



DOOSAN CORPORATION

Financial Statements

For the Years Ended December 31, 2022 and 2021

With the independent auditor's report

Doosan Corp.

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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 separate statements of Doosan Corporation (the "Company"), which comprise the separate statements of financial position as of December 31, 2022 and 2021, and the separate statements of income, separate statements of comprehensive income, separate statements of changes in equity and separate statements of cash flows for the years then ended, and notes to the separate financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying separate financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and its financial performance and its cash flows for the years then ended in accordance with International Financial Reporting Standards as adopted by the Republic of Korea ("KIFRS").

We also have audited, in accordance with Korean Standards on Auditing ("KSA"), The Company's internal control over financial reporting ("ICFR") as of December 31, 2022, based on criteria established in Conceptual Framework for designing and operating ICFR in accordance with KGAAS established by the Operating Committee of ICFR (the "ICFR Committee"), and our report dated March 21, 2022, expressed "an unqualified opinion thereon".

Basis for opinion

We conducted our audit in accordance with KSA. Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the separate financial statements section of our report. We are independent of the Company in accordance with the ethical requirements that are relevant to our audit of the separate financial statements in the Republic of Korea, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key audit matters

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

(1) Impairment test on investments in subsidiaries

As described in Note 11 to the separate financial statements, the Company conducted an impairment test on investments in Doosan Enerbility Co., Ltd., its subsidiary, as of December 31, 2022. And no impairment loss was recognized as a result of the impairment test. In order to determine the recoverable amount of investments in subsidiaries, the Company estimated the fair value less costs of disposal.

As of December 31, 2022, the carrying amount of investments in Doosan Enerbility Co., Ltd. is ₩2,536,311 million, accounting for 50.6% of its total assets. In addition, recoverable amount may vary depending on the inputs requiring management's judgement, and accordingly have a have a significant impact on the financial statements of the Company. Therefore, we identified the estimation of recoverable amount of investments in Doosan Enerbility Co., Ltd. as a key audit matter.

The main audit procedures we have performed for this key audit matter are as follows:

- We obtained understanding for and assessed internal controls related to impairment testing of investment in subsidiary.
- We made inquiry and conducted inspection on the valuation model used by management.
- We assessed management's experts who participated in estimating the value in use based on their qualification and independence.
- We evaluated inputs utilized by management of the Company for calculating recoverable amount by comparing them with external benchmarks while using valuation experts from the auditor's side.
- We conducted independent recalculation to verify the accuracy of the recoverable amount.

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

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

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

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

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

Our objectives are to obtain reasonable assurance about whether the separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an 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 separate 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 separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the separate financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the separate financial statements, including the disclosures, and whether the separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

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

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and 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 separate 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 separate financial statements and may result in modifications to this report.

Doosan Corporation

Separate financial statements
for the years ended December 31, 2022 and 2021

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

Hong Sung Moon
Chief Executive Officer
Doosan Corporation

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

	Notes	2022	2021
Assets			
Current assets:			
Cash and cash equivalents	4,10,34	₩ 381,777,404,797	₩ 49,062,002,726
Short-term financial instruments	4,5,10,32	48,456,002,193	534,554,468,125
Short-term investment securities	4,6,10	11,068,808,705	1,496,808,705
Trade receivables	4,7,10,24,33	155,195,629,816	229,241,566,625
Other receivables	4,7,10,24,33	32,715,208,302	72,423,691,713
Current derivative assets	4,9,10	4,614,805,731	34,449,259,957
Inventories	8	115,308,038,690	110,302,908,051
Other current assets		42,704,528,463	36,430,753,212
Total current assets		791,840,426,697	1,067,961,459,114
Non-current assets:			
Long-term financial instruments	4,5,10	11,445,539,635	11,541,924,268
Long-term investment securities	4,6,10,33	122,973,729,774	200,694,017,796
Investments in subsidiaries, joint ventures and associates	11	3,413,334,032,276	3,389,030,228,991
Property, plant and equipment	12,32	254,410,534,212	252,385,769,561
Intangible assets	13	62,603,181,138	53,034,944,769
Investment properties	14,32	306,362,451,910	298,855,089,108
Long-term other receivables	4,7,10,33	5,621,627,051	1,331,244,506
Deposits	4,10,33	40,454,779,092	33,209,987,159
Other non-current assets		3,765,042,300	242,221,381
Total non-current assets		4,220,970,917,388	4,240,325,427,539
Total assets		₩ 5,012,811,344,085	₩ 5,308,286,886,653

(Continued)

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

	Notes	2022	2021
Liabilities			
Current liabilities:			
Trade payables	4,10,33	₩ 105,452,532,107	₩ 111,658,160,009
Other payables	4,10,33	67,544,463,550	85,285,773,599
Due to customers for contract work	24	2,794,587,094	-
Short-term borrowings	4,10,15	175,000,000,000	668,399,166,468
Current portion of bonds	4,10,15	153,836,456,220	264,511,710,517
Current portion of long-term asset-backed loans	4,10,15	88,380,095,656	65,738,259,513
Current lease liabilities	4,10,16	28,195,562,004	27,411,566,229
Derivative liabilities	4,9,10	-	1,314,440,934
Current provisions	18	1,949,631,415	7,816,715,745
Current tax liabilities	29	89,707,425,373	284,660,778,912
Other current liabilities		67,090,051,024	67,892,770,179
Total current liabilities		779,950,804,443	1,584,689,342,105
Non-current liabilities:			
Long-term other payables	4,10	14,653,822,377	18,294,675,461
Bonds	4,10,15	177,634,508,673	291,196,590,613
Long-term borrowings	4,10,15	418,301,422,707	-
Long-term asset-backed loans	4,10,15	108,020,116,913	16,434,564,878
Non-current lease liabilities	4,10,16	210,314,598,930	234,720,033,224
Net defined benefit liabilities	17	9,303,066,642	28,501,921,186
Non-current provisions	18	8,858,237,517	3,588,928,973
Deferred tax liabilities	29	9,983,557,589	70,350,950,900
Other non-current liabilities		92,274,274,795	14,099,487,679
Total non-current liabilities		1,049,343,606,143	677,187,152,914
Total liabilities		1,829,294,410,586	2,261,876,495,019
Equity			
Share capital	1,19	123,738,105,000	123,738,105,000
Capital surplus	19,20	794,035,947,562	793,456,657,395
Other equity items	21	(1,146,547,169,797)	(1,149,030,789,975)
Accumulated other comprehensive income	22	23,811,508,578	33,322,013,575
Retained earnings	23	3,388,478,542,156	3,244,924,405,639
Total equity		3,183,516,933,499	3,046,410,391,634
Total liabilities and equity		₩ 5,012,811,344,085	₩ 5,308,286,886,653

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

Doosan Corporation
Separate statements of profit or loss
for the years ended December 31, 2022 and 2021
(Korean won)

	Notes	2022	2021
Sales			
Merchandise and finished goods	24,33 ₩	828,252,858,234	₩ 749,886,753,107
Construction	24	3,985,412,906	-
Others	24,33	229,229,067,452	206,688,249,145
Dividend	24,33	15,727,774,403	10,889,725,232
		1,077,195,112,995	967,464,727,484
Cost of sales			
Merchandise and finished goods	25,33	604,038,371,330	539,623,801,346
Construction	25	2,941,605,040	-
Others	25,33	172,432,941,635	161,931,865,315
Selling and administrative expenses	25,33	225,421,042,431	199,292,467,949
		1,004,833,960,436	900,848,134,610
Operating profit		72,361,152,559	66,616,592,874
Finance income	4,10,27	72,728,391,413	140,120,478,120
Finance expenses	4,10,27	111,052,924,812	86,751,534,593
Other non-operating income	28	252,688,918,029	68,875,065,239
Other non-operating expenses	28	86,046,379,135	74,597,360,710
Profit before income tax expenses		200,679,158,054	114,263,240,930
Income tax expenses	29	25,212,757,238	25,251,782,829
Profit from continuing operations		175,466,400,816	89,011,458,101
Profit from discontinued operations	36	-	321,810,192,749
Profit for the year		₩ 175,466,400,816	₩ 410,821,650,850
Earnings per share attributable to the equity holders of the Company	30		
Basic earnings per ordinary share from continuing operations	₩	9,848	₩ 4,098
Basic earnings per ordinary share	₩	9,848	₩ 23,070
Diluted earnings per ordinary share from continuing operations	₩	9,848	₩ 4,098
Diluted earnings per ordinary share	₩	9,848	₩ 23,070
Basic earnings per old-type preferred share from continuing operations	₩	9,898	₩ 4,107
Basic earnings per old-type preferred share	₩	9,898	₩ 23,120
Diluted earnings per old-type preferred share from continuing operations	₩	9,898	₩ 4,107
Diluted earnings per old-type preferred share	₩	9,898	₩ 23,120

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

Doosan Corporation
Separate statements of comprehensive income
for the years ended December 31, 2022 and 2021

(Korean won)

	Notes	2022	2021
Profit for the year		₩ 175,466,400,816	₩ 410,821,650,850
Other comprehensive income	22		
Items not to be subsequently reclassified to profit or loss			
Remeasurements of net defined benefit liabilities	17	3,440,667,833	(4,380,682,389)
Land revaluation surplus	12	(754,653,160)	2,418,961,806
Gain (Loss) on valuation of financial assets (designated) at fair value through OCI	6	(12,723,243,440)	5,146,082,779
Items to be subsequently reclassified to profit or loss			
Gain (Loss) on valuation of derivatives designated as hedges	9	4,386,800,471	(1,007,003,703)
Total other comprehensive income		(5,650,428,296)	2,177,358,493
Total comprehensive income for the year		₩ 169,815,972,520	₩ 412,999,009,343

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

Doosan Corporation
Separate 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	Total
As of January 1, 2021	₩ 123,738,105,000	792,396,115,124	₩ (1,147,970,247,704)	₩ 37,297,569,826	₩ 2,847,844,794,745	₩ 2,653,306,336,991
Total comprehensive income:						
Profit for the year	-	-	-	-	410,821,650,850	410,821,650,850
Remeasurements of net defined benefit liabilities	-	-	-	-	(4,380,682,389)	(4,380,682,389)
Land revaluation surplus	-	-	-	(8,114,635,327)	10,533,597,133	2,418,961,806
Gain on valuation of financial assets (designated) at fair value through OCI	-	-	-	5,146,082,779	-	5,146,082,779
Loss on valuation of derivatives designated	-	-	-	(1,007,003,703)	-	(1,007,003,703)
Subtotal	-	-	-	(3,975,556,251)	416,974,565,594	412,999,009,343
Transactions with shareholders directly reflected in shareholders' equity and others:						
Cancellation of stock options	-	1,060,542,271	(1,060,542,271)	-	-	-
Payment of dividends	-	-	-	-	(19,894,954,700)	(19,894,954,700)
Subtotal	-	1,060,542,271	(1,060,542,271)	-	(19,894,954,700)	(19,894,954,700)
As of December 31, 2021	₩ 123,738,105,000	₩ 793,456,657,395	₩ (1,149,030,789,975)	₩ 33,322,013,575	₩ 3,244,924,405,639	₩ 3,046,410,391,634
As of January 1, 2022	₩ 123,738,105,000	793,456,657,395	₩ (1,149,030,789,975)	₩ 33,322,013,575	₩ 3,244,924,405,639	₩ 3,046,410,391,634
Total comprehensive income:						
Profit for the year	-	-	-	-	175,466,400,816	175,466,400,816
Remeasurements of net defined benefit liabilities	-	-	-	-	3,440,667,833	3,440,667,833
Land revaluation surplus	-	-	-	(754,653,160)	-	(754,653,160)
Loss on valuation of financial assets (designated) at fair value through OCI	-	-	-	(12,723,243,440)	-	(12,723,243,440)
Gain on valuation of derivatives designated	-	-	-	4,386,800,471	-	4,386,800,471
Subtotal	-	-	-	(9,091,096,129)	178,907,068,649	169,815,972,520
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	-	-	3,062,910,345
Payment of dividends	-	-	-	-	(35,772,341,000)	(35,772,341,000)
Reclassification of accumulated other comprehensive income to retained earnings	-	-	-	(419,408,868)	419,408,868	-
Subtotal	-	579,290,167	2,483,620,178	(419,408,868)	(35,352,932,132)	(32,709,430,655)
As of December 31, 2022	₩ 123,738,105,000	₩ 794,035,947,562	₩ (1,146,547,169,797)	₩ 23,811,508,578	₩ 3,388,478,542,156	₩ 3,183,516,933,499

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

Doosan Corporation
Separate 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:	34		
Profit for the year	₩	175,466,400,816	₩ 410,821,650,850
Adjustments		(61,256,357,575)	(254,573,598,852)
Changes in operating assets and liabilities		103,689,221,455	(101,744,874,229)
		217,899,264,696	54,503,177,769
Interest received		20,399,455,365	6,897,894,980
Interest paid		(77,333,100,268)	(70,272,793,507)
Dividends received		16,363,826,581	9,914,977,646
Income tax paid		(278,894,719,999)	(274,272,852,818)
Net cash flows used in operating activities		(101,565,273,625)	(273,229,595,930)
Cash flows from investing activities			
Cash inflows from investing activities:			
Decrease in short-term loans		-	3,000,000,000
Decrease in short-term financial instruments		501,195,894,887	34,390,784,612
Decrease in long-term financial instruments		-	2,499,789,000
Disposal of long-term investment securities		3,335,872,543	-
Disposal of investment in subsidiaries and associates		719,037,864,931	-
Disposal of property, plant and equipment		2,434,054,367	20,895,446,304
Disposal of intangible assets		2,655,969,373	1,378,000,000
Decrease in long-term loans		721,970,855	624,246,479
Increase in government grants		815,826,878	1,276,724,714
Net cash flows from disposal of discontinued operations		-	1,149,209,571,874
Cash inflows from other investing activities		55,391,992,351	-
		1,285,589,446,185	1,213,274,562,983
Cash outflows from investing activities:			
Increase in short-term loans		-	8,385,000,000
Increase in short-term financial instruments		14,705,095,891	436,961,976,244
Acquisition of long-term financial instruments		200,000,000	408,640,200
Acquisition of long-term investment securities		5,032,464,925	124,935,307,568
Acquisition of investments in subsidiaries and associates		503,206,841,697	88,384,839,000
Acquisition of property, plant and equipment		58,723,393,915	41,753,852,619
Acquisition of intangible assets		14,838,467,431	15,151,613,675
Acquisition of Investment properties		-	67,731,942
Increase in long-term loans		720,027,760	309,040,000
Cash outflows from other investing activities		3,230,134,860	817,374,480
		(600,656,426,479)	(717,175,375,728)
Net cash flows provided by investing activities		684,933,019,706	496,099,187,255
Cash flows from financing activities			
Cash inflows from financing activities:			
Increase in short-term borrowings		1,187,000,000,000	2,253,463,503,990
Issuance of bonds		109,569,252,177	221,029,620,000
Increase in long-term borrowings		417,460,000,000	-
Increase in long-term asset-backed loans		196,148,150,000	-
		1,910,177,402,177	2,474,493,123,990
Cash outflows from financing activities:			
Repayment of short-term borrowings		1,680,399,166,468	2,342,825,832,522
Repayment of current long-term borrowings		-	14,512,183,114
Repayment of current long-term asset-backed loans		66,103,172,827	96,499,058,261
Repayment of long-term asset-backed loans		16,439,713,327	84,088,841,739
Repayment of bonds		335,793,972,602	137,974,389,081
Repayment of lease liabilities		27,631,629,463	29,760,888,815
Payment of dividends		35,772,341,000	19,894,954,700
		(2,162,139,995,687)	(2,725,556,148,232)
Net cash flows used in financing activities		(251,962,593,510)	(251,063,024,242)
Effect of exchange rate changes on cash and cash equivalents		1,310,249,500	7,645,375,148
Net increase (decrease) in cash and cash equivalents		332,715,402,071	(20,548,057,769)
Cash and cash equivalents, beginning of the year		49,062,002,726	69,610,060,495
Cash and cash equivalents, end of the year		₩ 381,777,404,797	₩ 49,062,002,726

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

1. General

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.

