Hanwha TotalEnergies Petrochemical Co., Ltd. and its subsidiaries

Consolidated financial statements
for each the two years in the period ended December 31, 2023
with the independent auditor's report

Table of contents

Ernst & Young Han Young
2-4F,6-8F,Taeyoung Building, 111, Yeouigongwon-ro,
Yeongdeungpo-gu, Seoul 07241 Korea

Tel: +82 2 3787 6600
Fax: +82 2 783 5890
ey.com/kr

Independent auditor's report

(English Translation of a Report Originally Issued in Korean)

The Shareholders and Board of Directors
Hanwha TotalEnergies Petrochemical Co., Ltd.

Opinion

We have audited the consolidated financial statements of Hanwha TotalEnergies Petrochemical Co., Ltd. and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as of December 31, 2023 and 2022, and the consolidated statements of comprehensive income, consolidated statements of changes in equity and consolidated statements of cash flows for each of the two years in the period ended December 31, 2023, and the notes to the consolidated financial statements, including material accounting policy information.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2023 and 2022, and its consolidated financial performance and its consolidated cash flows for each of the two years in the period ended December 31, 2023 in accordance with International Financial Reporting Standards as adopted by the Republic of Korea ("KIFRS").

Basis for opinion

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

Emphasis of matter

Without qualifying our audit opinion, we draw attention to Note 2 to the consolidated financial statements. As described in Note 2 to the consolidated financial statements, for the year ended December 31, 2023, the Group decided to apply the revaluation model for subsequent measurement of land instead of the cost model applied to other items of property, plant and equipment. As the Group first adopted the revaluation model, in accordance with KIFRS 1016 *Property, Plant and Equipment*, the Group is not required to apply the model retrospectively and accordingly did not restate the financial statements as of and for the year ended December 31, 2022 presented for comparative purposes.

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

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

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

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

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

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

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

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

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

Ernst & Young Han Young

March 15, 2024

This audit report is effective as of March 15, 2024, the independent auditor’s report date. Accordingly, certain material subsequent events or circumstances may have occurred during the period from the date of the independent auditor’s report to the time this report is used. Such events and circumstances could significantly affect the accompanying consolidated financial statements and may result in modifications to this report.

Hanwha TotalEnergies Petrochemical Co., Ltd.
and its subsidiaries

Consolidated financial statements
for each of the two years in the period ended December 31, 2023

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

Sang Seop Na & Thierry Boulfroy
Chief Executive Officers
Hanwha TotalEnergies Petrochemical Co., Ltd.

Hanwha TotalEnergies Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of financial position
as of December 31, 2023 and 2022

(Korean won)

	Notes		2023		2022
Assets					
Current assets:					
Cash and cash equivalents	3	₩	144,980,560,156	₩	100,254,868,645
Trade and other accounts receivable, net	3,4,13,22,24		1,114,295,507,964		1,086,077,418,034
Prepaid expenses			24,100,043,640		28,280,277,565
Current income tax assets			1,203,103,480		70,015,223,515
Other current assets			2,710,529,661		4,683,937,178
Inventories, net	5		1,702,147,750,154		1,870,301,452,327
Total current assets			2,989,437,495,055		3,159,613,177,264
Non-current assets:					
Long-term investment securities	3,6		11,075,262,606		10,825,773,962
Long-term loans, net	3,4		711,739,392		543,891,376
Long-term accounts receivable, net	3,4,24		5,739,170,860		56,202,601,558
Long-term prepaid expenses			318,420,814		603,041,994
Property, plant and equipment, net	7,8,23		4,735,440,326,346		4,208,751,725,721
Intangible assets, net	9,23		26,746,814,653		26,753,531,843
Defined benefit assets, net	12		37,880,816,019		57,453,593,504
Other non-current assets	3		14,500,000		14,500,000
Deferred tax assets	18		7,169,621		7,476,939,161
Total non-current assets			4,817,934,220,311		4,368,625,599,119
Total assets		**₩**	**7,807,371,715,366**	**₩**	**7,528,238,776,383**

