoul Guarantee Insurance	644
Doosan Business Research Institute		285
	Seoul Guarantee Insurance	521
Doosan Enerbility Co., Ltd.	Korea Exim Bank	227,237
	Machinery Financial Cooperative	1,855,156
	Seoul Guarantee Insurance	161,591
	Construction Guarantee	915,364
	Construction Industry Guarantee	288,391
	Hana Bank	41,198
	Engineering Guarantee Insurance	473,081
	Korea Federation of Small and Medium Business	35,409
	Korea Trade Insurance Corporation	143,994
	Korea Development Bank (*2)	384,467
Others	4,158,790	
Doosan Bobcat Inc.	Machinery Financial Cooperative	4,064
	Seoul Guarantee Insurance	823
	Woori Bank	2,803
	Shinhan Bank	18,173
Doosan Fuel Cell Co., Ltd.	Machinery Financial Cooperative	59,357
	Seoul Guarantee Insurance	124,680
	<u>₩</u>	<u>9,017,456</u>

(*1) In connection with this, as of December 31, 2022, equity share of ₩272 million is provided as collateral.

(*2) As a subsidiary, Doosan Enerbility Co., Ltd. is provided with payment guarantees for foreign bonds of USD 300,000 thousand 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, 2022 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
Doosan Corporation:			
D-Pay 3rd Co., Ltd. (*1)	The duty to replenishment of principal and interest of borrowings and others	₩ 197,000	₩ 236,400
Doosan Bears Inc.: NewstarBears Co., Ltd. (*2)		8,800	10,560

(*1) D-Pay 3rd 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 ₩197,000 million as of December 31, 2022.

(*2) NewStarBears Co., Ltd. was established for the purpose of securitizing future accounts receivable of Doosan Bears Inc., a subsidiary. It is mainly financed by issuing ABLs from financial institutions. Based on the book value presented in its financial statements, underlying amounted to ₩8,800 million as of December 31, 2022.

32.9 Agreement between shareholders

The Company has entered into a contract between investors and shareholders in relation to the issuance of shares in the following subsidiaries during the year ended December 31, 2022. Details are as follows.

	Doosan Robotics Inc.	Doosan Mobility Innovation Inc.
Outstanding shares	441,998 Ordinary shares	279,670 Redeemable convertible preference shares
Amount issued	₩40,000 million	₩29,000 million
Investor's put option	In the event of a specific reason, an investor may request the Company to purchase all or part of ordinary shares that the investor holds. A purchase request could be made at the higher of the amount of the issuance plus a certain level of return on investment and the appraisal amount of the accounting firm.	In the event of a specific reason, an investor may request the Company to purchase all or part of redeemable convertible preferred shares the investor holds. A purchase request could be made at the higher of the amount of the issuance plus a certain level of return on investment and the appraisal amount of the accounting firm.
Investor's tag-along right	If the majority of Doosan Robotics Inc. shares held by the Company are sold to a third party, the investor has the right to jointly sell the shares with the Company.	If the majority of Doosan Mobility Innovation Inc. shares held by the Company are sold to a third party, the investor has the right to jointly sell the shares with the Company.

32.10 Other commitments

The Company sold Doosan Tower, located in 275, Jangchungdan-ro, Jung-gu, Seoul, as of September 28, 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 10,000 thousand), and the remaining investment commitment is USD 5,238 thousand as of December 31, 2022.

The Company entered into a lease contract for land located in Jungjang-ri, Anmyeon-eup, Taean-gun, Chungcheongnam-do. As of January 25, 2022, the Company has received a total rent of ₩90,000 million from the tenant for a total lease period of 25 years (i.e., a rent until January 25, 2047). The rent is amortized through straight-line method during the lease period and is recognized as rental income in the statements of profit or loss. In this regard, other non-current liabilities (long-term unearned revenues) of ₩82,800 million and other current liabilities (unearned revenues) of ₩3,600 million are recognized for the year ended December 31, 2022. Meanwhile, superficies and leasehold interest are established by the tenant on the land.

Doosan Property Co., Ltd., a subsidiary, has 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 to a five-year lease contract with Doosan Enerbility Co., Ltd., Doosan Bobcat Inc., and Hyundai Doosan Infracore Co., Ltd. (formerly, Doosan Infracore Co., Ltd.) after the sale of Bundang Doosan Tower. In this regard, the Group has been responsible for a part of Bundang Doosan Tower for five years since the sale. If the Group fails to meet certain conditions, the lease agreement will be extended on the same terms once for 5 years. On December 31, 2022, Hyundai Doosan Infracore Co., Ltd. withdrew from the lease agreement, and Doosan Enerbility Co., Ltd. took over the related status, rights and obligations. Meanwhile, Doosan Property Co., Ltd. was absorbed and merged into Doosan Cuvex Co., Ltd., the Company's subsidiary, and was extinguished.

The Group accounted for the aforementioned joint lease contract as a joint operation 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*. The participation share ratio of the Group for the year ended December 31, 2022 is 78.9%, and due to the exclusion of the joint lease agreement with Hyundai Doosan Infracore Co., Ltd. described in the former paragraph above, the participation share ratio of the Group has changed to 100% as of December 31, 2022.

As of December 31, 2022, Doosan Enerbility Co., Ltd, a subsidiary, has signed a contract to assume a liability (limit: ₩296,475 million) if it fails to complete construction of the 3rd apartment units in Yangsan Deokgye, 5th apartment units in Yangsan Deokgye, Suncheon Urban Development Project, Dapsimni Officetel Development Project and Suwon Mangpo Knowledge Industry Center.

Doosan Enerbility Co., Ltd, 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, Doosan Enerbility Co., Ltd 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. Meanwhile, Doosan Enerbility Co., Ltd. received a credit rating of BBB0 (Stable) from two or more credit rating agencies as of December 31, 2022, and completed the return of existing reserves during the year ended December 31, 2022 owing to criteria for exemption from the accumulation obligation that it satisfied.

As of December 31, 2022, if Doosan Enerbility Co., Ltd sells Doosan Engineering & Construction Co.,Ltd.'s ordinary shares (53.65%) held by The Zenith Holdings Ltd., it will compensate investors for the shortfall within the return on Doosan Engineering & Construction Co.,Ltd.'s ordinary shares (46.35%) held by Doosan Enerbility Co., Ltd 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).

32.10 Other commitments (cont'd)

Doosan Enerbility Co., Ltd., the Group's subsidiary, acquired preferred shares in Nuscale Power LLC with Nuscale Korea LLC and others ("financial investors") in 2019 and 2021. Doosan Enerbility Co., Ltd signed a put option contract, in which can be exercised when specific conditions and others, are not satisfied, for the preferred shares of USD 12,605 thousand that is acquired by external financial investors.

The Group classifies the put option contract as derivatives, and there is no amount recognized as gain or loss on valuation of derivatives or derivative liabilities as of the December 31, 2022.

As of December 31, 2022, Doosan Enerbility Co., Ltd., a subsidiary, has entered into a financing supplement agreement of ₩84,638 million, corresponding to the amount of credit provided to Woori Bank and Doosan Mecatec Co., Ltd. pursuant to the terms of the Doosan Mecatec Co., Ltd.'s Stock Purchase Agreement.

Clark Equipment Co. and Doosan Bobcat EMEA s.r.o, the two subsidiaries, have signed a Supply Chain Financing contract, and recognized USD 50,054 thousand as trade payables related thereto.

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 1,869 thousand.

Daesan Green Energy Co., Ltd., an associate of Doosan Fuel Cell Co., Ltd., has signed a loan agreement of ₩200,000 million with financial institutions such as Korea Development Bank and others. In this regard, the investors of Daesan Green Energy Co., Ltd. (i.e., Doosan Fuel Cell Co., Ltd. and other shareholders) have signed an investor agreement with 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 Doosan Fuel Cell Co., Ltd. is obligated to provide expenses for the performance of settlement obligations, and others, 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.

In connection with the above funding agreement, Doosan Fuel Cell Co., Ltd. provided ₩1,004 million of capital to Daesan Green Energy Co., Ltd. during the year ended December 31, 2022.

