LG ENERGY SOLUTION, LTD.
AND ITS SUBSIDIARIES

Consolidated Financial Statements

As of and For the Years Ended December 31, 2022 and 2021

(With the Independent Auditor's Report Thereon)

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Independent Auditor's Report

English Translation of Independent Auditor's Report Originally Issued in Korean on March 8, 2023

To the Shareholders and the Board of Directors of
LG Energy Solution, Ltd.:

Audit Opinion

We have audited the consolidated financial statements of LG Energy Solution, Ltd. and its subsidiaries (the "Group"), which comprise the consolidated statement of financial position as of December 31, 2022, and the related consolidated statement of profit or loss, the consolidated statement of comprehensive income, consolidated statement of changes in equity and consolidated statement of cash flows, for the year then ended, all expressed in Korean won, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the financial position of the Group as of December 31, 2022, and its financial performance and its cash flows for the year then ended in accordance with Korean International Financial Reporting Standards ("K-IFRSs").

Basis for Audit Opinion

We conducted our audit in accordance with the Korean Standards on Auditing ("KSAs"). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Consolidated Financial Statements section of our report. We are independent of the Group in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in the Republic of Korea, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Key Audit Matters

The key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

GM Recall Warranty Provisions

1) Description of Key Audit Matter

As stated in Note 4 of the consolidated financial statements, the warranty provisions for voluntary recalls related to the customers are estimated based on the number of vehicles subject to recall, the expected total repair costs, and the cost-sharing ratio, etc. General Motors Company ("GM"), the Group's customer, voluntarily decided to recall certain vehicles during the year ended December 31, 2021, and the estimated amount of the provision the Group has recognized for this recall is ₩236,883 million, as of December 31, 2022.

We have assessed this item as a Key Audit Matter considering that the recognized amount of the provision is material and the assessment process is judgmental.

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2) How our audit addressed the Key Audit Matter

Our procedures included the following:

- Evaluate whether the Group's policies and internal controls for measuring and recognizing warranty provisions are effectively designed and operated.
- Perform the following procedures to assess the reasonableness of the key assumptions used by management:
  - Compare the underlying data with external and internal sources of information
  - Engage an auditor's expert to evaluate the reasonableness of the key assumptions and variables used by management
- Evaluate the competence and objectivity of the external expert engaged by management
- Independently recalculate the balance of the provision
- Assess the adequacy of the related footnote disclosures

Other Matters
The consolidated financial statements of the Group for the year ended December 31, 2021, were audited by Ernst and Young, in accordance with KSAs, whose report dated on March 7, 2022 expressed an unqualified opinion.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements
Management is responsible for the preparation of the accompanying consolidated financial statements in accordance with K-IFRS, and for such internal control as they determine is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

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

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

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

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

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our audit opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

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

- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We are solely responsible for our audit opinion.

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

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

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

The engagement partner on the audit resulting in this independent auditor's report is Kiu Seok Seo.

Deloitte Anjin LLC

March 8, 2023

This report is effective as of March 8, 2023, the auditor's report date. Certain subsequent events or circumstances may have occurred between the auditor's report date and the time the auditor's report is read. Such events or circumstances could significantly affect the consolidated financial statements and may result in modifications to the auditor's report.

LG ENERGY SOLUTION, LTD.
AND ITS SUBSIDIARIES

Consolidated financial statements
as of and for the years ended December 31, 2022 and 2021

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

Young Soo Kwon
Chief Executive Officer
LG Energy Solution, Ltd.

LG Energy Solution, Ltd. and its subsidiaries
Consolidated statements of financial position
As of December 31, 2022 and 2021

(Korean won in millions)

	Notes	December 31, 2022	December 31, 2021
Assets			
Current assets			
Cash and cash equivalents	3,5,6	₩ 5,937,967	₩ 1,282,880
Trade receivables	3,5,7,30	4,771,846	2,914,458
Other receivables	3,5,7,30	462,188	814,843
Other current financial assets	3,5,8	9,167	21,499
Prepaid income taxes		46,205	149,413
Other current assets	13	581,267	456,931
Inventories	9	6,995,629	3,895,803
		18,804,269	9,535,827
Non-current assets			
Trade receivables	3,5,7	120,698	67,055
Other receivables	3,5,7,30	119,058	92,271
Other non-current financial assets	3,5,8	408,551	193,820
Investments in associates and joint ventures	10,30,32	203,696	225,567
Deferred tax assets	27	2,100,492	1,855,198
Property, plant and equipment	11,18,32	15,331,047	11,050,777
Intangible assets	12,32	642,090	455,360
Investment properties	32,34	213,042	224,325
Other non-current assets	13,16	356,502	63,937
		19,495,176	14,228,310
Total assets		₩ 38,299,445	₩ 23,764,137
Liabilities			
Current liabilities			
Trade payables	3,5,30	₩ 3,841,766	₩ 2,177,736
Other payables	3,5,30	2,882,030	2,799,603
Borrowings	3,5,11,14,31	2,866,701	2,203,376
Provisions	15	976,949	1,527,476
Other current financial liabilities	3,5,8	3,923	-
Income tax payables		173,120	155,467
Other current liabilities	17,33	700,434	610,359
		11,444,923	9,474,017
Non-current liabilities			
Other payables	3,5,30	36,606	10,672
Borrowings	3,5,11,14,31	5,242,552	4,765,817
Other non-current financial liabilities	3,5,8	742	126
Provisions	15	518,781	580,539
Net defined benefit liabilities	16	499	202
Deferred tax liabilities	27	108,350	59,168
Other non-current liabilities	17,33	353,230	131,223
		6,260,760	5,547,747
Total liabilities		17,705,683	15,021,764
Equity attributable to owners of the Parent Company			
Share capital	19	117,000	100,000
Capital surplus	19	17,164,627	7,122,437
Accumulated other comprehensive income		296,070	406,092
Retained earnings	20	1,154,518	337,587
		18,732,215	7,966,116
Non-controlling interest	1	1,861,547	776,257
Total equity		20,593,762	8,742,373
Total liabilities and equity		₩ 38,299,445	₩ 23,764,137

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

LG Energy Solution, Ltd. and its subsidiaries
Consolidated statements of profit or loss
For the years ended December 31, 2022 and 2021

(Korean won in millions)

	Notes	2022	2021
Revenue	30,33,35	₩ 25,598,609	₩ 17,851,906
Cost of sales	22,23,30	21,308,077	13,953,123
Gross profit		4,290,532	3,898,783
Selling and administrative expenses	21,22,30	3,076,813	3,130,313
Operating profit		1,213,719	768,470
Finance income	5,24,31	385,537	339,996
Finance costs	5,24,31	519,021	295,258
Share of loss of associates and joint ventures	10	(36,641)	(11,556)
Other non-operating income	25	1,349,485	465,006
Other non-operating expenses	26	1,397,765	489,474
Profit before income tax expense		995,314	777,184
Income tax expense	27	215,488	76,523
Profit from continuing operations		779,826	700,661
Profit from discontinued operations		-	229,207
Profit for the period		₩ 779,826	₩ 929,868
Profit for the period attributable to:			
Owners of the Parent Company:			
Profit from continuing operations		₩ 767,236	₩ 607,343
Profit from discontinued operations		-	185,176
		767,236	792,519
Non-controlling interests:	1		
Profit from continuing operations		12,590	93,318
Profit from discontinued operations		-	44,031
		12,590	137,349
Earnings per share attributable to the equity holders of the Parent Company (in Korean won)	28		
Basic or diluted earnings per share		3,306	3,963
Basic or diluted earnings per share from continuing operations		3,306	3,036

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

LG Energy Solution, Ltd. and its subsidiaries
Consolidated statements of comprehensive income
For the years ended December 31, 2022 and 2021

(Korean won in millions)

	Notes	2022	2021
Profit for the year		₩ 779,826	₩ 929,868
Other comprehensive income:			
Items that will not be subsequently reclassified to profit or loss:			
Remeasurements of net defined benefit liabilities	16	68,543	(2,578)
Gain on valuation of financial assets at FVOCI	5	54,743	5,104
Income tax effect of other comprehensive income		(36,145)	(701)
		87,141	1,825
Items that may be subsequently reclassified to profit or loss:			
Exchange differences on translation of foreign operations		(96,207)	481,282
Gain (loss) on cash flow hedge	5	6,021	(18,082)
Share of other comprehensive income of associates and joint ventures	10	14,771	4,197
Income tax effect of other comprehensive income		(39,175)	39,283
		(114,590)	506,680
Other comprehensive income (loss) for the period, net of tax		(27,449)	508,505
Total comprehensive income for the period, net of tax		₩ 752,377	₩ 1,438,373
Total comprehensive income for the period attributable to:			
Owners of the Parent Company		₩ 706,907	₩ 1,195,531
Non-controlling interest		45,470	242,842

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

LG Energy Solution, Ltd. and its subsidiaries
Consolidated statements of changes in equity
For the years ended December 31, 2022 and 2021

(Korean won in millions)

	Notes	Attributable to the equity holders of the Parent Company					Non-controlling interests	Total
		Share capital	Capital surplus	Accumulated other comprehensive income (loss)	Retained earnings (accumulated deficit)	Subtotal		
As of January 1, 2021		₩ 100,000	₩ 7,231,468	₩ 1,205	₩ (453,058)	₩ 6,879,615	₩ 685,790	₩ 7,565,405
Comprehensive income for the period:								
Profit for the period		-	-	-	792,519	792,519	137,349	929,868
Remeasurements of net defined benefit liabilities	16	-	-	-	(1,874)	(1,874)	-	(1,874)
Exchange differences on translation of foreign operations		-	-	408,608	-	408,608	105,500	514,108
Gain on valuation of financial assets at FVOCI	5	-	-	3,700	-	3,700	-	3,700
Loss on cash flow hedge	5	-	-	(11,618)	-	(11,618)	(7)	(11,625)
Equity adjustments in equity method	10	-	-	4,197	-	4,197	-	4,197
Total comprehensive income for the period		-	-	404,887	790,645	1,195,532	242,842	1,438,374
Transactions with owners of the Parent Company recognized directly in equity:								
Others		-	(109,031)	-	-	(109,031)	(152,375)	(261,406)
		-	(109,031)	-	-	(109,031)	(152,375)	(261,406)
As of December 31, 2021		₩ 100,000	₩ 7,122,437	₩ 406,092	₩ 337,587	₩ 7,966,116	₩ 776,257	₩ 8,742,373
As of January 1, 2022		₩ 100,000	₩ 7,122,437	₩ 406,092	₩ 337,587	₩ 7,966,116	₩ 776,257	₩ 8,742,373
Comprehensive income (loss) for the period:								
Profit for the period		-	-	-	767,236	767,236	12,590	779,826
Remeasurements of net defined benefit liabilities	16	-	-	-	49,695	49,695	-	49,695
Exchange differences on translation of foreign operations		-	-	(166,655)	-	(166,655)	32,878	(133,777)
Gain on valuation of financial assets at FVOCI	5	-	-	37,447	-	37,447	-	37,447
Gain on cash flow hedge	5	-	-	4,415	-	4,415	-	4,415
Equity adjustments in equity method	10	-	-	14,771	-	14,771	-	14,771
Total comprehensive income (loss) for the period		-	-	(110,022)	816,931	706,909	45,468	752,377
Transactions with owners of the Parent Company recognized directly in equity:								
Capital increase		17,000	10,079,370	-	-	10,096,370	1,039,822	11,136,192
Others		-	(37,180)	-	-	(37,180)	-	(37,180)
		17,000	10,042,190	-	-	10,059,190	1,039,822	11,099,012
As of December 31, 2022		₩ 117,000	₩ 17,164,627	₩ 296,070	₩ 1,154,518	₩ 18,732,215	₩ 1,861,547	₩ 20,593,762

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

LG Energy Solution, Ltd. and its subsidiaries
Consolidated statements of cash flows
For the years ended December 31, 2022 and 2021

(Korean won in millions)

	Notes	2022	2021
Cash flows from operating activities:			
Cash generated from operations	31	₩ (260,840)	₩ 1,575,868
Interest received		145,955	19,616
Interest paid		(120,323)	(71,210)
Income tax paid		(344,599)	(545,689)
Net cash (used in) provided by operating activities		(579,807)	978,585
Cash flows from investing activities:			
Cash inflow from investing activities:			
Decrease in other receivables		6,222,412	614,400
Decrease in other non-current receivables		12,636	86,206
Proceeds from disposal of investments in associates and joint ventures		-	28,377
Proceeds from disposal of property, plant and equipment		9,729	59,100
Proceeds from disposal of intangible assets		9,184	1
Proceeds from disposal of financial assets		1,287	-
Government grants received		205,516	348,545
Cash inflows from transfer of business		-	622,564
		6,460,764	1,759,193
Cash outflow for investing activities:			
Increase in other receivables		(6,245,586)	(11,755)
Increase in other non-current receivables		(26,453)	(83,165)
Acquisition of investments in associates and joint ventures		-	(209,132)
Acquisition of financial instruments		(141,637)	(116,285)
Acquisition of property, plant and equipment		(6,209,926)	(3,462,890)
Acquisition of intangible assets		(88,232)	(53,517)
Business combination		(8,286)	(570)
		(12,720,120)	(3,937,314)
Net cash used in investing activities		(6,259,356)	(2,178,121)
Cash flows from financing activities:			
Cash inflow from financing activities:			
Proceeds from borrowings and others		2,547,892	1,640,170
Capital increase		10,096,371	-
Paid-in capital by non-controlling interests		1,039,821	589,061
		13,684,084	2,229,231
Cash outflow for financing activities:			
Repayments of borrowings and others		(1,627,850)	(1,083,877)
Capital decrease of a subsidiary		(604,437)	(64,916)
Share repurchases by subsidiaries		-	(197,603)
Others		(37,180)	-
		(2,269,467)	(1,346,396)
Net cash provided by financing activities		11,414,617	882,835
Net increase (decrease) in cash and cash equivalents		4,575,454	(316,701)
Cash and cash equivalents at the beginning of the year		1,282,880	1,493,145
Effects of exchange rate changes on cash and cash equivalents		79,633	106,436
Cash and cash equivalents at the end of the year		₩ 5,937,967	₩ 1,282,880

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

1. GENERAL:

General information about LG Energy Solution, Ltd. (the "Company" or the "Parent Company") and its 15 subsidiaries (collectively, the "Group") is as follows:

1.1 Company Information

The Parent Company, a split-off of LG Chem Ltd.'s battery division, was incorporated on December 1, 2020.

As of December 31, 2022, the Company is engaged in the battery industry, with its manufacturing facilities located in Ochang.

The Company's shares have been listed on the Korea Exchange since January 27, 2022, and the share capital is ₩117,000 million as of December 31, 2022. The largest shareholder of the Company is LG Chem Ltd., which holds 81.84% of the Company's ordinary shares.

The Company is authorized to issue 800 million shares (₩500 per share) and has issued 234 million of ordinary shares as of December 31, 2022.

1.2 Business Overview

The Group is engaged in providing energy solution services.

The Group manufactures and supplies batteries ranging from IT and new application batteries for mobile phones and laptops to automotive batteries for electric vehicles and ESS batteries. Demand for mobile batteries for new applications, such as electric tools and other electrical devices, as well as traditional IT devices, is increasing recently, and the automotive battery business is also expected to expand rapidly due to increasing demand for batteries associated with enhanced environment regulation in developed countries. Demand for ESS is expanding with an increasing importance of efficient usage of electricity and generation of renewable energy.

1.3 Consolidated Subsidiaries and Investments in Associates and Joint Ventures

	Ownership (%)				
	December 31, 2022	December 31, 2021	Location	Closing month	Business
Subsidiaries:					
LG Energy Solution (Nanjing) Co., Ltd.	100	100	China	December	Mobile battery manufacturing, sales, and others
LG Energy Solution Michigan Inc. (*1)	100	100	USA	December	Automotive battery research, development, and manufacturing
LG Energy Solution Battery (Nanjing) Co., Ltd.	100	100	China	December	Automotive battery manufacturing and sales
LG Energy Solution Wroclaw sp. z o.o.	100	100	Poland	December	Automotive battery manufacturing and sales
LG Energy Solution Australia Pty Ltd.	100	100	Australia	December	ESS battery sales
LG Energy Solution Technology (Nanjing) Co., Ltd.	100	100	China	December	Automotive battery manufacturing, sales, and others
Ultium Cells Holdings LLC (*2)	50	-	USA	December	Automotive battery manufacturing and sales
Ultium Cells LLC (*2)	50	50	USA	December	Automotive battery manufacturing and sales
LG Energy Solution Europe GmbH	100	100	Germany	December	ESS battery sales and others
LG Energy Solution (Taiwan) Ltd.	100	100	Taiwan	December	Mobile battery sales and others
Areum noori Co., Ltd.	100	100	Korea	December	Facility management and cleaning
LG Energy Solution Fund I LLC	100	100	USA	December	Investment in ventures
LG Energy Solution Vertech Inc. (*3)	100	-	USA	December	ESS installation service
ES America LLC (*4)	100	-	USA	December	Mobile battery manufacturing and sales
Baterias De Castilla, S.L. (*5)	100	-	Spain	December	Others
Associates and joint ventures:					
VINFAST LITHIUM BATTERY PACK LLC (*6)	35	35	Vietnam	December	Mobile battery manufacturing, sales, and others
Jiangxi VL Battery Co., Ltd.	34	34	China	December	Mobile battery manufacturing, sales, and others
PT. HLI Green Power (*7)	50	50	Indonesia	December	Automotive battery manufacturing and sales

(*1) LG Energy Solution Michigan Inc. owns 50% of Ultium Cells LLC's shares.

(*2) During the current year, the Group acquired 50% ownership of Ultium Cells Holdings LLC by contributing the entire stake it held in Ultium Cells LLC. The Group does not hold a majority ownership interest in Ultium Cells LLC or Ultium Cells Holdings LLC. According to the arrangement between shareholders, however, the Group holds the majority of voting rights in the decision-making process of the entity and has the ability to affect the variable returns by engaging in the entity's production and cost management. This implies that the Group exercises control over the entity.

(*3) During the current year, the Group newly acquired 100% of LG Energy Solution Vertech Inc. for ₩16,168 million.

(*4) ES America LLC was incorporated during the current year, and the Group acquired 100% of its shares for ₩66,590 million.

(*5) During the current year, the Group newly acquired 100% of Baterias De Castilla, S.L. for ₩4 million.

(*6) Although the Group holds a 35% ownership stake in VINFAST LITHIUM BATTERY PACK LLC, it has been classified as a joint venture as it meets the classification criteria of a joint venture, including the existence of contractual arrangements that effectively result in unanimous consent.

(*7) As a company established under a joint arrangement in which the Group participated, the investee is structured as a separate vehicle over which the Group has rights to the net assets. Therefore, it is classified as a joint venture.

1.4 Summarized Financial Information of Subsidiaries, Associates and Joint Ventures

Summarized financial information of subsidiaries, associates and joint ventures (before the elimination of intercompany transactions and adjustments for differences in accounting policies) is as follows (Korean won in millions):

	December 31, 2022			2022	
	Asset	Liability	Equity	Revenue	Net income (loss)
Subsidiaries:					
LG Energy Solution (Nanjing) Co., Ltd.	₩ 5,486,991	₩ 2,474,044	₩ 3,012,947	₩ 8,328,534	₩ 637,303
LG Energy Solution Michigan Inc.	3,573,800	1,031,654	2,542,146	2,457,871	27,822
LG Energy Solution Battery (Nanjing) Co., Ltd.	972,715	578,513	394,202	1,774,106	70,338
LG Energy Solution Wroclaw sp. z o.o.	9,845,139	7,654,235	2,190,904	10,767,806	438,249
LG Energy Solution Australia Pty Ltd.	12,903	10,926	1,977	25,306	248
LG Energy Solution Technology (Nanjing) Co., Ltd.	2,170,096	990,347	1,179,749	2,743,190	184,593
Ultium Cells Holdings LLC(*)	5,255,664	1,532,150	3,723,514	106,974	25,615
Ultium Cells LLC	5,255,664	1,532,150	3,723,514	106,974	25,615
LG Energy Solution Europe GmbH	252,708	205,366	47,342	280,244	7,003
LG Energy Solution (Taiwan) Ltd.	3,468	904	2,564	5,381	404
Areum noori Co., Ltd.	3,330	1,917	1,413	8,498	232
LG Energy Solution Fund I LLC	22,225	2	22,223	-	(1,470)
LG Energy Solution Vertech Inc.	89,508	46,357	43,151	60,224	(23,881)
ES America LLC	107,288	38,507	68,781	-	(962)
Baterias De Castilla, S.L.	4	-	4	-	-
Associates and joint ventures:					
VINFAST LITHIUM BATTERY PACK LLC	13,297	5,888	7,409	11,072	(3,809)
Jiangxi VL Battery Co., Ltd.	82,311	43,170	39,141	2,670	(19,851)
PT. HLI Green Power	667,930	227,305	440,625	-	(10,855)

(*) The entity holds a 100% stake in Ultium Cells LLC and has presented financial information on a consolidated basis.