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
	<u>16,523,835</u>	<u>100.00</u>

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.

2. Summary of significant accounting policies

2.1 Basis of preparation

The Company prepares statutory financial statements in Korean in accordance with KIFRS enacted by *the Act on External Audit of Stock Companies*. The Company's financial statements are separate financial statements prepared in accordance with KIFRS 1027 *Separate Financial Statements*, in which the controlling company, investors of associates or participants of joint control company have stated investment assets as accounting based on direct equity investment, not based on the reported performance and net assets of the investee. The accompanying separate 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 separate financial statements are described below. Significant accounting policies applied in the preparation of the separate financial statements for the year ended December 31, 2022 are the same as those adopted in the preparation of the separate 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 separate financial statements have been prepared on the historical cost basis, except for certain non-current assets and financial instruments that are measured at fair values, as explained in the accounting policies below. Historical cost is based on the fair values of the consideration given in exchange for assets.

2.2 Changes of accounting policies and disclosure

2.2.1 New and amended standards and interpretations

The company 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 Company 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 financial statements of the Company.

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 Company 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 have no impact on the financial statements of the Company.

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 Company. The amendments are not expected to have a material impact on the Company.

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. The amendments are not expected to have no impact on the Company.

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 Company as it did not have assets in scope of KIFRS 1041 as of the reporting date.

2.2.2 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 Company's financial statements are disclosed below. The Company 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 Company 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 Company.

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

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 Company is currently assessing the impact of the amendments.

2.3 Investments in subsidiaries, joint ventures and associates

The Company has elected to use book value under previous generally accepted accounting principles as deemed cost for subsidiaries, joint ventures and associates at the date of transition to KIFRS. After the date of transition, subsidiaries, joint ventures and associates are measured at cost.

The Company determines whether an impairment loss is recognized in respect of investments in subsidiaries, joint ventures and associates in accordance with KIFRS 1036 *Financial Instruments: Recognition and Measurement*. If there is an indication of impairment, the total carrying amount of the subsidiaries, joint ventures and associates (including goodwill) is compared to the recoverable amount (the greater between fair value less cost 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 the associates, joint ventures and associates. The reversal of impairment loss is recognized in accordance with KIFRS 1036 as the recoverable amount of the investment assets increases subsequently.

2.4 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 operation. 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 Company 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 Company, conducts transactions such as joint sales and purchases of assets, the Company does not recognize its portion of the profit or loss until the assets are resold to a third party.

2.5 Operating segments

The Company's operating segments are disclosed in a manner consistent with the business segment reporting provided to the chief operating decision-maker, and the information is disclosed in Consolidated Financial statement Note 24 in accordance with KIFRS 1108 *Operating Segments*.

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.

2.7 Assets held for sale and Discontinued operation

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.

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.

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

The Company 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 Company 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.

2.7.3 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 Company 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 36.

2.8 Revenue from contracts with customers

2.8.1 Identifying performance obligations

The Company's major businesses include manufacturing of copperplate and fuel cell and service such as IT system development/operating.

2.8.2 Variable consideration

If the consideration in a contract includes a variable amount, the Company estimates the amount of consideration to which it will be entitled in exchange for transferring the goods to the customer. The variable consideration is estimated at contract inception and constrained until it is highly probable that a significant revenue reversal in the amount of cumulative revenue recognized will not occur when the associated uncertainty with the variable consideration is subsequently resolved.

2.8.3 Allocation of the transaction price

The Company allocates the transaction price on the basis of the stand-alone selling price to the various performance obligations identified in a single contract. The Company 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 Lease

The Company 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 Company as a lessee

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

2.9.1 Right-of-use assets

The Company 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 Company applies cost model on subsequent measurement. To apply cost model, the Company 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 Company at the end of the lease term or if the Company 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 2.19.

2.9.2 Lease liabilities

On lease commencement date, the Company 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 Company 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 Company 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.

2.9.3 Short-term lease and lease of low-value assets

The Company 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 Company 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 Company as lessor

The Company 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 statements of profit or loss depending on the nature of the business. The direct cost of lease opening borne in the course of an operating lease is added to the carrying amount of the underlying asset and recognized as an expense over the lease period on the same basis as the lease income. Conditional rent is recognized as revenue at the time the rent is received.

2.10 Foreign currencies

The separate financial statements of the Company are presented in the currency of the primary economic environment in which the entity operates (its functional currency). For the purpose of the separate financial statements, the results and financial position of the Company are expressed in Korean won, which is the functional currency of the entity and the presentation currency for the separate 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 2.24 below for hedging accounting policies)
- Exchange differences on monetary items forming part of the net investment in the foreign operation.

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 Company 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 Company determines the transaction date for each payment or receipt of advance consideration.

2.11 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.

2.12 Retirement benefit costs and termination benefits

The Company 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 separate statement of financial position 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 component.

The Company 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 separate statement of financial position represents the actual deficit or surplus in the Company'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.

2.13 Share-based payment transactions of the Company

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 Company's estimate of equity instruments that will eventually vest. At the end of each reporting period, the Company 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.

2.14 Taxation

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

2.14.1 Current tax

The tax currently payable is based on taxable profit for the year. Taxable profit differs from profit as reported in the separate 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 Company's liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

2.14.2 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 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 Company expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

2.14.3 Current and deferred taxes for the year

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

2.15 Government grants

Government grants are not recognized until there is reasonable assurance that the Company 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 separate statement of financial position 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 Company 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 Company with no future-related costs are recognized in profit or loss in the period in which they become receivable.

2.16 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 Company and the cost of an asset can be measured reliably. Routine maintenance and repairs are expensed as incurred.

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

	Estimated useful lives (in years)
Buildings	5–50
Structures	2–30
Machinery	2–15
Other property, plant and equipment	2–10

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

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.

2.17 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 Company 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.

2.18 Intangible assets

2.18.1 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.

2.18.2 Internally generated intangible assets

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 Company 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.

2.18.3 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.

2.18.4 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.

2.18.5 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:

	Estimated useful lives (in years)
Development costs	5–10
Industrial rights	5–10
Other intangible assets	4–15

2.19 Impairment of Property, plant and equipment and intangible assets other than goodwill

At the end of each reporting period, the Company reviews the carrying amounts of its Property, plant and equipment 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 Company 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 prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

2.20 Inventories

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

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

2.21 Provisions

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

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.

2.22 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.

2.22.1 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 Company'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 Company'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 Company 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

Financial assets at amortized cost (debt instruments)

The Company 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.

2.22.1 Financial assets (cont'd)

Financial assets at fair value through OCI (debt instruments)

The Company 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 Company 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 Company 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 Company 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.

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.

2.22.1 Financial assets (cont'd)

[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 Company's separate statements of financial position) when:

- The rights to receive cash flows from the asset have expired, or
- The Company 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 Company has transferred substantially all the risks and rewards of the asset, or (b) the Company has neither transferred nor retained substantially all the risks and rewards of the asset, but has transferred control of the asset

When the Company 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 Company continues to recognize the transferred asset to the extent of its continuing involvement. In that case, the Company 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 Company 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 Company could be required to repay.

[Impairment of financial assets]

The Company 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 Company 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).

For trade receivables and contract assets, the Company applies a simplified approach in calculating ECLs. Therefore, the Company does not track changes in credit risk, but instead recognizes a loss allowance based on lifetime ECLs at each reporting date. The Company 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.

2.22.2 Financial liabilities

[Initial recognition and measurement]

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

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

[Subsequent measurement]

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

Financial liabilities at fair value through profit or loss

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

Financial liabilities are classified as held for trading if they are incurred for the purpose of repurchasing in the near term. This category also includes derivative financial instruments entered into by the Company 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.

2.22.3 Offsetting of financial instruments

Financial assets and financial liabilities are offset and the net amount is reported in the separate statements of financial position 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.

2.22.4 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 of 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

2.23 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 Company are recognized at the proceeds received, net of direct issue costs.

Repurchase of the Company'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 Company's own equity instruments.

2.24 Derivative financial instruments and hedge accounting

The Company 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 Company formally designates and documents the hedge relationship to which the Company wishes to apply hedge accounting and the risk management objective and strategy for undertaking the hedge.

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

The documentation includes identification of the hedging instrument, the hedged item, the nature of the risk being hedged and how the Company 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:

- 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 Company actually hedges and the quantity of the hedging instrument that the Company 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 Company 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 Company 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.

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

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.

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 statements 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 statements of profit or loss.

2.25 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 Company 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 separate 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 1116 *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.

2.26 Approval of separate financial statements

The separate financial statements of the Company 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 Company's accounting policies, 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 goodwill

Determining whether goodwill is impaired requires an estimation of the value in use of the CGUs to which goodwill 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 Company'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 Company's best estimates of the variables, such as discount rates, rates of expected future salary increases and mortality rates.

3.4 Provisions

The Company provides warranty for products when it recognizes the relevant revenue. The Company 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 Company 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.

Provisions for the expected cost of warranty obligations are recognized at the best estimate of the expenditure required to settle the Company'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 Company 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 Company'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 Company is obliged to pay additional income taxes calculated by the same Act. As a result, as the Company 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 Company 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 Leases – Estimating the incremental borrowing rate

When the Company cannot readily determine the interest rate implicit in the lease, it uses its incremental borrowing rate ("IBR") to measure lease liabilities. The IBR is the rate of interest that the Company 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. So the incremental borrowing interest rate is observable if there is no rate or if it needs to be adjusted to reflect the terms of the lease (for example, if the lease agreement is not our functional currency), it will reflect what the company 'should pay'.

The Company 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 Company's stand-alone credit rating).

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

The Company 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 Company has several lease contracts that include extension and termination options. The Company 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 Company 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 – Company as lessor

The Company has sub-lease contracts for right-of-use assets classified as investment properties. The Company 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 Fair value

When the fair values of financial instruments recorded in the separate statements of financial position 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.

4. Financial risk management

The Company 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 Company. 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 Company enters into derivative contracts to hedge against certain risks.

4.1 Market risk

4.1.1 Foreign currency risk

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

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

The carrying amount of the Company's monetary assets and liabilities denominated in foreign currencies other than the Company'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	₩	170,424	₩ 64	₩ 2,400	₩ 9,889	₩ 16,192	₩ 198,969
Liabilities		(63,073)	-	(955)	-	(18)	(64,046)
	₩	107,351	₩ 64	₩ 1,445	₩ 9,889	₩ 16,174	₩ 134,923

		December 31, 2021					
		USD	EUR	JPY	GBP	Others	Total
Assets	₩	127,057	₩ 1,361	₩ 2,124	₩ 8,107	₩ 5,034	₩ 143,683
Liabilities		(61,229)	(1)	(1,910)	(1,272)	(58)	(64,470)
	₩	65,828	₩ 1,360	₩ 214	₩ 6,835	₩ 4,976	₩ 79,213

A sensitivity analysis on the Company'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	₩	13,492	₩ 7,921
10% Decrease		(13,492)	(7,921)

The above-mentioned sensitivity analysis is based on monetary assets and liabilities denominated in foreign currencies other than the Company's functional currency as of December 31, 2022 and 2021.

4.1.2 Interest rate risk

The Company'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 Company is exposed to interest rate risk mainly due to its borrowings 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 Company 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 Company manages its interest rate risk preemptively through regular monitoring and adjustments to the changing domestic and overseas markets conditions and nature of its interest rates.

The carrying amount of the Company'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	₩ 175,117	₩ 31,202
Financial liabilities	(209,000)	(285,500)
	<u>₩ (33,883)</u>	<u>₩ (254,298)</u>

A sensitivity analysis on the Company'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	₩ (339)	₩ (2,543)
1% Decrease	339	2,543

4.1.3 Price risk

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

4.2 Credit risk

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

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

Also, the Company reevaluates customers' creditworthiness periodically, reassesses credit transaction limit and readjusts level of collateral. The Company 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 of the financial assets exposed to credit risk as of December 31, 2022 and 2021 is as follows (Korean won in millions). The carrying amount indicates the maximum exposure to credit risk.

	December 31, 2022
Cash and cash equivalents	₩ 381,777
Short-term and long-term financial instruments	59,902
Trade and other receivables	193,532
Deposits	40,455
Short-term and long-term investment securities (excluding equity securities):	
Financial assets at fair value through profit or loss	14,505
Derivative assets	4,615
	<u>₩ 694,786</u>
	December 31, 2021
Cash and cash equivalents	₩ 49,062
Short-term and long-term financial instruments	546,096
Trade and other receivables	302,997
Deposits	33,210
Short-term and long-term investment securities (excluding equity securities):	
Financial assets at fair value through profit or loss	12,764
Derivative assets	203
	<u>₩ 944,332</u>

Apart from the above, in the case of contracts such as financial guarantees provided by the Company, the amount of guarantees to be paid by the Company at the request of the guarantee is the maximum amount exposed to the credit risk (See Note 31).

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4.2 Credit risk (cont'd)

Details of trade receivables 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									
	Individually assessed trade receivables (*1)	Trade receivables assessed for impairment on a collective basis (*2)					Subtotal	Total	
		Within due	Less than 3 months	3-6 months	6-12 months	More than 12 months			
Book value	₩ 102,447	₩ 63,741	₩ 3,409	₩ 1,543	₩ 1,385	₩ 99	₩ 70,177	₩ 172,624	
Expected credit loss rate	16.90%	0.00%	0.03%	0.29%	1.80%	82.82%			
Expected credit loss	₩ 17,312	₩ 3	₩ 1	₩ 5	₩ 25	₩ 82	₩ 116	₩ 17,428	

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

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

December 31, 2021									
Trade receivables									
	Individually assessed trade receivables (*1)	Trade receivables assessed for impairment on a collective basis (*2)					Subtotal	Total	
		Within due	Less than 3 months	3-6 months	6-12 months	More than 12 months			
Book value	₩ 184,260	₩ 61,184	₩ 1,634	₩ 116	₩ 337	₩ 112	₩ 63,383	₩ 247,643	
Expected credit loss rate	9.97%	0.00%	0.00%	0.00%	0.59%	33.04%			
Expected credit loss	₩ 18,362	₩ -	₩ -	₩ -	₩ 2	₩ 37	₩ 39	₩ 18,401	

(*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.

4.3 Liquidity risk

Liquidity risk is the risk that the Company 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 Company prepares for the funding balance of its business activities, investment activities and financing activities for the maturity of financial assets and liabilities. The Company manages the liquidity risks that may occur in the future in advance by securing and maintaining required liquidity.

A summary of the Company's non-derivative liabilities maturity as of December 31, 2022 and 2021 is as follows (Korean won in millions):

		December 31, 2022				
		Nominal cash flows according to contract				
	Book value	Total	Less than 1 year	1–2 years	2–5 years	More than 5 years
Financial liabilities	₩ 1,546,437	₩ 1,605,788	₩ 629,850	₩ 695,465	₩ 175,976	₩ 104,497
Interest on financial liabilities		58,852	45,889	12,422	541	-
	<u>₩ 1,546,437</u>	<u>₩ 1,664,640</u>	<u>₩ 675,739</u>	<u>₩ 707,887</u>	<u>₩ 176,517</u>	<u>₩ 104,497</u>
		December 31, 2021				
		Nominal cash flows according to contract				
	Book value	Total	Less than 1 year	1–2 years	2–5 years	More than 5 years
Financial liabilities	₩ 1,775,291	₩ 1,847,499	₩ 1,229,272	₩ 280,936	₩ 195,910	₩ 141,381
Interest on financial liabilities		43,607	34,410	8,446	751	-
	<u>₩ 1,775,291</u>	<u>₩ 1,891,106</u>	<u>₩ 1,263,682</u>	<u>₩ 289,382</u>	<u>₩ 196,661</u>	<u>₩ 141,381</u>

The above-mentioned maturity analysis is based on an undiscounted cash flow according to the contract, which differs from the carrying amount of non-derivative liabilities presented in the separate statements of financial position. It also includes the interest expenses on financial liabilities to be paid in the future. Apart from the above-mentioned non-derivative liabilities, as of December 31, 2022, financial guarantee liabilities of the Company are explained in Note 31.