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.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

33. Pledged assets

The Group pledged certain assets as collateral for its long-term and short-term borrowings as of December 31, 2022 as follows (Korean won in millions):

Provided by	Pledged assets	Institution	Financial liabilities	Pledged amount
Doosan	Short-term financial instruments, property, plant and equipment, Investments in subsidiaries and others(*1)	New Star Eneo Ville The 1st Co., Ltd. and others	₩ 456,686	₩ 916,278
Doosan Investment Co., Ltd	Investments in subsidiaries, long-term investment securities and others	Shinhan Bank and others	243,639	245,639
Doosan Tesna Inc.	Property, plant and equipment	Korea Development Bank and others	192,975	250,100
Doosan Enerbility	Property, plant and equipment (*2)	Korea Development Bank and others	948,972	1,248,390
	Investments in subsidiaries and equity share (*2,3)	Korea Development Bank and others	1,733,542	2,376,256
Doosan Bobcat	Property, plant and equipment	Shinhan Bank and others	64,510	95,604
	Inventories	Wells Fargo Bank	16,267	224,557
	Property, plant and equipment, intangible assets and Investments in subsidiaries	Multiple Institutional Investors and Banks in the United States	1,132,491	2,556,026
Doosan Cuvex Co., Ltd	Beneficiary certificates (*4)	Woori Bank	20,000	24,000
Doosan Fuel Cell Co., Ltd.	Property, plant and equipment.	Korea Development Bank	50,000	60,000
			<u>₩ 4,859,082</u>	<u>₩ 7,996,850</u>

(*1) As of December 31, 2022, the Company must provide additional collateral for ₩400,000 million of long-term borrowings borrowed from New Star Eneo Ville The 1st Co., Ltd. and others if the Company fails to maintain the contracted collateral limit (see Note 32).

(*2) As of December 31, 2022, Doosan Enerbility Co., Ltd. has provided 42,489,537 shares in Doosan Bobcat Inc., 22,780,229 shares in Doosan Fuel Cell Co., Ltd. and land as collateral regarding its bonds and borrowing agreement. (see Note 32)

(*3) As of December 31, 2022, a total of 50,000,000 shares in Doosan Engineering & Construction Co., Ltd. held by Doosan Enerbility Co., Ltd. are provided as collateral in connection with Doosan Enerbility Co., Ltd.'s payment guarantee.

(*4) This is a real estate security trust beneficiary certificates for property, plant and equipment.

In addition, collateral is established for ₩25,840 million, including trade receivables recognized in the consolidated financial statements, in relation to the Group's liquidated debt (see Notes 15 and 32.3).

33. Pledged assets (cont'd)

Other collateral details provided by the Group as of December 31, 2022 are as follows (Korean won in millions):

As of December 31, 2022, Doosan Enerbility Co., Ltd., a subsidiary, has pledged to complete its responsibility in connection with the construction project for the EPCs of Samcheok Thermal Power Plant Units 1 and 2. In addition, 1,193,066 shares of Samcheok Blue Power Co., Ltd (book value: ₩31,876 million) held by Doosan Enerbility Co., Ltd. are provided as collateral for the Company's project financing, and the right to pledge is set with the PF lender, Korea Development Bank.

As of December 31, 2022, Doosan Enerbility Co., Ltd., a subsidiary, has provided part of its land, buildings, and machinery (pledged amount: ₩420,000 million) located in Changwon factory, and all of its shares in Doosan Power Systems S.A. (pledged amount: GBP 293 million) as collateral, in relation to the export guarantee insurance limit contract with a limit to ₩459,000 million, which was entered into with Korea Trade Insurance Corporation.

As of December 31, 2022, Doosan Enerbility Co., Ltd., a subsidiary, has pledged to complete its responsibility in connection with the Changwon hydrogen liquefaction project. In addition, 1,400,000 shares in Hychangwon Co., Ltd. (book value: ₩7,013 million) held by Doosan Enerbility Co., Ltd. are provided as collateral for the Company's project financing, and the right to pledge is set with the PF lender, Kyongnam Bank.

As of December 31, 2022, Doosan Enerbility Co., Ltd., a subsidiary, is providing 3,400,000 shares in Doosan Bobcat Inc. equivalent to the credit size (₩20,116 million) of Doosan Mecatec Co., Ltd. as collateral to Korea Development Bank pursuant to the terms of the Doosan Mecatec Co., Ltd.'s Stock Purchase Agreement.

As of December 31, 2022, Doosan Enerbility Co., Ltd., a subsidiary, is providing ₩8,043 million in deposits to Korea Securities Finance Co., Ltd. as collateral in connection with employee's Stock Ownership Association's acquisition fund loan.

As of December 31, 2022, the equity shares of Machinery Financial Cooperative and Construction Industry Guarantee acquired by the Group for business activities are provided as collateral to the cooperative.

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
Doosan Enerbility Co., Ltd	Long-term investment securities (*1)	₩ 1,424	Kookmin Bank and others	Gyeonggi East-West Beltway Co.
Doosan Fuel Cell Co., Ltd.	Investments in associates	2,476	Korea Development Bank	Daesan Green Energy Co., Ltd.
		<u>₩ 3,900</u>		

(*1) As of December 31, 2022, out of Doosan Enerbility Co., Ltd.'s long-term investment securities, shares in Gyeonggi East-West Beltway Co. are provided as collateral for the Company's project financing.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

34. Related party transactions

Details related to the disclosure of related parties as of December 31, 2022 and 2021 are as follows:

	December 31, 2022	December 31, 2021	Remarks
Associates	KDDI Korea Corporation	KDDI Korea Corporation	-
	-	Wise Fashion, Co., Ltd.	-
	PT. SEGARA AKASA	PT. SEGARA AKASA	-
	Mastern Professional Investment Type Private Security Investment Trust No.98	Mastern Professional Investment Type Private Security Investment Trust No.98	-
	SiO2 Medical Products, Inc.	SiO2 Medical Products, Inc.	-
	Versogen, Inc.	-	-
	TTC House Inc.	-	-
	Protera SAS	Protera SAS	-
	Stathera IP Holding Inc.	Stathera IP Holding Inc.	-
	Folletto Robotics Co., Ltd..	-	-
	MARCONI Growth No. 1 Private Equity Fund	-	-
	-	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.	-
	Tuwaiq Casting & Forging Company	-	-
	-	ReCarbon, Inc.	-
	Doosan Engineering & Construction Co.,Ltd.	Doosan Engineering & Construction Co.,Ltd.	-
	Daesan Green Energy Co., Ltd.	Daesan Green Energy Co., Ltd.	-
	Prestolite Asia Ltd.	Prestolite Asia Ltd.	-
	Ainstein AI, Inc.	Ainstein AI, Inc.	-
	-	StructionSite Inc.	-
	Bundang Doosan Tower Reit Co., Ltd.	Bundang Doosan Tower Reit Co., Ltd.	-
Multi-asset ESG Sea Wind Power General Private Equity Investment Trust No. 1	-	-	
Joint ventures	Sichuan Kelun-Doosan Biotechnology Company Limited	Sichuan Kelun-Doosan Biotechnology Company Limited	-
	-	Doosan Babcock W.L.L.(formely, Doosan Babcock Blackcat W.L.L.)	-
	Weve Holdings Ltd.	Weve Holdings Ltd.	-
Other related parties	The Zenith Holdings Ltd.	The Zenith Holdings Ltd.	-
	Doosan Yonkang Foundation	Doosan Yonkang Foundation	(*1)
	-	Doosan Credit Union	(*1)
	Doosan Credit Union Valuegrowth Co., Ltd.	Valuegrowth Co., Ltd	-
	-	The Path With you (formerly, Dongdaemun Future Foundation)	(*2)
-	Wonsang Co., Ltd.	-	(*1)
Chung-Ang University and others	Chung-Ang University and others	(*1)	

(*1) 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.

(*2) During the year ended December 31, 2022, it was excluded from companies belonging to the same large-scale enterprise group under the Monopoly Regulation and Fair Trade Act.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

34. Related party transactions (cont'd)

Significant transactions for the years ended December 31, 2022 and 2021, between the Group and related parties are as follows (Korean won in millions):