(Continued)

Hanwha TotalEnergies Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of financial position
as of December 31, 2023 and 2022
(Korean won)

	Notes		2023		2022
Liabilities					
Current liabilities:					
Trade and other					
accounts payable	3,13,14,22	₩	1,487,608,814,484	₩	1,396,322,482,310
Short-term borrowings	3,4,10,21,24		422,823,710,906		436,270,457,738
Current portion of bonds payable	3,8,10,21,24				
and long-term borrowings			905,720,694,628		633,638,699,861
Income tax payable			411,970,315		2,008,662,097
Other current liabilities	11		25,525,724,828		20,668,805,643
Total current liabilities			2,842,090,915,161		2,488,909,107,649
Non-current liabilities:					
Bonds payable, net	3,10,21,24		778,373,715,070		1,254,801,155,992
Long-term borrowings	3,8,10,21,24		336,133,013,846		283,847,558,236
Long-term accounts payable	3		8,525,211,837		2,805,370,753
Deferred tax liabilities	18		107,958,088,485		-
Other non-current liabilities			9,248,815,439		8,147,352,854
Total non-current liabilities			1,240,238,844,677		1,549,601,437,835
Total liabilities			**4,082,329,759,838**		**4,038,510,545,484**
Equity					
Equity attributable to					
owners of the parent:					
Issued capital	16		95,826,580,000		95,826,580,000
Share premium	16		864,898,306,667		864,898,306,667
Accumulated other comprehensive income	16		404,703,113,359		7,961,424,917
Retained earnings	16		2,359,613,955,502		2,521,041,919,315
			3,725,041,955,528		3,489,728,230,899
Non-controlling interests			-		-
Total equity			**3,725,041,955,528**		**3,489,728,230,899**
Total liabilities and equity		₩	**7,807,371,715,366**	₩	**7,528,238,776,383**

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

Hanwha TotalEnergies Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of comprehensive income
for the years ended December 31, 2023 and 2022
(Korean won)

	Notes		2023		2022
Sales	17,22,23	₩	11,481,660,877,783	₩	13,991,229,487,471
Cost of goods sold	5,17,22		11,163,856,505,144		13,445,400,974,873
Gross profit			**317,804,372,639**		**545,828,512,598**
Selling and administrative expenses	15,17		320,592,936,006		321,803,937,542
Operating profit (loss)	23		**(2,788,563,367)**		**224,024,575,056**
Finance income	3,13,17		348,145,422,215		570,647,285,036
Finance costs	3,13,17		416,399,551,230		685,733,846,174
Other income	17		15,007,498,183		10,012,566,300
Other expenses	17		41,580,201,952		28,215,572,670
Profit (loss) before tax			**(97,615,396,151)**		**90,735,007,548**
Income tax expenses (benefits)	18		(17,616,660,297)		21,948,103,259
Profit (loss) for the year	23	**₩**	**(79,998,735,854)**	**₩**	**68,786,904,289**
Other comprehensive income (loss)					
Other comprehensive income (loss) that may be reclassified to profit or loss in subsequent periods:					
Net gain (loss) on valuation of interest rate swaps	13		(5,369,437,142)		2,338,943,282
Exchange differences on translation of foreign operations			(133,893,262)		(709,493,911)
Net other comprehensive income (loss) that may be reclassified to profit or loss in subsequent periods			**(5,503,330,404)**		**1,629,449,371**
Other comprehensive income (loss) that will not be reclassified to profit or loss in subsequent periods:					
Remeasurement gain (loss) on net defined benefit assets	12		(12,889,287,568)		14,591,332,635
Net gain on valuation of financial instruments measured at fair value through other comprehensive income ("FVOCI")	6		189,103,296		1,803,963,818
Revaluation surplus at FVOCI			402,063,975,159		-
Net other comprehensive income that will not be reclassified to profit or loss in subsequent periods			**389,363,790,887**		**16,395,296,453**
Other comprehensive income for the year, net of tax			**383,860,460,483**		**18,024,745,824**
Total comprehensive income for the year, net of tax		**₩**	**303,861,724,629**	**₩**	**86,811,650,113**
Profit (loss) for the year attributable to:					
Owners of the parent		₩	(79,998,735,854)	₩	68,786,904,289
Non-controlling interests			-		-
		₩	(79,998,735,854)	₩	68,786,904,289
Total comprehensive income for the year attributable to:					
Owners of the parent			303,861,724,629		86,811,650,113
Non-controlling interests			-		-
		₩	303,861,724,629	₩	86,811,650,113
Earnings (loss) per share:					
Basic and diluted, earnings per share	19	₩	(4,174)	₩	3,589