4.4 Capital risk

The Company 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 Company 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 Company'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	₩ 1,829,294	₩ 2,261,876
Total equity	3,183,517	3,046,410
Debt-to-equity ratio	57.46%	74.25%

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
Short-term financial instruments	₩ 33,751	₩ 534,554	Deposits, establishment of the right of pledge and others
Long-term financial instruments	11,446	11,539	Bank transaction deposits, deposits provided for business, establishment of the right of pledge and others
	<u>₩ 45,197</u>	<u>₩ 546,093</u>	

6. Short-term and long-term investment securities

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	₩ 11,069	₩ 1,497
Long-term investment securities	Financial assets at fair value through OCI	12,766	29,453
	Financial assets at fair value through profit or loss	110,208	171,241
		<u>122,974</u>	<u>200,694</u>
		<u>₩ 134,043</u>	<u>₩ 202,191</u>

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
Financial assets (designated) at fair value through OCI	Marketable equity securities Preferred shares of Solus Advanced Materials Co., Ltd. and others	₩ 9,531	₩ 26,218
	Non-marketable equity securities Sensorview Co., Ltd. and others	<u>3,235</u>	<u>3,235</u>
		12,766	29,453
Financial assets at fair value through profit or loss	Non-marketable equity securities SiO2 Medical Products, Inc. and others (*1)	106,772	159,974
	Contributions Machinery Financial Cooperative and others	3,004	3,666
	Beneficiary certificates Pangaea Ventures Fund IV and others	6,644	4,241
	Debt securities Kodit 2020 the 9th Securitization Specialty Co., Ltd. and others (*2)	<u>4,857</u>	<u>4,857</u>
		<u>121,277</u>	<u>172,738</u>
		<u>₩ 134,043</u>	<u>₩ 202,191</u>

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

(*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 Co., Ltd. and others as of December 31, 2022.

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	Ending balance
Financial assets at fair value through OCI (*1)	₩	29,453	₩ 1,946	₩ (1,937)	₩ (16,696)	₩ -	₩ 12,766
Financial assets at fair value through profit or loss		172,738	3,086	(1,193)	(53,373)	19	121,277
	₩	202,191	₩ 5,032	₩ (3,130)	₩ (70,069)	₩ 19	₩ 134,043

(*1) During the year ended December 31, 2022, the Company disposed of 12,705 1st preferred shares and 87,209 2nd preferred shares in Solus Advanced Materials Co., Ltd. which the Company held. On the date of disposal, the fair value of the 1st and 2nd preferred shares amounted to ₩199 million and ₩1,728 million. The accumulated gain on valuation of financial assets at fair value through OCI of ₩419 million, which was recognized in accumulated other comprehensive income, was reclassified to retained earnings.

		2021				
		Beginning balance	Acquisition	Disposal	Valuation	Ending balance
Financial assets (designated) at fair value through OCI	₩	19,664	₩ 3,000	₩ -	₩ 6,789	₩ 29,453
Financial assets at fair value through profit or loss		51,764	121,935	(961)	-	172,738
	₩	71,428	₩ 124,935	₩ (961)	₩ 6,789	₩ 202,191

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

Changes in accumulated other comprehensive income of financial assets (designated) at fair value through OCI for the years ended December 31, 2022 and 2021 are as follows (Korean won in millions):

		2022			
		Beginning balance	Valuation	Disposal	Ending balance
Equity instruments at fair value through OCI	Accumulated other comprehensive income before income tax	₩ 10,511	₩ (16,696)	₩ (553)	₩ (6,738)
	Income tax effect	(2,543)	3,972	134	1,563
		₩ 7,968	₩ (12,724)	₩ (419)	₩ (5,175)
		2022			
		Beginning balance	Valuation	Disposal	Ending balance
Equity instruments at fair value through OCI	Accumulated other comprehensive income before income tax	₩ 3,722	₩ 6,789	₩ -	₩ 10,511
	Income tax effect	(900)	(1,643)	-	(2,543)
		₩ 2,822	₩ 5,146	₩ -	₩ 7,968

7. Trade and other receivables

Trade and other receivables as of December 31, 2022 and 2021 consist of the following (Korean won in millions):

		December 31, 2022		
		Gross amount	Provision for impairment	Book value
Current:				
Trade receivables	₩	172,624	₩ (17,428)	₩ 155,196
Non-trade receivables		24,892	(2,119)	22,773
Accrued income		7,928	-	7,928
Short-term loans		1,445	(5)	1,440
Current portion of long-term financial lease receivables		574	-	574
Others		-	-	-
	₩	207,463	₩ (19,552)	₩ 187,911
		December 31, 2022		
		Gross amount	Provision for impairment	Book value
Non-current:				
Trade receivables	₩	-	₩ -	₩ -
Non-trade receivables		-	-	-
Long-term loans		1,178	-	1,178
Financial lease receivables		4,444	-	4,444
	₩	5,622	₩ -	₩ 5,622

7. Trade and other receivables (cont'd)

	December 31, 2021		
	Gross amount	Provision for impairment	Book value
Current:			
Trade receivables	₩ 247,643	₩ (18,401)	₩ 229,242
Non-trade receivables	50,764	(1,705)	49,059
Accrued income	8,246	-	8,246
Short-term loans	15,093	(5)	15,088
Current portion of long-term financial lease payments receivables	-	-	-
Others	31	-	31
	<u>₩ 321,777</u>	<u>₩ (20,111)</u>	<u>₩ 301,666</u>

	December 31, 2021		
	Gross amount	Provision for impairment	Book value
Non-current:			
Trade receivables	₩ -	₩ -	₩ -
Non-trade receivables	-	-	-
Long-term loans	1,331	-	1,331
financial lease payments receivables	-	-	-
	<u>₩ 1,331</u>	<u>₩ -</u>	<u>₩ 1,331</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	Ending balance
Trade receivables	₩ 18,401	₩ (772)	₩ (201)	₩ 17,428
Non-trade receivables	1,705	414	-	2,119
Short-term loans	5	-	-	5
	<u>₩ 20,111</u>	<u>₩ (358)</u>	<u>₩ (201)</u>	<u>₩ 19,552</u>

	2021				
	Beginning balance	Provision for impaired receivables (reversal)	Write off	Others	Ending balance
Trade receivables	₩ 20,340	₩ 335	₩ (785)	₩ (1,489)	₩ 18,401
Non-trade receivables	3,584	600	(2,255)	(224)	1,705
Short-term loans	5	-	-	-	5
	<u>₩ 23,929</u>	<u>₩ 935</u>	<u>₩ (3,040)</u>	<u>₩ (1,713)</u>	<u>₩ 20,111</u>

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

8. Inventories

Details of 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
Merchandise	₩ 70	₩ (31)	₩ 39	₩ 490	₩ (9)	₩ 481
Finished goods	27,993	(7,517)	20,476	33,316	(4,896)	28,420
Work in process	21,694	-	21,694	18,156	-	18,156
Raw materials	70,678	(2,432)	68,246	60,850	(1,849)	59,001
Materials in transit	1,880	-	1,880	1,589	-	1,589
Others	3,033	(60)	2,973	2,656	-	2,656
	<u>₩ 125,348</u>	<u>₩ (10,040)</u>	<u>₩ 115,308</u>	<u>₩ 117,057</u>	<u>₩ (6,754)</u>	<u>₩ 110,303</u>

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 ₩3,286 million and ₩(-)279 million.

9. Derivatives

Overview of derivative contracts are as follows:

Derivative contracts	Purpose	Description
Currency forward contracts	Cash flow hedge	The Company designated the currency forward contracts as hedging instrument to hedge the cash flow risk arising from changes in foreign currency of forecast sales
Stock swap, Stock warrants and others	Held for trading	Changes in fair value are recognized in profit or loss

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							
	Buy		Sell		Assets (liabilities)	Gain (loss)	Accumulated other comprehensive income (*1)
	Currency	Amount	Currency	Amount			
Currency forward contracts	KRW	74,541	USD	55,300	₩ 4,615	₩ -	₩ 4,615

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

December 31, 2021							
	Buy		Sell		Assets (liabilities)	Gain (loss)	Accumulated other comprehensive income (*1)
	Currency	Amount	Currency	Amount			
Currency forward contracts	KRW	142,677	USD	121,000	₩ (1,111)	₩ -	₩ (1,111)
Stock warrants (*2)					34,246	25,639	-
Stock swap (*3)					-	58,055	-
					₩ 33,135	₩ 83,694	₩ (1,111)

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

(*2) Valuation of stock warrants issued by Doosan Enerbility Co., Ltd. (formerly, Doosan Heavy Industry and Construction Co., Ltd.).

(*3) The amounts are gain (loss) on valuation of fair value of contract. During the previous year, the Company invested the ordinary shares and preferred shares of Doosan Fuel Cell Co., Ltd. in kind to Doosan Enerbility Co., Ltd..

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10. Financial instruments by category

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

Financial assets	December 31, 2022					
	Financial assets at fair value through profit or loss	Financial assets (designated) at fair value through OCI	Derivatives designated as hedging instruments	Financial assets at amortized cost	Book value	Fair value
Cash and cash equivalents	₩ -	₩ -	₩ -	₩ 381,777	₩ 381,777	₩ 381,777
Short-term and long-term financial instruments	-	-	-	59,902	59,902	59,902
Short-term and long-term investment securities	121,277	12,766	-	-	134,043	134,043
Trade and other receivables	-	-	-	193,533	193,533	193,533
Derivative assets	-	-	4,615	-	4,615	4,615
Deposits	-	-	-	40,455	40,455	40,455
	<u>₩ 121,277</u>	<u>₩ 12,766</u>	<u>₩ 4,615</u>	<u>₩ 675,667</u>	<u>₩ 814,325</u>	<u>₩ 814,325</u>

Financial liabilities	December 31, 2022					
	Financial liabilities at fair value through profit or loss	Derivatives designated as hedging instruments	Financial guarantee contract	Financial liabilities at amortized cost	Book value	Fair value
Trade and other payables	₩ -	₩ -	₩ 896	₩ 186,755	₩ 187,651	₩ 187,651
Borrowings, bonds and asset-backed loans	-	-	-	1,121,172	1,121,172	1,121,172
Lease liabilities	-	-	-	238,510	238,510	238,510
	<u>₩ -</u>	<u>₩ -</u>	<u>₩ 896</u>	<u>₩ 1,546,437</u>	<u>₩ 1,547,333</u>	<u>₩ 1,547,333</u>

Financial assets	December 31, 2021					
	Financial assets at fair value through profit or loss	Financial assets (designated) at fair value through OCI	Derivatives designated as hedging instruments	Financial assets at amortized cost	Book value	Fair value
Cash and cash equivalents	₩ -	₩ -	₩ -	₩ 49,062	₩ 49,062	₩ 49,062
Short-term and long-term financial instruments	-	-	-	546,096	546,096	546,096
Short-term and long-term investment securities	172,738	29,453	-	-	202,191	202,191
Trade and other receivables	-	-	-	302,997	302,997	302,997
Derivative assets	34,246	-	203	-	34,449	34,449
Deposits	-	-	-	33,210	33,210	33,210
	<u>₩ 206,984</u>	<u>₩ 29,453</u>	<u>₩ 203</u>	<u>₩ 931,365</u>	<u>₩ 1,168,005</u>	<u>₩ 1,168,005</u>

Financial liabilities	December 31, 2021					
	Financial liabilities at fair value through profit or loss	Derivatives designated as hedging instruments	Financial guarantee contract	Financial liabilities at amortized cost	Book value	Fair value
Trade and other payables	₩ -	₩ -	₩ 8,360	₩ 206,879	₩ 215,239	₩ 215,239
Borrowings, bonds and asset-backed loans	-	-	-	1,306,281	1,306,281	1,306,281
Lease liabilities	-	-	-	262,132	262,132	262,132
Derivative liabilities	-	1,314	-	-	1,314	1,314
	<u>₩ -</u>	<u>₩ 1,314</u>	<u>₩ 8,360</u>	<u>₩ 1,775,292</u>	<u>₩ 1,784,966</u>	<u>₩ 1,784,966</u>

10. Financial instruments by category (cont'd)

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 at fair value:				
Financial assets at fair value through profit or loss	₩ -	₩ -	₩ 121,277	₩ 121,277
Financial assets at fair value through OCI	9,531	-	3,235	12,766
Derivative assets designated as hedging instruments	-	4,615	-	4,615
	9,531	4,615	124,512	138,658
Financial liabilities at fair value:				
Financial liabilities at fair value through profit or loss	-	-	-	-
Derivative liabilities designated as hedging instruments	-	-	-	-
	-	-	-	-
	₩ 9,531	₩ 4,615	₩ 124,512	₩ 138,658

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
Financial assets at fair value:				
Financial assets at fair value through profit or loss	₩ -	₩ -	₩ 172,738	₩ 172,738
Financial assets at fair value through OCI	26,218	-	3,235	29,453
Derivative assets	-	203	34,246	34,449
	26,218	203	210,219	236,640
Financial liabilities at fair value:				
Financial liabilities at fair value through profit or loss	-	-	-	-
Derivative liabilities designated as hedging instruments	-	1,314	-	1,314
	-	1,314	-	1,314
	₩ 26,218	₩ (1,111)	₩ 210,219	₩ 235,326

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 Company 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 separate statements of financial position. 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.