Related parties	2022					
	Sales	Other income	Others (disposal of assets and other)	Purchases	Other expenses	Others (acquisition of assets and other)
Associates:						
PT. SEGARA AKASA	₩ 1	₩ -	₩ -	₩ -	₩ -	₩ -
Mastern Professional Investment Type Private Security Investment Trust No.98	-	-	-	60	12,929	-
Folletto Robotics Co., Ltd..	720	-	-	2,853	14	-
The HS-City Expressway(*1)	9	-	-	-	-	-
Samcheok Blue Power Co., Ltd.	416,708	-	-	-	-	-
Neo Trans Co., Ltd. (*2)	-	-	-	-	-	-
New Seoul Railroad Co., Ltd. (*2)	-	-	-	-	-	-
Hychangwon Co., Ltd.	53,696	-	-	-	-	-
Tuwaiq Casting & Forging Company	137,852	-	-	-	-	-
Incheon Fuel Cell Co., Ltd. (*2)	-	-	-	-	-	-
Bit Goeul Echo Energy Co., Ltd. (*2)	-	-	-	-	-	-
Doosan Engineering & Construction Co.,Ltd. (*3)	35,746	148	-	38	4,424	1,234
Daesan Green Energy Co., Ltd.	14,523	-	-	-	43	-
Bundang Doosan Tower Reit Co., Ltd.	-	-	-	-	18,023	-
	<u>659,255</u>	<u>148</u>	<u>-</u>	<u>2,951</u>	<u>35,433</u>	<u>1,234</u>
Joint ventures:						
Tianjin Lovol Doosan Engine Co. Ltd.(*2)	-	-	-	-	-	-
Doosan Infracore Liaoning Machinery Sales Co., Ltd.(*2)	-	-	-	-	-	-
Other related parties:						
Doosan Yonkang Foundation	1,593	-	-	333	4,824	-
Chung-Ang University and others	30	-	-	1,643	10,343	-
Doosan Credit Union	241	-	-	-	323	-
Valuegrowth Co., Ltd.(*3)	812	-	-	-	-	-
The Path With you (*1)	19	-	-	-	19	-
Wonsang Co., Ltd.	91	-	-	-	-	-
Others	-	-	-	-	-	-
	<u>2,786</u>	<u>-</u>	<u>-</u>	<u>1,976</u>	<u>15,509</u>	<u>-</u>
	<u>₩ 662,041</u>	<u>₩ 148</u>	<u>₩ -</u>	<u>₩ 4,927</u>	<u>₩ 50,942</u>	<u>₩ 1,234</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

34. Related party transactions (cont'd)

Related parties	2021					
	Sales	Other income	Others (disposal of assets and other)	Purchases	Other expenses	Others (acquisition of assets and other)
Associates:						
PT. SEGARA AKASA	₩ 1	₩ -	₩ -	₩ -	₩ -	₩ -
Mastern Professional Investment Type Private Security Investment Trust No.98	31	-	-	55	14,012	-
Folletto Robotics Co., Ltd.	-	-	-	-	-	-
The HS-City Expressway(*1)	16	-	-	-	-	-
Samcheok Blue Power Co., Ltd.	529,661	-	-	-	-	-
Neo Trans Co., Ltd. (*2)	8,685	-	-	-	649	-
New Seoul Railroad Co., Ltd. (*2)	51,399	-	-	-	-	-
Hychangwon Co., Ltd.	9,766	-	-	-	-	-
Tuwaiq Casting & Forging Company	-	-	-	-	-	-
Incheon Fuel Cell Co., Ltd. (*2)	46,544	-	-	-	-	-
Bit Goeul Echo Energy Co., Ltd. (*2)	33,052	-	-	-	-	-
Doosan Engineering & Construction Co.,Ltd. (*3)	2,180	-	-	38	5	6
Daesan Green Energy Co., Ltd.	14,500	-	-	-	43	-
Bundang Doosan Tower Reit Co., Ltd.	-	-	620,000	-	18,681	232,909
	695,835	-	620,000	93	33,390	232,915
Joint ventures:						
Tianjin Lovol Doosan Engine Co. Ltd. (*2)	547	-	-	1,444	613	-
Doosan Infracore Liaoning Machinery Sales Co., Ltd. (*2)	14,960	-	-	-	-	-
	15,507	-	-	1,444	613	-
Other related parties:						
Doosan Yonkang Foundation	1,539	-	55,430	496	2,715	48
Chung-Ang University and others	59	-	-	709	10,830	-
Doosan Credit Union	174	-	-	-	464	-
Valuegrowth Co., Ltd.(*3)	657	-	-	-	-	-
The Path With you (*1)	187	-	-	-	166	-
Wonsang Co., Ltd.	-	-	-	-	-	-
Others	-	129	-	-	-	-
	2,616	129	55,430	1,205	14,175	48
	₩ 713,958	₩ 129	₩ 675,430	₩ 2,742	₩ 48,178	₩ 232,963

(*1) It was excluded from related parties during the year ended December 31, 2022, and the amount is the transaction details before being excluded from related parties.

(*2) 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.

(*3) During the year ended December 31, 2021, Doosan Engineering & Construction Co.,Ltd. and its subsidiaries were excluded from the scope of consolidation, and transactions with them were included in related parties' transactions.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

34. Related party transactions (cont'd)

The transaction details above include carrying amount classified as the profit or loss from discontinued operations on consolidated statements of profit or loss.

Significant balances related to the transactions between the Group and related parties as of December 31, 2022 and 2021 are as follows (Korean won in millions):

Related parties	December 31, 2022					
	Trade receivables	Other receivables	Loans	Trade payables	Other payables	Lease liabilities
Associates:						
Mastern Professional Investment Type Private Security Investment Trust No.98	₩ -	₩ 32,200	₩ -	₩ -	₩ 3,034	₩ 215,713
Folletto Robotics Co., Ltd.	318	-	-	3	-	-
Samcheok Blue Power Co., Ltd.	-	99,581	-	-	-	-
Hychangwon Co., Ltd.	4,070	-	-	-	9,313	-
Tuwaiq Casting & Forging Company	32,430	-	-	-	201,223	-
Doosan Engineering & Construction Co.,Ltd.	30,813	17,221	-	123	10,483	-
Daesan Green Energy Co.,Ltd.	3,625	-	1,004	-	-	-
Bundang Doosan Tower Reit Co., Ltd.	-	22,091	-	-	-	187,653
	<u>71,256</u>	<u>171,093</u>	<u>1,004</u>	<u>126</u>	<u>224,053</u>	<u>403,366</u>
Joint ventures:						
Sichuan Kelun-Doosan Biotechnology Co., Ltd.	-	1,245	-	-	-	-
	-	1,245	-	-	-	-
Other related parties:						
Doosan Yonkang Foundation	129	2,759	-	-	104	74
Chung-Ang University	41	-	-	245	334	-
Doosan Credit Union	14	-	-	-	454	-
Valuegrowth Co., Ltd.	50	-	-	-	-	-
	<u>234</u>	<u>2,759</u>	<u>-</u>	<u>245</u>	<u>892</u>	<u>74</u>
	<u>₩ 71,490</u>	<u>₩ 175,097</u>	<u>₩ 1,004</u>	<u>₩ 371</u>	<u>₩ 224,945</u>	<u>₩ 403,440</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

34. Related party transactions (cont'd)

Related parties	December 31, 2021					
	Trade receivables	Other receivables	Loans	Trade payables	Other payables	Lease liabilities
Associates:						
Mastern Professional Investment Type Private Security Investment Trust No.98	₩ -	₩ 32,200	₩ -	₩ -	₩ 2,996	₩ 235,512
Folletto Robotics Co., Ltd.	-	-	-	-	-	-
Samcheok Blue Power Co., Ltd.	-	317,889	-	-	-	-
Hychangwon Co., Ltd.	12,210	-	-	-	46,428	-
Tuwaiq Casting & Forging Company	-	-	-	-	-	-
Doosan Engineering & Construction Co.,Ltd.	10,049	16,595	-	124	20,452	-
Daesan Green Energy Co., Ltd.	3,625	-	-	-	4	-
Bundang Doosan Tower Reit Co., Ltd	-	19,375	-	-	-	191,424
	<u>25,884</u>	<u>386,059</u>	<u>-</u>	<u>124</u>	<u>69,880</u>	<u>426,936</u>
Joint ventures:						
Sichuan Kelun-Doosan Biotechnology Co., Ltd.	-	1,238	-	-	-	-
	<u>-</u>	<u>1,238</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
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	-	-	-	-	-
	<u>217</u>	<u>2,688</u>	<u>-</u>	<u>22</u>	<u>867</u>	<u>232</u>
	<u>₩ 26,101</u>	<u>₩ 389,985</u>	<u>₩ -</u>	<u>₩ 146</u>	<u>₩ 70,747</u>	<u>₩ 427,168</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

34. Related party transactions (cont'd)

Fund and equity transactions for the years ended December 31, 2022 and 2021, between the Group and related parties are as follows (Korean won in millions):