	December 31, 2021			2021	
	Asset	Liability	Equity	Revenue	Net income (loss)
Subsidiaries:					
LG Energy Solution (Nanjing) Co., Ltd.	₩ 4,776,953	₩ 2,307,876	₩ 2,467,077	₩ 4,404,238	₩ 565,809
LG Energy Solution Michigan Inc.	1,924,943	1,065,217	859,726	1,212,958	(48,693)
LG Energy Solution Battery (Nanjing) Co., Ltd.	1,115,896	707,952	407,944	1,318,955	94,824
LG Energy Solution Wroclaw sp. z o.o.	7,092,867	5,608,405	1,484,462	8,014,862	312,829
LG Energy Solution Australia Pty Ltd.	7,782	6,063	1,719	15,475	(69)
LG Energy Solution Technology (Nanjing) Co., Ltd.	2,031,679	1,000,656	1,031,023	1,330,482	129,374
Ultium Cells LLC	1,740,733	188,221	1,552,512	-	282
LG Energy Solution Europe GmbH	90,629	50,460	40,169	212,276	5,283
LG Energy Solution (Taiwan) Ltd.	3,429	1,183	2,246	4,499	249
Areum noori Co., Ltd.	2,199	1,018	1,181	5,518	681
LG Energy Solution Fund I LLC	21,438	3	21,435	-	(1,405)
Associates and joint ventures:					
VINFAST LITHIUM BATTERY PACK LLC	17,496	6,295	11,201	13,590	(1,570)
Jiangxi VL Battery Co., Ltd.	76,496	16,799	59,697	17,836	(10,245)
PT. HLI Green Power	404,131	1,156	402,975	-	(18,403)

1.5 Information of Subsidiaries Whose Non-Controlling Interests are Important to the Reporting Company

(1) Ultium Cells Holdings LLC

- Percentage of ownership held by non-controlling interests and cumulative non-controlling interests (Korean won in millions)

	December 31, 2022	December 31, 2021
Percentage of ownership held by non-controlling interests	50.0%	50.0%
Cumulative non-controlling interests	₩ 1,861,547	₩ 776,257

- Net income and total comprehensive income attributable to non-controlling interests (Korean won in millions)

	2022
Net income allocated to non-controlling interests	₩ 12,500
Total comprehensive income allocated to non-controlling interests	45,380

- The consolidated statements of financial position of subsidiaries whose non-controlling interests are material to the Group (before the elimination of intercompany transactions) (Korean won in millions):

	December 31, 2022	December 31, 2021
Total assets		
Current assets	₩ 1,201,757	₩ 472,813
Non-current assets	4,053,907	1,267,920
	₩ 5,255,664	₩ 1,740,733
Total liabilities		
Current liabilities	₩ 713,966	₩ 188,200
Non-current liabilities	818,184	21
	₩ 1,532,150	₩ 188,221
Total equity	₩ 3,723,514	₩ 1,552,512

- The consolidated statements of comprehensive income of subsidiaries whose non-controlling interests are material to the Group (before the elimination of intercompany transactions) (Korean won in millions):

	2022	2021
Revenue	₩ 106,974	₩ -
Operating profit	28,980	165
Net income	₩ 25,615	₩ 282

- The consolidated statements of cash flows of subsidiaries whose non-controlling interests are material to the Group (before the elimination of intercompany transactions) (Korean won in millions):

	2022	2021
Cash flows from operating activities	₩ (334,638)	₩ (18,751)
Cash flows from investing activities	(2,480,393)	(803,651)
Cash flows from financing activities	2,794,084	1,177,783
Effects of exchange rate changes on cash and cash equivalents	65,286	28,230
Increase in cash and cash equivalents	44,339	383,611
Cash and cash equivalents at the beginning of the year	471,494	87,883
Cash and cash equivalents at the end of the year	₩ 515,833	₩ 471,494

1.6 Changes in Scope for Consolidation

New subsidiaries included in the consolidated financial statements for the year ended December 31, 2022, are as follows:

	Reason
LG Energy Solution Vertech Inc.	Acquired during current reporting period
ES America, LLC	Incorporated during current reporting period
Baterias De Castilla, S.L.	Acquired during current reporting period
Ultium Cells Holdings LLC	Acquired during current reporting period

2. BASIS OF CONSOLIDATION AND SIGNIFICANT ACCOUNTING POLICIES:

2.1 Basis of Consolidation

The Group has prepared the consolidated financial statements in accordance with the Korean International Financial Reporting Standards ("K-IFRS").

The principal accounting policies are set out below. Except for the effect of the amendments to K-IFRSs and new interpretations set out below, the principal accounting policies used to prepare the consolidated financial statements as of and for the year ended December 31, 2022, are consistent with the accounting policies used to prepare the consolidated financial statements as of and for the year ended December 31, 2021.

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

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, regardless of whether that price is directly observable or estimated using another valuation technique. In estimating the fair value of an asset or a liability, the Group takes into account the characteristics of the asset or liability if market participants would take those characteristics into account when pricing the asset or liability at the measurement date. Fair value for measurement and/or disclosure purposes in these consolidated financial statements is determined on such a basis, except for share-based payment transactions that are within the scope of K-IFRS 1102 Share-based payment, leasing transactions that are within the scope of K-IFRS 1116 Leases, and measurements that have some similarities to fair value, but are not fair value, such as net realizable value in K-IFRS 1002 Inventories or value in use in K-IFRS 1036 Impairment of Assets.

The directors have, at the time of approving the financial statements, a reasonable expectation that the Group has adequate resources to continue in operational existence for the foreseeable future. Thus they continue to adopt the going concern basis of accounting in preparing the consolidated financial statements.

2.2 Application of the Amended and Enacted Standards

1) New and amended K-IFRSs and new interpretations that are effective for the current year

- K-IFRS 1103 *Business Combinations* - Reference to the Conceptual Framework (Amendment)

The amendments update K-IFRS 1103 so that it refers to the Conceptual Framework (2018) instead of the Framework (2007). They also add to K-IFRS 1103 a requirement that, for obligations within the scope of K-IFRS 1037, an acquirer applies K-IFRS 1037 to determine whether at the acquisition date a present obligation exists as a result of past events. For a levy that would be within the scope of K-IFRS 2121 Levies, the acquirer applies K-IFRS 2121 to determine whether the obligating event that gives rise to a liability to pay the levy has occurred by the acquisition date.

Finally, the amendments add an explicit statement that an acquirer does not recognize contingent assets acquired in a business combination.

- K-IFRS 1016 *Property, Plant and Equipment* - Proceeds before Intended Use (Amendment)

The amendments prohibit deducting from the cost of an item of property, plant and equipment any proceeds from selling items produced before that asset is available for use, i.e., proceeds while bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Consequently, an entity recognizes such sales proceeds and related costs in profit or loss. The entity measures the cost of those items in accordance with K-IFRS 1002 Inventories.

If not presented separately in the consolidated statements of comprehensive income, the financial statements shall disclose the amounts of proceeds and costs included in profit or loss that relate to items produced that are not an output of the entity's ordinary activities, and which line item(s) in the consolidated statements of comprehensive income include(s) such proceeds and cost.

The amendments are applied retrospectively, but only to items of property, plant and equipment that are brought to the location and condition necessary for them to be capable of operating in the manner intended by management on or after the beginning of the earliest period presented in the financial statements in which the entity first applies the amendments.

- K-IFRS 1037 *Provisions, Contingent Liabilities and Contingent Assets* - Onerous Contracts - Cost of Fulfilling a Contract (Amendments)

The amendments specify that the 'cost of fulfilling' a contract comprises the 'costs that relate directly to the contract'. Costs that relate directly to a contract consist of both the incremental costs of fulfilling that contract (examples would be direct labor or materials) and an allocation of other costs that relate directly to fulfilling contracts (an example would be the allocation of the depreciation charge for an item of property, plant and equipment used in fulfilling the contract).

The amendments apply to contracts for which the entity has not yet fulfilled all its obligations at the beginning of the annual reporting period in which the entity first applies the amendments. Comparatives are not restated. Instead, the entity shall recognize the cumulative effect of initially applying the amendments as an adjustment to the opening balance of retained earnings or other component of equity, as appropriate, at the date of initial application.

- *Annual Improvements to K-IFRS Standards 2018–2020*

The annual improvements include amendments to four standards such as K-IFRS 1101 First-time Adoption of K-IFRS, K-IFRS 1109 Financial Instruments, K-IFRS 1116 Leases, and K-IFRS 1041 Agriculture.

① K-IFRS 1101 *First-Time Adoption of K-IFRSs*

The amendment provides additional relief to a subsidiary which becomes a first-time adopter later than its parent in respect of accounting for cumulative translation differences. As a result of the amendment, a subsidiary that uses the exemption in K-IFRS 1101 paragraph D16(1) can now also elect to measure cumulative translation differences for all foreign operations at the carrying amount that would be included in the parent's consolidated financial statements, based on the parent's date of transition to K-IFRSs, if no adjustments were made for consolidation procedures and for the effects of the business combination in which the parent acquired the subsidiary. A similar election is available to an associate or joint venture that uses the exemption in K-IFRS 1101 paragraph D16(1).

② K-IFRS 1109 *Financial Instruments*

The amendment clarifies that in applying the '10 per cent' test to assess whether to derecognize a financial liability, an entity includes only fees paid or received between the entity (the borrower) and the lender, including fees paid or received by either the entity or the lender on the other's behalf.

The amendment is applied prospectively to modifications and exchanges that occur on or after the date the entity first applies the amendment.

③ K-IFRS 1116 *Leases*

The amendment removes the illustration of the reimbursement of leasehold improvements.

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

At the date of authorization of these consolidated financial statements, the Group has not applied the following new and revised K-IFRSs that have been issued but are not yet effective:

- K-IFRS 1001 *Presentation of Financial Statements* - Classification of Liabilities as Current or Non-current (Amendments)

The amendments to K-IFRS 1001 affect only the presentation of liabilities as current or non-current in the consolidated statements of financial position and not the amount or timing of recognition of any asset, liability, income or expenses, or the information disclosed about those items.

The amendments clarify that the classification of liabilities as current or non-current is based on rights that are in existence at the end of the reporting period, specify that classification is unaffected by expectations about whether an entity will exercise its right to defer settlement of a liability, explain that rights are in existence if covenants are complied with at the end of the reporting period, and introduce a definition of 'settlement' to make clear that settlement refers to the transfer to the counterparty of cash, equity instruments, other assets or services.

The amendments are applied retrospectively for annual periods beginning on or after January 1, 2023, with early application permitted.

- K-IFRS 1001 *Presentation of Financial Statements and IFRS Practice Statement 2 Making Materiality Judgements* - Disclosure of Accounting Policies (Amendments)

The amendments change the requirements in K-IFRS 1001 with regard to the disclosure of accounting policies. The amendments replace all instances of the term 'significant accounting policies' with 'material accounting policy information'. Accounting policy information is material if, when considered together with other information included in an entity's financial statements, it can reasonably be expected to influence decisions that the primary users of general purpose financial statements make on the basis of those financial statements.

The supporting paragraphs in K-IFRS 1001 are also amended to clarify that accounting policy information that relates to immaterial transactions, other events or conditions is immaterial and need not be disclosed. Accounting policy information may be material because of the nature of the related transactions, other events or conditions, even if the amounts are immaterial. However, not all accounting policy information relating to material transactions, other events or conditions is itself material.

The board has also developed guidance and examples to explain and demonstrate the application of the 'four-step materiality process' described in IFRS Practice Statement 2.

The amendments to K-IFRS 1001 are effective for annual periods beginning on or after January 1, 2023, with earlier application permitted and are applied prospectively. The amendments to IFRS Practice Statement 2 do not contain an effective date or transition requirements.

- K-IFRS 1001 *Presentation of Financial Statements* - Disclosure of financial liabilities with condition to adjust exercise price (Amendment)

The amendments require disclosure of valuation gains or losses (limited to those recognized in the profit or loss) of the conversion options or warrants (or financial liabilities including them), if all or part of the financial instrument with exercise price that is adjusted depending on the issuer's share price change is classified as financial liability as defined in paragraph 11 (2) of K-IFRS 1032.

The amendments are applied retrospectively for annual periods beginning on or after January 1, 2023, with early application permitted.

- K-IFRS 1008 *Accounting Polices, Changes in Accounting Estimates and Errors* - Definition of Accounting Estimates (Amendments)

The amendments replace the definition of a change in accounting estimates with a definition of accounting estimates. Under the new definition, accounting estimates are "monetary amounts in financial statements that are subject to measurement uncertainty".

The definition of a change in accounting estimates was deleted. However, the IASB retained the concept of changes in accounting estimates in the Standard with the following clarifications:

- A change in accounting estimate that results from new information or new developments is not the correction of an error
- The effects of a change in an input or a measurement technique used to develop an accounting estimate are changes in accounting estimates if they do not result from the correction of prior period errors

The amendments are effective for annual periods beginning on or after January 1, 2023 to changes in accounting policies and changes in accounting estimates that occur on or after the beginning of that period, with earlier application permitted.

- K-IFRS 1012 *Income Taxes* - Deferred Tax related to Assets and Liabilities arising from a Single Transaction (Amendments)

The amendments introduce a further exception from the initial recognition exemption. Under the amendments, an entity does not apply the initial recognition exemption for transactions that give rise to equal taxable and deductible temporary differences.

Depending on the applicable tax law, equal taxable and deductible temporary differences may arise on initial recognition of an asset and liability in a transaction that is not a business combination and affects neither accounting nor taxable profit. For example, this may arise upon recognition of a lease liability and the corresponding right-of-use asset applying K-IFRS 1116 at the commencement date of a lease.

Following the amendments to K-IFRS 1012, an entity is required to recognize the related deferred tax asset and liability, with the recognition of any deferred tax asset being subject to the recoverability criteria in K-IFRS 1012.

The board also adds an illustrative example to K-IFRS 1012 that explains how the amendments are applied.
The amendments apply 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 an entity recognizes:

- A deferred tax asset (to the extent that it is probable that taxable profit will be available against which the deductible temporary difference can be utilized) and a deferred tax liability for all deductible and taxable temporary differences are associated with:
  - Right-of-use assets and lease liabilities
  - Decommissioning, restoration and similar liabilities and the corresponding amounts recognized as part of the cost of the related asset
- The cumulative effect of initially applying the amendments as an adjustment to the opening balance of retained earnings (or other component of equity, as appropriate) at that date.
- The amendments are effective for annual reporting periods beginning on or after January 1, 2023, with earlier application permitted.

The Group does not anticipate that the application of the enactment and amendments will have a significant impact on the Group's consolidated financial statements.

2.3 Basis of Consolidation

The consolidated financial statements incorporate the financial statements of the Company and entities controlled by the Company (and its subsidiaries) made up to December 31 each year. Control is achieved when the Company 1) has the power over the investee, 2) is exposed, or has rights, to variable returns from its involvement with the investee, and 3) has the ability to use its power to affect its returns. The Company reassesses whether or not it controls an investee if facts and circumstances indicate that there are changes to one or more of the three elements of control listed above.

When the Company has less than a majority of the voting rights of an investee, it considers that it has power over the investee when the voting rights are sufficient to give it the practical ability to direct the activities of the investee unilaterally. The Company considers all relevant facts and circumstances in assessing whether or not the Company's voting rights in an investee are sufficient to give it power, including:

- the size of the Company's holding of voting rights relative to the size and dispersion of holdings of the other vote holders;
- potential voting rights held by the Company, other vote holders or other parties;
- rights arising from other contractual arrangements; and
- any additional facts and circumstances that indicate that the Company has, or does not have, the current ability to direct the relevant activities at the time that decisions need to be made, including voting patterns at previous shareholders' meetings.

Consolidation of a subsidiary begins when the Company obtains control over the subsidiary and ceases when the Company loses control of the subsidiary. Specifically, the results of subsidiaries acquired or disposed of during the year are included in profit or loss from the date the Company gains control until the date when the Company ceases to control the subsidiary. Profit or loss and each component of other comprehensive income are attributed to the owners of the Company and to the non-controlling interests. Total comprehensive income of the subsidiaries is attributed to the owners of the Company and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

When necessary, adjustments are made to the financial statements of subsidiaries to bring the accounting policies used into line with the Group’s accounting policies.

All intra-group assets and liabilities, equity, income, expenses and cash flows relating to transactions between the members of the Group are eliminated on consolidation

Non-controlling interests in subsidiaries are identified separately from the Group’s equity therein. Those interests of non-controlling shareholders that are present ownership interests entitling their holders to a proportionate share of net assets upon liquidation may initially be measured at 1) fair value or 2) at the non-controlling interests’ proportionate share of the fair value of the acquiree’s identifiable net assets. The choice of measurement is made on an acquisition-by-acquisition basis. Other non-controlling interests are initially measured at fair value. Subsequent to the acquisition, the carrying amount of non-controlling interests is the amount of those interests at initial recognition plus the non-controlling interests’ share of subsequent changes in equity. Total comprehensive income is attributed to non-controlling interests even if this results in the non-controlling interests having a deficit balance.

Changes in the Group’s interests in subsidiaries that do not result in a loss of control are accounted for as equity transactions. The carrying amounts of the Group’s interests and the non-controlling interests are adjusted to reflect the changes in their relative interests in the subsidiaries. Any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognized directly in equity and attributed to owners of the Company.

When the Group loses control of a subsidiary, a gain or loss on disposal is calculated as the difference between (i) the aggregate of the fair value of the consideration received and the fair value of any retained interest and (ii) the previous carrying amount of the assets (including goodwill), less liabilities of the subsidiary and any non-controlling interests. All amounts previously recognized in other comprehensive income in relation to that subsidiary are accounted for as if the Group had directly disposed of the related assets or liabilities of the subsidiary (i.e., reclassified to profit or loss or transferred to another category of equity as required/permitted by applicable K-IFRSs). The fair value of any investment retained in the former subsidiary at the date when control is lost is recognized as the fair value on initial recognition for subsequent accounting under K-IFRS 1109 Financial Instruments when applicable, or the cost on initial recognition of an investment in an associate or a joint venture.

2.4 Business Combination

Acquisitions of businesses are accounted for using the acquisition method. The consideration transferred in a business combination is measured at fair value, which is calculated as the sum of the acquisition-date fair values of the assets transferred by the Group, liabilities incurred by the Group to the former owners of the acquiree and the equity interest issued by the Group in exchange for control of the acquiree. Acquisition-related costs are recognized in profit or loss as incurred.

At the acquisition date, the identifiable assets acquired and the liabilities assumed are recognized at their fair value at the acquisition date, except that:

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

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

When the consideration transferred by the Group in a business combination includes contingent consideration arrangement, the contingent consideration is measured at its acquisition-date fair value and included as part of the consideration transferred in a business combination. Changes in fair value of the contingent consideration that qualify as measurement period adjustments are adjusted retrospectively, with corresponding adjustments against goodwill. Measurement period adjustments are adjustments that arise from additional information obtained during the ‘measurement period’ (which cannot exceed one year from the acquisition date) about facts and circumstances that existed at the acquisition date.

The subsequent accounting for changes in the fair value of the contingent consideration that do not qualify as measurement period adjustments depends on how the contingent consideration is classified. Contingent consideration that is classified as equity is not remeasured at subsequent reporting dates and its subsequent settlement is accounted for within equity. Other contingent consideration is remeasured to fair value at subsequent reporting dates with changes in fair value recognized in profit or loss.

When a business combination is achieved in stages, the Group’s previously held interests (including joint operations) in the acquired entity are remeasured to its acquisition-date fair value and the resulting gain or loss, if any, is recognized in profit or loss. Amounts arising from interests in the acquiree prior to the acquisition date that have previously been recognized in other comprehensive income are reclassified to profit or loss, where such treatment would be appropriate if that interest were disposed of.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period (see above), or additional assets or liabilities are recognized, to reflect new information obtained about facts and circumstances that existed as of the acquisition date that, if known, would have affected the amounts recognized as of that date.

2.5 Investments in associates and joint ventures

An associate is an entity over which the Group has significant influence and that is neither a subsidiary nor an interest in a joint venture. Significant influence is the power to participate in the financial and operating policy decisions of the investee but is not control or joint control over those policies.

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

The results and assets and liabilities of associates or joint ventures are incorporated in these financial statements using the equity method of accounting, except when the investment is classified as held for sale, in which case it is accounted for in accordance with K-IFRS 1105. Under the equity method, an investment in an associate or a joint venture is recognized initially in the consolidated statement of financial position at cost and adjusted thereafter to recognize the Group's share of the profit or loss and other comprehensive income of the associate or joint venture. When the Group's share of losses of an associate or a joint venture exceeds the Group's interest in that associate or joint venture (which includes any long-term interests that, in substance, form part of the Group's net investment in the associate or joint venture), the Group discontinues recognizing its share of further losses. Additional losses are recognized only to the extent that the Group has incurred legal or constructive obligations or made payments on behalf of the associate or joint venture.

An investment in an associate or a joint venture is accounted for using the equity method from the date on which the investee becomes an associate or a joint venture. On acquisition of the investment in an associate or a joint venture, any excess of the cost of the investment over the Group's share of the net fair value of the identifiable assets and liabilities of the investee is recognized as goodwill, which is included within the carrying amount of the investment. Any excess of the Group's share of the net fair value of the identifiable assets and liabilities over the cost of the investment, after reassessment, is recognized immediately in profit or loss in the period in which the investment is acquired.

If there is objective evidence that the Group's net investment in an associate or joint venture is impaired, the requirements of K-IFRS 1036 are applied to determine whether it is necessary to recognize any impairment loss with respect to the Group's investment. When necessary, the entire carrying amount of the investment (including goodwill) is tested for impairment in accordance with K-IFRS 1036 as a single asset by comparing its recoverable amount (higher of value in use and fair value less costs of disposal) with its carrying amount. Any impairment loss recognized is not allocated to any asset, including goodwill that forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized in accordance with K-IFRS 1036 to the extent that the recoverable amount of the investment subsequently increases.

The Group discontinues the use of the equity method from the date when the investment ceases to be an associate or a joint venture. When the Group retains an interest in the former associate or a joint venture and the retained interest is a financial asset, the Group measures the retained interest at fair value at that date and the fair value is regarded as its fair value on initial recognition in accordance with K-IFRS 1109. The difference between the carrying amount of the associate or a joint venture at the date the equity method was discontinued, and the fair value of any retained interest and any proceeds from disposing of a part interest in the associate or a joint venture is included in the determination of the gain or loss on disposal of the associate or joint venture. In addition, the Group accounts for all amounts previously recognized in other comprehensive income in relation to that associate on the same basis as would be required if that associate had directly disposed of the related assets or liabilities. Therefore, if a gain or loss previously recognized in other comprehensive income by that associate or joint venture would be reclassified to profit or loss on the disposal of the related assets or liabilities, the Group reclassifies the gain or loss from equity to profit or loss (as a reclassification adjustment) when the associate or joint venture is disposed of.

When the Group reduces its ownership interest in an associate or a joint venture, but the Group continues to use the equity method, the Group reclassifies to profit or loss the proportion of the gain or loss that had previously been recognized in other comprehensive income relating to that reduction in ownership interest if that gain or loss would be reclassified to profit or loss on the disposal of the related assets or liabilities.

When a group entity transacts with an associate or a joint venture of the Group, profits and losses resulting from the transactions with the associate or joint venture are recognized in the Group's consolidated financial statements only to the extent of interests in the associate or joint venture that are not related to the Group.

The Group applies K-IFRS 1109, including the impairment requirements, to long-term interests in an associate or joint venture to which the equity method is not applied and which form part of the net investment in the investee. Furthermore, in applying K-IFRS 1109 to long-term interests, the Group does not take into account adjustments to their carrying amount required by K-IFRS 1028 (i.e., adjustments to the carrying amount of long-term interests arising from the allocation of losses of the investee or assessment of impairment in accordance with K-IFRS 1028).

2.6 Segment Reporting

Information of each operating segment is reported in a manner consistent with the business segment reporting provided to the chief operating decision-maker (Note 32). The chief operating decision-maker, who is responsible for allocating resources and assessing performance of the operating segments and the Group has identified the board of directors as the chief operating decision-maker.

2.7 Revenue Recognition

(1) Identify performance obligation

With regard to the contract of selling products to the customer, the Group identifies the services provided separately to the customer as a different performance obligation. When the Group makes a sales contract with the customer, the standard warranty period for each product and customer is set up considering the legal warranty period. Even though the standard warranty period has been expired, the warranties are recognized as a revenue and is identified as a consolidated performance obligation when the Group provides additional warranties for the quality of product or when the customer has an option to purchase additional warranties separately.