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

Hanwha TotalEnergies Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of changes in equity
for the years ended December 31, 2023 and 2022

(Korean won)

	Issued capital	Share premium	Accumulated other comprehensive income	Retained earnings	Equity attributable to equity holders of the Company	Non-controlling interests	Total equity
As of January 1, 2022	**₩ 95,826,580,000**	**₩ 864,898,306,667**	**₩ 4,528,011,728**	**₩ 2,878,693,682,391**	**₩ 3,843,946,580,786**	**₩ -**	**₩ 3,843,946,580,786**
Profit for the period	-	-	-	68,786,904,289	68,786,904,289	-	68,786,904,289
Net gain on valuation of interest rate swaps (Note 13)	-	-	2,338,943,282	-	2,338,943,282	-	2,338,943,282
Exchange differences on translation of foreign operations	-	-	(709,493,911)	-	(709,493,911)	-	(709,493,911)
Re-measurement gain on net defined benefit assets (Note 12)	-	-	-	14,591,332,635	14,591,332,635	-	14,591,332,635
Net gain on valuation of financial instruments measured at FVOCI (Note 6)	-	-	1,803,963,818	-	1,803,963,818	-	1,803,963,818
Total comprehensive income for the period	-	-	3,433,413,189	83,378,236,924 `	86,811,650,113	-	86,811,650,113
Annual Dividend	-	-	-	(441,030,000,000)	(441,030,000,000)	-	(441,030,000,000)
As of December 31, 2022	**₩ 95,826,580,000**	**₩ 864,898,306,667**	**₩ 7,961,424,917**	**₩ 2,521,041,919,315**	**₩ 3,489,728,230,899**	**₩ -**	**₩ 3,489,728,230,899**
As of January 1, 2023	**₩ 95,826,580,000**	**₩ 864,898,306,667**	**₩ 7,961,424,917**	**₩ 2,521,041,919,315**	**₩ 3,489,728,230,899**	**₩ -**	**₩ 3,489,728,230,899**
Loss for the period	-	-	-	(79,998,735,854)	(79,998,735,854)	-	(79,998,735,854)
Net loss on valuation of interest rate swaps (Note 13)	-	-	(5,369,437,142)	-	(5,369,437,142)	-	(5,369,437,142)
Exchange differences on translation of foreign operations	-	-	(133,893,262)	-	(133,893,262)	-	(133,893,262)
Re-measurement loss on net defined benefit assets (Note 12)	-	-	-	(12,889,287,568)	(12,889,287,568)	-	(12,889,287,568)
Net gain on valuation of financial instruments measured at FVOCI (Note 6)	- -	-	189,103,296	-	189,103,296	-	189,103,296
Revaluation surplus at FVOCI		-	402,063,975,159	-	402,063,975,159	-	402,063,975,159
Reclassification of revaluation surplus at FVOCI	-	-	(8,059,609)	8,059,609	-	-	-
Total comprehensive income (loss) for the period	-	-	396,741,688,442	(92,879,963,813) `	303,861,724,629	-	303,861,724,629
Annual Dividend	-	-	-	(68,548,000,000)	(68,548,000,000)	-	(68,548,000,000)
As of December 31, 2023	**₩ 95,826,580,000**	**₩ 864,898,306,667**	**₩ 404,703,113,359**	**₩ 2,359,613,955,502**	**₩ 3,725,041,955,528**	**₩ -**	**₩ 3,725,041,955,528**