Related parties	2022													
	Loan		Lease liabilities		Contribution		Dividend							
	Loans	Repayment	Increase	Decrease	Received	Provided	Income	Paid						
Associates:														
KDDI Korea Corporation	₩	-	₩	-	₩	-	₩	-	₩	228	₩	-		
Mastern Professional Investment Type Private Security Investment Trust No.98	-	-	-	32,728	-	-	-	4,800	-	-	-			
Versogen, Inc..	-	-	-	-	-	6,063	-	-	-	-	-			
TTC House Inc.	-	-	-	-	-	500	-	-	-	-	-			
Folletto Robotics Co., Ltd.	-	-	-	-	-	2,400	-	-	-	-	-			
Hychangwon Co., Ltd.	-	-	-	-	-	2,000	-	-	-	-	-			
Tuwaiq Casting & Forging Company.	-	-	-	-	-	43,926	-	-	-	-	-			
Daesan Green Energy Co., Ltd.	1,004	-	-	-	-	-	-	-	-	-	-			
Bundang Doosan Tower Reit Co., Ltd.	-	-	-	21,577	-	-	-	2,635	-	-	-			
Multi-asset ESG Marine Wind Power General Private Equity Fund No. 1	-	-	-	-	-	8,500	-	-	-	-	-			
Joint ventures:														
Sichuan Kelun-Doosan Biotechnology Co., Ltd.	-	-	-	-	-	-	-	1,323	-	-	-			
Other related parties:														
Doosan Yonkang Foundation	-	-	-	162	-	-	-	-	-	3,150	-			
The Path With you (formerly, Dongdaemun Future Foundation)	-	-	-	-	-	-	-	-	-	-	170			
	₩	1,004	₩	-	₩	54,467	₩	-	₩	63,389	₩	8,986	₩	3,320

Related parties	2021											
	Loan		Lease liabilities		Contribution		Dividend					
	Loans	Repayment	Increase	Decrease	Received	Provided	Income	Paid				
Associates:												
KDDI Korea Corporation	₩	-	₩	-	₩	-	₩	-	₩	701	₩	-
Mastern Professional Investment Type Private Security Investment Trust No.98	-	-	-	32,308	-	-	-	4,800	-	-	-	
SiO2 Medical Products, Inc.	-	-	-	-	-	119,974	-	-	-	-	-	
Potenit Co., Ltd.	-	-	-	-	-	(5,334)	-	-	-	-	-	
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)	-	-	-	-	-	
Prestolite Asia Ltd.	-	-	-	-	-	-	23	-	-	-	-	
StructionSite Inc.	-	-	-	-	-	1,697	-	-	-	-	-	
Bundang Doosan Tower Reit Co., Ltd.	-	-	246,863	22,321	-	29,700	954	-	-	-	-	
Joint ventures:												
Sichuan Kelun-Doosan Biotechnology Co., Ltd.	-	-	-	-	-	-	1,301	-	-	-	-	
The Zenith Holdings Ltd.	-	-	-	-	-	120,000	-	-	-	-	-	
Weve Holdings Ltd.	-	-	-	-	-	120,000	-	-	-	-	-	
Tianjin Lovol Doosan Engine Co., Ltd.	-	-	-	-	-	(28,163)	-	-	-	-	-	
Doosan Infracore Liaoning Machinery Sales Co., Ltd	-	-	-	-	-	(718)	-	-	-	-	-	

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

34. Related party transactions (cont'd)

Related parties	2021							
	Loan		Lease liabilities		Contribution		Dividend	
	Loans	Repayment	Increase	Decrease	Received	Provided	Income	Paid
Other related parties:								
Doosan Yonkang Foundation	-	-	249	1,783	-	-	-	3,150
The Path With you (formerly, Dongdaemun Future Foundation) and others	-	-	-	-	-	-	-	170
	<u>₩ 10,000</u>	<u>₩ -</u>	<u>₩ 247,112</u>	<u>₩ 56,412</u>	<u>₩ -</u>	<u>₩ 247,833</u>	<u>₩ 7,779</u>	<u>₩ 3,320</u>

The transaction details above include carrying amount classified as the 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, 2022 (see Notes 32 and 33).

Compensation to key management personnel of the Group for the years ended December 31, 2022 and 2021 is as follows (Korean won in millions):

	2022	2021
Employee benefits	₩ 81,190	₩ 61,725
Retirement benefits	31,400	25,551
Share-based payment cost	6,227	-
	<u>₩ 118,817</u>	<u>₩ 87,276</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, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Adjustments for:		
Bad debt expenses	₩ 21,692	₩ 18,124
Loss from valuation of inventories	16,808	14,440
Depreciation	456,398	435,834
Amortization	161,804	176,772
Retirement benefits	132,616	133,766
Interest income	(33,740)	(58,810)
Dividend income	(4,409)	(1,934)
Gain on foreign currency translation	(158,280)	(157,451)
Gain on valuation of derivatives	(94,887)	(101,842)
Gain on valuation of firm commitment	(82,476)	(121,534)
Interest expense	371,221	452,294
Loss on foreign currency translation	307,490	219,149
Loss on valuation of derivatives	111,493	251,845
Loss on valuation of firm commitment	54,208	7,665
Loss on repayment of bonds	16,547	84
Loss (gain) on repayment of loans	10,675	(2,871)
Financial guarantee expenses	-	2,885
Increase in provision	235,535	101,668
Loss (gain) on disposal of short-term investment securities, long-term investment securities	(3,735)	(4,097)
Loss (gain) on valuation of short-term investment securities, long-term investment securities	41,024	(16,374)
Gain on disposal of property, plant and equipment	(3,940)	(16,337)

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

35. Cash flow statement (cont'd)

	2022	2021
Gain on disposal of intangible assets	(915)	(1,229)
Gain on disposal of investment properties	(2,347)	(2,027)
Loss on disposal of trade receivables	7,841	10,849
Gain on valuation of investment properties	(5,399)	(19,324)
Impairment loss on property, plant and equipment	30,572	8,101
Impairment loss on intangible assets	422,688	27,789
Loss on disposal of property, plant and equipment	5,628	2,719
Loss on disposal of intangible assets	1,134	1,335
Loss on disposal of investment properties	864	-
Loss on valuation of investment properties	13,254	46,425
Loss on land revaluation	-	289
Loss on disposal of investments in subsidiaries	-	1,116
Impairment loss on investments in associates	118,597	-
Other bad debt expenses	13,230	47,339
Share of loss (gain) of associates and joint ventures accounted for using the equity method	224,852	(3,212)
Income tax expenses	201,344	446,272
Loss (gain) from disposal of discontinued operations and impairment loss	106,120	(267,056)
Loss (gain) on disposal of assets held for sale and Impairment loss on assets held for sale	(12,978)	(69,526)
Other expenses (income)	24,637	(11,270)
	<u>₩ 2,705,166</u>	<u>₩ 1,551,866</u>
	2022	2021
Changes in operating assets and liabilities:		
Trade receivables	₩ (662,508)	₩ (144,341)
Other receivables	(117,522)	(191,150)
Due from customers for contract work	192,479	(83,923)
Derivative assets (liabilities)	(54,025)	53,297
Inventories	(682,822)	(539,498)
Other current assets	(15,114)	(15,524)
Long-term other receivables	(37,803)	3,415
Other non-current assets	(2,214)	103,965
Trade payables	563,274	534,209
Other payables	106,473	46,097
Due to customers for contract work	303,650	181,298
Provisions	(100,398)	(155,645)
Other current liabilities	346	(74,294)
Long-term other payables	60,589	5,518
Other non-current liabilities	(85,198)	(154,708)
Retirement benefits paid	(28,867)	(38,708)
Plan assets	(114,895)	(111,103)
Other assets and liabilities related to operating activities	(8,466)	(6,574)
	<u>₩ (683,021)</u>	<u>₩ (587,669)</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

35. Cash flow statement (cont'd)

Significant non-cash transactions for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022	2021
Reclassification of construction in progress to property, plant and equipment and others	₩ 411,283	₩ 144,954
Acquisition of right-of-use assets	127,607	318,493
Current portion of bonds and borrowings	1,119,453	2,011,543
Transfer to investment property	110,286	1,757
Transfer to assets and liabilities held for sale (see Note 38)	3,057	51,572
Write-off of trade receivables and other receivables	46,673	194,473

Details of changes in liabilities arising from financing activities for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022						
	January 1	Cash flows from financing activities	Changes in scope of consolidation	Fluctuation of foreign exchange rate	Reclassification of current portion	Others	December 31
Short-term borrowings	₩ 4,725,061	₩ (2,793,628)	₩ (15,401)	₩ (53,636)	₩ 344	₩ -	₩ 1,862,740
Current portion of long-term borrowings	463,729	(443,213)	12,500	1,622	195,163	-	229,801
Current portion of long-term asset-backed loan	115,042	(116,903)	-	-	92,841	751	91,731
Current portion of bonds	690,901	(767,707)	(9,998)	24,540	731,859	48,290	717,885
Current portion of lease liabilities	99,479	(69,588)	23,124	1,228	93,566	(5,418)	142,391
Current portion of sale-and-leaseback liabilities (*1)	30,936	-	-	-	5,680	(9,117)	27,499
Long-term borrowings	1,520,834	1,672,626	93,750	95,465	(195,507)	20,363	3,207,531
Long-term asset-backed loan	16,435	189,563	-	-	(92,841)	196	113,353
Bonds	1,139,454	77,754	-	31,530	(731,859)	17,103	533,982
Non-current lease liabilities	591,533	(65,451)	37,147	21,615	(93,566)	115,468	606,746
Sale-and-leaseback liabilities (*1)	283,194	(28,800)	(174,386)	-	(5,680)	5,490	79,818

(*1) It is included in other current or non-current payables in the consolidated statement of financial position.