(2) A performance obligation satisfied at a point in time

The revenue from the sale of goods is recognized at the time they are delivered to the customer. Delivery occurs when the products have been shipped to the specific location, the risks of obsolescence and loss have been transferred to the customer, and either the customer has accepted the products in accordance with the sales contract, the acceptance provisions have lapsed, or the group has objective evidence that all criteria for acceptance have been satisfied.

The goods are often sold with volume discounts, and it is the Group’s policy to sell its products to the customer with a right of return. Accumulated experience is used to estimate for the discounts and the refund, and the volume discounts is calculated based on the periodical forecast sales. The warranty provision for the sales and refund is reasonably estimated and recognized properly.

(3) Providing ESS battery installation services

The Group recognizes revenue from installation of ESS batteries based on the percentage of completion. In order to measure the services provided with reliability, the Group determines the progress using various methods depending on the nature of the transaction. These methods include examining the degree of work performed, the ratio of accumulated work performed to the total expected services, and the ratio of accumulated costs incurred to the total estimated costs, and others.

(4) Significant financing component

As a practical expedient, the Group need not adjust the promised amount of consideration for the effects of a significant financing component as the period between when the entity transfers a promised good or service to a customer and when the customer pays for that good or service is generally one year or less.

2.8 Lease

(1) The Group as lessee

The Group assesses whether a contract is or contains a lease, at inception of the contract. The Group recognizes a right-of-use asset and a corresponding lease liability with respect to all lease arrangements in which it is the lessee, except for short-term leases (defined as leases with a lease term of 12 months or less) and leases of low value assets (such as tablets and personal computers, small items of office furniture and telephones). For these leases, the Group recognizes the lease payments as an operating expense on a straight-line basis over the term of the lease unless another systematic basis is more representative of the time pattern in which economic benefits from the leased assets are consumed.

The lease liability is initially measured at the present value of the lease payments that are not paid at the commencement date, discounted by using the rate implicit in the lease. If this rate cannot be readily determined, the Group uses its incremental borrowing rate.

The incremental borrowing rate depends on the term, currency and start date of the lease and is determined based on a series of inputs, including: the risk-free rate based on government bond rates; a country-specific risk adjustment; a credit risk adjustment based on bond yields; and an entity-specific adjustment when the risk profile of the entity that enters into the lease is different to that of the Group and the lease does not benefit from a guarantee from the Group.

Lease payments included in the measurement of the lease liability comprise:

- Fixed lease payments (including in-substance fixed payments), less any lease incentives receivable;
- Variable lease payments that depend on an index or rate, initially measured using the index or rate at the commencement date;
- The amount expected to be payable by the lessee under residual value guarantees;
- The exercise price of purchase options, if the lessee is reasonably certain to exercise the options; and
- Payments of penalties for terminating the lease, if the lease term reflects the exercise of an option to terminate the lease.

The lease liability is presented as a separate line in the consolidated statements of financial position.

The lease liability is subsequently measured by increasing the carrying amount to reflect interest on the lease liability (using the effective interest method) and by reducing the carrying amount to reflect the lease payments made.

The Group remeasures the lease liability (and makes a corresponding adjustment to the related right-of-use asset) whenever:

- The lease term has changed or there is a significant event or change in circumstances resulting in a change in the assessment of exercise of a purchase option, in which case the lease liability is remeasured by discounting the revised lease payments using a revised discount rate.
- The lease payments change due to changes in an index or rate or a change in expected payment under a guaranteed residual value, in which cases the lease liability is remeasured by discounting the revised lease payments using an unchanged discount rate (unless the lease payments change is due to a change in a floating interest rate, in which case a revised discount rate is used).
- A lease contract is modified and the lease modification is not accounted for as a separate lease, in which case the lease liability is remeasured based on the lease term of the modified lease by discounting the revised lease payments using a revised discount rate at the effective date of the modification.

The right-of-use assets comprise the initial measurement of the corresponding lease liability, lease payments made at or before the commencement day, plus any lease incentives received and any initial direct costs. They are subsequently measured at cost less accumulated depreciation and impairment losses.

Whenever the Group incurs an obligation for costs to dismantle and remove a leased asset, restore the site on which it is located or restore the underlying asset to the condition required by the terms and conditions of the lease, a provision is recognized and measured under K-IFRS 1037. To the extent that the costs relate to a right-of-use asset, the costs are included in the related right-of-use asset, unless those costs are incurred to produce inventories.

Right-of-use assets are depreciated over the shorter period of lease term and useful life of the right-of-use asset. If a lease transfers ownership of the underlying asset or the cost of the right-of-use asset reflects that the Group expects to exercise a purchase option, the related right-of-use asset is depreciated over the useful life of the underlying asset. The depreciation starts at the commencement date of the lease.

The right-of-use assets are included in the measurement of the Property, plant and equipment comprise.

The Group applies K-IFRS 1036 to determine whether a right-of-use asset is impaired and accounts for any identified impairment loss as described in the 'Property, Plant and Equipment' policy.

Variable rents that do not depend on an index or rate are not included in the measurement the lease liability and the right-of-use asset. The related payments are recognized as an expense in the period in which the event or condition that triggers those payments occurs and are included in profit or loss.

As a practical expedient, K-IFRS 1116 permits a lessee not to separate non-lease components, and instead account for any lease and associated non-lease components as a single arrangement. The Group has not used this practical expedient. For a contract that contains a lease component and one or more additional lease or non-lease components, the Group allocates the consideration in the contract to each lease component on the basis of the relative stand-alone price of the lease component and the aggregate stand-alone price of the non-lease components.

(2) The Group as lessor

The Group enters into lease agreements as a lessor with respect to some of its investment properties. The Group also rents equipment to retailers necessary for the presentation and customer fitting and testing of footwear and equipment manufactured by the Group.

Leases for which the Group is a lessor are classified as finance or operating leases. Whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee, the contract is classified as a finance lease. All other leases are classified as operating leases.

When the Group is an intermediate lessor, it accounts for the head lease and the sub-lease as two separate contracts. The sub-lease is classified as a finance or operating lease by reference to the right-of-use asset arising from the head lease.

Rental income from operating leases is recognized on a straight-line basis over the term of the relevant lease. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognized on a straight-line basis over the lease term.

Amounts due from lessees under finance leases are recognized as receivables at the amount of the Group's net investment in the leases. Finance lease income is allocated to accounting periods so as to reflect a constant periodic rate of return on the Group's net investment outstanding in respect of the leases.

Subsequent to initial recognition, the Group regularly reviews the estimated unguaranteed residual value and applies the impairment requirements of K-IFRS 1109, recognizing an allowance for expected credit losses on the lease receivables.

Finance lease income is calculated with reference to the gross carrying amount of the lease receivables, except for credit-impaired financial assets for which interest income is calculated with reference to their amortized cost (i.e., after a deduction of the loss allowance).

When a contract includes both lease and non-lease components, the Group applies K-IFRS 1115 to allocate the consideration under the contract to each component.

2.9 Foreign currencies

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

In preparing the consolidated financial statements of the Group entities, 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; and
- exchange differences on monetary items receivable from or payable to a foreign operation for which settlement is neither planned nor likely to occur (therefore forming part of the net investment in the foreign operation), which are recognized initially in other comprehensive income and reclassified from equity to profit or loss on disposal or partial disposal of the net investment.

For the purpose of presenting consolidated financial statements, the assets and liabilities of the Company's foreign operations are expressed in Korean won using exchange rates prevailing at the end of the reporting period. Income and expense items are translated at the average exchange rates for the period, unless exchange rates fluctuated significantly during that period, in which case the exchange rates at the dates of the transactions are used. Exchange differences arising, if any, are recognized in other comprehensive income and accumulated in a foreign exchange translation reserve (attributed to non-controlling interests as appropriate).

On the disposal of a foreign operation (i.e., a disposal of the Group's entire interest in a foreign operation, or a disposal involving loss of control over a subsidiary that includes a foreign operation, or partial disposal of an interest in a joint arrangement or an associate that includes a foreign operation of which the retained interest becomes a financial asset), all of the accumulated exchange differences in respect of that operation attributable to the owners of the Company are reclassified to profit or loss. Any exchange differences that have previously been attributed to non-controlling interests are derecognized, but they are not reclassified to profit or loss.

In the case of a partial disposal (i.e., no loss of control) of a subsidiary that includes a foreign operation, the proportionate share of accumulated exchange differences is re-attributed to non-controlling interests in equity and are not recognized in profit or loss. For all other partial disposals (i.e., partial disposals of associates or joint arrangements that do not result in the Group losing significant influence or joint control), the proportionate share of the accumulated exchange differences is reclassified to profit or loss.

Goodwill and fair value adjustments arising on the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated at the closing rate. Exchange differences arising are recognized in other comprehensive income.

2.10 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.

To the extent that variable rate borrowings are used to finance a qualifying asset and are hedged in an effective cash flow hedge of interest rate risk, the effective portion of the derivative is recognized in other comprehensive income and reclassified to profit or loss when the qualifying asset impacts profit or loss. To the extent that fixed rate borrowings are used to finance a qualifying asset and are hedged in an effective fair value hedge of interest rate risk, the capitalized borrowing costs reflect the hedged interest rate.

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.

2.11 Government grants

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

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

Government grants related to assets are presented in the consolidated statements of financial position by deducting the grant from the carrying amount of the asset(including property, plant and equipment). The related grant is recognized in profit or loss over the life of a depreciable asset as a reduced depreciation expense.

Government grants related to income are recognized in profit or loss on a systematic basis over the periods in which the Group recognizes as expenses the related costs for which the grants are intended to compensate.

Government grants towards staff re-training costs are recognized as income over the periods necessary to match them with the related costs and are deducted in reporting the related expense.

2.12 Retirement benefit costs and termination benefits

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

For defined benefit retirement benefit plans, the cost of providing benefits is determined using the Projected Unit Credit Method, with actuarial valuations being carried out at the end of each annual reporting period. Remeasurements comprising actuarial gains and losses, the effect of the asset ceiling (if applicable) and the return on plan assets (excluding interest) are recognized immediately in the consolidated statement of financial position with a charge or credit to the consolidated statement of comprehensive income in the period in which they occur. Remeasurements recognized in the consolidated statement of comprehensive income are not reclassified. Past service cost is recognized in profit or loss when the plan amendment or curtailment occurs, or when the Group recognizes related restructuring costs or termination benefits, if earlier. Gains or losses on settlement of a defined benefit plan are recognized when the settlement occurs.

Net interest is calculated by applying a discount rate to the net defined benefit liability or asset. Defined benefit costs are split into three categories:

- service costs, which include current service cost, past service cost and gains and losses on curtailments and settlements;
- net interest expense or income; and
- remeasurements.

Service costs and net interest expense or income are recognized within cost of sales and selling and administrative expenses, and the remeasurement component in other comprehensive income. Curtailment gains and losses are accounted for as past service costs.

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

2.13 Taxation

Income tax expense represents the sum of the tax currently payable and deferred tax.

(1) Current tax

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

A provision is recognized for those matters for which the tax determination is uncertain but it is considered probable that there will be a future outflow of funds to a tax authority. The provisions are measured at the best estimate of the amount expected to become payable. The assessment is based on the judgement of tax professionals within the Company supported by previous experience in respect of such activities and in certain cases based on specialist independent tax advice.

(2) Deferred tax

Deferred tax is the tax expected to be payable or recoverable on differences between the carrying amounts of assets and liabilities in the consolidated financial statements and the corresponding tax bases used in the computation of taxable profit, and is accounted for using the liability method. 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.

Deferred tax liabilities are recognized for taxable temporary differences associated with investments in subsidiaries and associates, and interests in joint ventures, except where the Group is able to control the reversal of the temporary difference, and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax assets arising from deductible temporary differences associated with such investments and interests are only recognized to the extent that it is probable that there will be sufficient taxable profits against which to utilize the benefits of the temporary differences, and they are expected to reverse in the foreseeable future.

The carrying amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the asset to be recovered.

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

Deferred tax assets and liabilities are offset if, and only if, the Group has a legally enforceable right to offset current tax assets against current tax liabilities, and the deferred tax assets and liabilities relate to income taxes levied by the same taxation authority on either the same taxable entity or different taxable entities, which intend either to settle current tax liabilities and assets on a net basis, or to realize the assets and settle the liabilities simultaneously, in each future period in which significant amounts of deferred tax liabilities or assets are expected to be settled or recovered.

For the purpose of measuring deferred tax liabilities and deferred tax assets for investment properties that are measured using the fair value model, the carrying amounts of such properties are presumed to be recovered entirely through sale, unless the presumption is rebutted. The presumption is rebutted when the investment property is depreciable and is held within a business model whose objective is to consume substantially all of the economic benefits embodied in the investment properties over time, rather than through sale.

(3) Current and deferred tax for the year

Current and deferred tax 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 tax 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.

2.14 Property, plant and equipment

Property, plant and equipment are stated at cost, less subsequent accumulated depreciation and accumulated impairment losses. 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 the carrying amount of an asset or as a separate asset if it is probable that future economic benefits associated with the assets will flow into the Group and the cost of an asset can be measured reliably. Routine maintenance and repairs are expensed as incurred.

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

	Useful lives
Buildings	25 – 50 years
Structures	6 – 50 years
Machinery	6 – 15 years
Others	1 – 12 years

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

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

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

2.15 Investment property

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 reported at cost less accumulated depreciation and accumulated impairment losses.

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

While land is not depreciated, all other investment property is depreciated based on the straight-line method.

The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimate accounted for on a prospective basis.

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.

2.16 Intangible assets

(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.

	Useful lives
Software	6 years
Development costs	6 years
Industrial property rights	1 – 10 years
Others	6 – 10 years

(2) Internally-generated intangible assets - research and development expenditure

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

An internally-generated intangible asset arising from development (or from the development phase of an internal project) is recognized if, and only if, all of the following conditions have been demonstrated:

- the technical feasibility of completing the intangible asset so that it will be available for use or sale;
- the intention to complete the intangible asset and use or sell it;
- the ability to use or sell the intangible asset;
- how the intangible asset will generate probable future economic benefits;
- the availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset; and
- the ability to measure reliably the expenditure attributable to the intangible asset during its development.

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

The amount initially recognized for internally-generated intangible assets is the sum of the expenditure incurred from the date when the intangible asset first meets the recognition criteria. Where no internally-generated intangible asset can be recognized, development expenditure is recognized in profit or loss in the period in which it is incurred.

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.

(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.

(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.

(5) Patents and trademarks

Patents and trademarks are measured initially at purchase cost and are amortized on a straight-line basis over their estimated useful lives.

2.17 Impairment of tangible and intangible assets other than goodwill

At each reporting date, the Group reviews the carrying amounts of its tangible and intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). When it is not possible to estimate the recoverable amount of an individual asset, the Group estimates the recoverable amount of the cash-generating unit to which the asset belongs. Where a reasonable and consistent basis of allocation can be identified, corporate assets are also allocated to individual cash-generating units, or otherwise they are allocated to the smallest group of cash-generating units for which a reasonable and consistent allocation basis can be identified.

Intangible assets 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 or value in use. If the recoverable amount of an asset (or a cash-generating unit) is estimated to be less than its carrying amount, the carrying amount of the asset (or the cash-generating unit) 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 cash-generating unit) 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 cash-generating unit) in prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

2.18 Inventories

Inventories are stated at the lower of cost and net realizable value. Cost of inventories, except for those in in-transit measured using specific identification of their individual costs, are measured under the weighted average method 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.

2.19 Provisions

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

The amount recognized as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. When a provision is measured using the cash flows estimated to settle the present obligation, its carrying amount is the present value of those cash flows (where the effect of the time value of money is material). The discount rate used is a pre-tax 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.

2.20 Cash and cash equivalents

In the consolidated statement of financial position, cash and bank balances comprise cash (i.e., cash on hand and demand deposits) and cash equivalents. Cash equivalents are short-term (generally with original maturity of three months or less), highly liquid investments that are readily convertible to a known amount of cash and are subject to an insignificant risk of changes in value. Cash equivalents are held for the purpose of meeting short-term cash commitments rather for investment or other purposes.

Bank balances for which use by the Group is subject to third party contractual restrictions are included as part of cash unless the restrictions result in a bank balance no longer meeting the definition of cash. If the contractual restrictions to use the cash extend beyond 12 months after the end of the reporting period, the related amounts are classified as non-current in the consolidated statements of financial position.

For the purposes of the consolidated statements of cash flows, cash and cash equivalents consist of cash and cash equivalents as defined above, net of outstanding bank overdrafts which are repayable on demand and form an integral part of the Group's cash management. Such overdrafts are presented as short-term borrowings in the consolidated statements of financial position.

2.21 Financial Instruments

Financial assets and financial liabilities are recognized in the Group's consolidated statements of financial position when the Group becomes a party to the contractual provisions of the instrument.

Financial assets and financial liabilities are initially measured at fair value, except for trade receivables that do not have significant financing components, which are measured at transaction price. Transaction costs that are directly attributable to the acquisition or issue of financial assets and financial liabilities (other than financial assets and financial liabilities at fair value through profit or loss) are added to or deducted from the fair value of the financial assets or financial liabilities, as appropriate, on initial recognition. Transaction costs directly attributable to the acquisition of financial assets or financial liabilities at fair value through profit or loss are recognized immediately in profit or loss.

2.22 Financial assets

All regular way purchases or sales of financial assets are recognized and derecognized on a trade date basis. Regular way purchases or sales are purchases or sales of financial assets that require delivery of assets within the time frame established by regulation or convention in the marketplace.

All recognized financial assets are measured subsequently in their entirety at either amortized cost or fair value, depending on the classification of the financial assets.

(1) Classification of financial assets

Debt instruments that meet the following conditions are measured subsequently at amortized cost:

- the financial asset is held within a business model whose objective is 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.

Debt instruments that meet the following conditions are measured subsequently at fair value through other comprehensive income (FVOCI):

- the financial asset is held within a business model whose objective is achieved by both collecting contractual cash flows and selling the financial assets; 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.

By default, all other financial assets are measured subsequently at fair value through profit or loss (FVPL).

Despite the foregoing, the Group may make the following irrevocable election / designation at initial recognition of a financial asset:

- the Group may irrevocably elect to present subsequent changes in fair value of an equity investment in other comprehensive income if certain criteria are met (see (1-3) below); and
- the Group may irrevocably designate a debt investment that meets the amortized cost or FVOCI criteria as measured at FVPL if doing so eliminates or significantly reduces an accounting mismatch (see (1-4) below).

1-1) Amortized cost and effective interest method
The effective interest method is a method of calculating the amortized cost of a debt instrument and of allocating interest income over the relevant period. For financial assets other than purchased or originated credit-impaired financial assets (i.e., assets that are credit-impaired on initial recognition), the effective interest rate is the rate that exactly discounts estimated future cash receipts (including all fees and points paid or received that form an integral part of the effective interest rate, transaction costs and other premiums or discounts), excluding expected credit losses, through the expected life of the debt instrument, or, where appropriate, a shorter period, to the gross carrying amount of the debt instrument on initial recognition. For purchased or originated credit-impaired financial assets, a credit-adjusted effective interest rate is calculated by discounting the estimated future cash flows, including expected credit losses, to the amortized cost of the debt instrument on initial recognition.

The amortized cost of a financial asset is the amount at which the financial asset is measured at initial recognition minus the principal repayments, plus the cumulative amortization using the effective interest method of any difference between that initial amount and the maturity amount, adjusted for any loss allowance. The gross carrying amount of a financial asset is the amortized cost of a financial asset before adjusting for any loss allowance.

Interest income is recognized using the effective interest method for debt instruments measured subsequently at amortized cost and at FVOCI. For financial assets other than purchased or originated credit-impaired financial assets, interest income is calculated by applying the effective interest rate to the gross carrying amount of a financial asset, except for financial assets that have subsequently become credit-impaired (see below). For financial assets that have subsequently become credit-impaired, interest income is recognized by applying the effective interest rate to the amortized cost of the financial asset. If, in subsequent reporting periods, the credit risk on the credit-impaired financial instrument improves so that the financial asset is no longer credit-impaired, interest income is recognized by applying the effective interest rate to the gross carrying amount of the financial asset.

For purchased or originated credit-impaired financial assets, the Group recognizes interest income by applying the credit-adjusted effective interest rate to the amortized cost of the financial asset from initial recognition. The calculation does not revert to the gross basis even if the credit risk of the financial asset subsequently improves so that the financial asset is no longer credit-impaired.

Interest income is recognized in profit or loss and is included in the "finance income" line item.

1-2) Debt instruments classified as at FVOCI

The corporate bonds held by the Group are classified as at FVOCI. Fair value is determined in the manner described in Note 50. The corporate bonds are initially measured at fair value plus transaction costs. Subsequently, changes in the carrying amount of these corporate bonds as a result of foreign exchange gains and losses, impairment gains or losses, and interest income calculated using the effective interest method are recognized in profit or loss. The amounts that are recognized in profit or loss are the same as the amounts that would have been recognized in profit or loss if these corporate bonds had been measured at amortized cost. All other changes in the carrying amount of these corporate bonds are recognized in other comprehensive income and accumulated under the heading of investments revaluation reserve. When these corporate bonds are derecognized, the cumulative gains or losses previously recognized in other comprehensive income are reclassified to profit or loss.

1-3) Equity instruments designated as at FVOCI

On initial recognition, the Group may make an irrevocable election (on an instrument-by-instrument basis) to designate investments in equity instruments as at FVOCI. Designation at FVOCI is not permitted if the equity investment is held for trading or if it is contingent consideration recognized by an acquirer in a business combination.

Investments in equity instruments at FVOCI are initially measured at fair value plus transaction costs. Subsequently, they are measured at fair value with gains and losses arising from changes in fair value recognized in other comprehensive income and accumulated in the investments revaluation reserve. The cumulative gain or loss is not reclassified to profit or loss on disposal of the equity investments, instead, it is transferred to retained earnings.

Dividends on these investments in equity instruments are recognized in profit or loss in accordance with K-IFRS 1109, unless the dividends clearly represent a recovery of part of the cost of the investment. Dividends are included in the 'finance income' line item in profit or loss.

The Group designated all investments in equity instruments that are not held for trading as at FVOCI on initial recognition.

A financial asset is held for trading if:

- it has been acquired principally for the purpose of selling it in the near term; or
- on initial recognition it is part of a portfolio of identified financial instruments that the Group manages together and has evidence of a recent actual pattern of short-term profit-taking; or
- it is a derivative (except for a derivative that is a financial guarantee contract or a designated and effective hedging instrument).