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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											Other comprehensive income (*1)				
		Interest		Dividends		Financial guarantee		Valuation		Impairment (loss)		Disposal		Foreign exchange			
Financial assets:																	
Financial assets at amortized cost		₩	15,059	₩	-	₩	-	₩	-	₩	358	₩	-	₩	11,263	₩	-
Financial assets at fair value through profit or loss			-		-		-		(53,373)		19		216		-		-
Financial assets at fair value through OCI			-		136		-		-		-		(10)		-		(16,696)
		₩	15,059	₩	136	₩	-	₩	(53,373)	₩	377	₩	206	₩	11,263	₩	(16,696)
Financial liabilities:																	
Financial liabilities at amortized cost		₩	(79,593)	₩	-	₩	-	₩	-	₩	-	₩	(1,185)	₩	(7,674)	₩	-
Financial guarantee contract			-		-		2,541		-		-		-		-		-
		₩	(79,593)	₩	-	₩	2,541	₩	-	₩	-	₩	(1,185)	₩	(7,674)	₩	-

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

		2021												
		Profit or loss (*1)										Other comprehensive income (*2)		
		Interest		Dividends		Financial guarantee		Impairment (loss)		Disposal				Foreign exchange
Financial assets:														
Financial assets at amortized cost														
	₩	15,933	₩	-	₩	-	₩	(935)	₩	(659)	₩	30,285	₩	-
Financial assets at fair value through profit or loss														
		-		-		-		-		-		-		-
Financial assets at fair value through OCI														
		-		35		-		-		-		-		6,789
	₩	15,933	₩	35	₩	-	₩	(935)	₩	(659)	₩	30,285	₩	6,789
Financial liabilities:														
Financial liabilities at amortized cost														
	₩	(74,019)	₩	-	₩	-	₩	-	₩	(989)	₩	(7,451)	₩	-
Financial guarantee contract														
		-		-		10,765		-		-		-		-
	₩	(74,019)	₩	-	₩	10,765	₩	-	₩	(989)	₩	(7,451)	₩	-

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

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

10. Financial instruments by category (cont'd)

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 loss (*1)	Profit or loss		Other comprehensive loss (*1)
	Valuation	Disposal		Valuation	Disposal	
Derivatives held for trading	₩ -	₩ 21,146	₩ -	₩ 83,694	₩ -	₩ -
Derivatives designated as cash flow hedges	-	(16,705)	5,726	-	(4,537)	(1,329)
	₩ -	₩ 4,441	₩ 5,726	₩ 83,694	₩ (4,537)	₩ (1,329)

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

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11. Investments in subsidiaries, joint ventures and associates

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

	Location	Ownership interests (%)	December 31, 2022	December 31, 2021
Subsidiaries:				
Doosan Enerbility Co., Ltd. (formerly, Doosan Heavy Industry and Construction Co., Ltd.) (*1,2,3,4)	Korea	30.51	₩ 2,536,311	₩ 2,655,736
Oricom, Inc.	Korea	62.83	23,168	23,168
Doosan Bears, Inc.	Korea	100.00	15,559	15,559
Doosan Digital Innovation America, LLC.	USA	100.00	4,889	4,889
Doosan Information & Communications Beijing Co., Ltd.	China	100.00	3,230	3,230
Doosan Digital Innovation Europe Limited	UK	100.00	4,870	4,870
Doosan Business Research Institute Co., Ltd.	Korea	100.00	8,000	8,000
Doosan Logistics Solution Co., Ltd. (*5)	Korea	100.00	49,400	24,500
Doosan Investment Co., Ltd. (*6)	Korea	100.00	280,575	-
Doosan Shanghai Chemical Materials Co., Ltd.	China	100.00	-	-
Doosan Electro-Materials Singapore Pte. Ltd.	Singapore	100.00	-	-
Doosan (Hong Kong) Ltd.	China	100.00	-	-
Doosan Electro-Materials (Changshu) Co., Ltd.	China	100.00	45,964	45,964
Doosan Electro-Materials America, LLC	USA	100.00	8,837	8,837
Doosan Electro-Materials Vietnam Company Limited	Vietnam	100.00	12,300	12,300
HyAxiom, Inc. (formerly, Doosan Fuel Cell America, Inc.) (*7)	USA	100.00	192,405	192,405
Doosan Energy Solutions America, Inc (*8)	USA	100.00	44,442	37,339
Doosan Robotics, Inc.	Korea	90.91	86,000	86,000
Doosan Mobility Innovation, Inc. (*9)	Korea	100.00	72,300	72,300
D-Pay 2nd Co., Ltd. (*10,11)	Korea	-	-	-
D-Pay 3rd Co., Ltd. (*10, 11)	Korea	-	-	-
Doosan Second Real Estate Securitization Specialty Ltd. (*10)	Korea	-	-	-
Doosan Cuvex Co., Ltd. (*12)	Korea	-	-	69,314
Doosan Property Co., Ltd. (*12)	Korea	-	-	49,004
			<u>3,388,250</u>	<u>3,313,415</u>
Associates:				
KDDI KOREA Corporation (*13)	Korea	10.76	-	-
Wise Fashion Co., Ltd. (*14)	Korea	-	-	3,018
PT. SEGARA AKASA	Indonesia	30.02	71	71
Mastern Professional Investment Type Private Security Investment Trust No.98 (*6,15)	Korea	7.27	20,000	70,000
SiO2 Medical Products, Inc. (*16)	USA	7.48	-	-
Versogen, Inc. (*13,17)	USA	3.67	2,487	-
TCC House, Inc. (*16)	Korea	14.29	-	-
			<u>22,558</u>	<u>73,089</u>
Joint venture:				
Sichuan Kelun-Doosan Biotechnology Company Limited	China	50.00	<u>2,526</u>	<u>2,526</u>
			<u>3,413,334</u>	<u>3,389,030</u>

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

(*1) The (potential) share of the decision-making rights of the above subsidiaries for assessing whether they have control or not is less than half, but it has been determined that they have de facto control.

(*2) During the year ended December 31, 2022, Doosan Heavy Industry and Construction Co., Ltd. changed its name to Doosan Enerbility Co., Ltd.

(*3) The Company made its paid-in capital increase by ₩252,375 million during the current year. And the Company dispose ₩371,802 million during the current year.

(*4) The shares of investments in subsidiaries are provided as collateral to New Star Eneo Ville The 1st Co., Ltd. and others (See Note 32).

(*5) The Company made its paid-in capital increase by ₩11,100 million during the current year. Additionally, the Company acquired ₩13,800 million by debt for equity swap during the current year.

(*6) The Company newly established Doosan Investment Co., Ltd. by investing ₩200 million during the year ended December 31, 2022. The Company also invested in kind by transferring some of its beneficiary certificates of Mastern Professional Investment Type Private Security Investment Trust No.98 and invested in cash ₩229,799 million. As a result, the Company acquired 179,999 ordinary shares worth at ₩280,375 million.

(*7) During the year ended December 31, 2022, the name of the Doosan Fuel Cell America, Inc. changed its name to HyAxiom, Inc.

(*8) The Company made its paid-in capital increase by ₩7,103 million during the year ended December 31, 2022.

(*9) As of the December 31, 2022, The Company's voting rights are 86.12% considering the convertible repayment preferred shares with voting rights issued by the subsidiary.

(*10) Although the Company does not hold a significant stake in a special-purpose company, considering the terms of the arrangement in which the structured entity was established, the Company decided that it had control over the activities of the structured entity that could have the most significant impact on the special-purpose company's earnings.

(*11) During the year ended December 31, 2022, D-Pay 2nd Co., Ltd. was liquidated and D-pay 3rd Co., Ltd. was newly established.

(*12) During the year ended December 31, 2022, the Company sell shares to Doosan Enerbility Co., Ltd.

(*13) Although the Company's ownership interest in the investee is less than 20%, the investee is classified as an associate considering the exercise of voting rights in the Board of Directors.

(*14) During the year ended December 31, 2022, ₩3,018 million of impairment loss on investment in associates was recognized as the dissolution and liquidating procedures of the associates were resolved. The impairment loss is included in other non-operating expenses in the separate statements of profit or loss.

(*15) The combined share ratio of Doosan Investment Co., Ltd. is 25.45%.

(*16) The Company acquired redeemable convertible preferred shares in TTC House, Inc. during the year ended December 31, 2022, and convertible preferred shares in SiO2 Medical Products, Inc. during the year ended December 31, 2021. Although the Company has significant influence on the Board of Directors of the investees, shares acquired are classified as financial assets measured at fair value through profit or loss in accordance with KIFRS 1109, as the existing ownership, in substance, does not currently give it access to returns associated with ownership interests (See Note 6).

(*17) The Company newly acquired shares by ₩2,487 million during the year ended December 31, 2022.

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

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

	December 31, 2022		December 31, 2021	
	Book value	Fair value	Book value	Fair value
Subsidiaries:				
Doosan Enerbility Co., Ltd.	₩ 2,536,311	₩ 2,998,237	₩ 2,655,736	₩ 4,182,177
Oricom, Inc.	23,168	112,284	23,168	46,809

The Company determines whether impairment loss is recognized in respect of subsidiaries, joint ventures and associates in accordance with KIFRS 1036 *Impairment of Assets*. The Company determined whether there is any indication of impairment of investment securities as of December 31, 2022. As a result, the Company performed an impairment test by comparing the carrying amount of the investment in Doosan Enerbility Co., Ltd., a subsidiary, with the recoverable amount (the greater of the fair value less costs and value in use).

The carrying amount of investments in Doosan Enerbility Co., Ltd. before impairment test was ₩2,536,311 million as of December 31, 2022.

The recoverable amount of investments in Doosan Enerbility Co., Ltd. was calculated based on fair value less costs of disposal, and the measurement of the fair value was determined based on the market price disclosed in the active market.

As a result of measuring the recoverable amount, there is no impairment loss recognized for Doosan Enerbility Co., Ltd. during the current year as the carrying amount of the investment stock does not exceed the recoverable amount.

A reasonably possible change in a key assumption would cause the change of recoverable amount.

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	₩ 40,201	₩ 125,643	₩ 41,358	₩ 21,343	₩ 23,841	₩ 252,386
Acquisition/capital expenditure	24	779	2,264	11,489	48,224	62,780
Acquisition of government grants	-	-	(223)	(25)	-	(248)
Transfers (*1)	(4,851)	5,727	7,287	1,626	(23,200)	(13,411)
Disposal	-	(79)	(436)	(1,322)	(5,286)	(7,123)
Depreciation	-	(15,269)	(8,944)	(8,870)	-	(33,083)
Reversal of Impairment (loss)	(1,760)	(524)	(1,204)	(564)	(2,838)	(6,890)
December 31	₩ 33,614	₩ 116,277	₩ 40,102	₩ 23,677	₩ 40,741	₩ 254,411
Acquisition cost	₩ 22,049	₩ 185,729	₩ 225,781	₩ 130,811	₩ 41,789	₩ 606,159
Accumulated depreciation (accumulated impairment losses are included)	-	(69,452)	(185,479)	(107,100)	(1,048)	(363,079)
Government grants	-	-	(200)	(34)	-	(234)
Accumulated revaluation surplus	11,565	-	-	-	-	11,565

(*1) Transfers include some portions of land, buildings and construction-in-progress reclassified to investment properties during the year ended December 31, 2022

	2021					
	Land	Buildings and Structures	Machinery	Others	Construction in progress	Total
January 1	₩ 110,485	₩ 108,649	₩ 46,776	₩ 61,700	₩ 17,149	₩ 344,759
Acquisition/capital expenditure	465	17,347	1,378	13,085	28,824	61,099
Acquisition of government grants	-	-	(12)	(20)	-	(32)
Transfers	(4,324)	32,154	8,215	7,085	(15,703)	27,427
Disposal	(11,104)	(4,535)	(105)	(670)	-	(16,414)
Depreciation	(19)	(17,662)	(10,351)	(15,067)	-	(43,099)
Asset revaluation	3,063	-	-	-	-	3,063
Decrease due to division (See Note 35)	(58,365)	(10,310)	(4,543)	(44,047)	(6,429)	(123,694)
Reversal of Impairment (loss)	-	-	-	(723)	-	(723)
December 31	₩ 40,201	₩ 125,643	₩ 41,358	₩ 21,343	₩ 23,841	₩ 252,386
Acquisition cost	₩ 26,284	₩ 179,389	₩ 223,340	₩ 141,494	₩ 24,889	₩ 595,396
Accumulated depreciation (accumulated impairment losses are included)	-	(53,746)	(181,968)	(120,134)	(1,048)	(356,896)
Government grants	-	-	(14)	(17)	-	(31)
Accumulated revaluation surplus	13,917	-	-	-	-	13,917

In addition, the Company's land and buildings are partially pledged as collateral for loans from financial institutes (See Note 32).

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

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

	2022				
	Land	Buildings and Structures	Machinery	Others	Total
January 1	₩ -	₩ 86,441	₩ 830	₩ 4,960	₩ 92,231
Acquisition/capital expenditure	-	768	173	3,364	4,305
Disposal (*1)	-	(79)	-	(211)	(290)
Depreciation	-	(12,465)	(414)	(2,851)	(15,730)
December 31	₩ -	₩ 74,665	₩ 589	₩ 5,262	₩ 80,516
Acquisition cost	₩ -	₩ 100,498	₩ 4,989	₩ 30,742	₩ 136,229
Accumulated depreciation	-	(25,833)	(4,400)	(25,480)	(55,713)

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

	2021				
	Land	Buildings and Structures	Machinery	Others	Total
January 1	₩ 166	₩ 57,370	₩ 1,355	₩ 6,573	₩ 65,464
Acquisition/capital expenditure	-	15,077	184	3,011	18,272
Transfers	-	31,256	(92)	(53)	31,111
Disposal (*1)	-	(9)	-	(441)	(450)
Depreciation	(19)	(14,478)	(617)	(3,974)	(19,088)
Decrease due to division (See Note 35)	(147)	(2,775)	-	(156)	(3,078)
December 31	₩ -	₩ 86,441	₩ 830	₩ 4,960	₩ 92,231
Acquisition cost	₩ -	₩ 99,895	₩ 4,900	₩ 29,478	₩ 134,273
Accumulated depreciation	-	(13,454)	(4,070)	(24,518)	(42,042)

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

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

The Company recognizes subsequent measurement of the land as revaluation, and the revaluation amount is the fair value of the revaluation date. 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 statement of comprehensive income related to revaluation model, which the Company applies to measurement of the land is ₩3,191 million as of December 31, 2021.

In addition, if the land were stated at cost, the land would amount to ₩22,049 million and ₩26,284 million as of December 31, 2022 and 2021, respectively.

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

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	₩ -	₩ -	₩ 33,614	₩ -	₩ -	₩ 40,201

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 Parcel conditions and others Land conditions affecting the sales price and others	Fair value increases (decreases), if rate of land price increases (decreases). Fair value increases (decreases), if correction of parcel conditions and others increases (decreases). Fair value increases (decreases), if correction of land conditions affecting the sales price increases (decreases).
Trade Case Comparison method: When comparing the transaction case of an object that is similar to the target object, fair value is measured through the process of correcting the private information, correcting the timing, comparing the factors of the value formation and others	Private information correction Point-in-time correction Value formation factor	Fair value increases (decreases), if the private information correction increases (decreases). Fair value increases (decreases), if the point-in-time correction increases (decreases). Fair value increases (decreases), if the value forming factor increases (decreases).

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

	2022	2021
Cost of sales	₩ 25,240	₩ 27,057
Selling and administrative expenses	7,843	8,682
Loss from discontinued operations	-	7,360
	₩ 33,083	₩ 43,099

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	₩ 10,728	₩ 11,738
Selling and administrative expenses	5,002	5,680
Loss from discontinued operations	-	1,670
	₩ 15,730	₩ 19,088

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	₩ 8,073	₩ 837	₩ 27,645	₩ 16,479	₩ 53,034
Acquisition/capital expenditure	-	175	11,588	3,076	14,839
Acquisition of government grants	-	-	(556)	(12)	(568)
Transfers	-	-	1,122	557	1,679
Disposal	-	(26)	-	(337)	(363)
Amortization	-	(272)	(3,393)	(2,314)	(5,979)
Reversal of impairment(loss)	-	-	-	(39)	(39)
December 31	₩ 8,073	₩ 714	₩ 36,406	₩ 17,410	₩ 62,603
Acquisition costs	₩ 8,073	₩ 5,049	₩ 87,944	₩ 64,514	₩ 165,580
Accumulated amortization (accumulated impairment losses are included)	-	(4,335)	(48,366)	(47,089)	(99,790)
Government grants	-	-	(3,172)	(15)	(3,187)

	2021				
	Goodwill	Industrial rights	Development costs	Other intangible assets	Total
January 1	₩ 23,149	₩ 1,280	₩ 38,444	₩ 22,697	₩ 85,570
Acquisition/capital expenditure	-	239	13,806	1,106	15,151
Acquisition of government grants	-	-	(1,235)	(10)	(1,245)
Transfers	-	-	152	397	549
Disposal	-	(1)	-	(225)	(226)
Amortization	-	(412)	(3,764)	(3,285)	(7,461)
Reversal of impairment(loss)	-	-	(2,765)	-	(2,765)
Decrease due to division (See Note 35)	(15,076)	(269)	(16,993)	(4,201)	(36,539)
December 31	₩ 8,073	₩ 837	₩ 27,645	₩ 16,479	₩ 53,034
Acquisition costs	₩ 8,073	₩ 4,926	₩ 76,761	₩ 61,757	₩ 151,517
Accumulated amortization (accumulated impairment losses are included)	-	(4,089)	(44,591)	(45,268)	(93,948)
Government grants	-	-	(4,525)	(10)	(4,535)

The carrying amount of membership with indefinite useful lives in other intangible assets is ₩10,935 million and ₩9,064 million as of December 31, 2022 and 2021, respectively.