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

Hanwha TotalEnergies Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of cash flows
for the years ended December 31, 2023 and 2022
(Korean won)

	2023	2022
Operating activities:		
Profit (loss) for the period	₩ (79,998,735,854)	₩ 68,786,904,289
Non-cash adjustments to reconcile profit for the years to net cash flows (Note 21)	549,193,329,192	608,544,251,473
Working capital adjustments (Note 21)	351,351,863,747	26,605,864,916
Interest received	8,050,655,209	5,658,637,444
Income tax paid (refund)	61,812,180,200	(309,612,905,453)
Net cash flows provided by operating activities	**890,409,292,494**	**399,982,752,669**
Investing activities:		
Decrease in long-term loans	130,151,984	719,999,984
Increase in long-term loans	(298,000,000)	(80,558,000)
Proceeds from disposal of long-term investment securities	-	13,005,000
Acquisition of long-term investment securities	(12,000)	(7,700)
Decrease in deposits	271,215,286	333,262,006
Increase in deposits	(611,130,290)	(95,659,749)
Proceeds from disposal of property, plant and equipment	3,602,310,167	98,580,997
Acquisition of property, plant and equipment	(510,811,539,849)	(219,129,682,214)
Proceeds from disposal of intangible assets	-	1,805,001,000
Acquisition of intangible assets	(242,263,758)	(130,409,660)
Government subsidiary received	-	115,000,000
Settlement of derivatives	1,443,963,431	(19,538,380,052)
Dividends received	845,797,615	538,438,800
Net cash flows used in investing activities	**(505,669,507,414)**	**(235,351,409,588)**
Financing activities (Note 21) :		
Increase in bonds payable	308,808,040,000	488,864,540,000
Net decrease in short-term borrowings	(12,720,604,585)	(81,270,846,856)
Repayment of current portion of long-term bonds payable and long-term borrowings	(636,832,885,079)	(325,844,770,521)
Increase in long-term borrowings	150,000,000,000	175,961,300,000
Increase in deposits withheld	-	6,579,314
Decrease in deposits withheld	(26,310,295)	(4,061,284)
Interest paid	(80,631,752,817)	(61,853,390,490)
Dividends paid	(68,548,000,000)	(441,030,000,000)
Net cash flows used in financing activities	**(339,951,512,776)**	**(245,170,649,837)**
Net Increase (decrease) in cash and cash equivalents	**44,788,272,304**	**(80,539,306,756)**
Cash and cash equivalents as of January 1	**100,254,868,645**	**181,015,315,864**
Net foreign exchange difference	**(62,580,793)**	**(221,140,463)**
Cash and cash equivalents as of December 31	**₩ 144,980,560,156**	**₩ 100,254,868,645**

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

1. General information

Corporate information

Hanwha TotalEnergies Petrochemical Co., Ltd. (the "Company") was incorporated on August 1, 2003 under the laws of the Republic of Korea in accordance with a joint venture agreement entered into on June 10, 2003, between Total Holdings UK Limited (currently, TotalEnergies Holdings UK, "TotalEnergies Holdings", which is a subsidiary of TotalEnergies SE in France (formerly, Total SE)) of the United Kingdom and Samsung General Chemical Co., Ltd. ("SGC") of the Republic of Korea, and an in-kind contribution agreement entered into between the Company and SGC.

Upon the Company's incorporation on August 1, 2003, SGC sold 50% of its equity interest in the Company to Total Holdings in accordance with a share purchase agreement entered into with Total Holdings, SGC and SGC's two shareholders on June 10, 2003. At the time of establishment, the Company was named Samsung Atofina Co., Ltd. and changed to Samsung Total Petrochemical Co., Ltd. in October 2004.

On November 26, 2014, Hanwha Group and Samsung Group entered into a share transfer agreement of SGC. In accordance with a resolution at the shareholders' meeting on April 30, 2015, the name of the Company was changed from Samsung Total Petrochemical Co., Ltd. to Hanwha Total Petrochemical Co., Ltd.