1-4) Financial assets at FVPL

Financial assets that do not meet the criteria for being measured at amortized cost or FVOCI are measured at FVPL. Specifically:

- Investments in equity instruments are classified as at FVPL, unless the Group designates an equity investment that is neither held for trading nor a contingent consideration arising from a business combination as at FVOCI on initial recognition (see (1-3) above).
- Debt instruments that do not meet the amortized cost criteria or the FVOCI criteria (see (1-1) and (1-2) above) are classified as at FVPL. In addition, debt instruments that meet either the amortized cost criteria or the FVOCI criteria may be designated as at FVPL upon initial recognition if such designation eliminates or significantly reduces a measurement or recognition inconsistency (so called 'accounting mismatch') that would arise from measuring assets or liabilities or recognizing the gains and losses on them on different bases. The Group has not designated any debt instruments as at FVPL.

Financial assets at FVPL are measured at fair value at the end of each reporting period, with any fair value gains or losses recognized in profit or loss to the extent they are not part of a designated hedging relationship (see hedge accounting policy). The net gain or loss recognized in profit or loss includes interest earned on the financial asset and is included in the 'financial income' line item. Fair value is determined in the manner described in Note 3.

(2) Foreign exchange gains and losses

The carrying amount of financial assets that are denominated in a foreign currency is determined in that foreign currency and translated at the spot rate at the end of each reporting period. Specifically;

- for financial assets measured at amortized cost that are not part of a designated hedging relationship, exchange differences are recognized in profit or loss in the 'other non-operating income (expenses)' line item;
- for debt instruments measured at FVOCI that are not part of a designated hedging relationship, exchange differences on the amortized cost of the debt instrument are recognized in profit or loss in the 'other non-operating income (expenses)' line item. As the foreign currency element recognized in profit or loss is the same as if it was measured at amortized cost, the residual foreign currency element based on the translation of the carrying amount (at fair value) is recognized in other comprehensive income in the investments revaluation reserve;

- for financial assets measured at FVPL that are not part of a designated hedging relationship, exchange differences are recognized in profit or loss in the 'other non-operating income (expenses)' line item as part of the fair value gain or loss; and
- for equity instruments measured at FVOCI, exchange differences are recognized in other comprehensive income in the investments revaluation reserve.

(3) Impairment of financial assets

The Group recognizes a loss allowance for expected credit losses on investments in debt instruments that are measured at amortized cost or at FVOCI, lease receivables, trade receivables and contract assets, as well as on financial guarantee contracts. The amount of expected credit losses is updated at each reporting date to reflect changes in credit risk since initial recognition of the respective financial instrument.

The Group always recognizes lifetime ECL for trade receivables, contract assets and lease receivables. The expected credit losses on these financial assets are estimated using a provision matrix based on the Group's historical credit loss experience, adjusted for factors that are specific to the debtors, general economic conditions and an assessment of both the current and the forecast direction of conditions at the reporting date, including time value of money where appropriate.

For all other financial instruments, the Group recognizes lifetime ECL when there has been a significant increase in credit risk since initial recognition. However, if the credit risk on the financial instrument has not increased significantly since initial recognition, the Group measures the loss allowance for that financial instrument at an amount equal to 12-month ECL.

Lifetime ECL represents the expected credit losses that will result from all possible default events over the expected life of a financial instrument. In contrast, 12-month ECL represents the portion of lifetime ECL that is expected to result from default events on a financial instrument that are possible within 12 months after the reporting date.

(4) Measurement and recognition of expected credit losses

The measurement of expected credit losses is a function of the probability of default, loss given default (i.e., the magnitude of the loss if there is a default) and the exposure at default. The assessment of the probability of default and loss given default is based on historical data adjusted by forward-looking information as described above. As for the exposure at default, for financial assets, this is represented by the assets' gross carrying amount at the reporting date; for financial guarantee contracts, the exposure includes the amount of guaranteed debt that has been drawn down as at the reporting date, together with any additional guaranteed amounts expected to be drawn down by the borrower in the future by default date determined based on historical trend, the Group's understanding of the specific future financing needs of the debtors, and other relevant forward-looking information.

For financial assets, the expected credit loss is estimated as the difference between all contractual cash flows that are due to the Group in accordance with the contract and all the cash flows that the Group expects to receive, discounted at the original effective interest rate. For a lease receivable, the cash flows used for determining the expected credit losses is consistent with the cash flows used in measuring the lease receivable in accordance with K-IFRS 1116 Leases.

For a financial guarantee contract, as the Group is required to make payments only in the event of a default by the debtor in accordance with the terms of the instrument that is guaranteed, the expected loss allowance is the expected payments to reimburse the holder for a credit loss that it incurs less any amounts that the Group expects to receive from the holder, the debtor or any other party.

If the Group has measured the loss allowance for a financial instrument at an amount equal to lifetime ECL in the previous reporting period, but determines at the current reporting date that the conditions for lifetime ECL are no longer met, the Group measures the loss allowance at an amount equal to 12-month ECL at the current reporting date, except for assets for which simplified approach was used.

The Group recognizes an impairment gain or loss in profit or loss for all financial instruments with a corresponding adjustment to their carrying amount through a loss allowance account, except for investments in debt instruments that are measured at FVOCI, for which the loss allowance is recognized in other comprehensive income and accumulated in the investment revaluation reserve, and does not reduce the carrying amount of the financial asset in the consolidated statement of financial position.

(5) Derecognition of financial assets

The Group derecognizes a financial asset only when the contractual rights to the cash flows from the asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity. If the Group neither transfers nor retains substantially all the risks and rewards of ownership and continues to control the transferred asset, the Group recognizes its retained interest in the asset and an associated liability for amounts it may have to pay. If the Group retains substantially all the risks and rewards of ownership of a transferred financial asset, the Group continues to recognize the financial asset and also recognizes a collateralized borrowing for the proceeds received.

On derecognition of a financial asset measured at amortized cost, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss. In addition, on derecognition of an investment in a debt instrument classified as at FVOCI, the cumulative gain or loss previously accumulated in the investments revaluation reserve is reclassified to profit or loss. In contrast, on derecognition of an investment in equity instrument, which the Group has elected on initial recognition to measure at FVOCI, the cumulative gain or loss previously accumulated in the investments revaluation reserve is not reclassified to profit or loss, but is transferred to retained earnings.

2.23 Financial liabilities and equity instruments

(1) Financial liabilities

All financial liabilities are measured subsequently at amortized cost using the effective interest method or at FVPL. However, financial liabilities that arise when a transfer of a financial asset does not qualify for derecognition or when the continuing involvement approach applies, and financial guarantee contracts issued by the Group, are measured in accordance with the specific accounting policies set out below.

1-1) Financial liabilities at FVPL

Financial liabilities are classified as at FVPL when the financial liability is (i) contingent consideration of an acquirer in a business combination, (ii) held for trading or (iii) it is designated as at FVPL.

A financial liability is classified as held for trading if either:

- it has been acquired principally for the purpose of repurchasing it in the near term; or
- on initial recognition it is part of a portfolio of identified financial instruments that the Group manages together and has a recent actual pattern of short-term profit-taking; or
- it is a derivative that is not designated and effective as a hedging instrument.

A financial liability other than a financial liability held for trading or contingent consideration of an acquirer in a business combination may be designated as at FVPL upon initial recognition if either:

- such designation eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise; or
- the financial liability forms part of a group of financial assets or financial liabilities or both, which is managed and its performance is evaluated on a fair value basis, in accordance with the Group's documented risk management or investment strategy, and information about the grouping is provided internally on that basis; or
- it forms part of a contract containing one or more embedded derivatives, and K-IFRS 1109 permits the entire combined contract to be designated as at FVPL.

Financial liabilities at FVPL are measured at fair value, with any gains or losses arising on changes in fair value recognized in profit or loss to the extent that they are not part of a designated hedging relationship (see Hedge accounting policy). The net gain or loss recognized in profit or loss incorporates any interest paid on the financial liability and is included in the 'financial costs' line item in profit or loss.

However, for financial liabilities that are designated as at FVPL, the amount of change in the fair value of the financial liability that is attributable to changes in the credit risk of that liability is recognized in other comprehensive income, unless the recognition of the effects of changes in the liability's credit risk in other comprehensive income would create or enlarge an accounting mismatch in profit or loss. The remaining amount of change in the fair value of liability is recognized in profit or loss. Changes in fair value attributable to a financial liability's credit risk that are recognized in other comprehensive income are not subsequently reclassified to profit or loss; instead, they are transferred to retained earnings upon derecognition of the financial liability.

Gains or losses on financial guarantee contracts issued by the Group that are designated by the Group as at FVPL are recognized in profit or loss.

1-2) Financial liabilities measured subsequently at amortized cost

Financial liabilities that are not (i) contingent consideration of an acquirer in a business combination, (ii) held-for-trading, or (iii) designated as at FVPL, are measured subsequently at amortized cost using the effective interest method.

The effective interest method is a method of calculating the amortized cost of a financial liability and of allocating interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments (including all fees and points paid or received that form an integral part of the effective interest rate, transaction costs and other premiums or discounts) through the expected life of the financial liability, or (where appropriate) a shorter period, to the amortized cost of a financial liability.

(2) Financial guarantee contracts

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 instruments.

Financial guarantee contract liabilities are measured initially at their fair values and, if not designated as at FVPL and do not arise from a transfer of an asset, are measured subsequently at the higher of:

- the amount of the loss allowance determined in accordance with K-IFRS 1109; and
- the amount recognized initially less, where appropriate, cumulative amortization recognized in accordance with the revenue recognition policies set out above.

(3) Foreign exchange gains and losses

For financial liabilities that are denominated in a foreign currency and are measured at amortized cost at the end of each reporting period, the foreign exchange gains and losses are determined based on the amortized cost of the instruments. These foreign exchange gains and losses are recognized in the 'other non-operating income (expenses)' line item in profit or loss for financial liabilities that are not part of a designated hedging relationship. For those which are designated as a hedging instrument for a hedge of foreign currency risk foreign exchange gains and losses are recognized in other comprehensive income and accumulated in a separate component of equity.

The fair value of financial liabilities denominated in a foreign currency is determined in that foreign currency and translated at the spot rate at the end of the reporting period. For financial liabilities that are measured as at FVPL, the foreign exchange component forms part of the fair value gains or losses and is recognized in profit or loss for financial liabilities that are not part of a designated hedging relationship.

(4) Derecognition of financial liabilities

The Group derecognizes financial liabilities when, and only when, the Group's obligations are discharged, cancelled or have expired. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable is recognized in profit or loss.

When the Group exchanges with the existing lender one debt instrument into another one with the substantially different terms, such exchange is accounted for as an extinguishment of the original financial liability and the recognition of a new financial liability. Similarly, the Group accounts for substantial modification of terms of an existing liability or part of it as an extinguishment of the original financial liability and the recognition of a new liability. It is assumed that the terms are substantially different if the discounted present value of the cash flows under the new terms, including any fees paid net of any fees received and discounted using the original effective interest rate is at least 10 percent different from the discounted present value of the remaining cash flows of the original financial liability. If the modification is not substantial, the difference between: (1) the carrying amount of the liability before the modification; and (2) the present value of the cash flows after modification should be recognized in profit or loss as the modification gain or loss within other gains and losses.

2.24 Derivative financial instruments

The Group enters into a variety of derivative financial instruments to manage its exposure to interest rate and foreign exchange rate risks, including foreign exchange forward contracts, options and interest rate swaps.

Derivatives are recognized initially at fair value at the date a derivative contract is entered into and are subsequently remeasured to their fair value at each reporting date. The resulting gain or loss is recognized in profit or loss immediately unless the derivative is designated and effective as a hedging instrument, in which event the timing of the recognition in profit or loss depends on the nature of the hedge relationship.

A derivative with a positive fair value is recognized as a financial asset, whereas a derivative with a negative fair value is recognized as a financial liability. Derivatives are not offset in the consolidated financial statements, unless the Group has both legally enforceable right and intention to offset. A derivative is presented as a non-current asset or a non-current liability if the remaining maturity of the instrument is more than 12 months and it is not due to be realized or settled within 12 months. Other derivatives are presented as current assets or current liabilities.

(1) Hedge accounting

The Group designates certain derivatives as hedging instruments in respect of foreign currency risk and interest rate risk in fair value hedges, cash flow hedges, or hedges of net investments in foreign operations. Hedges of foreign exchange risk on firm commitments are accounted for as cash flow hedges.

At the inception of the hedge relationship, the Group documents the relationship between the hedging instrument and the hedged item, along with its risk management objectives and its strategy for undertaking various hedge transactions. Furthermore, at the inception of the hedge and on an ongoing basis, the Group documents whether the hedging instrument is effective in offsetting changes in fair values or cash flows of the hedged item attributable to the hedged risk, which is when the hedging relationships meet all of the following hedge 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; and
- the hedge ratio of the hedging relationship is the same as that resulting from the quantity of the hedged item that the Group actually hedges and the quantity of the hedging instrument that the Group actually uses to hedge that quantity of hedged item.

If a hedging relationship ceases to meet the hedge effectiveness requirement relating to the hedge ratio, but the risk management objective for that designated hedging relationship remains the same, the Group adjusts the hedge ratio of the hedging relationship (i.e., rebalances the hedge) so that it meets the qualifying criteria again.

The Group designates the full change in the fair value of a forward contract (i.e., including the forward elements) as the hedging instrument for all of its hedging relationships involving forward contracts.

The Group designates only the intrinsic value of options as hedging instrument as a means to hedge risks associated with forecast transactions. Time value changes(i.e., undesignated elements) are recognized in profit or loss in accordance with K-IFRS 1039 Financial Instruments: Recognition and Measurement. The changes in the fair value of the aligned time value of the option are recognized in other comprehensive income in accordance with K-IFRS 1109 Financial Instruments. The amount accumulated in equity is either reclassified to the profit or loss or derecognized from equity and included in the book value of non-financial items during when the hedged item affects the profit or loss.

The Group designates only the intrinsic value of option contracts as a hedging instrument, i.e., excluding the time value of the option. The changes in the fair value of the aligned time value of the option are recognized in other comprehensive income and accumulated in the cost of hedging reserve. If the hedged item is transaction-related, the time value is reclassified to profit or loss when the hedged item affects profit or loss. If the hedged item is time-period related, then the amount accumulated in the cost of hedging reserve is reclassified to profit or loss on a rational basis – the Group applies straight-line amortization. Those reclassified amounts are recognized in profit or loss in the same line as the hedged item. If the hedged item is a non-financial item, then the amount accumulated in the cost of hedging reserve is removed directly from equity and included in the initial carrying amount of the recognized non-financial item. Furthermore, if the Group expects that some or all of the loss accumulated in cost of hedging reserve will not be recovered in the future, that amount is immediately reclassified to profit or loss.

1-1) Fair value hedges

The fair value change on qualifying hedging instruments is recognized in profit or loss except when the hedging instrument hedges an equity instrument designated at FVOCI in which case it is recognized in other comprehensive income.

The carrying amount of a hedged item not already measured at fair value is adjusted for the fair value change attributable to the hedged risk with a corresponding entry in profit or loss. For debt instruments measured at FVOCI, the carrying amount is not adjusted as it is already at fair value, but the hedging gain or loss is recognized in profit or loss instead of other comprehensive income. When the hedged item is an equity instrument designated at FVOCI, the hedging gain or loss remains in other comprehensive income to match that of the hedging instrument.

Where hedging gains or losses are recognized in profit or loss, they are recognized in the same line as the hedged item.

The Group discontinues hedge accounting only when the hedging relationship (or a part thereof) ceases to meet the qualifying criteria (after rebalancing, if applicable). This includes instances when the hedging instrument expires or is sold, terminated or exercised. The discontinuation is accounted for prospectively. The fair value adjustment to the carrying amount of the hedged item arising from the hedged risk is amortized to profit or loss from that date.

1-2) Cash flow hedges

The effective portion of changes in the fair value of derivatives and other qualifying hedging instruments that are designated and qualify as cash flow hedges is recognized in other comprehensive income and accumulated under the heading of cash flow hedging reserve, limited to the cumulative change in fair value of the hedged item from inception of the hedge. The gain or loss relating to the ineffective portion is recognized immediately in profit or loss, and is included in the ‘other gains and losses’ line item.

Amounts previously recognized in other comprehensive income and accumulated in equity are reclassified to profit or loss in the periods when the hedged item affects profit or loss, in the same line as the recognized hedged item. However, when the hedged forecast transaction results in the recognition of a non-financial asset or a non-financial liability, the gains and losses previously recognized in other comprehensive income and accumulated in equity are removed from equity and included in the initial measurement of the cost of the non-financial asset or non-financial liability. This transfer does not affect other comprehensive income. Furthermore, if the Group expects that some or all of the loss accumulated in the cash flow hedging reserve will not be recovered in the future, that amount is immediately reclassified to profit or loss.

The Group discontinues hedge accounting only when the hedging relationship (or a part thereof) ceases to meet the qualifying criteria (after rebalancing, if applicable). This includes instances when the hedging instrument expires or is sold, terminated or exercised. The discontinuation is accounted for prospectively. Any gain or loss recognized in other comprehensive income and accumulated in cash flow hedge reserve at that time remains in equity and is reclassified to profit or loss when the forecast transaction occurs. When a forecast transaction is no longer expected to occur, the gain or loss accumulated in cash flow hedge reserve is reclassified immediately to profit or loss.

2.25 Accounting Treatment related to the Emission Rights Cap and Trade Scheme

The Group classifies the emission rights as intangible assets. Emission rights allowances the government allocated free of charge are measured at nil, and emission rights allowances purchased are measured at cost, which the Group paid to purchase the allowances. If emission rights the government allocated free of charge are sufficient to settle the emission rights allowances allotted for vintage year, the emissions liabilities are measured at nil. However, for the emissions liabilities that exceed the allowances allocated free of charge, the shortfall is measured at best estimate at the end of the reporting period.

3. FINANCIAL RISK MANAGEMENT:

3.1 Financial Risk Factors

The Group's activities expose it to a variety of financial risks: market, credit, and liquidity risk. The Group's overall risk management program focuses on the unpredictability of financial markets and seeks to minimize potential adverse effects on the financial performance of the Group. The Group uses derivative financial instruments to hedge certain risk exposures.

Risk management is carried out by the Group's finance team under policies approved by the board of directors. The finance team identifies, evaluates and hedges financial risks in close cooperation with the Group's operating units. The board of directors reviews and approves written principles for overall risk management, as well as written policies covering specific areas, such as foreign exchange risk, interest rate risk and credit risk; use of derivative financial instruments and non-derivative financial instruments; and investment of excess liquidity.

(1) Market risk

1) Foreign exchange risk

The Group operates internationally and is exposed to foreign exchange risk arising from foreign currency exposures, primarily with respect to the US dollar. Foreign exchange risk arises from forecast transactions and recognized assets and liabilities.

Management has set up a policy to require each company in the Group to manage its foreign exchange risk against its functional currency. The Group manages maximum loss for currency risk exposures within acceptable range using currency risk management model and employs who are exclusively responsible for currency risk management.

The Group has certain investments in foreign operations, whose net assets are exposed to foreign exchange risk. Currency exposure arising from the net assets of the Group's foreign operations is managed primarily through borrowings denominated in the relevant foreign currencies.

Monetary assets and liabilities denominated in foreign currencies as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022		December 31, 2021	
	Assets	Liabilities	Assets	Liabilities
USD	₩ 3,628,076	₩ 4,457,064	₩ 3,302,173	₩ 3,411,934
EUR	532,887	4,976,907	306,986	4,778,291
JPY	12,975	104,805	15,298	91,433
CNY and others	176,651	423	340,878	462

With all other variables held constant as of December 31, 2022 and 2021, a hypothetical change in exchange rates by 10% would have increased (decreased) the Group's profit before income tax as follows (Korean won in millions):

	December 31, 2022		December 31, 2021	
	10% Increase	10% Decrease	10% Increase	10% Decrease
USD	₩ (82,899)	₩ 82,899	₩ (10,976)	₩ 10,976
EUR	(444,402)	444,402	(447,131)	447,131
JPY	(9,183)	9,183	(7,614)	7,614
CNY and others	17,623	(17,623)	34,042	(34,042)

The above sensitivity analysis has been performed for monetary assets and liabilities denominated in foreign currencies as of the end of the years.

As of December 31, 2022, the Group entered into foreign currency forward to hedge change in exchange rates and the details are as follows (Korean won in millions):

						Book amount	
	Contractor	Contract amount (in millions)	Contract exchange rate	Contract inception date	Contract maturity	Assets	Liabilities
Currency forward (*1)	Shinhan Bank	USD 500	1,135.60	2020.10.14	2024.10.15	₩ 47,695	₩ -
	KDB	USD 500	1,102.83	2020.11.24	2029.04.16	41,780	-
	ING	EUR 100	4.7800(*2)	2022.01.05	2023.01.05	-	2,522

(*1) A derivative where hedge accounting is not applied.
(*2) Represents EUR/PLN exchange rate.

2) Interest rate risk

Interest rate risk is defined as the risk that the interest income or expenses arising from deposits and borrowings will fluctuate because of changes in future market interest rate. The interest rate risk mainly arises through floating-rate deposits and borrowings. The objective of interest rate risk management lies in maximizing corporate value by minimizing uncertainty in interest rate fluctuations and net interest expense.

The Group adequately minimizes risks from interest rate fluctuations through various policies, such as sharing excess cash within the Group (internal cash sharing) to minimize external borrowings; avoiding high-rate borrowings; reforming capital structure; managing an appropriate ratio of fixed-rate borrowings and floating-rate borrowings; monitoring a fluctuation of domestic and foreign interest rates daily, weekly and monthly; establishing alternatives; and balancing floating-rate short-term borrowings with floating-rate deposits.

The table below summarizes the impact of increases/decreases of interest rate on the Group's equity and profit after tax for the period. The analysis is based on the assumption that the interest rate has increased/decreased by 1% (100 bp) with all other variables held constant. (Korean won in millions)

	Effect on profit and loss after tax		Impact on equity	
	December 31, 2022	December 31, 2021	December 31, 2022	December 31, 2021
Increase	₩ (39,531)	₩ (37,075)	₩ (39,531)	₩ (37,075)
Decrease	39,531	37,075	39,531	37,075

3) Price risk

The Group is exposed to price risks from equity instruments. As of December 31, 2022, the fair value of equity instruments is ₩250,085 million. With all other variables held constant, a price change in equity instruments by 10% would have changed the Company's equity by ₩18,284 million after tax.

(2) Credit risk

Credit risk arises from trade receivables that the Group holds, as well as financial assets at amortized cost or at fair value through other comprehensive income ("FVOCI").

The Group has established the following policies and procedures to manage credit risks:

To manage credit risks relating to trade receivables, the Group evaluates the credit rating of customers and determines the credit limit for each customer based on the information provided by credit rating agencies and other available financial information before commencing business with new customers. The credit risks relating to trade receivables are also mitigated by insurance contracts and collateral, as well as payment guarantees.