Meanwhile, expenditure on research and development, which was recognized as expenses, amounted to ₩17,321 million and ₩22,604 million for the years ended December 31, 2022 and 2021, respectively.

13. Intangible assets (cont'd)

Before impairment test, the carrying amount of goodwill was allocated to CGUs as of December 31, 2022 and 2021 are as follows (Korean won in millions):

CGUs	December 31, 2022	December 31, 2021	Description
Digital Innovation BU	₩ 2,015	₩ 2,015	Operation and development of software
Fuel Cell BU	6,058	6,058	Manufacturing and sale of fuel cell
	<u>₩ 8,073</u>	<u>₩ 8,073</u>	

The recoverable amount of CGU is determined based on value in use. The discount rate and the permanent growth rate used in calculating value in use as of December 31, 2022 are as follows:

	Digital Innovation BU	Fuel Cell BG
Discount rate	9.90%	15.82%
Permanent growth rate	0.00%	1.00%

Estimates for value in use calculation are as follows.

The Company uses cash flow projections based on financial budgets approved by the directors covering five-year periods 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 periods have been extrapolated using the expected 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 result of recoverable amount of the Company calculated based on value in use calculation was not to cause the aggregate carrying amount to exceed the aggregate recoverable amount of the CGUs. Therefore, no impairment loss is recognized based on the impairment test for the year ended December 31, 2022.

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

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

	2022	2021
Cost of sales	₩ 1,397	₩ 1,572
Selling and administrative expenses	4,582	4,538
Loss from discontinued operations	-	1,351
	<u>₩ 5,979</u>	<u>₩ 7,461</u>

14. Investment properties

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

	2022			
	Land	Buildings	Construction in Progress	Total
January 1	₩ 178,614	₩ 120,241	₩ -	₩ 298,855
Acquisition	-	-	-	-
Transfers	4,851	-	7,824	12,675
Valuation (*1)	5,298	(10,466)	-	(5,168)
December 31	₩ 188,763	₩ 109,775	₩ 7,824	₩ 306,362

	2021			
	Land	Buildings	Construction in Progress	Total
January 1	₩ 158,545	₩ 200,210	₩ -	₩ 358,755
Acquisition	-	3,315	-	3,315
Transfers	4,325	(34,381)	-	(30,056)
Valuation (*1)	15,744	(48,903)	-	(33,159)
December 31	₩ 178,614	₩ 120,241	₩ -	₩ 298,855

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

Some of the above investment properties, superficies and leasehold interest are established by the tenant on the land. (See Note 31).

In addition, lease income related to investment properties amounted to ₩16,788 million and ₩12,252 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	₩ 118,761	₩ 197,204
Acquisition	-	3,248
Transfers	-	(32,838)
Valuation (*1)	(10,347)	(48,853)
December 31	₩ 108,414	₩ 118,761

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

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

The Company 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.

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	₩ -	₩ -	₩ 188,763	₩ -	₩ -	₩ 178,614
Buildings	-	-	109,775	-	-	120,241
Construction in Progress	-	-	7,824	-	-	-
	₩ -	₩ -	₩ 306,362	₩ -	₩ -	₩ 298,855

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 decreases (increases).
Discounted cash flow method: Fair value is measured by estimating the appropriate market rent for the remaining lease period from the present time of the evaluation by comparing transaction cases and then discounting it to the present value	Private information correction Point-in-time correction Value formation factor Discount rate	Fair value increases (decreases), if the private information correction increases (decreases) Fair value increases (decreases), if point-in-time correction increases (decreases) Fair value increases (decreases), if the value-forming factor increases (decreases) Fair value increases (decreases), if the discount rate decreases (increases)

15. Bonds and borrowings

15.1 Bonds

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

	Annual interest rate (%) (*1)	December 31, 2022	December 31, 2021
The 299	-	₩ -	₩ 75,000
The 300	-	-	50,000
The 301	-	-	20,000
The 302	-	-	50,000
The 303	-	-	140,000
The 304	5.99	35,000	35,000
The 305	3.60	80,000	80,000
The 306-1	3.50	74,000	74,000
The 306-2	3.80	33,000	33,000
The 307-1	3.92	70,000	-
The 307-2	4.34	40,000	-
		332,000	557,000
Less: discount on bonds payable		(529)	(1,291)
		331,471	555,709
Less: reclassification of current portion of long-term bonds		(153,836)	(264,512)
Principal amount of bonds		154,000	265,000
Discount on bonds payable		(164)	(488)
		₩ 177,635	₩ 291,197

(*1) Nominal interest rate

15.2 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	December 31, 2021
General borrowings	Shinhan Bank and others	3.70 ~ 7.19	₩ 175,000	₩ 668,399

15.3 Long-term borrowings

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

	Annual interest rate (%)	December 31, 2022	December 31, 2021
Borrowings in Korean won:			
New Star Eneo Ville The 1st Co., Ltd. and others	4.65 ~ 4.70	₩ 420,000	₩ -
Less: present value discounts		(1,699)	-
Less: reclassification of current portion of long-term borrowings		-	-
		₩ 418,301	₩ -

15.4 Asset-backed loans

The Company has transferred some of its future trade receivables to the securitization companies to carry out the asset-backed securitizations (ABS). Details of the long-term asset-backed loans as of December 31, 2022 and 2021 are as follows (Korean won in millions):

	Annual interest rate (%)	December 31, 2022	December 31, 2021
Asset-backed loan:			
D-Pay 2nd Co., Ltd.	-	₩ -	₩ 82,500
D-Pay 3rd Co., Ltd.	4.50 ~ 7.24	197,000	-
		197,000	82,500
Less: present value discounts		(600)	(327)
		196,400	82,173
Less: reclassification of current portion of long- term asset-backed loan		(88,380)	(65,738)
		₩ 108,020	₩ 16,435

With respect to the above asset-backed loan, the carrying amount of the trade receivables and others recognized in the financial statement as of December 31, 2022 and 2021 is ₩29,770 million and ₩26,163 million, respectively, which did not meet the derecognition criteria (See Note 31).

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 and 14. The composition of depreciation expenses by accounts arising from right-of-use assets classified as property, plant and equipment for the years ended December 31, 2022 and 2021 is described in Note 12.

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	₩	262,132	₩	275,898
Acquisition of lease assets		4,305		19,491
Payment of lease fees		(41,912)		(45,437)
Interest expense		14,280		15,676
Contract cancellation		(295)		(461)
Decrease due to division (See Note 35)		-		(3,035)
December 31	₩	238,510	₩	262,132

The maturity analysis of lease liabilities as of December 31, 2022 and 2021 are 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	₩ 294,627	₩ 40,765	₩ 38,416	₩ 111,249	₩ 104,197

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	₩ 332,055	₩ 41,221	₩ 39,584	₩ 110,169	₩ 141,081

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 are as follows (Korean won in millions):

	2022		2021	
Cost of sales	₩	364	₩	916
Selling and administrative expenses		531		567
Loss from discontinued operations		-		62
	₩	895	₩	1,545

Cash outflows from financing activities due to the repayment of lease liabilities are ₩41,912 million and ₩45,437 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 ₩895 million and ₩1,545 million for the years ended December 31, 2022 and 2021, respectively. Therefore, the total cash outflow of the lease is ₩42,806 million and ₩46,982 million for the years ended December 31, 2022 and 2021, respectively.

16.3 Financial lease payments receivable

The maturity analysis of lease payments receivable as of December 31, 2022 is as follow (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
Financial lease payments receivable	₩	5,991	₩ 799	₩ 799	₩ 2,396	₩ 1,997

17. Net defined benefit liabilities

The Company 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	₩ 162,254	₩ 165,807
Fair value of plan assets	(152,951)	(137,305)
Net defined benefit liabilities	₩ 9,303	₩ 28,502

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 cost	₩ 16,338	₩ 15,326
Past service cost	(660)	20,633
Net interest cost	955	624
	₩ 16,633	₩ 36,583

Classification of the retirement benefits generated by defined benefits retirement pension recognized in the 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	₩ 8,391	₩ 9,224
Selling and administrative expenses	8,090	25,696
Others	152	136
Loss from discontinued operations	-	1,527
	₩ 16,633	₩ 36,583

17. Net defined benefit liabilities (cont'd)

Changes in net defined benefit liabilities 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
Beginning balance	₩ 165,807	₩ (137,305)	₩ 28,502
Profit or loss:			
Current service cost	16,338	-	16,338
Past service cost	(660)	-	(660)
Interest cost (income)	4,506	(3,551)	955
	20,184	(3,551)	16,633
Remeasurements:			
Interest income on plan assets excluding interest recognized in profit or loss	-	1,348	1,348
Actuarial loss from change in demographic assumptions	7	-	7
Actuarial gain from change in financial assumptions	(23,472)	-	(23,472)
Actuarial loss from empirical adjustment	17,004	-	17,004
	(6,461)	1,348	(5,113)
Transfer in	3,653	(1,694)	1,959
Transfer out	(4,338)	1,390	(2,948)
Contributions by employer directly to plan assets	-	(26,900)	(26,900)
Benefit payments	(16,591)	13,761	(2,830)
Ending balance	₩ 162,254	₩ (152,951)	₩ 9,303

	2021		
	Defined benefit obligations	Plan assets	Net defined benefit liabilities
Beginning balance	₩ 168,022	₩ (152,139)	₩ 15,883
Profit or loss:			
Current service cost	15,326	-	15,326
Past service cost	20,633	-	20,633
Interest cost (income)	3,461	(2,837)	624
	39,420	(2,837)	36,583
Remeasurements:			
Interest income on plan assets excluding interest recognized in profit or loss	-	-	-
Actuarial loss from change in demographic assumptions	10	-	10
Actuarial gain from change in financial assumptions	(1,961)	-	(1,961)
Actuarial loss from empirical adjustment	6,410	-	6,410
	4,459	1,321	5,780
Transfer in	1,792	(803)	989
Transfer out	(2,514)	1,271	(1,243)
Decrease due to division (See Note 35)	(29,482)	28,261	(1,221)
Contributions by employer directly to plan assets	-	(24,486)	(24,486)
Benefit payments	(15,890)	12,107	(3,783)
Ending balance	₩ 165,807	₩ (137,305)	₩ 28,502

17. Net defined benefit liabilities (cont'd)

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

	December 31, 2022	December 31, 2021
Discount rate (%)	5.32	2.78
Salary growth rate (%):		
Employee	4.0 ~ 5.2	3.0 ~ 4.6
Executive	1.5	0.8

Plan assets as of December 31, 2022 and 2021 are invested in principal-guaranteed fixed-income products.

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 obligation			
	December 31, 2022		December 31, 2021	
	Amount	Ratio	Amount	Ratio
Discount rate:				
1% increase	₩ (9,264)	(-) 5.71%	₩ (11,091)	(-) 6.69%
1% decrease	10,461	6.45%	12,690	7.65%
Salary growth rate:				
1% increase	10,418	6.42%	12,382	7.47%
1% decrease	(9,399)	(-) 5.79%	(11,053)	(-) 6.67%

The weighted average maturity of the defined benefit obligations as of December 31, 2022 and 2021 is 6.4 years and 7.4 years, respectively. The Company expects to contribute ₩24,288 million for defined benefit plans in 2023.

Regarding the defined contribution retirement benefit plan, the Company paid ₩1,353 million during the current year.

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	Other provisions	Total
January 1	₩ 4,366	₩ 1,296	₩ 5,744	₩ 11,406
Increase(decrease)	899	19	(1,289)	(371)
Utilized	(1,118)	-	-	(1,118)
Decrease due to division (See Note 35)	-	-	-	-
Reclassification	-	-	891	891
December 31	₩ 4,147	₩ 1,315	₩ 5,346	₩ 10,808
Current	₩ 1,950	₩ -	₩ -	₩ 1,950
Non-current	2,197	1,315	5,346	8,858

	2021			
	Provision for product warranties	Provision for restoration	Other provisions	Total
January 1	₩ 9,609	₩ -	₩ 37	₩ 9,646
Increase(decrease)	2,943	1,296	5,707	9,946
Utilized	(4,489)	-	-	(4,489)
Decrease due to division (See Note 35)	(3,697)	-	-	(3,697)
Reclassification	-	-	-	-
December 31	₩ 4,366	₩ 1,296	₩ 5,744	₩ 11,406
Current	₩ 2,054	₩ 19	₩ 5,744	₩ 7,817
Non-current	2,312	1,277	-	3,589

The Company recognizes the expected expenses due to quality assurance, exchange 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	
Balance as of January 1, 2021	16,523,835	4,889,500	₩ 99,291	₩ 24,447	₩ 123,738	₩ 322,462
Balance as of December 31, 2021	16,523,835	4,889,500	₩ 99,291	₩ 24,447	₩ 123,738	₩ 322,462
Balance as of January 1, 2022	16,523,835	4,889,500	₩ 99,291	₩ 24,447	₩ 123,738	₩ 322,462
Balance as of 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	194,032	193,453
	₩ 794,036	₩ 793,457

21. Other equity items

21.1 Other equity items

Other equity 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)
	<u>₩ (1,146,547)</u>	<u>₩ (1,149,031)</u>

21.2 Treasury stocks

The Company acquired registered ordinary shares and non-voting preferred shares, and recognized them as other capital item 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
Balance as of January 1, 2021	3,000,866	612,104	3,612,970	₩ 171,231	₩ 13,794	₩ 185,025
Balance as of December 31, 2021	<u>3,000,866</u>	<u>612,104</u>	<u>3,612,970</u>	<u>₩ 171,231</u>	<u>₩ 13,794</u>	<u>₩ 185,025</u>
Balance as of January 1, 2022	3,000,866	612,104	3,612,970	₩ 171,231	₩ 13,794	₩ 185,025
Balance as of December 31, 2022	<u>3,000,866</u>	<u>612,104</u>	<u>3,612,970</u>	<u>₩ 171,231</u>	<u>₩ 13,794</u>	<u>₩ 185,025</u>

21.3 Share-based payment

21.3.1 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 life (from December 31, 2022 to maturity) of stock options is 0.8 years.

21.3.2 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.

22. Accumulated other comprehensive income

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

	December 31, 2022	December 31, 2021
Gain(loss) on valuation of derivatives designated as hedges	₩ 3,544	₩ (844)
Gain(loss) on valuation of financial assets at fair value through OCI	(5,175)	7,968
Land revaluation surplus	25,443	26,198
	<u>₩ 23,812</u>	<u>₩ 33,322</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	3,321,056	3,177,501
	<u>₩ 3,388,479</u>	<u>₩ 3,244,924</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.

Separate statements of appropriation of retained earnings for the years ended December 31, 2022 and 2021 are as follows (Korean won):

	2022	2021
Unappropriated retained earnings:		
Unappropriated retained earnings carried over from the previous year	₩ 3,141,729,197,139	₩ 2,760,526,972,545
Profit for the year	175,466,400,816	410,821,650,850
Remeasurements of net defined benefit liabilities	3,440,667,833	(4,380,682,389)
Reclassification of land revaluation surplus	-	10,533,597,133
Reclassification from AOCI to retained earnings	419,408,868	-
	<u>3,321,055,674,656</u>	<u>3,177,501,538,139</u>
Appropriation of retained earnings:		
Dividends	<u>(35,772,341,000)</u>	<u>(35,772,341,000)</u>
Unappropriated retained earnings to be carried forward	<u>₩ 3,285,283,333,656</u>	<u>₩ 3,141,729,197,139</u>

Appropriation dates for 2022 and 2021 fiscal years are March 29, 2023 and March 29, 2022, respectively.