	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
Sale-and-leaseback liabilities (*1)	307,060	(7,978)	-	-	-	-	15,048	314,130

(*1) It is included in other current or non-current payables in the consolidated statement of financial position

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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:

	<u>Contents</u>
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:

	<u>Divided company</u>	<u>Newly incorporated company</u>
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

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 (see Note 37).

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

37. Discontinued operations

Details of discontinued operations for the years ended December 31, 2022 and 2021 are as follows:

	2022			2021			
	Doosan Babcock Ltd. and its subsidiaries ("DBL")	Doosan Mecatec Co., Ltd. and its subsidiaries ("Doosan Mecatec")	Mottrol segment	Doosan Infracore segment	Doosan Engineering & Construction segment	DBL	Doosan Mecatec
Main business	Engineering and service	Manufacturing industrial heating boilers, metal tanks and similar containers	Manufacturing and sales of hydraulic components, etc. and defense industry	Manufacturing and sale of construction equipment	Construction	Engineering and service	Manufacturing industrial heating boilers, metal tanks and similar containers
Method	Transfer of business (*1)	Transfer of business (*2)	Transfer of business (*3)	Transfer of business (*4)	Loss of control (*5)	Transfer of business (*1)	Transfer of business (*2)

(*1) Doosan Enerbility Co., Ltd, a subsidiary, has decided to sell its subsidiary Doosan Babcock Ltd. in accordance with a resolution made at the Board of Directors' meeting in October 2021. Accordingly, the sale process was completed as of September 25, 2022 (sales price: ₩53,117 million).

(*2) Doosan Enerbility Co., Ltd, a subsidiary, has decided to sell its subsidiary Doosan Mecatec in accordance with a resolution made at the Board of Directors' meeting on June 3, 2022. Accordingly, the sale process was completed as of September 15, 2022.

(*3) In accordance with resolutions made at the Board of directors' meeting on September 4, 2020 and the shareholders' meeting on October 20, 2020, The Company decided to split off its Mottrol division and sell all of the shares acquired through the split-off. As of January 4, 2021, the sale of the shares was completed (sales price: ₩450,230 million).

(*4) In accordance with the resolution made at the Board of Directors' meeting on February 5, 2021, Doosan Enerbility Co., Ltd, a subsidiary, decided spin off its DI division and to sell all of the shares acquired through the spin-off. As of August 19, 2021, the sale of the shares was completed (sales price: ₩850,000 million).

(*5) As of December 21, 2021, Doosan Enerbility Co., Ltd, a subsidiary, invested 82,005,761 ordinary shares and 5,649,462 redeemable convertible preferred shares in Doosan Engineering & Construction Co.,Ltd. to The Zenith Holdings Ltd. in accordance with the resolution of the Board of Directors made on November 19, 2021. In addition, as of December 21, 2021, Doosan Engineering & Construction Co.,Ltd. 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 over Doosan Engineering & Construction Co.,Ltd. during the year ended December 31, 2021.

The performance the above segment is indicated as a discontinued operation, and the comparative consolidated statements of profit or loss for the previous year has been restated.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

37. Discontinued operations (cont'd)

With regard to discontinued operations that occurred during the year ended December 31, 2022, assets and liabilities removed from the Consolidated Statement as follows (Korean won in millions):

	2022	
	<u>Doosan Mecatec</u>	
Assets		
Cash and cash equivalents	₩	40,448
Trade receivables and other receivables		57,935
Due from customers for contract work		191,437
Inventories		32,897
Investments in associates and joint ventures		7,995
Property, plant and equipment		273,288
Intangible assets		1,512
Other assets		91,153
	₩	<u>696,665</u>
Liabilities		
Trade and other payables	₩	47,888
Due to customers for contract work		50,156
Bonds and borrowings		59,399
Lease liabilities		14,212
Other liabilities		227,178
	₩	<u>398,833</u>

Details of profit or loss from discontinued operations for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022		
	DBL	Doosan Mecatec	Total
Sales	₩ 462,541	₩ 212,986	₩ 675,527
Cost of sales	418,179	197,196	615,375
Selling and administrative expenses	43,871	13,757	57,628
Operating profit(loss)	491	2,033	2,524
Non-operating profit(loss)	10,185	(510)	9,675
Profit(loss) before income tax expenses	10,676	1,523	12,199
Income tax expenses(benefits)	539	(10,527)	(9,988)
	<u>10,137</u>	<u>12,050</u>	<u>22,187</u>
Profit(loss) from disposal of discontinued operations before income tax expenses, impairment loss	57,420	(163,540)	(106,120)
Tax expenses(benefits) related to disposal of discontinued operations	-	-	-
Profit(loss) from disposal of discontinued operations	<u>57,420</u>	<u>(163,540)</u>	<u>(106,120)</u>
Profit(loss) from discontinued operations	₩ <u>67,557</u>	₩ <u>(151,490)</u>	₩ <u>(83,933)</u>
Profit/loss attributable to:			
Equity holders of the Company	₩ 20,569	₩ (54,012)	₩ (33,443)
Non-controlling interests	46,988	(97,478)	(50,490)

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

37. Discontinued operations (cont'd)

	2021					
	Mottrol segment	Doosan Infracore segment	Doosan Engineering & Construction segment	DBL	Doosan Mecatec	Total
Sales	₩ -	₩ 2,625,096	₩ 1,369,390	₩ 524,065	₩ 287,365	₩ 4,805,916
Cost of sales	-	2,064,175	1,218,589	456,197	261,382	4,000,343
Selling and administrative expenses	-	321,228	64,020	54,963	14,952	455,163
Operating profit(loss)	-	239,693	86,781	12,905	11,031	350,410
Non-operating profit(loss)	-	(31,242)	(80,210)	(1,537)	(2,255)	(115,244)
Profit(loss) before income tax expenses	-	208,451	6,571	11,368	8,776	235,166
Income tax expenses(benefits)	-	277,272	556	(5,372)	1,396	273,852
	-	(68,821)	6,015	16,740	7,380	(38,686)
Profit(loss) from disposal of discontinued operations and impairment loss before income tax expenses	172,628	48,652	45,774	-	-	267,054
Tax expenses(benefits) related to disposal of discontinued operations and Impairment loss	46,093	(9,154)	(111,873)	-	-	(74,934)
Profit(loss) from disposal of discontinued operations and impairment loss	126,535	57,806	157,647	-	-	341,988
Profit(loss) from discontinued operations	₩ 126,535	₩ (11,015)	₩ 163,662	₩ 16,740	₩ 7,380	₩ 303,302
Profit/loss attributable to:						
Equity holders of the Company	₩ 126,535	₩ 16,389	₩ 64,254	₩ 6,572	₩ 2,897	₩ 216,647
Non-controlling interests	-	(27,404)	99,408	10,168	4,483	86,655

Cash flows from discontinued operations for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

	2022		
	DBL	Doosan Mecatec	Total
Net cash flows from operating activities	₩ (8,156)	₩ (41,923)	₩ (50,079)
Net cash flows from investing activities (*1)	(28,423)	10,925	(17,498)
Net cash flows from financing activities	41,616	3,725	45,341
Effect of exchange rate changes	(794)	315	(479)
	₩ 4,243	₩ (26,958)	₩ (22,715)

(*1) Net cash flows of investing activities include cash flows of the disposal of discontinued operations.

	2021					
	Mottrol segment	Doosan Infracore segment	Doosan Engineering & Construction segment	DBL	Doosan Mecatec	Total
Net cash flows from operating activities	₩ -	₩ (168,758)	₩ 97,274	₩ (4,276)	₩ 31,051	₩ (44,709)
Net cash flows from investing activities (*1)	441,075	684,894	(102,958)	5,460	(12,548)	1,015,923
Net cash flows from financing activities	-	262,139	24,977	(6,998)	(9,888)	270,230
Effect of exchange rate changes	-	89,373	2	8,369	(34)	97,710
	₩ 441,075	₩ 867,648	₩ 19,295	₩ 2,555	₩ 8,581	₩ 1,339,154

(*1) Net cash flows of investing activities include cash flows of the disposal of discontinued operations.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

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, 2022 and 2021 are as follows (Korean won in millions):

	December 31, 2022		
	Book value before impairment	Accumulated impairment loss	Net fair value
Property, plant and equipment (*1,2)	₩ 5,871	₩ (1,186)	₩ 4,685

(*1) Doosan Industrial Vehicle Co., Ltd., a subsidiary, signed a contract to sell operating rental assets as of August 12, 2022, classifying such assets as asset held for sale, and completed the partial sale of the assets on November 30, 2022.