The Group has entered into export bond insurance contracts with Korea Trade Insurance Corporation to mitigate credit risks relating to export trade receivables to overseas customers. The Group is also provided with collateral by customers depending on their credit rating or payment guarantees from the customers' financial institutions, if necessary.

The Group has deposited its cash and cash equivalents and other long-term deposits in several financial institutions, such as Woori Bank and others. The Group has also entered into derivative contract with several financial institutions. The Group maintains business relationship with the financial institutions with high credit ratings evaluated by independent credit rating agencies and, accordingly, credit risks associated with these financial institutions are limited.

1) Trade receivables

The Group applies the simplified approach in measuring expected credit losses, which uses lifetime expected provisions for trade receivables. To measure the expected credit losses, trade receivables have been grouped based on shared credit risk characteristics and the days past due. The provisions for receivables as of December 31, 2022 and 2021, are as follows. Expected credit losses include forward-looking information (Korean won in millions):

	Receivables not past due (*)	Receivables past due, but not impaired (*)	Receivables impaired (individually evaluated)	Total
December 31, 2022 (trade receivables)				
Gross carrying amount	₩ 4,732,757	₩ 159,787	₩ 1,234	₩ 4,893,778
Expected loss rate	-	-	100.0%	0.03%
Provisions for receivables	-	-	1,234	1,234
December 31, 2021 (trade receivables)				
Gross carrying amount	₩ 2,794,006	₩ 187,518	₩ -	₩ 2,981,524
Expected loss rate	0.00%	-	-	0.00%
Provisions for receivables	11	-	-	11

(*) See Note 7.(3) for aging analysis.

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

	2022	2021
Beginning	₩ 11	₩ 131
Addition(Reversal) of provisions recognized in profit or loss during the current year	481	(120)
Business combination	724	-
Exchange differences	18	-
Ending	₩ 1,234	₩ 11

As of December 31, 2022, the carrying amount of trade receivables representing the maximum exposure to credit risk amounts to ₩4,892,544 million (as of December 31, 2021, was ₩2,981,524 million).

2) Other financial assets at amortized cost

As of December 31, 2022, the provision for other financial assets at amortized cost was ₩54 million, the same as of December 31, 2021.

All of the financial assets at amortized cost are considered to have low credit risk, and the provisions recognized during the period were, therefore, limited to 12 months' expected losses.

3) Debt instruments measured at FVOCI

Debt instruments measured at FVOCI include trade receivables to be discounted. The provisions for these instruments are recognized in profit or loss and reduce the amount that would have been recognized in other comprehensive income as a loss on fair value change.

(3) Liquidity risk

The finance team of the Group monitors rolling forecasts of the Group's liquidity requirements to ensure it has sufficient cash to meet operational needs, while maintaining the limit of unused borrowings at an appropriate level so that the Group does not breach borrowing limits or covenants (where applicable) on any of its borrowing facilities. The Group's liquidity management policy considers the Group's financing plans, covenants on the debt contracts, target financial ratios and, if applicable, other external regulatory requirements on the currency and others.

1) The table below analyzes the Group's derivative financial liabilities into relevant maturity groupings based on the remaining period from the reporting period to the contractual maturity date. Cash flows presented below are gross cash flows before discount and include cash flows for interests (Korean won in millions):

	December 31, 2022			
	Less than 1 year	Between 1 year–2 years	Between 2–5 years	More than 5 years
Non-derivative instruments:				
Borrowings	₩ 2,969,739	₩ 1,686,157	₩ 2,726,522	₩ 1,253,521
Lease liabilities	41,833	38,891	48,955	539
Trade and other payables	6,723,796	32,613	3,043	950
	9,735,368	1,757,661	2,778,520	1,255,010
Derivative instruments:				
Currency forwards settled in gross:				
Inflows	(135,120)	(633,650)	-	(633,650)
Outflows	137,999	567,800	-	551,415
	2,879	(65,850)	-	(82,235)
	₩ 9,738,247	₩ 1,691,811	₩ 2,778,520	₩ 1,172,775

	December 31, 2021			
	Less than 1 year	Between 1 year–2 years	Between 2–5 years	More than 5 years
Non-derivative instruments:				
Borrowings	₩ 2,184,253	₩ 1,559,772	₩ 2,724,892	₩ 721,487
Lease liabilities	23,927	18,242	40,056	-
Trade and other payables	4,977,339	7,269	3,403	-
	7,185,519	1,585,283	2,768,351	721,487
Derivative instruments:				
Currency forwards settled in gross:				
Inflows	(1,026,890)	-	(592,750)	(592,750)
Outflows	1,030,088	-	567,800	551,415
	3,198	-	(24,950)	(41,335)
	₩ 7,188,717	₩ 1,585,283	₩ 2,743,401	₩ 680,152

2) As of December 31, 2022, the Group has entered into swap contracts, to which cash flow hedge accounting is applied, to avoid fluctuations in the market price of raw materials (Korean won in millions).

	Purpose of the contracts	Hedged items	Financial institution	Maturity	December 31, 2022		December 31, 2021	
					Assets	Liabilities	Assets	Liabilities
Merchandise (raw materials) swap (*)	Cash flow hedge	Non-ferrous metal	Citibank, etc.	2025.12	₩ 13,931	₩ 2,143	₩ 5,911	₩ 126

(*) Gain (loss) on the contracts that hedge the cash flow risk of forecast transaction is recognized in accumulated other comprehensive income and is fully effective portion for hedging.

3) Details of financial guaranteed contracts by maturity are as follows (Korean won in millions):

	December 31, 2022			
	Less than 1 year	Between 1 year-2 years	Between 2-5 years	More than 5 years
Financial guarantee contracts (*)	₩ 88,711	₩ -	₩ -	₩ -

(*) The Group has provided financial guarantees for joint ventures. The amount represents the maximum amount that can be guaranteed as of December 31, 2022 (see Note 18).

3.2 Capital Risk Management

The Group's objectives for managing capital are to safeguard the Group's ability to continue to provide profits to shareholders and for other stakeholders as a going concern and to maintain an optimal capital structure to reduce the cost of capital.

Consistent with others in the industry, the Group monitors capital on the basis of the gearing ratio. This ratio is calculated as net debt divided by total capital. Net debt is calculated as total borrowings, less cash and cash equivalents. Total capital is calculated as 'equity' as shown in the consolidated statements of financial position, plus net debt.

The gearing ratio and debt-to-equity ratio as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Total borrowings (Note 14) (A)	₩ 8,109,253	₩ 6,969,193
Less: cash and cash equivalents (B)	(5,937,967)	(1,282,880)
Net debt (C=A+B)	2,171,286	5,686,313
Total liabilities (D)	17,705,683	15,021,764
Total equity (E)	20,593,762	8,742,373
Total capital (F=C+E)	22,765,048	14,428,686
Gearing ratio (C/F)	9.5%	39.4%
Debt-to-equity ratio (D/E)	86.0%	171.8%

3.3 Fair Value Estimation

(1) The carrying amount and fair value of financial instruments by category as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022		December 31, 2021	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial assets (current):				
Cash and cash equivalents	₩ 5,937,967	(*)	₩ 1,282,880	(*)
Trade receivables	4,771,846	(*)	2,914,458	(*)
Other receivables (excluding due from financial institutions)	462,188	(*)	813,776	(*)
Due from financial institutions	-	-	1,067	(*)
Current derivative financial assets	9,167	9,167	4,605	4,605
Current derivative financial assets (currency forward)	-	-	16,894	16,894
Financial assets (non-current):				
Due from financial institutions	70,997	(*)	60,911	(*)
Trade receivables	120,698	(*)	67,055	(*)
Other receivables (excluding due from financial institutions)	48,061	(*)	31,360	(*)
Other non-current financial assets (measured at fair value)				
Marketable financial assets	50,626	50,626	14,063	14,063
Non-marketable financial assets	259,127	259,127	107,374	107,374
Non-current derivative financial assets	9,323	9,323	17,465	17,465
Non-current derivative financial assets (currency forward)	89,475	89,475	54,919	54,919
Financial liabilities (current):				
Trade and other payables	6,723,796	(*)	4,977,339	(*)
Current borrowings (excluding lease liabilities)	2,826,757	(*)	2,180,155	(*)
Current derivative financial liabilities	1,401	1,401	-	-
Current derivative financial liabilities (currency forward)	2,522	2,522	-	-
Financial liabilities (non-current):				
Non-current borrowings (excluding lease liabilities)	5,157,273	5,083,456	4,708,654	4,772,320
Other non-current payables	36,606	(*)	10,672	(*)
Non-current derivative financial liabilities	742	742	126	126

(*) Fair values for these financial assets and liabilities are not disclosed above as their carrying amounts are reasonable approximation of their fair values.

(2) Fair values for measurement and disclosure are determined based on the following method:

Fair values of financial liabilities (non-current) are calculated by discounting the expected cash outflows by yield from corporate bonds. These bonds are Korean won denominated with credit rating same as that of the Parent Company (AA+). The applied discount rates as of December 31, 2022 and 2021, are as follows:

	December 31, 2022	December 31, 2021
Discount rate	4.94%–5.33%	1.77%–2.80%

(3) Fair value hierarchy

Items that are measured at fair value are categorized by the fair value hierarchy levels, and the defined levels are as follows:

- Quoted prices (unadjusted) in active markets for identical assets or liabilities that the Group can access at the measurement date (Level 1).
- All inputs other than quoted prices included in Level 1 that are observable (either directly, i.e., prices, or indirectly, i.e., derived from prices) for the asset or liability (Level 2).
- Unobservable inputs for the asset or liability (Level 3).

As of December 31, 2022 and 2021, fair value hierarchy of the financial instruments that are consistently measured and recognized at fair value is as follows (Korean won in millions):

	December 31, 2022			
	Level 1	Level 2	Level 3	Total
Financial assets/liabilities measured at fair value:				
Current derivative financial assets	₩ -	₩ 9,167	₩ -	₩ 9,167
Non-current derivative financial assets	-	4,764	4,559	9,323
Non-current derivative financial assets (currency forward)	-	89,475	-	89,475
Other non-current financial assets (marketable financial assets)	50,626	-	-	50,626
Other non-current financial assets (non-marketable financial assets)	-	-	259,127	259,127
Current derivative financial liabilities	-	1,401	-	1,401
Current derivative financial liabilities (currency forward)	-	2,522	-	2,522
Non-current derivative financial liabilities	-	742	-	742
Financial assets/liabilities not measured at fair value:				
Non-current borrowings (excluding lease liabilities)	-	5,083,456	-	5,083,456

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
Financial assets/liabilities measured at fair value:				
Current derivative financial assets	₩ -	₩ 4,605	₩ -	₩ 4,605
Current derivative financial assets (currency forward)	-	16,894	-	16,894
Non-current derivative financial assets	-	1,305	16,160	17,465
Non-current derivative financial assets (currency forward)	-	54,919	-	54,919
Other non-current financial assets (marketable financial assets)	14,063	-	-	14,063
Other non-current financial assets (non-marketable financial assets)	-	-	107,374	107,374
Non-current derivative financial liabilities	-	126	-	126
Financial assets/liabilities not measured at fair value:				
Non-current borrowings (excluding lease liabilities)	-	4,772,320	-	4,772,320

(4) Along with the quantitative sensitivity analysis as of December 31, 2022, the significant unobservable inputs used in the fair value measurement classified at Level 3 of the fair value hierarchy are as follows:

	Evaluation Methods	Significant unobservable Inputs	Range (weighted average)	Sensitivity to fair value measurements
Unlisted equity security:				
Volta Energy Solutions S.a.r.l	Adjusted net asset method	-	-	-
Derivative:				
Put option on Volta Energy Solutions S.a.r.l	Binomial method	Volatility	45.6%	6.12 – 7.2%

4. SIGNIFICANT ACCOUNTING ESTIMATES AND ASSUMPTIONS:

The preparation of consolidated financial statements requires the Group to make estimates and assumptions concerning the future. Management also needs to exercise judgement in applying the Group's accounting policies. Estimates and assumptions are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. The resulting accounting estimates may differ from the related actual results.

The significant estimates and assumptions made by management on the application of the Group's consolidated financial statements are the same as those of the annual consolidated financial statements as of and for the year ended December 31, 2021, except for estimates used in determining income tax expenses.

The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below.

(1) Income taxes

The Group's taxable income generated from these operations is subject to income taxes based on tax laws and interpretations of tax authorities in numerous jurisdictions. There are many transactions and calculations for which the ultimate tax determination is uncertain. If certain portion of the taxable income is not used for investments, increase in wages or dividends, the Group is liable to pay additional income tax calculated based on the tax laws. Accordingly, the measurement of current and deferred income taxes is affected by these tax effects. As the Group's income tax is dependent on the investments, increase in wages and dividends, there is an uncertainty measuring the final tax effects.

(2) Provisions

The Group recognizes provisions for product warranties as explained in Note 15. These provisions are estimated based on past experience. Provisions related to voluntary recalls by the Group's customer are estimated based on the number of vehicles subject to recall, estimated total repair cost and cost-sharing ratio.

(3) Fair value of financial instruments

The fair value of financial instruments that are not traded in an active market is determined using valuation techniques. The Group uses its judgment to select a variety of methods and make assumptions that are mainly based on market conditions existing on December 31, 2022 (see Note 3.3).

(4) Impairment of financial assets

The provision for impairment for financial assets is based on assumptions about risk of default and expected loss rates. The Group uses judgement in making these assumptions and selecting the inputs to the impairment calculation based on the Group's past experience and existing market conditions, as well as forward-looking estimates at the end of each reporting period (see Note 3.1.(2)).

(5) Net defined benefit liability(asset)

The present value of net defined benefit liability(asset) depends on a number of factors that are determined on an actuarial basis using a number of assumptions, including the discount rate (see Note 16).

(6) Lease

In determining the lease term, management considers all facts and circumstances that create an economic incentive to exercise an extension option or not exercise a termination option. Periods covered by the extension option (or the termination option) are only included in the lease term if the lease is reasonably certain to be extended (or not terminated).

The lease term is reassessed if an option is actually exercised (or not exercised) or the Group becomes obliged to exercise (or not exercise) it. The assessment of reasonable certainty is only revised if a significant event or a significant change in circumstances occurs, which affects this assessment, and that is within the control of the lessee.

5. FINANCIAL INSTRUMENTS BY CATEGORY:

(1) Categorizations of financial instruments are as follows (Korean won in millions):

	December 31, 2022				
Financial assets	**Financial assets at amortized cost**	**Financial assets at fair value through profit or loss**	**Financial assets at FVOCI (*1)**	**Other financial assets (*2)**	**Total**
Cash and cash equivalents	₩ 5,937,967	₩ -	₩ -	₩ -	₩ 5,937,967
Trade receivables	4,534,502	-	237,344	-	4,771,846
Non-current trade receivables	120,698	-	-	-	120,698
Other current receivables	462,188	-	-	-	462,188
Other non-current receivables	119,058	-	-	-	119,058
Other current financial assets	-	-	-	9,167	9,167
Other non-current financial assets	-	158,202	245,585	4,764	408,551
	₩ 11,174,413	₩ 158,202	₩ 482,929	₩ 13,931	₩ 11,829,475

	December 31, 2022			
Financial liabilities	**Financial liabilities at amortized cost**	**Financial liabilities at FVOCI**	**Other financial liabilities (*3)**	**Total**
Trade payables	₩ 3,841,766	₩ -	₩ -	₩ 3,841,766
Other payables	2,882,030	-	-	2,882,030
Current borrowings	2,826,757	-	39,944	2,866,701
Other current financial liabilities	-	2,522	1,401	3,923
Other non-current payables	36,606	-	-	36,606
Non-current borrowings	5,157,273	-	85,279	5,242,552
Other non-current financial liabilities	-	-	742	742
	₩ 14,744,432	₩ 2,522	₩ 127,366	₩ 14,874,320

(*1) At initial recognition, the Group made an irrevocable election to designate investments in equity instruments as at FVOCI. These instruments are held for the strategic purposes, not for short-term trading. In addition, the Group classified trade receivables under the 'hold to collect and sell' business model as financial assets at FVOCI.
(*2) Other financial assets include derivative assets.
(*3) Other financial liabilities include lease liabilities and derivative liabilities.

	December 31, 2021			
Financial assets	**Financial assets at amortized cost**	**Financial assets at fair value through profit or loss**	**Financial assets at FVOCI (*1)**	**Total**
Cash and cash equivalents	₩ 1,282,880	₩ -	₩ -	₩ 1,282,880
Trade receivables	2,901,128	-	13,330	2,914,458
Non-current trade receivables	67,055	-	-	67,055
Other receivables	814,843	-	-	814,843
Other non-current receivables	92,271	-	-	92,271
Other current financial assets	-	16,894	4,605	21,499
Other non-current financial assets	-	71,748	122,072	193,820
	₩ 5,158,177	₩ 88,642	₩ 140,007	₩ 5,386,826

	December 31, 2021			
Financial liabilities	**Financial liabilities at amortized cost**	**Financial liabilities at fair value through profit or loss**	**Other financial liabilities (*2)**	**Total**
Trade payables	₩ -	₩ 2,177,736	₩ -	₩ 2,177,736
Other payables	-	2,799,603	-	2,799,603
Current borrowings	-	2,180,154	23,222	2,203,376
Other non-current financial liabilities	126	-	-	126
Other non-current payables	-	10,672	-	10,672
Non-current borrowings	-	4,708,654	57,163	4,765,817
	₩ 126	₩ 11,876,819	₩ 80,385	₩ 11,957,330

(*1) At initial recognition, the Group made an irrevocable election to designate investments in equity instruments as at FVOCI. These instruments are held for the strategic purposes, not for short-term trading. In addition, the Group classified trade receivables under the 'hold to collect and sell' business model as financial assets at FVOCI.
(*2) Other financial liabilities include lease liabilities and derivative liabilities.

(2) Net gains (losses) on each category of financial instruments for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Interest income:		
Financial assets at amortized cost	₩ 152,690	₩ 21,831
Interest expense:		
Financial liabilities at amortized cost	(120,296)	(83,275)
Other financial liabilities	(2,089)	(1,468)
Financial assets at amortized cost (*1)	(3,289)	(514)
Financial assets at FVOCI (*1)	(31)	(60)
Gains (losses) on valuation or disposal:		
Financial assets at FVOCI (*2)	48,925	5,104
Derivative instruments	17,780	112,260
Exchange differences:		
Financial assets at amortized cost	222,161	213,475
Financial liabilities at amortized cost	(401,292)	(262,369)
Financial assets at fair value through profit or loss	241	-

(*1) Fees paid to financial institutions for factoring.
(*2) Changes in fair value are recognized in profit or loss or in other comprehensive income.

6. CASH AND CASH EQUIVALENTS:

(1) Details of cash and cash equivalents as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Bank deposits and cash on hand	₩ 1,062,442	₩ 1,004,368
Cash equivalents	4,875,525	278,512
	₩ 5,937,967	₩ 1,282,880

(2) As of December 31, 2022, cash and cash equivalents include ₩22,016 million, which is subject to a restriction on the use and remittance(as of December 31, 2021, was ₩984 million).

7. TRADE AND OTHER RECEIVABLES:

(1) Trade and other receivables and their provisions for impairment as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022			December 31, 2021		
	Gross amount	Provision for impairment	Carrying amount	Gross amount	Provision for impairment	Carrying amount
Trade receivables	₩ 4,773,080	₩ (1,234)	₩ 4,771,846	₩ 2,914,469	₩ (11)	₩ 2,914,458
Non-current trade receivables	120,698	-	120,698	67,055	-	67,055
Other current receivables	462,242	(54)	462,188	814,897	(54)	814,843
Other non-current receivables	119,058	-	119,058	92,271	-	92,271
	₩ 5,475,078	₩ (1,288)	₩ 5,473,790	₩ 3,888,692	₩ (65)	₩ 3,888,627

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

	December 31, 2022	December 31, 2021
Current:		
Non-trade receivables	₩ 437,182	₩ 806,450
Due from financial institutions	-	1,067
Accrued income	2,963	291
Guarantee deposits provided	22,043	7,035
	462,188	814,843
Non-current:		
Non-trade receivables	5,201	4,285
Due from financial institutions (*)	70,997	60,911
Loans	3,900	1,047
Guarantee deposits provided	38,960	26,028
	119,058	92,271
	₩ 581,246	₩ 907,114

(*) As of December 31, 2022, due from financial institutions (non-current) is subject to withdrawal restrictions, which includes ₩60,000 million for the Agreement on the Win-Win Growth Cooperation, ₩10,000 million for the loans in relation to the employee stock ownership and PLN 3 million in relation to guarantee deposit for transfer of dangerous waste abroad.

(3) The aging analysis of trade and other receivables as of December 31, 2022 and 2021, is as follows (Korean won in millions):

	December 31, 2022		December 31, 2021	
	Trade receivables	Other receivables	Trade receivables	Other receivables
Receivables not past due	₩ 4,732,757	₩ 536,530	₩ 2,794,006	₩ 871,245
Past due, but not impaired:				
Up to three months	159,348	27,297	90,969	35,469
Between 3–6 months	439	10,843	15,844	400
Over six months	-	6,576	80,705	-
	159,787	44,716	187,518	35,869
Impaired receivables	1,234	54	-	54
	₩ 4,893,778	₩ 581,300	₩ 2,981,524	₩ 907,168

(4) Changes in the provision for impairment of trade and other receivables for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022		2021	
	Trade receivables	Other receivables	Trade receivables	Other receivables
Beginning	₩ 11	₩ 54	₩ 131	₩ 54
Additions (reversal)	481	-	(120)	-
Business combinations	724	-	-	-
Exchange differences	18	-	-	-
Ending	₩ 1,234	₩ 54	₩ 11	₩ 54

(5) As of December 31, 2022 and 2021, the carrying amounts of trade and other receivables are approximation of their fair values.

(6) The Group transferred ₩196,954 million of trade receivables along with substantially all the risks and rewards of ownership. Therefore, the amount was derecognized on the discount date as of December 31, 2022.

8. OTHER FINANCIAL ASSETS AND LIABILITIES:

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

	December 31, 2022	December 31, 2021
Other financial assets:		
Financial assets at FVOCI	₩ 245,585	₩ 120,767
Cash flow hedge	13,931	5,911
Financial assets at FVPL	158,202	88,642
	₩ 417,718	₩ 215,320
Other financial liabilities:		
Cash flow hedge	₩ 2,143	₩ 126
Financial liabilities at FVPL	2,522	-
	₩ 4,665	₩ 126

(2) Details of changes in equity securities included in other financial assets for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Beginning	₩ 120,767	₩ -
Acquisitions/transfer	75,328	115,588
Valuation gain (before income tax deduction), other comprehensive income item	54,743	5,104
Valuation loss (before income tax deduction), profit or loss item	(5,818)	-
Others	565	75
Ending	₩ 245,585	₩ 120,767

The Group has entered into a put option contracts to secure the investment capital for its equity securities held in Volta Energy Solutions S.a.r.l. The major terms of the agreements are as follows:

- Exercise date: from three years after the acceptance date (initial investment date, January 27, 2021) to the following three years
- Exercise price: the amount contributed, less any dividends received from the date of contribution up to the exercise
- Other term: the option cannot be exercised once Volta Energy Solutions S.a.r.l is listed.