23. Retained earnings (cont'd)

Details of dividends for the year ended December 31, 2022 are as follows (Korean won, except for share data and dividend amount):

	2022		
	Old-type preferred shares	New-type preferred shares	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):

	Old-type preferred shares	New-type preferred shares	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	
Dividend amount	₩ 7,036	₩ 1,690	₩ 27,046	₩ 35,772

24. Revenues

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

24.1 Disaggregation revenue

	2022	2021
Revenues from contracts with customers:		
Finished goods	₩ 796,110	₩ 721,497
Merchandise	32,143	28,390
Construction	3,985	-
Others	228,814	197,719
	<u>1,061,052</u>	<u>947,606</u>
Others:		
Dividend	15,728	10,890
Rental income and others	415	8,969
	<u>16,143</u>	<u>19,859</u>
	<u>₩ 1,077,195</u>	<u>₩ 967,465</u>

24.2 Disaggregation revenues from contracts with customers

	2022	2021
Type of Business:		
Electro-Materials BG	₩ 776,155	₩ 711,827
Digital Innovation BU	174,297	156,846
Others	110,600	78,933
	<u>₩ 1,061,052</u>	<u>₩ 947,606</u>
Timing of revenue recognition:		
Transfer at a point in time	₩ 828,368	₩ 751,407
Transfer over time	232,684	196,199
	<u>₩ 1,061,052</u>	<u>₩ 947,606</u>

24.3 Contract balances

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

	December 31, 2022
Receivables in trade	₩ 155,196
Contract assets (*1)	6,048
Contract liabilities (*2)	(6,773)

(*1) Contract assets are included in other receivables in the separate statements of financial position.

(*2) Contract liabilities are included in due to customers and other current liabilities in the separate statements of financial position.

Contract assets are amounts unbilled that the Company 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 contracts performed over time and are recognized as revenue as the Company transfers the goods or services to the customer.

24.3 Contract balances(cont'd)

The Company 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 is as follows (Korean won in millions):

	2022
Incremental cost of obtaining a contract recognized as an asset as of December 31, 2022	₩ 1,856
Amount of amortization recognized as cost of sales for the year ended December 31, 2022	689

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.

As a contract that recognizes revenue over time by applying the cost-based input method, changes in the balance of construction contract for the year ended December 31, 2022 is as follows (Korean won in millions):

	Project	Ending	Beginning	Recognized construction revenue	Ending
	Installation of renewable energy system for reconstruction project in Jamsil Jinju Apartment				
Fuel Cell BU	₩	-	₩ 13,979	₩ (3,985)	₩ 9,994

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 contract in progress as of December 31, 2022 is as follows (Korean won in millions):

	Provision for construction loss	Changes in total contract amount	Changes in total contract cost	Impact on profit (loss) for the current year	Impact on profit (loss) for succeeding year	Changes in due from/to customers for contract work
Fuel Cell BU	₩ -	₩ 274	₩ -	₩ 65	₩ 209	₩ 65

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

25. 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	₩ (5,005)	₩ (19,731)
Purchases of raw materials and merchandise	429,283	409,528
Employee benefits expenses	253,092	262,285
Depreciation and amortization	39,062	41,849
Others	288,402	206,917
	₩ 1,004,834	₩ 900,848

26. 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	₩ 91,696	₩ 79,309
Retirement benefits	8,145	25,752
Employee benefits	15,590	14,327
Shared-based payment expenses	2,914	-
Travel expenses	5,012	1,948
Utility expenses	601	475
Sales commission	3,091	1,896
Education and training expenses	3,488	2,918
Transportation and storage costs	15,718	10,497
Taxes and dues	3,037	3,736
Depreciation	7,843	8,682
Advertising expenses	14,373	7,157
Research and development	15,131	19,774
(Reversal of provision) bad debt expenses	(773)	(234)
Amortization	4,582	4,538
Others	34,973	18,517
	₩ 225,421	₩ 199,292

27. 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	₩ 15,059	₩ 15,890
Dividend income	136	35
Gain on foreign currency transaction	24,281	20,498
Gain on foreign currency translation	9,565	9,238
Gain on derivative transactions	21,146	-
Gain on valuation of derivatives	-	83,694
Financial guarantee income	2,541	10,765
	72,728	140,120
Finance expenses:		
Interest expense	₩ 79,612	₩ 73,842
Loss on foreign currency transactions	23,048	11,341
Loss on foreign currency translations	7,209	522
Loss on repayment of bonds	840	-
Loss on repayment of borrowings	344	989
Other financial expenses	-	58
	111,053	86,752
	₩ (38,325)	₩ 53,368

28. 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 investment in subsidiaries	₩ 228,918	₩ 43,269
Gain on disposal of investment in associates	434	-
Gain on disposal of property, plant and equipment	377	5,733
Gain on disposal of intangible assets	9,044	1,158
Gain on valuation of investment properties	5,398	15,845
Gain on valuation of long-term investment securities	329	-
Reversal of Impairment loss of long-term investment securities	19	-
Gain on disposal of short-term investment securities	216	-
Others	7,954	2,870
	<u>252,689</u>	<u>68,875</u>
Other non-operating expenses:		
Impairment loss of investment in subsidiaries and associates	₩ 3,018	₩ 9,291
Loss on disposal of trade receivables	-	6
Other bad debt expense	414	470
Loss on disposal of property, plant and equipment	457	673
Loss on asset revaluation	-	128
Loss on disposal of intangible assets	26	5
Impairment loss of intangible assets	39	2,765
Impairment loss of Property, plant and equipment	5,457	-
Loss on valuation of short and long term investment securities	53,702	-
Loss on valuation of investment properties	10,566	49,004
Loss on disposal of long-term financial assets	10	-
Donations	4,425	3,893
Others	7,932	8,362
	<u>86,046</u>	<u>74,597</u>
	<u>₩ 166,643</u>	<u>₩ (5,722)</u>

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29. 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	₩ 83,941	₩ 381,339
Deferred tax:		
Origination and reversal of temporary differences	(60,367)	(231,897)
Charged or credited directly to equity	1,639	(695)
Income tax benefits classified as loss from discontinued operations	-	(123,495)
Income tax expenses	₩ 25,213	₩ 25,252

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

	2022			
	Changes			Ending balance
	Beginning balance	Profit or loss	Equity	
Accrued revenues	₩ (57)	₩ (309)	₩ -	₩ (366)
Write-down of inventories	1,634	695	-	2,329
Investment securities	(4,524)	5,825	3,973	5,274
Property, plant and equipment and investment properties	(30,324)	256	678	(29,390)
Accrued expenses	15,603	(867)	-	14,736
Defined benefit liabilities	7,757	(3,242)	(1,673)	2,842
Others	(60,440)	56,370	(1,339)	(5,409)
	₩ (70,351)	₩ 58,728	₩ 1,639	₩ (9,984)

	2021			
	Changes			Ending balance
	Beginning balance	Profit or loss	Equity	
Accrued revenues	₩ (27)	₩ (30)	₩ -	₩ (57)
Write-down of inventories	2,531	(897)	-	1,634
Investment securities	(160,929)	158,048	(1,643)	(4,524)
Property, plant and equipment and investment properties	(63,845)	34,293	(772)	(30,324)
Accrued expenses	17,601	(1,998)	-	15,603
Defined benefit liabilities	5,015	1,640	1,399	7,757
Others	(102,297)	41,536	321	(60,440)
	₩ (301,951)	₩ 232,592	₩ (695)	₩ (70,351)

The Company offsets deferred tax assets and deferred tax liabilities, if the Company 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 nil.

The probability of realizing deferred tax assets depends on the Company's ability to generate taxable income in future years, economic situation and industry forecast. The Company periodically reviews these matters.

29. Income tax expenses (cont'd)

Temporary differences from investments in subsidiaries, joint ventures and associates, 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	₩ (677,814)	₩ (630,403)	Able to control the timing of the reversal of the temporary difference

The aggregate deferred tax relating to items that are charged or credited directly to equity for the years ended December 31, 2022 and 2021 is as follows (Korean won in millions):

	2022	2021
Gain (loss) on valuation of financial assets (designated) at fair value through OCI	₩ 3,973	₩ (1,643)
Gain (loss) on valuation of derivatives	(1,339)	321
Land revaluation surplus	678	(772)
Remeasurements of net defined benefit liabilities	(1,673)	1,399
	₩ 1,639	₩ (695)

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

	2022	2021
Profit before income tax expenses	₩ 200,679	₩ 114,263
Tax at domestic tax rates applicable to profit	48,102	20,024
Adjustments:		
Non-taxable income and non-deductible expenses	4,334	18,809
Tax credits	(7,357)	(4,703)
Additional income tax and tax paid for previous year	(9,421)	9,837
Corporate tax on unappropriated earnings of enterprises	8,739	9,034
Temporary difference not recognized as deferred income tax	(17,353)	4,342
Others	(1,831)	(32,091)
Income tax expenses	₩ 25,213	₩ 25,252
Average effective tax rate (Income tax expenses/Profit before income tax expenses)	12.56%	22.10%

30. Earnings per share

30.1 Basic earnings per share

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

	2022			2021		
	Continuing	Discontinued	Total	Continuing	Discontinued	Total
Basic earnings per ordinary share	₩ 9,848	₩ -	₩ 9,848	₩ 4,098	₩ 18,972	₩ 23,070
Basic earnings per old-type preferred share (*1)	₩ 9,898	₩ -	₩ 9,898	₩ 4,107	₩ 19,013	₩ 23,120

(*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*.

Profit for the year attributable to the ordinary equity holders of the Company for the years ended December 31, 2022 and 2021 are as follows (Korean won):

	2022			2021		
	Continuing	Discontinued	Total	Continuing	Discontinued	Total
Profit for the year	₩ 175,466,400,816	₩ -	₩ 175,466,400,816	₩ 89,011,458,101	₩ 321,810,192,749	₩ 410,821,650,850
Less: Profit attributable to new-type preferred shares	(8,323,141,086)	-	(8,323,141,086)	(19,498,002,321)	-	(19,498,002,321)
Less: Profit attributable to old-type preferred shares	(33,971,495,637)	-	(33,971,495,637)	(14,095,844,820)	(65,256,236,905)	(79,352,081,725)
Profit for the year attributable to the ordinary equity holders of the Company	₩ 133,171,764,093	₩ -	₩ 133,171,764,093	₩ 55,417,610,960	₩ 256,553,955,844	₩ 311,971,566,804

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 is 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	13,522,969	3,432,220	13,522,969	3,432,220

30.2 Diluted earnings per share

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

	2022			2021		
	Continuing	Discontinued	Total	Continuing	Discontinued	Total
Diluted earnings per ordinary share	₩ 9,848	₩ -	₩ 9,848	₩ 4,098	₩ 18,972	₩ 23,070
Diluted earnings per old-type preferred share	₩ 9,898	₩ -	₩ 9,898	₩ 4,107	₩ 19,013	₩ 23,120

Diluted profit 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			2021		
	Continuing	Discontinued	Total	Continuing	Discontinued	Total
Profit for the year attributable to the ordinary equity holders of the Company	₩ 133,171,764,093	₩ -	₩ 133,171,764,093	₩ 256,553,955,844	₩ 311,971,566,804	₩ 568,525,522,648
Share-based compensation expense (after income tax)	-	-	-	-	-	-
Diluted profit for the year attributable to the ordinary equity holders of the Company	₩ 133,171,764,093	₩ -	₩ 133,171,764,093	₩ 256,553,955,844	₩ 311,971,566,804	₩ 568,525,522,648

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	13,522,969	13,522,969

As there are no potential ordinary shares for old-type preferred share, diluted earnings per share for old-type preferred share are equal to basic earnings per share for old-type preferred share.

30.3 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 dividend for the exceeded dividend.

31. Contingencies and commitments

31.1 Credit lines for borrowings

Credit lines for borrowings of the Company as of December 31, 2022 are as follows (Korean won in millions and foreign currency in thousands):

Description	Financial institutions	Credit line	
Operating borrowings and others	New Star Eneo Ville The 1st Co., Ltd. and others	KRW	836,000
Credit bond mortgage limit	Hana Bank and others	KRW	5,400
Facility borrowings and others	Woori Bank and others	KRW	58,600
		USD	20,000
L/C guarantees of payment	Korea Development Bank and others	USD	67,206
Commercial paper	Shinyoung Securities Co., Ltd. and others	KRW	60,000
Asset-backed loan	D-Pay 3rd Co., Ltd.	KRW	197,000
		KRW	1,157,000
		USD	87,206

31.2 Financial covenant

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.

31.3 Discounted trade receivables

As of December 31, 2022, in relation to the asset-backed loans, the Company recognizes financial instruments including trade receivables which do not meet the criteria for the derecognition of financial instruments at the carrying amount of ₩29,770 million (2021: ₩26,163 million) in the statement of financial position (see Note 15).

31.4 Litigation in progress

The Company is involved in lawsuits as a defendant with claims exposure of ₩4,400 million as of December 31, 2022. The ultimate outcome of the lawsuit cannot presently be determined. In relation to this, provision of ₩5,346 million is recognized in the statement of balance (See Note 18).

31.5 Technical contract

The Company has technical license agreements with Osaka Gas Co., Ltd. and others. The Company paid ₩3,925 million and ₩2,698 million for the years ended December 31, 2022 and 2021, respectively, as license fee.

31.6 Guarantees of payment

Guarantees of payment provided by the Company as of December 31, 2022 are as follows (Korean won in millions and foreign currency in thousands):

Provided to	Amount		Description
Doosan Logistics Solution Co., Ltd.	KRW	43,420	Financial guarantee and others
	EUR	10,000	Financial guarantee and others
Doosan Electro Materials (Changshu) Co., Ltd.	USD	18,000	Financial guarantee and others
Doosan Electro-Materials Vietnam Company Limited	USD	16,375	Financial guarantee and others
HyAxiom, Inc.	KRW	251,125	Financial guarantee and others
	USD	142,410	Financial guarantee and others
Doosan Energy Solutions America, Inc.	USD	61,092	Financial guarantee and others
DESA Service, LLC	USD	6,506	Financial guarantee and others
D-Pay 3rd Co., Ltd.	KRW	197,000	Financial guarantee and others
	KRW	491,545	
	USD	244,383	
	EUR	10,000	

In addition to the above, as a result of the spin-off completed in 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.) are obliged to repay in solidarity with respect to the debts to them having incurred before the division.

As a result of the split-off completed in 2021, in accordance with Article 530-9, Paragraph 1 of *the Commercial Act*, both the succeeding company after division (the Company) and the newly incorporated company (Doosan Industrial Vehicle Co., Ltd.) are obliged to repay in solidarity with respect to the debts to them having incurred before the division.

Details of payment guarantees provided by third parties to the Company as of December 31, 2022 are as follows (Korean won in millions and foreign currency in thousands):

Provided to	Amount		Description
Seoul Guarantee Insurance	KRW	44,746	Performance guarantee
Machinery Financial Cooperative	KRW	12,265	Performance guarantee
Korea Software Financial Cooperative (*1)	KRW	7,233	Performance guarantee
Korea Development Bank	USD	13,581	Debt guarantee
Woori Bank and others	USD	20,464	L/C guarantee of payment
	KRW	64,244	
	USD	34,045	

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

31.7 Agreement between shareholders

The Company has entered into a contract between investors and shareholders in connection with the issuance of shares in the following subsidiaries as of December 31, 2022. Details are as follows.