As of December 31, 2023, the issued and outstanding shares of the Company are equally owned by TotalEnergies Holdings and Hanwha Impact Corporation. The Company changed its name from Hanwha Total Petrochemical Co., Ltd. to Hanwha TotalEnergies Petrochemical Co., Ltd. at the shareholders' meeting on March 31, 2022.

The Company acquired all of the equity interest of West Sea Utilities Investment Private Company in West Sea Power Co., Ltd. and West Sea Water Co., Ltd. (acquired companies) in January 2012 to enhance the stabilization and efficiency of operations and competitiveness through the integration of utility facilities. The acquired companies were merged into the Company as of March 28, 2012.

The primary business activity of the Company is the production and sale of various petrochemical and fuel products, including polyethylenes, polypropylenes, butadienes, styrene monomers, paraxylenes, jetoil and gasoline. The Company's manufacturing plant is located in Seosan-si (the Seosan City), Choongchungnam-do.

Information about consolidated subsidiaries

The consolidated subsidiaries as of December 31, 2023 and 2022 are as follows:

Subsidiary	Principal activities	Equity interest (%)	Country of domicile
Dongguan Hanwha TotalEnergies Engineering Plastic Co., Ltd.	Production and sale of synthetic resins and various plastics	100	China
Hanwha TotalEnergies Petrochemical (Shanghai) Co., Ltd. (Formerly, Hanwha TotalEnergies Petrochemical Trading (Shanghai) Co., Ltd.)	Trading	100	China

Summarized financial information of the consolidated subsidiaries as of and for each of the two years in the period ended December 31, 2023, which has been included in the accompanying consolidated financial statements, is as follows (Korean won in thousands):

	2023					
Subsidiary	Assets	Liabilities	Equity	Revenue	Profit for the year	Total comprehensive income
Dongguan Hanwha TotalEnergies Engineering Plastic Co., Ltd.	₩ 29,201,612	₩ 2,890,603	₩ 26,311,009	₩ 48,767,565	₩ 2,165,620	₩ 2,045,644
Hanwha TotalEnergies Petrochemical (Shanghai) Co., Ltd. (Formerly, Hanwha TotalEnergies Petrochemical Trading (Shanghai) Co., Ltd.)	₩ 4,705,684	₩ 2,197,854	₩ 2,507,830	₩ 6,576,944	₩ 370,829	₩ 356,912

1. General information (cont'd)

	2022					
Subsidiary	Assets	Liabilities	Equity	Revenue	Profit for the year	Total comprehensive income
Dongguan Hanwha TotalEnergies Engineering Plastic Co., Ltd.	₩ 27,715,406	₩ 3,450,041	₩ 24,265,365	₩ 49,657,793	₩ 1,781,937	₩ 1,102,744
Hanwha TotalEnergies Petrochemical Trading (Shanghai) Co., Ltd.	₩ 4,618,510	₩ 2,467,592	₩ 2,150,918	₩ 6,115,266	₩ 386,426	₩ 356,126

There were no changes in the scope of consolidation for each of the two years in the period ended December 31, 2023.

2. Basis of preparation and summary of material accounting policies

Basis of preparation

The Company and its subsidiaries (collectively, the "Group") prepares its statutory consolidated financial statements in the Korean language in conformity with International Financial Reporting Standards as adopted by the Republic of Korea ("KIFRS") enacted by the *Act on External Audit of Stock Companies*. The consolidated financial statements have been prepared on a historical cost basis, except for certain assets that have been measured at fair value in accordance with KIFRS. The accompanying consolidated financial statements have been translated into the English language from the Korean language financial statements. In the event of any differences in interpreting the financial statements or the independent auditor's report thereon, the Korean version, which is used for regulatory reporting purpose, shall prevail. The consolidated financial statements are presented in Korean won, and all values are rounded to the nearest thousands, except when otherwise indicated.