(3) No impairment losses on other financial assets were recognized for the years ended December 31, 2022 and 2021.

9. INVENTORIES:

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

	December 31, 2022			December 31, 2021		
	Gross amount	Valuation allowance	Carrying amount	Gross amount	Valuation allowance	Carrying amount
Merchandise	₩ 184,285	₩ (12,040)	₩ 172,245	₩ 70,137	₩ (1,853)	₩ 68,284
Finished/semifinished products	4,393,089	(160,231)	4,232,858	2,510,481	(150,930)	2,359,551
Raw materials	1,630,837	(5,921)	1,624,916	913,144	(5,240)	907,904
Supplies	111,566	-	111,566	100,154	-	100,154
Materials in transit	854,044	-	854,044	459,910	-	459,910
	₩ 7,173,821	₩ (178,192)	₩ 6,995,629	₩ 4,053,826	₩ (158,023)	₩ 3,895,803

(2) The amount of inventories expensed as cost of sales for the years ended December 31, 2022 and 2021, was ₩16,854,040 million and ₩10,691,100 million, respectively.

10. INVESTMENTS IN ASSOCIATES AND JOINT VENTURES:

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

	2022			
	Beginning	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income of associates and joint ventures	Ending
VINFAST LITHIUM BATTERY PACK LLC	₩ 3,769	₩ (1,611)	₩ 270	₩ 2,428
Jiangxi VL Battery Co., Ltd.	20,310	(6,821)	(166)	13,323
PT. HLI Green Power	201,488	(28,210)	14,667	187,945
	₩ 225,567	₩ (36,642)	₩ 14,771	₩ 203,696

	2021					
	Beginning	Acquisitions	Disposals	Share of profit (loss) of associates and joint ventures	Share of other comprehensive income of associates and joint ventures	Ending
HL Greenpower Co., Ltd.(*1)	₩ 22,710	₩ -	₩ (24,557)	₩ 1,847	₩ -	₩ -
WUXI CL New Energy Technology Ltd(*1)	-	-	-	-	-	-
VINFAST LITHIUM BATTERY PACK LLC	4,179	-	-	(730)	320	3,769
Jiangxi VL Battery Co., Ltd.	21,461	-	-	(3,471)	2,320	20,310
PT. HLI Green Power(*2)	-	209,132	-	(9,201)	1,557	201,488
	₩ 48,350	₩ 209,132	₩ (24,557)	₩ (11,555)	₩ 4,197	₩ 225,567

(*1) During the previous year, the Group disposed of all ownership shares of HL Green Power Co., Ltd. and WUXI CL New Energy Technology Ltd., for ₩28,500 million and ₩0 million, respectively.
(*2) During the previous year, the Group newly acquired a stake in PT.HLI Green Power for ₩209,132 million.

(2) As of December 31, 2022 and 2021, the processes of adjusting the financial information to the carrying amounts of shares in associates and joint ventures are as follows (Korean won in millions):

	December 31, 2022					
	Net assets	Group's percentage of ownership	Net asset value for shares	Overseas operations translation	Internal transaction and others	Carrying amount
VINFAST LITHIUM BATTERY PACK LLC	₩ 7,409	35	₩ 2,593	₩ (165)	₩ -	₩ 2,428
Jiangxi VL Battery Co., Ltd.	39,141	34	13,308	15	-	13,323
PT. HLI Green Power	440,625	50	220,313	(9,907)	(22,461)	187,945
	₩ 487,175		₩ 236,214	₩ (10,057)	₩ (22,461)	₩ 203,696

	December 31, 2021				
	Net assets	Group's percentage of ownership	Net asset value for shares	Overseas operations translation and others	Carrying amount
VINFAST LITHIUM BATTERY PACK LLC	₩ 11,201	35	₩ 3,920	₩ (151)	₩ 3,769
Jiangxi VL Battery Co., Ltd.	59,697	34	20,297	13	20,310
PT. HLI Green Power	402,975	50	201,487	1	201,488
	₩ 473,873		₩ 225,704	₩ (137)	₩ 225,567

11. PROPERTY, PLANT AND EQUIPMENT:

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

	2022					
	Land	Building	Structures	Machinery	Vehicle	Tool
Beginning						
Carrying amount	₩ 274,358	₩ 3,229,701	₩ 149,144	₩ 8,426,166	₩ 14,643	₩ 1,020,874
Accumulated depreciation	-	(449,313)	(46,203)	(3,962,140)	(6,053)	(529,128)
Accumulated impairment	(668)	(3,470)	(1,835)	(3,450)	(8)	(377)
	₩ 273,690	₩ 2,776,918	₩ 101,106	₩ 4,460,576	₩ 8,582	₩ 491,369
Business combination	-	-	167	2,463	-	-
Acquisition/Replacement	75,163	1,513,326	90,288	2,072,280	2,937	326,432
Disposal/Replacement	(13)	(4,796)	(259)	(39,398)	(96)	(23,256)
Exchange differences	(253)	(39,247)	(2,243)	(88,676)	11	(5,353)
Depreciation	-	(116,633)	(10,360)	(1,346,256)	(2,122)	(172,592)
Ending						
Carrying amount	349,255	4,703,585	236,574	10,227,713	17,118	1,263,884
Accumulated depreciation	-	(570,459)	(56,040)	(5,163,539)	(7,798)	(646,927)
Accumulated impairment	(668)	(3,558)	(1,835)	(3,185)	(8)	(357)
	₩ 348,587	₩ 4,129,568	₩ 178,699	₩ 5,060,989	₩ 9,312	₩ 616,600

	2022(Cont.)					
	Fixtures	Others	Right-of-use assets	Construction in progress	Machinery in transit	Total
Beginning						
Carrying amount	₩ 243,946	₩ -	₩ 117,405	₩ 2,712,769	₩ 14,983	₩ 16,203,989
Accumulated depreciation	(117,308)	-	(28,684)	-	-	(5,138,829)
Accumulated impairment	(526)	-	-	(4,049)	-	(14,383)
	₩ 126,112	₩ -	₩ 88,721	₩ 2,708,720	₩ 14,983	₩ 11,050,777
Business combination	3	-	4,618	-	-	7,251
Acquisition/Replacement	196,420	6,206	78,884	6,391,238	33,016	10,786,190
Disposal/Replacement	(1,915)	(2,891)	(6,811)	(4,526,799)	(38,534)	(4,644,768)
Exchange differences	(3,053)	-	25,881	(15,858)	-	(128,791)
Depreciation	(46,418)	(298)	(44,933)	-	-	(1,739,612)
Ending						
Carrying amount	430,727	3,316	215,777	4,561,629	9,465	22,019,043
Accumulated depreciation	(159,050)	(299)	(69,417)	-	-	(6,673,529)
Accumulated impairment	(528)	-	-	(4,328)	-	(14,467)
	₩ 271,149	₩ 3,017	₩ 146,360	₩ 4,557,301	₩ 9,465	₩ 15,331,047

	2021					
	Land	Building	Structures	Machinery	Vehicle	Tool
Beginning						
Carrying amount	₩ 259,087	₩ 2,734,415	₩ 132,257	₩ 6,629,916	₩ 10,466	₩ 806,978
Accumulated depreciation	-	(335,064)	(38,965)	(2,769,226)	(4,351)	(412,791)
Accumulated impairment	(668)	(3,463)	(1,834)	(4,185)	(8)	(395)
	₩ 258,419	₩ 2,395,888	₩ 91,458	₩ 3,856,505	₩ 6,107	₩ 393,792
Acquisition/Replacement	14,679	371,597	13,423	1,534,794	4,177	248,308
Disposal/Replacement	(161)	(168)	(540)	(34,114)	(95)	(25,668)
Exchange differences	753	97,179	3,011	190,747	93	12,551
Depreciation	-	(87,578)	(6,246)	(1,087,356)	(1,700)	(137,614)
Ending						
Carrying amount	274,358	3,229,701	149,144	8,426,166	14,643	1,020,874
Accumulated depreciation	-	(449,313)	(46,203)	(3,962,140)	(6,053)	(529,128)
Accumulated impairment	(668)	(3,470)	(1,835)	(3,450)	(8)	(377)
	₩ 273,690	₩ 2,776,918	₩ 101,106	₩ 4,460,576	₩ 8,582	₩ 491,369

	2021(Cont.)				
	Fixtures	Right-of-use assets	Construction in progress	Machinery in transit	Total
Beginning					
Carrying amount	₩ 168,638	₩ 51,438	₩ 1,553,876	₩ 23,269	₩ 12,370,340
Accumulated depreciation	(94,993)	(16,543)	-	-	(3,671,933)
Accumulated impairment	(524)	-	(3,716)	-	(14,793)
	₩ 73,121	₩ 34,895	₩ 1,550,160	₩ 23,269	₩ 8,683,614
Acquisition/Replacement	88,390	82,174	3,682,835	32,360	6,072,737
Disposal/Replacement	(12,575)	(4,066)	(2,641,261)	(40,646)	(2,759,294)
Exchange differences	2,898	2,082	116,986	-	426,300
Depreciation	(25,722)	(26,364)	-	-	(1,372,580)
Ending					
Carrying amount	243,946	117,405	2,712,769	14,983	16,203,989
Accumulated depreciation	(117,308)	(28,684)	-	-	(5,138,829)
Accumulated impairment	(526)	-	(4,049)	-	(14,383)
	₩ 126,112	₩ 88,721	₩ 2,708,720	₩ 14,983	₩ 11,050,777

(2) The Group capitalized ₩8,701 million of borrowing costs in relation to acquisition of property, plant and equipment (for the year ended December 31, 2021, were ₩17,732 million). The capitalization rate of borrowings used to determine the amount of borrowing costs eligible for capitalization is 1.27% (for the year ended December 31, 2021, was 0.79%).

(3) Line items including depreciation for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Cost of sales	₩ 1,605,134	₩ 1,275,038
Selling and administrative expenses	134,478	97,424
Discontinued operations	-	118
	₩ 1,739,612	₩ 1,372,580

(4) Lease

① Amounts recognized in the consolidated statements of financial position

Details of amounts recognized in the consolidated statements of financial position in relation to lease for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Right-of-use assets (*):		
Real estate	₩ 132,480	₩ 81,965
Machinery	465	64
Vehicles	11,700	6,085
Tools	1,258	234
Equipment	457	373
	₩ 146,360	₩ 88,721

(*) Included in 'Property, plant and equipment' in the consolidated statements of financial position.

Additions to the right-of-use assets for the year ended December 31, 2022, are ₩83,502 million (for the year ended December 31, 2021, were ₩82,174 million).

	December 31, 2022	December 31, 2021
Lease liabilities (*):		
Current	₩ 39,944	₩ 23,221
Non-current	85,279	57,163
	₩ 125,223	₩ 80,384

(*) Included in 'Borrowings' in the consolidated statements of financial position.

② Amounts recognized in the consolidated statements of profit or loss

Details of amounts recognized in the consolidated statements of profit or loss in relation to lease for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Depreciation of right-of-use assets:		
Real estate	₩ 36,755	₩ 20,826
Machinery	352	34
Vehicles	7,129	4,961
Tools	363	160
Equipment	334	383
	₩ 44,933	₩ 26,364
Interest expense relating to lease liabilities (included in finance cost)	₩ 2,089	₩ 1,468
Expense relating to short-term leases (included in cost of goods sold and administrative expenses)	9,041	10,709
Expense relating to leases of low-value assets that are not short-term leases (included in cost of goods sold and administrative expenses)	5,572	4,133

Total cash outflow for leases for the year ended December 31, 2022, is ₩54,592 million (for the year ended December 31, 2021, was ₩44,201 million).

12. INTANGIBLE ASSETS:

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

	2022				
	Software	Industrial Property Rights	Memberships	Others	Total
Beginning	₩ 267,525	₩ 175,148	₩ 11,454	₩ 1,233	₩ 455,360
Business combination	1,503	-	-	-	1,503
Acquisition/transfer	208,266	65,751	9,456	8,160	291,633
Disposal/transfer	(377)	(760)	(5,997)	(388)	(7,522)
Exchange differences	(1,653)	-	(4)	(7)	(1,664)
Amortization	(78,307)	(18,731)	-	(182)	(97,220)
Ending	₩ 396,957	₩ 221,408	₩ 14,909	₩ 8,816	₩ 642,090

	2021				
	Software	Industrial Property Rights	Memberships	Others	Total
Beginning	₩ 167,349	₩ 148,105	₩ 9,361	₩ 971	₩ 325,786
Acquisition/transfer	156,534	44,032	2,076	1,159	203,801
Disposal/transfer	(1,484)	(740)	-	(782)	(3,006)
Exchange differences	1,858	(1)	17	33	1,907
Amortization	(56,732)	(16,248)	-	(148)	(73,128)
Ending	₩ 267,525	₩ 175,148	₩ 11,454	₩ 1,233	₩ 455,360

(2) Line items, including amortization of intangibles, are as follows (Korean won in millions):

	2022	2021
Cost of sales	₩ 31,526	₩ 27,447
Selling and administrative expenses	65,694	45,670
Discontinued operations	-	11
	₩ 97,220	₩ 73,128

(3) The total amount of research and development expenses recognized by the Group is ₩865,667 million (for the year ended December 31, 2021, was ₩631,078 million).

(4) Greenhouse gas emission right

① Based on the Korea Emission Trading Scheme, changes in greenhouse gas emission rights (included in other intangible assets) for the years ended December 31, 2022 and 2021, are as follows (ton in thousands and Korean won in millions):

	2022									
	2021		2022		2023		2024		2025	
	Ton	Amount	Ton	Amount	Ton	Amount	Ton	Amount	Ton	Amount
Beginning	-	₩ -	-	₩ -	-	₩ -	-	₩ -	-	₩ -
Allocated	281	-	300	-	300	-	297	-	297	-
Purchase /sale	(2)	(20)	-	-	-	-	-	-	-	-
Borrowing /carried over	22	388	3	-	-	-	-	-	-	-
Government submission	(301)	(368)	-	-	-	-	-	-	-	-
Ending	-	₩ -	303	₩ -	300	₩ -	297	₩ -	297	₩ -

	2021									
	2020		2021		2022		2023		2024		2025	
	Ton	Amount	Ton	Amount	Ton	Amount	Ton	Amount	Ton	Amount	Ton	Amount
Beginning	-	₩ -	-	₩ -	-	₩ -	-	₩ -	-	₩ -	-	₩ -
Allocated	236	-	275	-	300	-	300	-	297	-	297	-
Purchase/ sale	75	1,111	-	-	-	-	-	-	-	-	-	-
Borrowing/ carried over	(25)	(388)	25	388	-	-	-	-	-	-	-	-
Government submission	(286)	(723)	-	-	-	-	-	-	-	-	-	-
Ending	-	₩ -	300	₩ 388	300	₩ -	300	₩ -	297	₩ -	297	₩ -

② Based on the European Union Emission Trading System, changes in greenhouse gas emission rights (included in other intangible assets) for the year ended December 31, 2022, are as follows (ton in thousands and Korean won in millions):

	2022			
	2021		2022	
	Ton	Amount	Ton	Amount
Beginning	-	₩ -	-	₩ -
Purchase/sale	35	3,858	78	7,902
Government submission	(34)	(3,792)	-	-
Foreign exchange difference	-	1	-	33
Ending	1	₩ 67	78	₩ 7,935

13. OTHER CURRENT AND NON-CURRENT ASSETS:

Details of other current and other non-current assets as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Current:		
Prepayments and prepaid expenses	₩ 310,004	₩ 79,821
Prepaid value-added tax	112,973	309,593
Others	158,290	67,517
	₩ 581,267	₩ 456,931
Non-current:		
Long-term prepayments and long-term prepaid expenses	₩ 133,914	₩ 63,581
Net defined benefit assets	222,519	329
Others	69	27
	₩ 356,502	₩ 63,937

14. BORROWINGS:

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

	December 31, 2022	December 31, 2021
Current:		
Short-term borrowings	₩ 1,243,992	₩ 1,146,277
Current portion of long-term borrowings	907,687	1,033,878
Current portion of debentures	675,078	-
Current lease liabilities	39,944	23,221
	₩ 2,866,701	₩ 2,203,376
Non-current:		
Long-term borrowings	₩ 3,697,317	₩ 2,662,846
Debentures	1,459,956	2,045,808
Non-current lease liabilities	85,279	57,163
	5,242,552	4,765,817
	₩ 8,109,253	₩ 6,969,193

(2) Details of borrowings as of December 31, 2022 and 2021, are as follows:

1) Short-term borrowings (Korean won in millions)

	Bank	Latest maturity date	Interest rate (%)	December 31, 2022	December 31, 2021
Bank loans	KDB and others	2023.11.26	2.63–5.56	₩ 1,243,992	₩ 1,146,277

2) Long-term borrowings (Korean won in millions)

	December 31, 2022				
	Bank	Interest rate (%)	Amount	Current portion	Non-current portion
Borrowings in foreign currencies	Citibank	EUR: 3M EURIBOR + 0.62–0.70	₩ 203,096	₩ 67,699	₩ 135,397
	DBS	6M EURIBOR + 0.60	135,397	135,397	-
	DOE	3.65	705,620	-	705,620
	EBRD	6M EURIBOR + 0.62	257,255	67,698	189,557
	EIB	3M EURIBOR + 0.47	649,908	144,424	505,484
	ING	6M EURIBOR + 0.70	94,778	94,778	-
	KDB	USD: 3M LIBOR + 0.91–0.93	296,581	214,165	82,416
	KDB/Korea Exim/Nonghyup	EUR: 3M EURIBOR + 0.89–1.04	1,369,049	-	1,369,049
	KEB Hana	3M EURIBOR + 0.62	270,795	-	270,795
	MUFG	6M EURIBOR + 0.80	67,699	-	67,699
	SMBC	EUR: 0.32–0.48	192,941	148,937	44,004
	China: Agricultural Bank	LPR(1Y) – 0.70	68,222	4,355	63,867
	China	LPR (1Y) – 0.60–1.00	172,462	30,234	142,228
	China: Bank of Communications	LPR (1Y) – 0.75–1.00	121,201	-	121,201
			₩ 4,605,004	₩ 907,687	₩ 3,697,317

	December 31, 2021				
	Bank	Interest rate (%)	Amount	Current portion	Non-current portion
Borrowings in foreign currencies	Citibank	EUR: 3M EURIBOR + 0.62–0.70	₩ 201,530	₩ -	₩ 201,530
	DBS	6M EURIBOR + 0.60	134,353	-	134,353
	EBRD	6M EURIBOR + 0.62	322,448	67,177	255,271
	EIB	3M EURIBOR + 0.47	644,893	-	644,893
	HSBC	USD: 3M LIBOR + 1.40	8,318	8,318	-
	ING	6M EURIBOR + 0.70–0.83	161,224	67,177	94,047
	KDB	USD: 3M LIBOR + 0.91–0.93	251,168	70,541	180,627
	KDB/Korea Exim /Nonghyup	EUR: 3M EURIBOR + 1.00–1.50	1,293,697	738,942	554,755
	KEB Hana	3M EURIBOR + 0.62	268,706	-	268,706
	MUFG	6M EURIBOR + 0.60–0.80	134,354	67,177	67,177
	SMBC	EUR: 0.32–0.48	201,529	10,076	191,453
	China: Agricultural Bank	LPR (1Y) + 0.70	74,504	4,470	70,034
			₩ 3,696,724	₩ 1,033,878	₩ 2,662,846

3) Debentures (USD in thousands, EUR in thousands, and Korean won in millions)

	December 31, 2022					
	Financial institution	Interest rate (%)	Latest maturity date	Amount	Current portion	Non-current portion
1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.21	2026.03.13	₩ 200,000	₩ -	₩ 200,000
USD foreign currency debenture (non-guaranteed)	Citibank and others	3.25	2024.10.15	633,650 (USD 500,000)	-	633,650
USD foreign currency debenture (non-guaranteed)	Citibank and others	3.63	2029.04.15	633,650 (USD 500,000)	-	633,650
EUR foreign currency debenture (non-guaranteed)	Citibank and others	0.50	2023.04.15	675,600 (EUR 500,000)	675,600	-
Less: discount on debentures	-	-	-	(7,866)	(522)	(7,344)
				₩ 2,135,034	₩ 675,078	₩ 1,459,956

	December 31, 2021					
	Financial institution	Interest rate (%)	Latest maturity date	Amount	Current portion	Non-current portion
1st Debenture (non-guaranteed/public)	NH Investment & Securities Co., Ltd. and others	2.21	2026.03.13	₩ 200,000	₩ -	₩ 200,000
USD foreign currency debenture (non-guaranteed)	Citibank and others	3.25	2024.10.15	592,750 (USD 500,000)	-	592,750
USD foreign currency debenture (non-guaranteed)	Citibank and others	3.63	2029.04.15	592,750 (USD 500,000)	-	592,750
EUR foreign currency debenture (non-guaranteed)	Citibank and others	0.50	2023.04.15	671,170 (EUR 500,000)	-	671,170
Less: discount on debentures	-	-	-	(10,862)	-	(10,862)
				₩ 2,045,808	₩ -	₩ 2,045,808

4) Lease liabilities (Korean won in millions)

	December 31, 2022				
	Interest rate (%)	Latest maturity date	Amount	Current portion	Non-current portion
Baeksan industry and others	0.67–5.01	2042.6.9	₩ 125,223	₩ 39,944	₩ 85,279

	December 31, 2021				
	Interest rate (%)	Latest maturity date	Amount	Current portion	Non-current portion
Baeksan industry and others	0.67–5.01	2027.12.31	₩ 80,384	₩ 23,221	₩ 57,163

15. PROVISIONS:

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

	2022				
	Warranty(*1)	Greenhouse gas emission(*2)	Provision for restoration(*3)	Legal claims(*4)	Total
Beginning	₩ 2,103,880	₩ 79	₩ 3,069	₩ 987	₩ 2,108,015
Business combination	4,999	-	-	-	4,999
Provision transfer	630,174	12,493	1,049	-	643,716
Used	(1,256,153)	(3,860)	-	(987)	(1,261,000)
Ending	1,482,900	8,712	4,118	-	1,495,730
Less: current portion	(968,237)	(8,712)	-	-	(976,949)
	₩ 514,663	₩ -	₩ 4,118	₩ -	₩ 518,781

	2021				
	Warranty(*1)	Greenhouse gas emission(*2)	Provision for restoration(*3)	Legal claims(*4)	Total
Beginning	₩ 1,238,671	₩ 842	₩ -	₩ 331	₩ 1,239,844
Provision transfer	1,463,697	(39)	3,069	6,304	1,473,031
Used	(598,488)	(724)	-	(5,648)	(604,860)
Ending	2,103,880	79	3,069	987	2,108,015
Less: current portion	(1,527,397)	(79)	-	-	(1,527,476)
	₩ 576,483	₩ -	₩ 3,069	₩ 987	₩ 580,539

(*1) Warranty provisions have been accrued for the estimated warranty costs to be incurred due to quality control, exchange and refunds with regard to products based on historical experience. In addition, provisions related to replacement costs due to ESS replacement costs and voluntary automotive battery recalls are included. The amount recognized as a provision shall be the best estimate of the expenditure required to settle the present obligation at the end of the reporting period.