	Doosan Robotics Inc.	Doosan Mobility Innovation Inc.
Outstanding shares	441,998 Ordinary Shares	279,670 Redeemable convertible preferred shares
Issue amount	₩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.

31.8 Other commitments

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 DHI, DBI, and Hyundai Doosan Infracore Co., Ltd. (formerly, Doosan Infracore Co., Ltd.) after the sale of Bundang Doosan Tower. In this regard, the Company has been responsible for a part of Bundang Doosan Tower for five years since the sale. If the Company 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 Company accounts for the aforementioned joint lease contract as joint operation in which the parties jointly control the lease arrangement also and have the right to assets and liabilities of the leased asset in accordance with KIFRS 1111 *Joint Arrangements*. As of December 31, 2022, the Company's ownership interests are 6.7%.

The Company sold Doosan Technology Institute located in Seongbok-dong, Suji-gu, Yongin-si, Gyeonggi-do during 2019, and has been responsible for the lease for 5 years after the sale.

The Company sold Doosan Tower, located in 275, Jangchungdan-ro, Jung-gu, Seoul, during the 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 liability 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. and others (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.

32. Pledged assets

The Company pledged certain assets as collateral for its financial liabilities as of December 31, 2022, which are as follows (Korean won in millions and foreign currency in thousands):

Institution	Pledged asset	Related accounts	Financial liabilities		Pledged amount	
Korea Development Bank	Fixed deposit, Jeung-pyeong, Ik-san, Gim-cheon plant and others		KRW	16,000	KRW	214,475
Woori Bank	Investment in subsidiaries		KRW	-	USD	48,993
New Star Eneo Ville The 1st Co., Ltd. and others	Investment in subsidiaries (*1)	Financial instruments, property, plant and equipment and investment in subsidiaries and others	KRW	29,000	KRW	38,734
Hana Bank and others	Fixed deposit		KRW	400,000	KRW	572,572
Kookmin Bank	Gim-cheon plant		KRW	11,686	KRW	11,724
			KRW	-	KRW	4,725
			KRW	-	USD	9,437

(*1) As of December 31, 2022, the Company must provide additional collateral for ₩400,000 million of 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 31).

There is no collateral provided by the Company for third parties

33. Related party transactions

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

Relationship with the Company	December 31, 2022	December 31, 2021
Subsidiaries	<p>Doosan Enerbility Co., Ltd. (formerly, Doosan Heavy Industries & Construction Co., Ltd.) and its subsidiaries (*1,3)</p> <p>Doosan Bobcat Inc. and its subsidiaries (*2)</p> <p>Doosan Industrial Vehicle Co., Ltd. and its subsidiaries</p> <p>Oricom Inc. and its subsidiaries</p> <p>Doosan Bears Inc.</p> <p>Doosan Business Research Institute Co., Ltd.</p> <p>-</p> <p>-</p> <p>Doosan Robotics Inc. and its subsidiaries</p> <p>Doosan Mobility Innovation Inc. and its subsidiaries</p> <p>-</p> <p>D-Pay 3rd Co., Ltd. (*6)</p> <p>Doosan Second Real Estate Securitization Specialty Ltd.</p> <p>Doosan Digital Innovation America, LLC</p> <p>Doosan Information & Communications Beijing Co., Ltd.</p> <p>Doosan Digital Innovation Europe Limited</p> <p>Doosan (Hong Kong) Ltd. and its subsidiaries</p> <p>Doosan Electro-Materials Singapore Pte. Ltd.</p> <p>Doosan Shanghai Chemical Materials Co., Ltd.</p> <p>Doosan Electro-Materials (Changshu) Co., Ltd.</p> <p>Doosan Electro-Materials America, LLC</p> <p>Doosan Electro-Materials Vietnam Company Ltd.</p> <p>HyAxiom, Inc. (formerly, Doosan Fuel Cell America, Inc.) and its subsidiaries (*3)</p> <p>Doosan Energy Solution America, Inc. and its subsidiaries</p> <p>Doosan Logistics Solution Co., Ltd.</p> <p>Doosan Investment Co., Ltd. and its subsidiaries (*6)</p>	<p>Doosan Enerbility Co., Ltd. (Former, Doosan Heavy Industries & Construction Co., Ltd.) and its subsidiaries (*1,3)</p> <p>Doosan Bobcat Inc. and its subsidiaries (*2)</p> <p>Doosan Industrial Vehicle Co., Ltd. and its subsidiaries</p> <p>Oricom Inc. and its subsidiaries</p> <p>Doosan Bears Inc.</p> <p>Doosan Business Research Institute Co., Ltd.</p> <p>Doosan Cuvex Co., Ltd. (*4)</p> <p>Doosan Property Co., Ltd. (*4)</p> <p>Doosan Robotics Inc. and its subsidiaries</p> <p>Doosan Mobility Innovation Inc. and its subsidiaries</p> <p>D-Pay 2nd Co., Ltd. (*5)</p> <p>-</p> <p>Doosan Second Real Estate Securitization Specialty Ltd.</p> <p>Doosan Digital Innovation America, LLC</p> <p>Doosan Information & Communications Beijing Co., Ltd.</p> <p>Doosan Digital Innovation Europe Limited</p> <p>Doosan (Hong Kong) Ltd. and its subsidiaries</p> <p>Doosan Electro-Materials Singapore Pte. Ltd.</p> <p>Doosan Shanghai Chemical Materials Co., Ltd.</p> <p>Doosan Electro-Materials (Changshu) Co., Ltd.</p> <p>Doosan Electro-Materials America, LLC</p> <p>Doosan Electro-Materials Vietnam Company Ltd.</p> <p>HyAxiom, Inc. (formerly, Doosan Fuel Cell America, Inc.) and its subsidiaries (*3)</p> <p>Doosan Energy Solution America, Inc. and its subsidiaries</p> <p>Doosan Logistics Solution Co., Ltd.</p> <p>-</p>
Associates	<p>KDDI KOREA Corporation</p> <p>-</p> <p>PT. SEGARA AKASA</p> <p>Mastern Professional Investment Type Private Security Investment Trust No.98</p> <p>SiO2 Medical Products, Inc.</p> <p>Versogen, Inc. (*6)</p> <p>TTC House, Inc. (*6)</p>	<p>KDDI KOREA Corporation</p> <p>Wise Fashion Co., Ltd. (*5)</p> <p>PT. SEGARA AKASA</p> <p>Mastern Professional Investment Type Private Security Investment Trust No.98</p> <p>SiO2 Medical Products, Inc.</p> <p>-</p> <p>-</p>
Joint ventures	<p>Sichuan Kelun-Doosan Biotechnology Company Limited</p>	<p>Sichuan Kelun-Doosan Biotechnology Company Limited</p>
Other related parties	<p>Doosan Engineering & Construction Co., Ltd. and its subsidiaries (*7)</p> <p>Bundang Doosan Tower REIT Co., Ltd. (*8)</p> <p>Doosan Yonkang Foundation (*8)</p> <p>Won Sang Co., Ltd. (*6,8)</p> <p>Chung-Ang University and others (*8)</p> <p>-</p>	<p>Doosan Engineering & Construction Co., Ltd. and its subsidiaries (*7)</p> <p>Bundang Doosan Tower REIT Co., Ltd. (*8)</p> <p>Doosan Yonkang Foundation (*8)</p> <p>-</p> <p>Chung-Ang University and others (*8)</p> <p>The Path With You (*9)</p>

33. Related party transactions (cont'd)

(*1) Doosan Bobcat Inc. and its subsidiaries are excluded.

(*2) Doosan Industrial Vehicle Co., Ltd. and its subsidiaries are excluded.

(*3) During the current year, the name of the related party was changed.

(*4) During the current year, the Company sell shares in the entities to Doosan Enerbility Co., Ltd., and those entities are included in Doosan Enerbility Co., Ltd. and its subsidiaries.

(*5) During the current year, it is liquidated.

(*6) During the current year, newly established or acquired.

(*7) During the current year, the Company lost control over the investee and classified it as other related parties.

(*8) 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*.

(*9) During the current year, it is excluded by entities that belong to the same large-scale enterprise group under the *Monopoly Regulation and Fair Trade Act*.

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33. Related party transactions (cont'd)

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

		2022					
	Related parties	Sales	Other income	Others (disposal of assets, etc.)	Purchases	Other expenses	Others (purchase of assets, etc.)
Subsidiaries	Doosan Enerbility Co., Ltd. and its subsidiaries	₩ 137,003	₩ 5,930	₩ 152,692	₩ 5,621	₩ 3,669	₩ 129
	Doosan Infracore Co., Ltd. and its subsidiaries (*1)	-	-	-	-	-	-
	Doosan Bobcat Inc. and its subsidiaries	6,062	-	-	837	2,413	356
	Doosan Industrial Vehicle Co., Ltd. and its subsidiaries (*2)	18,030	39	-	-	-	-
	Others	194,616	3,409	8,477	6,552	15,908	285
		355,711	9,378	161,169	13,010	21,990	770
Associates		1	-	-	60	12,929	-
Other related parties (*3)		9,430	15	-	660	6,347	614
		₩ 365,142	₩ 9,393	₩ 161,169	₩ 13,730	₩ 41,266	₩ 1,384

		2021					
	Related parties	Sales	Other income	Others (disposal of assets, etc.)	Purchases	Other expenses	Others (purchase of assets, etc.)
Subsidiaries	Doosan Enerbility Co., Ltd. and its subsidiaries	₩ 116,798	₩ 9,479	₩ 2,837	₩ 5,521	₩ 3,976	₩ 88
	Doosan Infracore Co., Ltd. and its subsidiaries (*1)	31,081	-	-	24,248	406	35
	Doosan Bobcat Inc. and its subsidiaries	6,669	-	1	817	2,011	1,170
	Doosan Industrial Vehicle Co., Ltd. and its subsidiaries (*2)	203,455	278	-	27,649	54	-
	Others	175,707	9,230	1	11,522	11,416	295
		533,710	18,987	2,839	69,757	17,863	1,588
Associates		32	-	-	55	14,012	-
Other related parties (*3)		10,438	17	18,470	4,032	3,207	15,138
		₩ 544,180	₩ 19,004	₩ 21,309	₩ 73,844	₩ 35,082	₩ 16,726

(*1) During the previous year, Doosan Infracore Co., Ltd. and its subsidiaries were disposed of and excluded from related party, the above transaction details are before being excluded from associates.

(*2) During the previous year, Doosan Industrial division was divided and sold to Doosan Bobcat Inc., the previous year's transaction contains transaction between Doosan Industrial Vehicle Co., Ltd. and its subsidiaries before division.

(*3) Other related parties include details of transactions with Doosan Engineering & Construction Co., Ltd. and its subsidiaries in the current and previous year.

The above transaction details include amounts classified as profit or loss from discontinued operations in the current and previous income statements.

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33. Related party transactions (cont'd)

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

		December 31, 2022					
	Related parties	Trade receivables	Other receivables	Trade payables	Other payables	Lease liabilities	Asset-backed loan
Subsidiaries	Doosan Enerbility Co., Ltd. and its subsidiaries	₩ 22,878	₩ 4,200	₩ 134	₩ 1,243	₩ -	₩ -
	Doosan Bobcat Inc. and its subsidiaries	589	2,833	-	550	3,207	-
	Doosan Industrial Vehicle Co., Ltd. and its subsidiaries	2,716	202	-	853	-	-
	Others	52,505	20,966	1,673	3,039	-	197,000
		78,688	28,201	1,807	5,685	3,207	197,000
Associates		-	32,200	-	3,034	215,713	-
Joint ventures		-	1,245	-	-	-	-
Other related parties (*1)		2,958	7,692	5	286	12,546	-
		₩ 81,646	₩ 69,338	₩ 1,812	₩ 9,005	₩ 231,466	₩ 197,000

		December 31, 2021					
	Related parties	Trade receivables	Other receivables	Trade payables	Other payables	Lease liabilities	Asset-backed loan
Subsidiaries	Doosan Enerbility Co., Ltd. and its subsidiaries	₩ 95,983	₩ 22,562	₩ 459	₩ 2,154	₩ -	₩ -
	Doosan Bobcat Inc. and its subsidiaries	786	2,779	-	476	5,081	-
	Doosan Industrial Vehicle Co., Ltd. and its subsidiaries	2,667	639	-	958	-	-
	Others	56,614	25,173	2,607	4,432	-	82,500
		156,050	51,153	3,066	8,020	5,081	82,500
Associates		-	32,200	-	2,995	235,512	-
Joint ventures		-	1,238	-	-	-	-
Other related parties (*1)		4,389	7,613	2	570	13,756	-
		₩ 160,439	₩ 92,204	₩ 3,068	₩ 11,585	₩ 254,349	₩ 82,500

(*1) Other related parties include details of transactions with Doosan Engineering & Construction Co., Ltd. and its subsidiaries in the current and previous year.

The above receivables and payables include amounts classified as assets held for sale and liabilities held for sale in the previous financial statements.

Doosan Corporation
Notes to the separate financial statements
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33. Related party transactions (cont'd)

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

	2022									
	Borrowing		Lease liabilities		Contribution		Dividend		Loan	
Related parties	Borrowings	Repayment	Increase	Decrease	Received	Provided	Income(*2)	Paid	Loans	Repayment
Subsidiaries:										
Doosan Enerbility Co., Ltd. and its subsidiaries	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 183,062	₩ -	₩ -	₩ -	₩ -
Doosan Bobcat Inc. and its subsidiaries	-	-	356	2,479	-	-	-	-	-	-
Others (*1,3)	197,000	82,500	-	-	-	263,574	13,065	-	210	13,800
	197,000	82,500	356	2,479	-	446,636	13,065	-	210	13,800
Associates	-	-	-	32,728	-	(47,013)	1,339	-	-	-
Joint ventures	-	-	-	-	-	-	1,324	-	-	-
Other related parties	-	-	-	1,994	-	-	-	3,305	-	-
	₩ 197,000	₩ 82,500	₩ 356	₩ 37,201	₩ -	₩ 399,623	₩ 15,728	₩ 3,305	₩ 210	₩ 13,800

(*1) It contains transactions in which some of the Marston Specialized Investment Private Equity Investment Trust No. 98 beneficiary certificates held as investments in associates were invested in Doosan Investment Co., Ltd., a subsidiary of the company, and a debt for equity swap for Doosan Logistics Co., Ltd.

(*2) It is included in the operating income.

(*3) During the current year, The Path With You was excluded from the related party, and the above transaction includes the transaction before being excluded from the related party.

Doosan Corporation
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33. Related party transactions (cont'd)

Related parties	2021									
	Borrowing		Lease liabilities		Contribution		Dividend		Loan	
	Borrowings	Repayment	Increase	Decrease	Received	Provided	Income(*2)	Paid	Loans	Repayment
Subsidiaries:										
Doosan Enerbility Co., Ltd. and its subsidiaries (*2)	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 605,226	₩ -	₩ -	₩ -	₩ -
Doosan Infracore Co., Ltd. and its subsidiaries	-	-	-	1,660	-	-	-	-	-	-
Doosan Bobcat Inc. and its subsidiaries	-	-	1,076	2,578	-	-	-	-	-	-
Doosan Industrial Vehicle Co., Ltd. and its subsidiaries (*3)	-	-	-	-	-	(58,456)	-	-	-	-
Others (*2,4)	-	180,500	-	-	-	(332,801)	4,360	-	4,785	76,440
	-	180,500	1,076	4,238	-	213,969	4,360	-	4,785	76,440
Associates	-	-	-	32,308	-	118,980	5,228	-	-	-
Joint ventures	-	-	-	-	-	-	1,301	-	-	-
Other related parties	-	-	14,704	3,462	-	(468)	23	3,305	-	-
	₩ -	₩ 180,500	₩ 15,780	₩ 40,008	₩ -	₩ 332,481	₩ 10,912	₩ 3,305	₩ 4,785	₩ 76,440

(*1) It is included in the operating income.