(*2) Doosan Enerbility Co., Ltd, a subsidiary, classified heavy equipment related to the construction equipment rental business as assets held for sale during the year ended December 31, 2021, and completed the partial sale of heavy equipment during the year ended December 31, 2022

	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
Inventories	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 made on December 22, 2021. Accordingly, assets and liabilities attributable to Doosan Bobcat Chile Compact SpA are classified as asset held for sale and liability 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 asset held for sale and recognized impairment loss of ₩1,568 million. This sale was completed as of February 25, 2022.

(*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 Doosan Enerbility Co., Ltd, as asset held for sale, and recognized impairment loss of ₩919 million. In addition, some of the heavy equipment was sold during the year ended December 31, 2022

(*4) During the year ended December 31, 2021, Doosan Enerbility Co., Ltd, a subsidiary, classified ₩2,823 million of investments in associates as asset 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. The sale was completed as of December 29, 2022 (Consideration transferred: ₩18,390 million).

(*5) Doosan Enerbility Co., Ltd, a subsidiary, confirmed the sale plan of its subsidiary Doosan Babcock Ltd. at its Board of Directors' meeting in October 2021. As of December 31, 2021, assets and liabilities attributable to DBL are classified as asset and liability held for sale. The sale was completed as of September 25, 2022.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

39. Business Combination of Doosan Tesna Inc.

As of April 27, 2022, the Group acquired control over Doosan Tesna Inc. (formerly, Tesna Corporation) by acquiring 30.78% of shares in Doosan Tesna Inc. (2,909,292 ordinary shares and 2,320,672 preferred shares) and bonds with warrant on new shares therein (the number of ordinary shares to be issued in case of warrant exercise: 2,246,989 shares) from AI Tree Limited.

The Group has elected to measure the non-controlling interests at the proportionate share of the Group's equity instrument to the amounts recognized for Doosan Tesna Inc.'s identifiable net assets as of the acquisition date. As of the acquisition date, the fair value of Doosan Tesna Inc.'s identifiable assets and liabilities are as follows (Korean won in millions):

Assets	Book amount	Liabilities	Book amount
Cash and cash equivalents	₩ 46,948	Trade and other payables	₩ 21,149
Trade receivables and other receivables	24,400	borrowings	93,750
Property, plant and equipment	461,693	Deferred tax liabilities	28,714
Intangible assets	93,678	Other liabilities	137,869
Other assets	65,794		
Assets total	₩ 692,513	Liabilities total	₩ 281,482
① Fair value of net assets (total assets – total liabilities)			411,030
② Non-controlling interests			284,516
③ Consideration transferred (Cash)			460,000
Goodwill due to acquisition (②+③-①)			₩ 333,486

Doosan Tesna Inc.'s sales and net profit after the acquisition date included in the consolidated statements of profit or loss amount to ₩199,950 million and ₩30,310 million, respectively, and at the acquisition date was January 1, 2022, the Group's sales and net loss from continuous operations would be ₩17,073,466 million and ₩567,475 million.

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. Restatement of consolidated financial statements

As a result of an external audit conducted by the U.S.-based accounting firm on financial statements of the Group's subsidiary HyAxiom Inc. located in US for the year 2021, an error was found in the year ended December 31, 2022. Accordingly, the consolidated financial statements as of and for the year ended December 31, 2021 presented for comparative purposes have been retroactively restated. Adjustments for each item in the consolidated financial statements of the previous year affected by the correction of errors are as follows.

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

41.1.1 Restatement of consolidated statements of financial position

(Korean won in millions)

	2021			2020		
	Before adjustments	Adjustment on correction of error	Adjusted	Before adjustments	Adjustment on correction of error	Adjusted
Assets						
Current assets:						
Cash and cash equivalents	₩ 2,235,362	₩ (257)	₩ 2,235,105	₩ 2,707,379	₩ 575	₩ 2,707,954
Short-term financial instruments	1,063,279	368	1,063,647	438,760	(1,074)	437,686
Short-term investment securities	197,304	(107)	197,197	608,639	1,707	610,346
Trade receivables	1,200,207	(39,772)	1,160,435	2,255,531	(14,200)	2,241,331
Other receivables	299,132	(20)	299,112	469,129	-	469,129
Inventories	2,027,874	21,512	2,049,386	2,421,952	163	2,422,115
Other current assets	821,600	142	821,742	857,251	2,570	859,821
The others	2,050,524	-	2,050,524	2,839,683	-	2,839,683
	9,895,282	(18,134)	9,877,148	12,598,324	(10,259)	12,588,065
Non-current assets:						
Property, plant and equipment	5,963,449	(16,187)	5,947,262	6,983,728	1,931	6,985,659
Intangible assets	7,611,459	(29,707)	7,581,752	8,240,368	(21,248)	8,219,120
Deposits	394,833	(32)	394,801	495,024	-	495,024
Other non-current assets	41,519	33	41,552	56,057	250	56,307
The others	2,103,310	-	2,103,310	1,827,502	-	1,827,502
	16,114,570	(45,893)	16,068,677	17,602,679	(19,067)	17,583,612
Total assets	₩ 26,009,852	₩ (64,027)	₩ 25,945,825	₩ 30,201,003	₩ (29,326)	₩ 30,171,677
Liabilities						
Current liabilities:						
Trade payables	₩ 2,029,123	₩ 5,460	₩ 2,034,583	₩ 2,404,379	₩ 5,877	₩ 2,410,256
Other payables	817,708	(16,013)	801,695	1,142,632	342	1,142,974
Short-term borrowings	4,725,061	-	4,725,061	6,295,838	(54,944)	6,240,894
Current provisions	328,911	-	328,911	536,918	(392)	536,526
Other current liabilities	444,985	13,476	458,461	657,600	6,645	664,245
The others	3,660,661	-	3,660,661	4,770,878	-	4,770,878
	12,006,449	2,923	12,009,372	15,808,245	(42,472)	15,765,773
Non-current liabilities:						
Long-term borrowings	1,520,834	-	1,520,834	1,195,458	54,944	1,250,402
Long-term other liabilities	676,529	10,219	686,748	656,285	21,824	678,109
Non-current provisions	316,311	9,766	326,077	383,921	5,431	389,352
The others	2,992,676	-	2,992,676	4,391,523	-	4,391,523
	5,506,350	19,985	5,526,335	6,627,187	82,199	6,709,386
Total liabilities	17,512,799	22,908	17,535,707	22,435,432	39,727	22,475,159

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

41.1.1 Restatement of consolidated statements of financial position (cont'd)

	2021			2020		
	Before adjustments	Adjustment on correction of error	Adjusted	Before adjustments	Adjustment on correction of error	Adjusted
Equity						
Equity attributable to owners of the parent:						
Share capital	₩ 123,738	₩ -	₩ 123,738	₩ 123,738	₩ -	₩ 123,738
Capital surplus	1,237,399	-	1,237,399	1,090,774	-	1,090,774
Other equity items	(1,196,429)	-	(1,196,429)	(1,194,599)	-	(1,194,599)
Accumulated other comprehensive income	532,229	(2,073)	530,156	480,451	7,893	488,344
Retained earnings	1,468,140	(84,861)	1,383,279	1,159,309	(76,946)	1,082,363
	2,165,077	(86,934)	2,078,143	1,659,673	(69,053)	1,590,620
Non-controlling interests	6,331,976	-	6,331,976	6,105,898	-	6,105,898
Total equity	8,497,053	(86,934)	8,410,119	7,765,571	(69,053)	7,696,518
Total liabilities and equity	₩ 26,009,852	₩ (64,027)	₩ 25,945,825	₩ 30,201,003	₩ (29,326)	₩ 30,171,677

41.1.2 Restatement of Consolidated statements of profit or loss and other comprehensive income (loss)

(Korean won in millions)