(*2) In relation to greenhouse gas emissions, the Group estimates the expected future costs of emissions exceeding the Group's emission rights for the year and recognizes them as provisions. Estimated emissions are 417 thousand tons for the year ended December 31, 2022 (for the year ended December 31, 2021, were 255 thousand tons).

(*3) The Group estimates the cost of restoring the leased office to its original state and records it as a provision.

(*4) Lawsuit provisions have been accrued for certain pending cases.

16. NET DEFINED BENEFIT LIABILITIES (ASSETS):

(1) Details of net defined benefit liabilities (assets) 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 obligations (*1)	₩ 549,225	₩ 554,014
Fair value of plan assets	(771,244)	(554,142)
	₩ (222,019)	₩ (128)
Net defined benefit liabilities	499	201
Net defined benefit assets (*2)	(222,518)	(329)
	₩ (222,019)	₩ (128)

(*1) The present value of retirement benefit obligations is the amount after deducting contributions to the National Pension Plan of ₩42 million as of December 31, 2022 (as of December 31, 2021, was ₩45 million).

(*2) The ₩222,518 million of plan assets exceeding the defined benefit obligations of the Parent Company is included in other non-current assets as of December 31, 2022 (as of December 31, 2021, was ₩329 million).

(2) The amounts recognized in the consolidated statements of profit or loss for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Current service cost	₩ 77,785	₩ 70,936
Interest cost	(10)	270
	₩ 77,775	₩ 71,206

(3) Retirement benefits recognized for defined contribution plan for the year ended December 31, 2022, amounted to ₩1,862 million (for the year ended December 31, 2021, were ₩965 million).

(4) Retirement benefits recognized in the consolidated statements of profit or loss for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Cost of sales	₩ 37,730	₩ 35,773
Selling and administrative expenses	41,907	36,398
	₩ 79,637	₩ 72,171

(5) Changes in the present value of defined benefit obligations for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Beginning	₩ 554,014	₩ 458,710
Transfer in	8,212	34,251
Transfer out	(2,991)	(1,274)
Current service cost	77,785	70,936
Interest expense	16,409	12,939
Remeasurements:		
Actuarial loss from change in financial assumption	(102,359)	(36,305)
Actuarial gain from change in demographic assumption	(3,256)	1,766
Actuarial gain due to the difference between the estimated and the actual	31,915	20,755
Others	792	10,526
Foreign currency conversion difference	(30)	-
Payments from plans	(31,266)	(18,290)
Ending	₩ 549,225	₩ 554,014

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

	2022	2021
Beginning	₩ 554,142	₩ 415,924
Plan assets transferred through transfer between affiliates	-	1,135
Interest income	16,419	12,669
Remeasurements:		
Return on plan assets (excluding amounts included in interest income)	(4,390)	(5,801)
Contribution:		
Employer contribution to plan assets	235,213	147,000
Payments from plans	(29,120)	(16,054)
Administrative costs	(1,020)	(731)
Ending	₩ 771,244	₩ 554,142

(7) The actual return on plan assets for the year ended December 31, 2022, was ₩12,029 million (for the year ended December 31, 2021, was ₩6,868 million).

(8) The significant actuarial assumptions as of December 31, 2022 and 2021, are as follows:

	December 31, 2022	December 31, 2021
Discount rate	5.40%	3.02%
Salary growth rate	5.96%	5.00%

(9) The sensitivity analysis for changes in key actuarial assumptions as of December 31, 2022, is as follows (Korean won in millions):

	Increase by 1.0%	Decrease by 1.0%
Discount rate:		
Increase (decrease) in defined benefit liabilities	₩ (61,373)	₩ 73,311
Salary growth rate:		
Increase (decrease) in defined benefit liabilities	76,665	(64,886)

A decrease in corporate bond yields may lead most significantly to an increase in defined benefit liabilities.

The above sensitivity analyses are based on a change in an assumption, while holding all other assumptions constant. In practice, this is unlikely to occur, and changes in some of the assumptions may be correlated. The sensitivity of the defined benefit obligation to changes in actuarial assumptions is calculated using the projected unit credit method, the same method applied when calculating the defined benefit obligations recognized in the consolidated statements of financial position.

The methods and assumptions used for the sensitivity analysis are the same as those of the previous period.

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

	December 31, 2022		December 31, 2021	
	Amount	Composition (%)	Amount	Composition (%)
Insurance contracts with guaranteed yield	₩ 771,244	100	₩ 554,142	100

Plan assets consist of guaranteed debt instruments and others which have no quoted market prices in an active market.

(11) As of December 31, 2022, the weighted average maturity of the defined benefit obligations is 13.06 years.

The Group reviews the level of the fund every year and has a policy to compensate for any loss in the fund. The estimated contribution for the year ended December 31, 2023 is ₩21,800 million.

17. OTHER CURRENT AND NON-CURRENT LIABILITIES:

Details of other current and non-current liabilities as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Current:		
Advances from customers	₩ 131,482	₩ 268,789
Withholdings	52,642	54,988
Unearned revenues	68,225	67,433
Accrued expenses	448,085	219,149
	₩ 700,434	₩ 610,359
Non-current:		
Long-term accrued expenses	₩ 23,041	₩ 26,302
Long-term unearned revenues	215,645	88,093
Long-term advance received	114,544	16,828
	₩ 353,230	₩ 131,223

18. COMMITMENTS AND CONTINGENCIES:

(1) The Group is jointly liable with LG Chem Ltd. for liabilities recognized before the split-off date.

(2) As of December 31, 2022, the Group has been guaranteed by Seoul Guarantee Insurance Company for the execution of contracts and others.

(3) As of December 31, 2022, the Group has various specific line of credit agreements with several financial institutions as follows (Korean won in millions and foreign currencies in millions):

		December 31, 2022	
	Currency	The Parent Company	Certain subsidiaries
Limit of bank overdraft	KRW	8,700	-
	EUR	-	75
Limit of the letter of credit	USD	62	654
	CNY	-	1,939
Limit of discount of notes from export	USD	485	-
Limit of guaranteed payments in other foreign currency	USD	220	-
B2B purchase arrangements	KRW	125,000	-
General loan agreements	USD	-	4,892
	CNY	-	5,580
	EUR	-	2,978
Derivatives	KRW	-	24
	USD	663	678
	EUR	-	156
Factoring arrangements	KRW	150,000	-
	CNY	-	450
Limit of other credit	USD	70	-

(4) As of December 31, 2022, the Group has entered into payment guarantee contracts of USD 25 million, EUR 2 million and ₩7,755 million with financial institutions in relation to product warranty for certain installed products. Also, certain subsidiaries have entered into payment guarantee contracts of CNY 250 million with financial institutions in relation to custom clearance of imported raw materials.

(5) As of December 31, 2022, the Group has entered into an arrangement with General Motors ("GM") regarding joint investment in Ultium Cells Holdings LLC and Ultium Cells LLC, whereby each party can sell its shares to third parties in eight years after the inception of the contract. In addition, if one party defaults, the other party has the right to purchase shares from the other party. In this regard, the Group has completed the government's approval process for the use of core technologies in accordance with the Industrial Technology Protection Act.

(6) The Group has been sued in two class actions by consumers in relation to the sales of mobile batteries and GM Bolt EV, and two cases are still in process as of December 31, 2022. The Group has also been sued in other 130 cases (amounted to ₩3,446 million) and has filed three lawsuit cases (amounted to USD 90 million and ₩113 million). The ultimate outcome of these pending cases cannot be determined at the reporting date.

(7) The Group has entered into a license agreement with LG Corp. to use trademarks on the products that the Group manufactures and sells, and on the services the Group provides in relation to its business.

(8) As of December 31, 2022, the Group has entered into a joint venture agreement with Honda and has committed to invest USD 1,802 million. During the year ended December 31, 2022, the Company has decided to provide a payment guarantee of USD 450 million determined by its proportionate ownership of the borrowed amount up to a maximum limit of USD 883 million.

(9) As of December 31, 2022, the Group has entered into a joint venture agreement with Stellantis and has committed to invest USD 1,464 million.

(10) Capital expenditure arrangements that have not incurred as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Property, plant and equipment	₩ 4,938,173	₩ 3,080,278

(11) Investment commitments as of December 31, 2022, are as follows (Korean won in millions and USD in million):

	Currency	Contractual amount	Total investments	Remaining amount
BNZ (Beyond Net Zero) Fund	USD	75	23	52
Secondary Battery Growth Fund	KRW	6,700	2,680	4,020
KBE(Korea Battery ESG) Fund	KRW	75,000	27,587	47,413

(12) As of December 31, 2022, the Group has entered into payment guarantee for the borrowings of ₩88,711 million, and the details are as follows:

			Guaranteed amount		Credit limit	
Guarantor	Guarantee	Financial Instruments	December 31, 2022	December 31, 2021	December 31, 2022	December 31, 2021
LG Energy Solution, Ltd.	PT. HLI Green Power	ANZ and others	₩ 88,711	₩ -	₩ 450,525	₩ -

19. SHARE CAPITAL:

Changes in share capital and share premium for the year ended December 31, 2022, are as follows (Korean won in millions and shares):

	Ordinary shares		
	Number of shares	Share capital	Share premium
December 31, 2021	200,000,000	₩ 100,000	₩ 7,510,351
Changes	34,000,000	17,000	10,079,371
December 31, 2022	234,000,000	₩ 117,000	₩ 17,589,722

20. RETAINED EARNINGS:

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

	December 31, 2022	December 31, 2021
Unappropriated retained earnings	₩ 1,154,518	₩ 337,587

21. 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
Wages and salaries	₩ 803,570	₩ 517,082
Retirement benefits	41,907	36,398
Employee benefits	152,923	113,712
Travel expenses	50,539	25,957
Water and utilities	48,514	30,187
Packaging expenses	8,048	1,133
Rental expenses	68,365	50,448
Commission expenses	482,151	314,023
Depreciation	140,358	103,495
Advertising expenses	18,245	13,056
Freight expenses	234,324	153,936
Training expenses	22,194	10,819
Amortization	65,694	45,670
Sample expenses	3,114	4,586
Development costs	134,804	106,942
Addition of warranty provisions	630,174	1,463,697
Others	171,889	139,172
	₩ 3,076,813	₩ 3,130,313

22. CLASSIFICATION OF EXPENSES BY NATURE:

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

	2022	2021
Changes in inventories of merchandise, finished goods, semifinished goods, and work in process	₩ (1,977,268)	₩ (574,232)
Raw materials and consumables used	17,533,286	10,306,125
Purchase of merchandise	1,298,022	959,207
Employee benefit expenses	2,364,806	1,609,484
Advertising expenses	18,512	13,368
Freight expenses	262,484	170,765
Commission expenses	895,417	674,623
Depreciation and amortization	1,842,713	1,451,650
Rent expenses and usage fee	51,439	36,310
Addition of warranty provisions	630,174	1,463,697
Other expenses	1,465,305	972,439
	₩ 24,384,890	₩ 17,083,436

23. EMPLOYEE BENEFIT EXPENSES:

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

	2022	2021
Wages and salaries	₩ 1,999,607	₩ 1,326,792
Retirement benefits: defined benefit plan	77,775	71,206
Retirement benefits: defined contribution plan	1,862	965
Others	285,562	210,521
	₩ 2,364,806	₩ 1,609,484

24. FINANCE INCOME AND COSTS:

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

	2022	2021
Finance income:		
Interest income (*1)	₩ 152,690	₩ 21,831
Exchange differences	196,750	187,797
Gain on derivatives	36,097	130,368
	₩ 385,537	₩ 339,996
Finance costs:		
Interest expense (*2)	₩ 113,684	₩ 67,011
Exchange differences	377,679	227,648
Loss on disposal of trade receivables	3,320	574
Loss on derivatives	24,338	25
	₩ 519,021	₩ 295,258

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

	2022	2021
Due from financial institutions	₩ 143,908	₩ 14,116
Other loans and receivables	8,782	7,715
	₩ 152,690	₩ 21,831

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

	2022	2021
Interest on financial institutions	₩ 60,909	₩ 30,732
Interest on financial lease liabilities	2,089	1,468
Interest on debentures	57,361	51,400
Other interest expenses	2,026	1,143
Capitalized interest for qualifying assets	(8,701)	(17,732)
	₩ 113,684	₩ 67,011

25. OTHER NON-OPERATING INCOME:

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

	2022	2021
Exchange differences	₩ 1,294,890	₩ 427,553
Gain on disposal of property, plant and equipment	678	6,416
Gain on disposal of investments in associates	-	3,820
Others	53,917	27,217
	₩ 1,349,485	₩ 465,006

26. OTHER NON-OPERATING EXPENSES:

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

	2022	2021
Exchange differences	₩ 1,292,851	₩ 436,596
Loss on disposal of property, plant and equipment	61,731	40,781
Loss on disposal of intangible asset	244	93
Donations	1,866	2,661
Others	41,073	9,343
	₩ 1,397,765	₩ 489,474

27. INCOME TAX EXPENSE AND DEFERRED TAX:

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

	2022	2021
Current tax on profit for the period	₩ 490,216	₩ 521,797
Adjustment for past income tax	4,929	7,086
Deferred tax – movement in temporary differences	297,444	(476,203)
Changes in deferred tax – tax rate change	41,938	-
Changes in deferred tax – tax credit carryforwards	(189,183)	7,837
Changes in deferred tax – tax loss carryforwards	(346,311)	970
	₩ 299,033	₩ 61,487
Deferred tax changed directly to equity	(69,073)	38,582
Others	(14,472)	(23,546)
	₩ 215,488	₩ 76,523

(2) The aggregate deferred tax charged directly to equity (other comprehensive income) for the years ended December 31, 2022 and 2021, are as follows: (Korean won in millions)

	2022	2021
Remeasurements of net defined benefit liabilities	₩ (18,847)	₩ 703
Gain and losses on valuation of financial assets at FVOCI	(16,196)	(1,404)
Gain and losses on valuation of derivative instruments	-	6,459
Consolidation adjustment	(29,872)	32,824
Others	(4,158)	-
	₩ (69,073)	₩ 38,582

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

	2022					
		Increase(decrease)				
	Beginning	Profit(loss) for the period	Other comprehensive income(loss)	Exchange differences	Business combination and others	Ending
Defined benefit liabilities	₩ 137,924	₩ 11,170	₩ (18,847)	₩ -	₩ -	₩ 130,247
Plan assets	(149,882)	(35,840)	-	-	-	(185,722)
Provisions	582,415	(219,907)	-	(2,170)	-	360,338
Property, plant and equipment	100,046	35,071	-	372	-	135,489
Intangible assets	4,223	472	-	(49)	-	4,646
Investments in subsidiaries, associates and joint ventures	(64,986)	(39,676)	-	-	-	(104,662)
Government grants	214,678	5,987	-	(5,872)	-	214,793
Succession of assets (Property, plant and equipment)	79,837	(12,361)	-	-	-	67,476
Succession of assets (Patents)	589,677	(25,251)	-	-	-	564,426
Succession of assets (Others)	600	15	-	-	-	615
Others	267,874	22,391	(20,354)	(125)	(4,536)	265,250
	₩ 1,762,406	₩ (257,929)	₩ (39,201)	₩ (7,844)	₩ (4,536)	₩ 1,452,896
Consolidation adjustment	₩ 33,624	₩ -	₩ (29,872)	₩ -	₩ -	₩ 3,752
Tax credit carryforwards	-	189,183	-	-	-	189,183
Tax loss carryforwards	-	346,311	-	-	-	346,311
Deferred tax assets (liabilities)	₩ 1,796,030	₩ 277,565	₩ (69,073)	₩ (7,844)	₩ (4,536)	₩ 1,992,142

	2021				
		Increase(decrease)			
	Beginning	Profit(loss) for the period	Other comprehensive income(loss)	Exchange differences	Ending
Defined benefit liabilities	₩ 120,206	₩ 17,015	₩ 703	₩ -	₩ 137,924
Plan assets	(114,379)	(35,503)	-	-	(149,882)
Provisions	312,146	269,859	-	410	582,415
Property, plant and equipment	108,978	(13,048)	-	4,116	100,046
Intangible assets	2,099	1,914	-	210	4,223
Investments in subsidiaries, associates and joint ventures	(27,964)	(37,022)	-	-	(64,986)
Government grants	139,797	55,937	-	18,944	214,678
Succession of assets (Property, plant and equipment)	118,637	(38,800)	-	-	79,837
Succession of assets (Patents)	591,260	(1,583)	-	-	589,677
Succession of assets (Others)	600	-	-	-	600
Others	67,647	193,584	5,055	1,588	267,874
	₩ 1,319,027	₩ 412,353	₩ 5,758	₩ 25,268	₩ 1,762,406
Consolidation adjustment	₩ 800	₩ -	₩ 32,824	₩ -	₩ 33,624
Tax credit carryforwards	7,837	(7,837)	-	-	-
Tax loss carryforwards	970	(970)	-	-	-
Deferred tax assets (liabilities)	₩ 1,328,634	₩ 403,546	₩ 38,582	₩ 25,268	₩ 1,796,030

(4) The reconciliations between income tax expense and accounting profit for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Net profit before tax(*)	₩ 995,314	₩ 777,184
Tax at domestic tax rates	209,646	232,513
Tax effects:		
Income not subject to tax	(1,162)	(8,110)
Expenses not deductible for tax purposes	83,347	69,124
Effect of deferred tax recognition on temporary differences in prior periods	(47,874)	(128,034)
Effect of non-recognition of deferred tax on temporary differences	59,372	(6,773)
Effect of changes of deferred tax due to tax credits carryforwards	(189,183)	-
Tax credit	(37,751)	(142,433)
Effect of tax rate change	41,938	-
Others	97,155	60,236
Income tax expense	₩ 215,488	₩ 76,523
Effective tax rate(income tax expense/profit before tax)	21.65%	9.85%

(*) The amount represents before taking into consideration of the profit or loss from discontinued operations.

(5) The future feasibility of deferred tax assets depends on a variety of factors, including the Group's ability to generate taxable income during the period when the temporary difference is realized, the overall economic environment, and industry prospects. The Group reviews these factors periodically.

(6) Temporary differences that have not been recognized as deferred tax assets (liabilities) as of December 31, 2022 are ₩439,867 million related to investments in subsidiaries, associates, and joint ventures, and ₩276,971 million related to unused tax loss carryforwards (as of December 31, 2021, were ₩1,679,779 and ₩320,225 million, respectively).

(7) The maturity of unused tax loss as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Less than 1 year	₩ 169	₩ -
Between 1 – 2 years	5,956	-
Between 2 – 5 years	51,423	-
Over 5 years	₩ 219,423	₩ 320,225

28. EARNINGS PER SHARE:

Basic earnings per share are calculated by dividing the earnings attributable to ordinary shares of the Parent Company by the number of shares issued.

Basic earnings per ordinary share from continuing operations (Korean won in millions and in number of shares):

	2022	2021
Profits from continuing operations attributable to ordinary shares	₩ 767,236	₩ 607,343
Weighted-average number of ordinary shares outstanding	232,043,836	200,000,000
Basic earnings per ordinary share from continuing operations (in Korean won)	₩ 3,306	₩ 3,036

Basic earnings per ordinary share (Korean won in millions and in number of shares):

	2022	2021
Profits attributable to ordinary shares	₩ 767,236	₩ 792,519
Weighted-average number of ordinary shares outstanding	232,043,836	200,000,000
Basic earnings per ordinary share (in Korean won)	₩ 3,306	₩ 3,963

The Group did not issue any potential ordinary shares. Therefore, basic earnings per share are identical to diluted earnings per share.

29. DIVIDEND:

The Group did not pay any dividends for the accounting period ended December 31, 2022.

30. RELATED-PARTY TRANSACTIONS:

(1) As of December 31, 2022, the parent company is LG Chem Ltd. (percentage of ownership: 81.84%), over which LG Corp. exercises a significant influence.

(2) Details of other related parties that have sales and other transactions with the Group or have receivable and payable balances, other than associates and joint ventures (see Note 10) as of December 31, 2022, are as follows:

Related party	Related-party's subsidiary (Domestic)	Related-party's subsidiary (Overseas)	Details
LG Chem Ltd.	HAENGBOKNURI CO., LTD. and others	LEYOU NEW ENERGY MATERIALS (WUXI) Co.,Ltd and others	Subsidiary of LG Chem Ltd.
D&O Co., Ltd. (formerly S&I Corp.)	D&O CM, Ltd. (formerly S&I CM, Ltd.)	D&O CM NANJING (formerly S&I CM NANJING Co., Ltd.) and others	Subsidiary of LG Corp.
LG CNS Co., Ltd.	Biz Tech I Co., Ltd. (formerly Biz Tech Partners Co., Ltd.) and others	LG CNS America Inc. and others	
LG Management Development Institute			
LG Display Co., Ltd.	Nanum nuri Co., Ltd.	LG Display (China) Co., Ltd. and others	LG Enterprise group (*)
LG Electronics, Inc.	LG Innotek Co., Ltd. and others	LG Electronics Philippines, Inc. and others	
LG Household & Health Care Ltd.	Coca-Cola Beverage Co. and others	LG Household & Health Care Trading(Shanghai) Co., Ltd. and others	
LG Uplus Corp.	LG HelloVision Corp	LG UPLUS FUND I LLC. and others	
GllR Inc.	HS AD Inc.	GIIR America Inc. and others	

(*) Although these entities are not the related parties of the Group in accordance with K-IFRS 1024, these entities belong to a large enterprise group in accordance with the Monopoly Regulation and Fair Trade Act.