(*2) It contains transactions in which all of the ordinary shares and preferred shares of Doosan Fuel Cell Co., Ltd. were invested in Doosan Engineering & Construction Co., Ltd..

(*3) It contains transactions in which all ordinary shares issued by Doosan Industrial Vehicle Co., Ltd., newly incorporated company, and sold the shares to Doosan Bobcat Inc., during the previous year. (See Note 35).

(*4) It contains a debt for equity swap for HyAxiom, Inc. (formerly, Doosan Fuel Cell America, Inc.) during the previous year.

The above transactions include amounts classified as profit or loss from discontinued operations in the current and previous income statements.

The Company provided guarantees of payment and others to related parties as of December 31, 2022 (See Note 31).

The Company defines key management personnel as registered officer and non-registered officer (including outside director) who have the authority and responsibility for planning, operation and control and are in charge of business or division unit. Compensation to key management personnel of the Company for the years ended December 31, 2022 and 2021 is as follows (Korean won in millions):

	2022	2021
Employee benefits	₩ 26,261	₩ 23,783
Retirement benefits	3,994	22,241
Shared-based payment	3,084	-
	₩ 33,339	₩ 46,024

34. Cash flow statement

The adjustments and changes in cash generated from operating activities in the separate statements of cash flows for the years ended December 31, 2022 and 2021 is as follows (Korean won in millions):

	2022	2021
Adjustments for:		
Interest expense	₩ 79,612	₩ 74,041
Income tax expenses	25,213	148,747
Loss on foreign currency translation	7,209	1,262
Loss on disposal of trade receivables	-	659
Loss on disposal of long-term investment securities	10	-
Loss on repayment of bonds	840	-
Loss on repayment of borrowings	344	989
Loss on valuation of short and long-term investment securities	53,702	-
Depreciation	33,083	43,099
Amortization	5,979	7,461
Loss on disposal of property, plant and equipment	457	760
Impairment loss on property, plant and equipment	5,457	723
Loss on valuation of property, plant and equipment	-	128
Loss on disposal of intangible assets	26	6
Impairment loss on intangible assets	39	2,765
Shared-based payment	3,084	-
Loss on valuation of investment properties	10,566	49,004
Retirement benefits	16,481	36,448
Increase (reversal of) in bad debt expenses	(773)	335
Increase in other bad debt expenses	414	600
Increase in provisions	5,354	8,650
Write-down of inventories	3,286	(288)
Impairment loss on investment in subsidiaries and associates	3,018	9,291
Interest income	(15,059)	(15,933)
Dividend income	(15,864)	(10,948)
Gain on foreign currency translation	(9,565)	(13,495)
Gain on valuation of derivatives	-	(83,694)
Gain on trade of derivatives	(21,146)	-
Gain on valuation of long-term investment securities	(329)	-
Gain on disposal of long-term investment securities	(216)	-
Reversal of impairment loss of long-term investment securities	(19)	-
Gain on disposal of investment in subsidiaries and associates	(229,352)	(43,269)
Reversal of impairment loss of discontinued operations	-	(431,828)
Gain on disposal of property, plant and equipment	(377)	(5,739)
Gain on disposal of intangible assets	(9,044)	(1,158)
Gain on valuation of investment properties	(5,398)	(15,845)
Financial guarantee income	(2,541)	(10,765)
reversal of provisions	(5,744)	-
Others	(3)	(6,580)
	₩ (61,256)	₩ (254,574)

34. Cash flow statement (cont'd)

	2022	2021
Changes in operating assets and liabilities:		
Trade receivables	₩ 71,275	₩ (92,825)
Other receivables	24,787	(19,232)
Inventories	(8,291)	(30,514)
Other current assets	(9,877)	11,267
Long-term other receivables	(6,150)	2,225
Other non-current assets	242	301
Trade payables	(1,226)	57,659
Other payables	1,831	23,149
Due to customers	2,795	-
Provisions	(1,118)	(4,489)
Other current liabilities	(8,137)	1,544
Long-term other payables	68,343	(17,526)
Retirement benefits paid	(2,896)	(8,564)
Defined benefit liabilities transferred from affiliated companies	(989)	(254)
Increase in plan assets	(26,900)	(24,486)
	₩ 103,689	₩ (101,745)

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	₩ 23,200	₩ 15,703
Current portion of bonds	223,580	264,220
Reclassification of current portion of lease liabilities	28,591	29,029
Reclassification of current portion of long-term asset-backed loan	88,319	65,848
Acquisition of investment in subsidiaries	64,377	685,119

Doosan Corporation
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34. Cash flow statement (cont'd)

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

	2022					Ending balance
	Beginning balance	Cash flows from financing activities	Reclassification of current portion	Others		
Short-term borrowings	₩ 668,399	₩ (493,399)	₩ -	₩ -	₩	175,000
Current portion of long-term borrowings	-	-	-	-		-
Current portion of bonds	264,512	(335,794)	223,580	1,538		153,836
Current portion of long-term asset-backed loan	65,738	(66,103)	88,319	426		88,380
Current lease liabilities	27,412	(27,632)	28,591	(176)		28,195
Long-term borrowings	-	417,460	-	841		418,301
Bonds	291,197	109,569	(223,580)	449		177,635
Long-term asset-backed loan	16,435	179,708	(88,319)	196		108,020
Non-current lease liabilities	234,719	-	(28,591)	4,187		210,315
	<u>₩ 1,568,412</u>	<u>₩ (216,191)</u>	<u>₩ -</u>	<u>₩ 7,461</u>	<u>₩</u>	<u>1,359,682</u>

	2021					Ending balance
	Beginning balance	Cash flows from financing activities	Reclassification of current portion	Division (See Note35)	Others	
Short-term borrowings	₩ 709,761	₩ (89,362)	₩ -	₩ (40,000)	₩ 88,000	₩ 668,399
Current portion of long-term borrowings	102,508	(14,512)	-	-	(87,996)	-
Current portion of bonds	137,828	(137,974)	264,220	-	438	264,512
Current portion of long-term asset-backed loan	95,263	(96,499)	65,848	-	1,126	65,738
Current lease liabilities	30,320	(29,762)	29,029	(2,098)	(77)	27,412
Long-term borrowings	-	-	-	-	-	-
Bonds	333,632	221,030	(264,220)	-	755	291,197
Long-term asset-backed loan	166,215	(84,089)	(65,848)	-	157	16,435
Non-current lease liabilities	245,578	-	(29,029)	(937)	19,107	234,719
	<u>₩ 1,821,105</u>	<u>₩ (231,168)</u>	<u>₩ -</u>	<u>₩ (43,035)</u>	<u>₩ 21,510</u>	<u>₩ 1,568,412</u>

35. Division

The Company decided to sell the Industrial vehicle segment in accordance with a resolution of the Board of Directors on March 11, 2021 and the key decision is as follows:

	Contents
Subject held for sale	All of the shares issued by the newly incorporated company held by the Company through the split-off of Industrial vehicle segment
Buyer	Doosan Bobcat Inc.

As of March 11, 2021, the Company contracted with Doosan Bobcat Inc. for the sale of the shares. In accordance with the resolution of the shareholders' meeting dated June 25, 2021, the Company completed the split-off of the Industrial Vehicle segment and newly established Doosan Industrial Vehicle Co., Ltd. as of July 1, 2021.

The details of the split-off are as follows:

	Divided company	Newly incorporated company
Company name	Doosan Corporation	Doosan Industrial Vehicle Co., Ltd.
Main business	Other businesses except for the divided segment	Manufacturing and sale of forklifts and others

Details of the assets and liabilities of the Industrial Vehicle segment carried over to the newly incorporated company are as follows (Korean won in millions):

Assets	Book amount	Liabilities	Book amount
Cash and cash equivalents	₩ 40,068	Trade payables	₩ 144,888
Trade receivables	191,896	Short-term borrowings	40,000
Other receivables	12,337	Other payables	32,423
Inventory	82,153	Current lease liabilities	2,098
Other current assets	2,101	Other current liabilities	9,422
Investment in subsidiaries, associates and joint ventures	58,924	Provisions	3,697
Property, plant and equipment	123,694	Net defined benefit liabilities	1,220
Intangible assets	36,539	Non-current lease liabilities	937
Deposit	1,967	Other non-current liabilities	2,653
Deferred income tax assets	297		
	<u>₩ 549,976</u>		<u>₩ 237,338</u>

Accordingly, the Company acquired all of the shares issued by the Doosan Industrial Vehicle Co., Ltd., newly incorporated company, and sold the shares to Doosan Bobcat Inc. on July 6, 2021 (sales price: ₩750,433 million).

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 Industrial Vehicle Co., Ltd.) will be repaid in solidarity with respect to the debts of the company before the division.

The performance of the Industrial Vehicle segment carried forward to the newly incorporated company is indicated as a discontinued operation (See Note 36).

36. Discontinued operations

Details of discontinued operations for the year ended December 31, 2021 is as follows:

	2021	
Discontinued operations	Mottrol segment	Industrial Vehicle segment
Main business	Manufacturing and sales of hydraulic components, etc. and defense industry	Manufacturing and sales of engine related forklift, electric forklift, logistics equipment
Method	Split-off (*1)	Split-off (*2)

(*1) In accordance with the resolution of the shareholders' meeting dated October 20, 2020, the Company completed the division on December 1, 2020, by dividing the Mottrol segment into Mottrol Co., Ltd. According to the split-off, the divided company acquired all of the shares issued by the newly incorporated company. As of December 31, 2020, the shares were classified as assets held for sale. In addition, the sale of the shares was completed as of January 4, 2021 (sales price: ₩450,230 million).

(*2) In accordance with the resolution of the shareholders' meeting dated June 25, 2021, the Company completed the division of its industrial vehicle segment on July 1, 2021, and newly incorporated Doosan Industrial Vehicle Co., Ltd. As a result of the split-off, the Company acquired all of the shares issued by the newly incorporated company (see Note 35). In addition, the sale of the shares was completed as of July 6, 2021 (sales price: ₩750,433 million).

The operating results of the above segments are marked as discontinued operations.

36. Discontinued operations (cont'd)

Detail of profit or loss from discontinued operations for the year ended December 31, 2021 is as follows (Korean won in millions):

	2021		
	Mottrol segment	Industrial Vehicle segment	Total
Sales	₩ -	₩ 425,935	₩ 425,935
Cost of sales	-	365,092	365,092
Selling and administrative expenses	-	46,607	46,607
Operating profit (loss)	-	14,236	14,236
Non-operating profit (loss)	-	(758)	(758)
Profit (loss) before income tax expenses	-	13,478	13,478
Income tax expenses (benefits)	-	3,707	3,707
	-	9,771	9,771
Profit or loss from disposal of discontinued operations before income tax expenses and impairment loss	(507)	432,334	431,827
Tax expenses (benefits) related to disposal of discontinued operations	(123)	119,911	119,788
	(384)	312,423	312,039
Profit or loss from discontinued operations	₩ (384)	₩ 322,194	₩ 321,810

Cash flows from discontinued operations for the year ended December 31, 2021 is as follows (Korean won in millions):

	2021		
	Mottrol segment	Industrial Vehicle segment	Total
Net cash flows from operating activities	₩ -	₩ 15,706	₩ 15,706
Net cash flows from investing activities (*1)	441,075	696,499	1,137,574
Net cash flows from financing activities	-	-	-
	₩ 441,075	₩ 712,205	₩ 1,153,280

(*1) It includes cash flow from the disposal of discontinued operations.

37. 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 Company primarily engages several businesses, such as copper clad laminates manufacturing, development and maintenance service of information technology system 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 Company has prepared the separate financial statements by reasonably estimating the impact of COVID -19 on the Company. However, there are significant uncertainties in estimating the timing for endpoint of COVID -19 and the impact of COVID-19 on the Company.

Audit opinion on internal control over financial reporting

The accompanying independent auditor's report on internal control over financial reporting is attached as a result of auditing the internal control over financial reporting of Doosan Corporation (the "Company") and the separate financial statements of the Company for the year ended December 31, 2022 in accordance with the Article 8 of the *Act on External Audit of Stock Companies*.

Attachments:

1. Independent auditor's report on internal control over financial reporting
2. ICFR Operating Status Report by CEO

Independent auditor's report on internal control over financial reporting
(English Translation of a Report Originally Issued in Korean)

Doosan Corporation
The Shareholders and Board of Directors

Opinion on internal control over financial reporting

We have audited Doosan Corporation's (the "Company") internal control over financial reporting ("ICFR") based on the Conceptual Framework for designing and operating ICFR established by the Operating Committee of ICFR (the "ICFR Committee") as of December 31, 2022.

In our opinion, the Company's ICFR has been effectively designed and operated, in all material respects, as of December 31, 2022, in accordance with the Conceptual Framework for designing and operating ICFR.

We also have audited, in accordance with the Korean Standards on Auditing ("KSA"), the separate statement of financial position as of December 31, 2022, and the separate statement of profit or loss, separate statement of comprehensive income, separate statement of changes in equity and separate statement of cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies, and our report dated March 21, 2023 expressed an unqualified opinion thereon.

Basis for opinion on ICFR

We conducted our audit in accordance with KSA. Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of ICFR section of our report.

We are independent of the Company in accordance with the ethical requirements that are relevant to our audit of ICFR 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.

Responsibilities of management and those charged with governance for ICFR

Management is responsible for designing, implementing, and maintaining an effective ICFR, and for assessing the effectiveness of the ICFR included in the accompanying report on the effectiveness of the ICFR.

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

Auditor's responsibilities for the audit of ICFR

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

An audit of ICFR involves performing procedures to obtain audit evidence as to whether a material weakness exists. The procedures selected depend on the auditor's judgment, including the assessment of the risks that a material weakness exists. An audit also includes testing and evaluating the design and operating effectiveness of ICFR based on obtaining an understanding of ICFR and the assessed risk.

ICFR definition and inherent limitations

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

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

The engagement partner on the audit resulting in this independent 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 auditors' report date to the time this report is used. Such events and circumstances could significantly affect the Company's ICFR and may result in modifications to this report.

ICFR Operating Status Report by CEO

To the Shareholders, Board of Directors and Audit Committee of Doosan Corporation.

We, as the Chief Executive officer and the Internal Accounting Manager of Doosan Company, assessed operating status of the Company's Internal Control over Financial Reporting("ICFR") for the year ending December 31, 2022.

Design and operation of ICFR is the responsibility of the Company's management, including the Chief Executive Officer and the Internal Accounting Manager.

We evaluated whether the Company effectively designed and operated its ICFR to prevent and detect errors or frauds which may cause a misstatement in financial statements to ensure preparation and disclosure of reliable financial information.

We used the 'Conceptual Framework for Designing and Operating Internal Control over Financial Reporting' established by the Operating Committee of Internal Control over Financial Reporting in Korea (the "ICFR Committee") as the criteria for design and operation of the Company's ICFR. And we conducted an evaluation of ICFR based on the 'Management Guideline for Evaluating and Reporting Effectiveness of Internal Control over Financial Reporting' established by the ICFR Committee.

Based on our assessment, we concluded that the Company's ICFR is designed and operated effectively as of December 31, 2022, in all material respects, in accordance with the 'Conceptual Framework for Designing and Operating Internal Control over Financial Reporting'

We certify that this report does not contain any untrue statement of a fact, or omit to state a fact necessary to be presented herein. We also certify that this report does not contain or present any statements which might cause material misunderstandings of the readers, and we have reviewed and verified this report with sufficient care.

MAY 21 2023

Internal Accounting Manager

Baek Seung-am



Chief Executive Officer

Moon Hong-sung