	2021			
	Before adjustments	Discontinued operations (*1)	Adjustment on correction of error	Adjusted
Sales	₩ 13,204,153	₩ (287,365)	₩ (65,302)	₩ 12,851,486
Cost of sales	10,961,687	(261,382)	(55,736)	10,644,569
Gross profit	2,242,467	(25,984)	(9,566)	2,206,917
Selling and administrative expenses	1,296,535	(14,953)	4,277	1,285,860
Operating profit	945,931	(11,031)	(13,843)	921,057
Finance income	762,619	(14,968)	1,645	749,296
Finance expenses	1,090,780	(17,845)	(3,547)	1,069,387
Other non-operating income	152,694	(341)	(65)	152,287
Other non-operating expenses	164,225	(406)	-	163,819
Share of profit (loss) of investees accounted for using the equity method	4,122	(687)	-	3,435
Profit (loss) before income tax expenses	610,362	(8,776)	(8,717)	592,868
Income tax expense (benefit)	249,552	(1,396)	(802)	247,355
Profit (Loss) from continuing operations	360,809	(7,380)	(7,915)	345,514
Profit (Loss) from discontinued operations	295,922	7,380	-	303,302
Profit (Loss) for the year	656,731	-	(7,915)	648,815
Other comprehensive income (loss)				
Items not to be subsequently reclassified to profit or loss	321,411	-	-	321,411
Items to be subsequently reclassified to profit or loss	304,386	-	(9,966)	294,420
	625,796	-	(9,966)	615,831
Total comprehensive income (loss) for the year	₩ 1,282,527	₩ -	₩ (17,881)	₩ 1,264,646

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

41.1.2 Restatement of Consolidated statements of profit or loss and other comprehensive income (loss) (cont'd)

	2021			
	Before adjustments	Discontinued operations (*1)	Adjustment on correction of error	Adjusted
Total comprehensive income (loss) attributable to:				
Equity holders of the parent	₩ 374,153	₩ -	₩ (17,881)	₩ 356,272
Non-controlling interests	908,374	-	-	908,374

(*1) During the year ended December 31, 2022, the Group confirmed the sale plan of its subsidiary Doosan Mecatec Co., Ltd. and completed the sale process as of September 15, 2022. Accordingly, profit (loss) from discontinued operations was retroactively revised (see Note 37).

41.1.3 Restatement of Consolidated statements of changes in equity

Adjusted items in the consolidated statements of changes in equity as of and for the year ended December 31, 2021 affected by the correction of errors is same as those stated in the consolidated financial statements.

41.1.4 Restatement of Consolidated statements of cash flows

(Korean won in millions)

	2021		
	Before adjustments	Adjustment on correction of error	Adjusted
Cash flows from operating activities			
Cash generated from operating activities:			
Profit (Loss) for the year	₩ 656,731	₩ (7,915)	₩ 648,815
Adjustments:			
Bad debt expenses	17,863	261	18,124
Amortization	176,796	(24)	176,772
Interest income	(59,421)	611	(58,810)
Interest expense	454,977	(2,683)	452,294
Loss on foreign currency translation	220,186	(1,037)	219,149
Loss on disposal of intangible assets	(1,203)	(26)	(1,229)
Income tax expenses	447,074	(802)	446,272
Other expenses	299,294	-	299,294
	1,555,566	(3,700)	1,551,866
Changes in operating assets and liabilities:			
Trade receivables	(169,651)	25,310	(144,341)
Other receivables	(193,038)	1,888	(191,150)
Due from customers for contract work	(83,923)	-	(83,923)
Derivative assets (liabilities)	53,297	-	53,297
Inventories	(518,149)	(21,349)	(539,498)
Other current assets	(16,065)	541	(15,524)
Long-term other receivables	3,415	-	3,415
Other non-current assets	103,716	249	103,965
Trade payables	534,625	(416)	534,209
Other payables	54,583	(8,486)	46,097
Due to customers for contract work	181,298	-	181,298
Provisions	(160,155)	4,510	(155,645)
Other current liabilities	(74,294)	-	(74,294)
Long-term other payables	17,123	(11,605)	5,518

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

41.1.4 Restatement of Consolidated statements of cash flows (cont'd)

	2021		
	Before adjustments	Adjustment on correction of error	Adjusted
Other non-current liabilities	₩ (154,924)	₩ 216	₩ (154,708)
Retirement benefits paid	(38,708)	-	(38,708)
Plan assets	(111,103)	-	(111,103)
Other assets and liabilities related to operating activities	(2,452)	(4,123)	(6,575)
	<u>(574,405)</u>	<u>(13,265)</u>	<u>(587,670)</u>
	1,637,892	(24,880)	1,613,012
Interest received	40,083	611	40,694
Interest paid	(465,550)	2,683	(462,867)
Dividends received	8,398	-	8,398
Income tax paid	(477,608)	802	(476,807)
	<u>743,215</u>	<u>(20,784)</u>	<u>722,431</u>
Cash flows from investing activities			
Cash inflows from investing activities:			
Disposal of short-term investment securities	764,970	1,814	766,783
Decrease in short-term loans	88,641	19	88,661
Other investing activities	1,618,510	-	1,618,510
	<u>2,472,121</u>	<u>1,833</u>	<u>2,473,954</u>
Cash outflows from investing activities:			
Acquisition of property, plant and equipment	400,117	(18,119)	381,999
Other investing activities	2,387,055	-	2,387,054
	<u>(2,787,172)</u>	<u>18,119</u>	<u>(2,769,053)</u>
	(315,051)	19,952	(295,099)
Cash flows from financing activities	(1,035,752)	-	(1,035,752)
Effects of exchange rate changes on cash and cash equivalents	153,088	-	153,088
Decrease in cash due to reclassification of assets held for sale	(17,516)	-	(17,516)
Net decrease in cash and cash equivalents	(472,017)	(832)	(472,849)
Cash and cash equivalents, beginning of the year	2,707,379	575	2,707,954
Cash and cash equivalents, end of the year	<u>₩ 2,235,362</u>	<u>₩ (257)</u>	<u>₩ 2,235,105</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

41.2 Restatement of Consolidated financial statements

The effects of above adjustments on consolidated financial statements for the reporting period prior to error correction are as follows.

41.2.1 Restatement of Consolidated statements of financial position

(Korean won in millions)

	2019		
	Before adjustments	Adjustment on correction of error	Adjusted
Assets			
Current assets:			
Cash and cash equivalents	₩ 1,840,834	₩ (937)	₩ 1,839,897
Short-term financial instruments	296,380	(1,209)	295,171
Short-term investment securities	129,156	2,344	131,500
Trade receivables	2,523,770	(3,487)	2,520,283
Other receivables	680,645	77	680,722
Inventories	2,681,748	(10,567)	2,671,181
Other current assets	927,545	(509)	927,036
The others	1,967,954	-	1,967,954
	<u>11,048,032</u>	<u>(14,288)</u>	<u>11,033,744</u>
Non-current assets:			
Property, plant and equipment	7,953,359	710	7,954,069
Intangible assets	7,357,789	(22,912)	7,334,877
Deferred tax assets	416,185	(143)	416,042
Other non-current assets	36,263	214	36,477
The others	2,358,119	-	2,358,119
	<u>18,121,715</u>	<u>(22,131)</u>	<u>18,099,584</u>
Total assets	<u>₩ 29,169,747</u>	<u>₩ (36,419)</u>	<u>₩ 29,133,328</u>
Liabilities			
Current liabilities:			
Trade payables	₩ 3,089,735	₩ (4,130)	₩ 3,085,605
Other payables	1,560,251	2,386	1,562,637
Short-term borrowings	4,614,068	(27,787)	4,586,281
Current provisions	260,484	(416)	260,068
Current lease liabilities	86,441	335	86,776
Other current liabilities	824,252	4,790	829,042
The others	5,770,552	(3)	5,770,549
	<u>16,205,783</u>	<u>(24,825)</u>	<u>16,180,958</u>
Non-current liabilities:			
Long-term borrowings	2,258,814	27,787	2,286,601
Long-term other payables	541,899	23,180	565,079
Non-current provisions	251,589	(4,190)	247,399
Other non-current liabilities	178,860	8,887	187,747
The others	2,913,262	-	2,913,262
	<u>6,144,424</u>	<u>55,664</u>	<u>6,200,088</u>
Total liabilities	<u>22,350,207</u>	<u>30,840</u>	<u>22,381,047</u>

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

41.2.1 Restatement of consolidated statements of financial position (cont'd)

	2019		
	Before adjustments	Adjustment on correction of error	Adjusted
Equity			
Equity attributable to owners of the parent:			
Share capital	123,738	-	123,738
Capital surplus	732,266	-	732,266
Other equity items	(1,192,921)	-	(1,192,921)
Accumulated other comprehensive income	648,707	1,351	650,058
Retained earnings	1,250,725	(68,610)	1,182,115
	1,562,514	(67,257)	1,495,257
Non-controlling interests	5,257,025	-	5,257,025
Total equity	6,819,539	(67,258)	6,752,281
Total liabilities and equity	₩ 29,169,747	₩ (36,419)	₩ 29,133,328