(3) Transactions with related parties for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022				
		Purchase and others			
	Sales and others	Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Interest expense	Others
Parent:					
LG Chem Ltd.	₩ 5,488	₩ 2,312,580	₩ 98	₩ 47	₩ 8,148
Associates and joint ventures:					
PT. HLI Green Power	45,987	-	-	-	-
VINFAST LITHIUM BATTERY PACK LLC	4,969	-	-	-	-
Other related parties:					
LG Corp.	-	-	1,273	-	51,212
LG Chem America, Inc.	-	-	-	-	5
LG Chem (Taiwan), Ltd.	-	-	-	5	-
LG Chem (China) Investment Co., Ltd.	-	79	-	-	171
LG Chem Europe GmbH	-	-	-	-	43
HAENGBOKNURI CO., LTD.	13	51	-	-	1,087
LEYOU NEW ENERGY MATERIALS (WUXI) Co., Ltd.	-	2,059,808	-	-	45
Techwin, Inc	-	-	106	-	89
LG Chem Hangzhou Advanced Materials Co., Ltd.	-	15,006	-	-	-
LG Chem Poland Sp. z o.o	-	201,801	-	-	8
LG Management Development Institute	-	-	-	-	19,227
D&O Co., Ltd. and its subsidiaries	81	-	17,637	-	2,769
LG CNS Co., Ltd. and its subsidiaries	20,263	95	500,521	-	116,066
Others	-	-	-	-	3,198
Others:					
LG Display Co., Ltd. and its subsidiaries	7	-	-	13	-
LG Electronics Inc. and its subsidiaries	1,106,703	375,782	524,010	-	22,794
LX Holdings., Ltd. and its subsidiaries (*1)	262	58,703	79,157	9	146,434
Xi C&A (formerly S&I Construction) and its subsidiaries (*2)	-	16	297,622	-	391
S&I Corporation (*2)	-	5,980	43,815	-	34,959
Others	34	-	2,657	-	3,863
	₩ 1,183,807	₩ 5,029,901	₩ 1,466,896	₩ 74	₩ 410,509

(*1) Excluded from the large enterprise group after their separation from LG Group during the current year. The amount includes transactions before the separation.

(*2) During the current year, the entity was reclassified from a subsidiary of D&O Co., Ltd. to an associate, due to the sale of its shares. The amount includes the transactions prior to its reclassification as an associate.

	2021				
		Purchase and others			
	Sales and others	Purchase of raw materials /merchandises	Acquisition of property, plant and equipment and intangible assets	Interest expense	Others
Parent:					
LG Chem Ltd.	₩ 45,950	₩ 1,026,354	₩ 11	₩ 64	₩ 13,556
Associate and joint venture:					
PT. HLI Green Power	19,151	-	-	-	-
VINFAST LITHIUM BATTERY PACK LLC.	6,483	-	-	-	-
Jiangxi VL Battery Co., Ltd	530	-	-	-	-
HL Greenpower Co., Ltd.	386,838	-	-	-	-
Other related parties:					
LG Corp.	-	-	-	-	36,018
LG Chem America, Inc.	-	-	-	-	8
LG Chem (Taiwan), Ltd.	5,828	-	-	-	560
LG Chem Display Materials (Beijing) Co., Ltd.	5,113	-	-	-	-
LG Chem (China) Investment Co., Ltd.	-	234	21	-	1,037
LG Chem Europe GmbH	486	434	-	-	340
HAENGBOKNURI CO., LTD.	16	-	-	-	1,816
LG Chem (Guangzhou) Information & Electronics Materials Co., Ltd.	11,419	9,989	-	-	-
LEYOU NEW ENERGY MATERIALS(WUXI) Co., Ltd.	1	613,750	-	-	-
TECWIN Co., Ltd.	-	-	8,365	-	173
LG Chem Hangzhou Advanced Materials Co., Ltd.	-	26,990	-	-	-
LG Chem Poland Sp. z o.o.	10	11,962	-	-	-
LG Management Development Institute	-	-	-	-	12,484
D&O Co., Ltd. and its subsidiaries	78	12,544	347,111	-	65,558
LG CNS Co., Ltd. and its subsidiaries	13,749	583	234,893	-	99,721
Others	-	54	54	-	3,077
Others:					
LG Display Co., Ltd. and its subsidiaries	1,212	-	-	250	-
LG Electronics Inc. and its subsidiaries	667,459	918,814	302,046	-	58,670
LX Holdings., Ltd. and its subsidiaries (*)	244	191,008	27,308	1	202,324
Others	37	-	797	-	4,726
	₩ 1,164,604	₩ 2,812,716	₩ 920,606	₩ 315	₩ 500,068

(*) This includes entities whose holding company is LX Holdings., Ltd., resulting from its spin-off during the previous year.

(4) Balances of receivables and payables from related parties as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022						
	Receivables			Payables			
	Trade receivables	Other receivables	Total	Trade payables	Lease liabilities	Other payables	Total
Parent:							
LG Chem Ltd.	₩ -	₩ 23,163	₩ 23,163	₩ 571,271	₩ 1,650	₩ 2,904	₩ 575,825
Associates and joint ventures:							
PT. HLI Greenpower	-	1,311	1,311	-	-	88,093	88,093
Other related parties:							
LG Corp.	-	46	46	-	-	18,727	18,727
LG Chem (Taiwan), Ltd.	-	-	-	-	106	41	147
LG Chem (China) Investment Co., Ltd.	-	-	-	-	-	48	48
LG Chem Europe GmbH	-	-	-	-	-	1	1
HAENGBOKNURI CO., LTD.	-	1	1	-	-	120	120
LEYOU NEW ENERGY MATERIALS(WUXI) Co., Ltd.	-	-	-	316,606	-	26	316,632
TECWIN Co., Ltd.	-	-	-	-	-	54	54
LG Chem Poland Sp. z o.o.	-	-	-	59,336	-	1	59,337
LG Management Development Institute	-	-	-	-	-	544	544
D&O Co., Ltd. and its subsidiaries	-	-	-	-	-	3,957	3,957
LG CNS Co., Ltd. and its subsidiaries	5,782	205	5,987	526	-	335,380	335,906
Others	-	-	-	-	-	363	363
Others:							
LG Display Co., Ltd. and its subsidiaries	-	-	-	-	454	17	471
LG Electronics Inc. and its subsidiaries (*1)	275,784	26,322	302,106	77,580	-	142,674	220,254
Xi C&A (formerly S&I Construction) and its subsidiaries (*2)	-	-	-	-	-	125,451	125,451
S&I Corporation (*2)	-	-	-	-	-	48,679	48,679
Others	-	561	561	-	-	3,930	3,930
	₩ 281,566	₩ 51,609	₩ 333,175	₩ 1,025,319	₩ 2,210	₩ 771,010	₩ 1,798,539

(*1) Provisions for GM Bolt recall is not included in the balance of receivables and payables above.
(*2) During the current year, the entity was reclassified from a subsidiary of D&O Co., Ltd. to an associate, due to the sale of its shares. The amount includes the transactions prior to its reclassification as an associate.

	December 31, 2021						
	Receivables			Payables			
	Trade receivables	Other receivables	Total	Trade payables	Lease liabilities	Other payables	Total
Parent:							
LG Chem Ltd.	₩ 3,382	₩ 42,877	₩ 46,259	₩ 183,965	₩ 2,524	₩ 6,416	₩ 192,905
Associates and joint ventures:							
PT. HLI Green Power	-	-	-	-	-	134,054	134,054
VINFAST LITHIUM BATTERY PACK LLC	463	-	463	-	-	-	-
Jiangxi VL Battery Co., Ltd	-	4,109	4,109	-	-	-	-
Other related parties:							
LG Corp.	-	42	42	-	-	10,907	10,907
LG Chem (China) Investment Co., Ltd.	-	-	-	-	-	585,928	585,928
LG Chem Europe GmbH	-	112	112	-	-	318	318
HAENGBOKNURI CO., LTD.	-	-	-	-	-	93	93
LEYOU NEW ENERGY MATERIALS (WUXI) Co., Ltd.	-	1	1	121,325	-	-	121,325
TECWIN Co., Ltd.	-	-	-	317	-	16,095	16,412
LG Chem Hangzhou Advanced Materials Co., Ltd.	-	-	-	41,812	-	-	41,812
LG Chem Poland Sp. z o.o.	-	-	-	14,495	-	-	14,495
LG Management Development Institute	-	2,784	2,784	-	-	487	487
S&I Corp. and its subsidiaries	-	3,066	3,066	-	-	205,161	205,161
LG CNS Co., Ltd. and its subsidiaries	5,861	-	5,861	-	-	180,627	180,627
Others	-	-	-	-	-	499	499
Others:							
LG Display Co., Ltd. and its subsidiaries	-	-	-	-	360	30	390
LG Electronics Inc. and its subsidiaries (*1)	100,186	23,529	123,715	71,148	-	103,625	174,773
LX Holdings., Ltd. and its subsidiaries (*2)	-	10	10	-	-	59,927	59,927
Others	-	-	-	-	-	3,925	3,925
	₩ 109,892	₩ 76,530	₩ 186,422	₩ 433,062	₩ 2,884	₩ 1,308,092	₩ 1,744,038

(*1) Provisions for GM Bolt recall is not included in the balance of receivables and payables above.
(*2) This includes entities whose holding company is LX Holdings., Ltd., resulting from its spin-off during the previous year.

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

	2022						
	Dividends received	Dividends paid	Equity contribution in cash and others	Loans transaction		Borrowings transaction(*1)	
				Loans	Repayment	Borrowings	Repayment
Parent:							
LG Chem Ltd.	₩ -	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 827
Other related parties:							
LG Chem (Taiwan), Ltd.	-	-	-	-	-	-	187
Others:							
LG DISPLAY AMERICA, INC	-	-	-	-	-	-	176
LX Pantos Poland sp. z.o.o (*2)	-	-	-	-	-	62	7
Pantos Logistics Mexico S.A. de C.V (*2)	-	-	-	-	-	2,384	320
LX PANTOS TURKEY LOJISTIK (*2)	-	-	-	-	-	337	41
	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 2,783	₩ 1,558

(*1) The amounts represent lease liabilities that were recognized or repaid during the current year.
(*2) Excluded from the large enterprise group after their separation from LG Group during the current year. The amount includes transactions before the separation.

	2021						
	Dividends received	Dividends paid	Equity contribution in cash and others	Loans transaction		Borrowings transaction(*)	
				Loans	Repayment	Borrowings	Repayment
Parent:							
LG Chem Ltd.	₩ -	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 994
Associates and joint ventures:							
PT. HLI Green Power	-	-	209,132	-	-	-	-
Other related party:							
LG Chem (Taiwan), Ltd.	-	-	-	-	-	792	156
Others:							
LG DISPLAY AMERICA, INC	-	-	-	-	-	-	149
Pantos Logistics France S.A.R.L	-	-	-	-	-	-	419
Pantos Logistics Spain S.L.U.	-	-	-	-	-	-	161
	₩ -	₩ -	₩ 209,132	₩ -	₩ -	₩ 792	₩ 1,879

(*) The amounts represent lease liabilities that were recognized or repaid during the previous year.

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

	2022	2021
Short-term employee benefits	₩ 46,611	₩ 40,070
Retirement benefits	4,944	12,763
	₩ 51,555	₩ 52,833

Key management includes directors (including non-executive) having duties and responsibilities over planning, operations and controlling of the Group`s business activities.

(7) There are no provisions recognized against receivables from related parties as of December 31, 2022. Therefore, there is no bad debt expense recognized for the year ended December 31, 2022.

(8) As of the end of this year, the amount of guarantees provided by the Group for related parties is disclosed in Note 18.

(9) In the previous year, LG Energy Solution (Nanjing) Co., Ltd., a subsidiary of the Group, conducted paid-in capital reduction. This year, the subsidiary has paid ₩604,437 million this year to LG Chem (China) Investment Co., Ltd., a related party.

31. CONSOLIDATED STATEMENTS OF CASH FLOWS:

(1) Details of cash generated from operations for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Profit before income tax:		
Profit before income tax from continuing operations	₩ 995,314	₩ 777,184
Profit before income tax from discontinued operations	-	275,102
	995,314	1,052,286
Adjustments for:		
- Depreciation	₩ 1,745,493	₩ 1,378,651
- Amortization	97,220	73,128
- Retirement benefits	77,775	71,206
- Financial income	(491,512)	(205,524)
- Financial costs	594,211	197,555
- Foreign currency conversion differences	2,910	(29,699)
- Loss on valuations of inventories	20,169	99,435
- Gain on disposal of property, plant and equipment	(678)	(6,416)
- Loss on disposal of property, plant and equipment	61,731	40,781
- Loss on disposal of intangible assets	244	93
- Impairment losses on property, plant and equipment and intangible assets	1,450	-
- Gain on disposal of business	-	(243,740)
- Gain on disposal of investments in associates	-	(3,820)
- Gain on bargain purchase	(30,673)	-
- Contribution to provisions	642,667	1,469,962
- Other income (loss)	43,906	2,290
- Changes in inventories	(3,139,374)	(833,329)
- Changes in trade receivables	(2,129,797)	139,012
- Changes in other receivables	371,123	(712,845)
- Changes in other current assets	(321,960)	(13,446)
- Settlement of derivatives	7,336	-
- Changes in trade payables	1,841,424	(567,542)
- Changes in other payables	517,172	95,115
- Changes in other current liabilities	337,003	229,884
- Changes in provisions	(1,261,000)	(604,136)
- Changes in net defined benefit liabilities	(225,876)	(116,663)
- Other cash flows from operations	(17,118)	63,630
Cash generated from operations	₩ (260,840)	₩ 1,575,868

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

	2022						
	Beginning	Cash flows from financing activities	Reclassification of current portion	Amortization	Lease liabilities	Others	Ending
Short-term borrowings	₩ 2,203,376	₩ (188,490)	₩ 947,631	₩ -	₩ -	₩ (770,894)	₩ 2,191,623
Long-term borrowings	2,720,009	1,108,532	(947,631)	-	75,699	825,987	3,782,596
Debentures	2,045,808	-	-	3,443	-	85,783	2,135,034
Accounts payable	585,928	(604,437)	-	-	-	18,509	-
	₩ 7,555,121	₩ 315,605	₩ -	₩ 3,443	₩ 75,699	₩ 159,385	₩ 8,109,253

	2021						
	Beginning	Cash flows from financing activities	Reclassification of current portion	Amortization	Lease liabilities	Others	Ending
Short-term borrowings	₩ 1,123,038	₩ (374,377)	₩ 1,125,054	₩ -	₩ -	₩ 329,661	₩ 2,203,376
Long-term borrowings	3,092,585	930,670	(1,125,054)	-	94,002	(272,194)	2,720,009
Debentures	1,943,701	-	-	3,231	-	98,876	2,045,808
	₩ 6,159,324	₩ 556,293	₩ -	₩ 3,231	₩ 94,002	₩ 156,343	₩ 6,969,193

(3) 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	₩ 4,524,611	₩ 2,641,261
Reclassification of machinery in transit	38,534	40,646
Reclassification of long-term borrowings into current portion	947,631	1,125,054
Reclassification of debentures into current portion	675,078	-
Changes in other payables related to acquisitions of property, plant and equipment and intangible assets	262,792	331,776

32. SEGMENT INFORMATION:

(1) General information about the Group`s reportable segments is as follows:

Segment	Products or services	Major customers
Energy solution (*)	Automotive batteries, mobile batteries , ESS batteries and others	HP, GM and others

(*) The Group has determined the reporting segment as a single reporting segment based on the performance evaluation reported to the board of directors, the chief operating decision maker.

(2) Segment information on revenue and profit for the years ended December 31, 2022 and 2021, is as follows (Korean won in millions):

	2022	2021
Total segment revenue	₩ 25,598,609	₩ 17,851,906
Revenue from external customers (*1)	25,598,609	17,851,906
Operating profit of reportable segment (*2)	1,213,719	768,470

(*1) Revenue from external customers consists of sales of goods. Interest income and dividend income are included in finance income.
(*2) Management assesses the performance of the operating segments based on a measurement of operating profit of segment.

(3) Segment information on assets and liabilities as of December 31, 2022 and 2021, is as follows (Korean won in millions):

	December 31, 2022			December 31, 2021		
	Assets	Investments in associates and joint ventures	Liabilities	Assets	Investments in associates and joint ventures	Liabilities
Reportable segment assets and liabilities	₩ 38,299,445	₩ 203,696	₩ 17,705,683	₩ 23,764,137	₩ 225,567	₩ 15,021,764

(4) Sales for the years ended December 31, 2022 and 2021, and non-current assets as of December 31, 2022 and 2021, by geographical segments, are as follows (Korean won in millions):

	Sales		Non-current assets (*1)	
	2022	2021	December 31, 2022	December 31, 2021
Korea (*2)	₩ 1,349,928	₩ 2,235,338	₩ 3,243,244	₩ 2,466,332
China	6,067,389	2,910,541	3,786,273	3,623,783
Asia/Oceania	1,451,499	1,110,368	923	1,035
America	7,075,353	2,827,944	4,670,440	1,565,579
Europe	9,654,428	8,767,715	4,485,299	4,073,733
Africa	12	-	-	-
	₩ 25,598,609	₩ 17,851,906	₩ 16,186,179	₩ 11,730,462

(*1) Represents aggregate amount of property, plant and equipment; intangible assets; and investment properties.
(*2) Domestic sales include exports made through local letters of credit.

(5) For the year ended December 31, 2022, revenues from external customers who account for 10% or more of the Group's revenue amounted to ₩4,858,634 million, ₩3,244,739 million, and ₩2,607,959 million, respectively (the year ended December 31, 2021, were ₩2,341,999 million, ₩2,579,478 million, and ₩1,232,094 million).

33. ASSETS AND LIABILITIES RELATED TO CONTRACTS WITH CUSTOMERS:

(1) Assets and liabilities related to contracts with customers as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Contract assets:		
Due from customers	₩ 11,570	₩ -
	₩ 11,570	₩ -
Contract liabilities:		
Advances from customers received as part of the Group`s main business activities	₩ 282,418	₩ 285,496
Expected customer incentives	2,497	3,042
Unearned revenue	112,240	136,642
Due to customers	14,315	-
	₩ 411,470	₩ 425,180

(2) Revenue recognized in relation to contract liabilities

Revenues recognized from the carried-forward contract liabilities for the years ended December 31, 2022 and 2021, are as follows (Korean won in millions):

	2022	2021
Revenue recognized in the current period from the beginning contract liabilities:		
Revenues in relation to advances from customers received as part of the Group's main business activities	₩ 107,252	₩ 134,731
Unearned revenue	46,078	127
	₩ 153,330	₩ 134,858

34. INVESTMENT PROPERTIES:

(1) Details of investment properties as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022				December 31, 2021			
	Acquisition cost	Accumulated depreciation	Accumulated impairment	Book value	Acquisition cost	Accumulated depreciation	Accumulated impairment	Book value
Buildings	₩ 290,437	₩ (75,916)	₩ (1,724)	₩ 212,797	₩ 301,254	₩ (76,630)	₩ (460)	₩ 224,164
Land	283	(3)	(35)	245	161	-	-	161
	₩ 290,720	₩ (75,919)	₩ (1,759)	₩ 213,042	₩ 301,415	₩ (76,630)	₩ (460)	₩ 224,325

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

	2022		2021	
	Land	Building	Land	Building
Beginning	₩ 161	₩ 224,164	₩ -	₩ 255,086
Acquisition/transfer	122	7,160	161	-
Disposal/transfer	-	(11,320)	-	(24,851)
Depreciation	(3)	(5,878)	-	(6,071)
Impairment	(35)	(1,329)	-	-
Ending	₩ 245	₩ 212,797	₩ 161	₩ 224,164

(3) The fair value of investment properties is measured either by independent professional appraisers with certified qualification or measured based on official appraised value of land and available information from recent transactions of similar properties, and it is classified as 'Level 3' of the fair value hierarchy. The fair value of investment properties as of December 31, 2022, is ₩245,471 million (as of December 31, 2021, was ₩258,152 million). Rental income from investment properties under operating lease for the year ended December 31, 2022, is ₩12,575 million, and operating expenses incurred for investment properties that generated rental income (including maintenance and repair expenses) for the year ended December 31, 2022, are ₩5,881 million.

(4) Operating lease

Investment properties are leased to tenants under operating leases with monthly rent payments. Where considered necessary to reduce credit risk, the Group may obtain bank guarantees for the term of the lease.

Although the Group is exposed to changes in the residual value at the end of the current leases, the Group typically enters into new operating leases and, therefore, will not immediately realize any reduction in residual value at the end of these leases. Expectations about the future residual values are reflected in the fair value of investment properties.

The future minimum lease payments expected to be received in relation to the above operating lease agreement for investment properties as of December 31, 2022 and 2021, are as follows (Korean won in millions):

	December 31, 2022	December 31, 2021
Less than 1 year	₩ 11,858	₩ 12,357
Between 1 – 2 years	160	12,355
Between 2 – 5 years	478	-
	₩ 12,496	₩ 24,712

35. BUSINESS COMBINATION:

(1) On February 28, 2022, the Group acquired 100% shares of LG Energy Solution Vertech Inc., a provider of installation services for Energy Storage System (ESS) in the United States. As a result of the business combination, the Group expects to increase sales through expanded vertical integration by strengthening contact points with ESS customers.

1) The consideration transferred to LG Energy Solution Vertech Inc. and the values of assets and liabilities acquired at the acquisition date are as follows (Korean won in millions).

2) The bargain purchase difference of ₩30,673 million arising from the acquisition is recognized as other non-operating income item in the consolidated statements of profit or loss.

	Amount	
Consideration		
Cash and cash equivalents	₩	16,168
	₩	16,168
Accumulated amount of acquired assets and assumed liabilities		
Cash and cash equivalents	₩	7,748
Trade receivables and other receivables (*)		56,333
Inventories		5,477
Property, plant and equipment		7,251
Intangible assets		1,503
Other assets		12,295
Trade payables and other payables		(25,859)
Other liabilities		(15,543)
Deferred tax liabilities		(2,364)
Fair value of acquired net assets		46,841
Goodwill (gain on bargain purchase)		(30,673)
	₩	16,168

(*) The fair value of trade receivables and other receivables is equal to the contractual amount.

3) Sales and net loss of LG Energy Solution Vertech Inc. after the acquisition date reflected in the consolidated statements of profit or loss were ₩60,224 million and ₩23,881 million, respectively.

4) If LG Energy Solution Vertech Inc. had been consolidated from January 1, 2022, the Group's sales and net income would have been recorded in the consolidated statements of comprehensive income as ₩25,597,927 million and ₩759,062 million, respectively.

5) The Group's accounting for business combinations reported provisional amounts as of December 31, 2022, and may be adjusted if there is new information about the facts and circumstances related to the business combination within the measurement period within one year from the acquisition date.

36. EVENT AFTER THE REPORTING PERIOD:

The Group has entered into a long-term supply agreement for electric vehicle battery modules with U.S. FEPS(Freudenberg E-Power Systems) in February 2023, to secure market opportunities in the commercial vehicle (e.g., buses and trucks) industry with expected high future growth potential.

37. DATE OF APPROVAL FOR ISSUANCE OF CONSOLIDTAED FINANCIAL STATEMENTS:

The Group's consolidated financial statements were approved by the board of directors on January 26, 2023 and may be revised at the general meeting of shareholders.