41.2.2 Restatement of Consolidated statements of profit or loss and other comprehensive income (loss)

(Korean won in millions)

	2020			
	Before adjustments	Discontinued operations (*1)	Adjustment on correction of error	Adjusted
Sales	₩ 11,428,549	₩ (311,273)	₩ (17,019)	₩ 11,100,257
Cost of sales	9,947,642	(277,461)	(16,925)	9,653,255
Gross profit	1,480,908	(33,813)	(93)	1,447,002
Selling and administrative expenses	1,501,260	(11,081)	7,662	1,497,841
Operating loss	(20,353)	(22,732)	(7,755)	(50,840)
Finance income	543,561	(16,371)	283	527,472
Finance expenses	1,034,138	(24,696)	289	1,009,730
Other non-operating income	89,061	(3,475)	(272)	85,314
Other non-operating expenses	393,206	(597)	-	392,608
Share of profit (loss) of investees accounted for using the equity method	(6,327)	956	-	(5,371)
Loss before income tax expenses	(821,402)	(16,328)	(8,034)	(845,763)
Income tax expense (benefit)	1,955	(3,563)	303	(1,306)
Loss from continuing operations	(823,356)	(12,765)	(8,337)	(844,458)
Profit (loss) from discontinued operations	(140,536)	12,765	-	(127,771)
Loss for the year	(963,892)	-	(8,337)	(972,229)
Profit (Loss) attributable to:				
Equity holders of the parent	(553,308)	-	(8,337)	(561,645)
Non-controlling interests	(410,584)	-	-	(410,584)
Other comprehensive income (loss)				
Items not to be subsequently reclassified to profit or loss	296,372	-	-	296,372
Items to be subsequently reclassified to profit or loss:	(103,338)	-	6,542	(96,797)
	193,035	-	6,542	199,576
Total comprehensive loss for the year	₩ (770,857)	₩ -	₩ (1,795)	₩ (772,653)
Total comprehensive loss attributable to:				
Equity holders of the parent	₩ (242,722)	₩ -	₩ (1,795)	₩ (244,517)
Non-controlling interests	(528,136)	-	-	(528,136)

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

41.2.2 Restatement of Consolidated statements of profit or loss and other comprehensive income (loss) (cont'd)

(*1) During the year ended December 31, 2022, the Group confirmed the sale plan of its subsidiary Doosan Mecatec Co., Ltd. and completed the sale process as of September 15, 2022. Accordingly, profit (loss) from discontinued operations was retroactively revised (see Note 37).

41.2.3 Restatement of Consolidated statements of changes in equity

(Korean won in millions)

	Share Capital	Capital surplus	Other equity items	Accumulated other comprehensive income	Retained earnings	Non-controlling interests	Total
As of January 1, 2020	₩ 123,738	₩ 732,266	₩ (1,192,921)	₩ 648,707	₩ 1,250,725	₩ 5,257,025	₩ 6,819,539
Adjustment on correction of error	-	-	-	1,352	(68,609)	-	(67,258)
As of January 1, 2020 (adjusted)	123,738	732,266	(1,192,921)	650,058	1,182,115	5,257,025	6,752,281
Total comprehensive income (loss):							
Loss for the year	-	-	-	-	(561,645)	(410,584)	(972,229)
Remeasurements of net defined benefit liabilities	-	-	-	-	(12,754)	(27,751)	(40,505)
Land revaluation surplus	-	-	-	(97,256)	88,158	(12,277)	(21,375)
Gain (loss) on valuation of financial assets at fair value through OCI	-	-	-	400,995	(2,174)	(2)	398,818
Loss on valuation of derivatives designated	-	-	-	(40,270)	-	(4,266)	(44,537)
Loss on foreign operations translation	-	-	-	(24,995)	-	(73,622)	(98,617)
Negative Equity changes in equity method	-	-	-	5,425	-	367	5,791
	-	-	-	243,899	(488,415)	(528,136)	(772,653)
Transactions with shareholders directly reflected in shareholders' equity	-	358,508	(1,678)	(405,613)	388,663	1,377,009	1,716,889
As of December 31, 2020	₩ 123,738	₩ 1,090,774	₩ (1,194,599)	₩ 488,344	₩ 1,082,363	₩ 6,105,898	₩ 7,696,518

Doosan Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2022 and 2021

41.2.4 Restatement of Consolidated statements of cash flows

(Korean won in millions)

	2020		
	Before adjustments	Adjustment on correction of error	Adjusted
Cash flows from operating activities			
Cash generated from operating activities:			
Loss for the year	₩ (963,892)	₩ (8,337)	₩ (972,229)
Adjustments:			
Bad debt expenses	44,866	78	44,944
Amortization	195,274	(25)	195,249
Interest income	(51,571)	268	(51,303)
Interest expense	553,590	(469)	553,121
Loss on foreign currency translation	183,783	749	184,532
Increase in provision	427,925	1	427,926
Income tax expenses	122,331	302	122,633
Other expenses	953,808	-	953,808
	2,430,006	904	2,430,910
Changes in operating assets and liabilities:			
Trade receivables	13,209	10,651	23,860
Other receivables	34,563	(936)	33,627
Due from customers for contract work	84,456	-	84,456
Derivative assets (liabilities)	(45,405)	-	(45,405)
Inventories	365,541	(10,731)	354,810
Other current assets	119	(2,081)	(1,962)
Long-term other receivables	(23,689)	-	(23,689)
Other non-current assets	(199,242)	(178)	(199,420)
Trade payables	(639,600)	10,007	(629,593)
Other payables	(191,236)	(1,272)	(192,508)
Due to customers for contract work	191,674	-	191,674
Provisions	(171,050)	97	(170,953)
Other current liabilities	(2,020)	-	(2,020)
Long-term other payables	24,241	(1,355)	22,886
Other non-current liabilities	(20,193)	663	(19,530)
Retirement benefits paid	(64,796)	8	(64,788)
Plan assets	(74,360)	(3)	(74,363)
Other assets and liabilities related to operating activities	(1,120)	1,780	660
	(718,908)	6,650	(712,258)
	747,206	(783)	746,423
Interest received	51,105	268	51,373
Interest paid	(510,978)	470	(510,508)
Dividends received	12,318	-	12,318
Income tax paid	(173,114)	(303)	(173,417)
	126,536	(347)	126,189

41.2.4 Restatement of Consolidated statements of cash flows (cont'd)

	2020		
	Before adjustments	Adjustment on correction of error	Adjusted
Cash flows from investing activities			
Cash inflows from investing activities:			
Disposal of short-term investment securities	₩ 178,260	₩ 637	₩ 178,897
Other investing activities	2,619,155	-	2,619,155
	<u>2,797,415</u>	<u>637</u>	<u>2,798,052</u>
Cash outflows from investing activities:			
Acquisition of property, plant and equipment	566,816	(1,221)	565,595
Other investing activities	2,574,004	-	2,574,004
	<u>(3,140,820)</u>	<u>1,221</u>	<u>(3,139,599)</u>
	(343,406)	1,860	(341,546)
Cash flows from financing activities	1,152,121	-	1,152,121
Effects of exchange rate changes on cash and cash equivalents	(106,204)	-	(106,204)
Decrease in cash due to reclassification of assets held for sale	(26,929)	-	(26,929)
Increase in cash due to changes in scope of consolidation	64,427	-	64,427
Net increase in cash and cash equivalents	866,545	1,512	868,057
Cash and cash equivalents, beginning of the year	1,840,834	(937)	1,839,897
Cash and cash equivalents, end of the year	<u>₩ 2,707,379</u>	<u>₩ 575</u>	<u>₩ 2,707,954</u>

42. Financial structure improvement plan

Doosan Enerbility Co., Ltd. (formerly, Doosan Heavy Industries & Construction., Ltd.), a subsidiary, received a total amount of ₩3,000,000 million in financing from Korea Development Bank and Korea Exim Bank (individually referred to as "Government-run bank") to raise short-term liquidity during the first half of 2020. To improve its financial structure, Doosan Enerbility Co., Ltd raised funds through a capital increase in December 2020, the sale of its subsidiary Doosan Infracore Co., Ltd.'s business unit in August 2021, and another capital increase in February 2022. These measures enabled Doosan Enerbility Co., Ltd. to repay its debt to Government-run Banks. As of February 28, 2022, Doosan Enerbility Co., Ltd. has fully repaid the borrowings owned from banks, and the agreement to implement the financial restructuring plan has been terminated.