Basis of consolidation

The consolidated financial statements comprise the financial statements of the Company and its subsidiaries (collectively referred to as the "Group") as of December 31, 2023 and 2022. Control is achieved when the Group is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee. Specifically, the Group controls an investee if and only if the Group has:

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

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

- the contractual arrangements with the other vote holders of the investee;
- rights arising from other contractual arrangements; and
- the Group's voting rights and potential voting rights.

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

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

2. Basis of preparation and summary of material accounting policies (cont'd)

A change in the ownership interest of a subsidiary, without a loss of control, is accounted for as an equity transaction. If the Group loses control over a subsidiary, it:

- derecognizes the assets (including goodwill) and liabilities of the subsidiary;
- derecognizes the carrying amount of any non-controlling interests;
- derecognizes the cumulative translation differences recorded in equity;
- recognizes the fair value of the consideration received;
- recognizes the fair value of any investment retained;
- recognizes any surplus or deficit in profit or loss; and
- reclassifies the parent's share of components previously recognized in OCI to profit or loss or retained earnings, as appropriate.

Current versus non-current classification
The Group presents assets and liabilities in the consolidated statement of financial position based on current/non-current classification.

An asset is current when it is either:

- expected to be realized or intended to be sold or consumed in the normal operating cycle;
- held primarily for the purpose of trading;
- expected to be realized within twelve months after the reporting period; or
- cash or cash equivalent unless restricted from being exchanged or used to settle a liability for at least twelve months after the reporting period.

All other assets are classified as non-current.

A liability is current when either:

- it is expected to be settled in the normal operating cycle;
- it is held primarily for the purpose of trading;
- it is due to be settled within twelve months after the reporting period; or
- there is no unconditional right to defer the settlement of the liability for at least twelve months after the reporting period.

The Group classifies all other liabilities as non-current.

Deferred tax assets and liabilities are classified as non-current assets and liabilities.

Fair value measurement
The Group measures financial instruments, such as, derivatives, at fair value at each date of the consolidated statement of financial position. Fair value related disclosures for financial instruments that are measured at fair value, or where fair values are disclosed, are summarized in Note 3.

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. The fair value measurement is based on the presumption that the transaction to sell the asset or transfer the liability takes place either:

- in the principal market for the asset or liability; or
- in the absence of a principal market, in the most advantageous market for the asset or liability.

The fair value of an asset or a liability is measured using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest. The Group uses valuation techniques that are appropriate in the circumstances and for which sufficient data are available to measure fair value, maximizing the use of relevant observable inputs and minimizing the use of unobservable inputs.

2. Basis of preparation and summary of material accounting policies (cont'd)

All assets and liabilities for which fair value is measured or disclosed in the consolidated financial statements are categorized within the fair value hierarchy, described as follows, based on the lowest level input that is significant to the fair value measurement as a whole:

Level 1: Quoted (unadjusted) market prices in active markets for identical assets or liabilities
Level 2: Valuation techniques for which the lowest level input that is significant to the fair value measurement is directly or indirectly observable
Level 3: Valuation techniques for which the lowest level input that is significant to the fair value measurement is unobservable

For assets and liabilities that are recognized in the consolidated financial statements at fair value on a recurring basis, the Group determines whether transfers have occurred between levels in the hierarchy by re-assessing categorization (based on the lowest level input that is significant to the fair value measurement as a whole) at the end of each reporting period.

For the purpose of fair value disclosures, the Group has determined classes of assets and liabilities on the basis of the nature, characteristics and risks of the asset or liability and the level of the fair value hierarchy, as explained above.

Financial assets

Initial recognition and measurement

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

The classification of financial assets at initial recognition depends on the financial asset's contractual cash flow characteristics and the Group's business model for managing them. With the exception of trade receivables that do not contain a significant financing component or for which the Group has applied the practical expedient, the Group initially measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs. Trade receivables that do not contain a significant financing component or for which the Group has applied the practical expedient are measured at the transaction price determined under KIFRS 1115.

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

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

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

Subsequent measurement

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

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

2. Basis of preparation and summary of material accounting policies (cont'd)

Financial assets at amortized cost (debt instruments)
The Group measures financial assets at amortized cost if both of the following conditions are met:
- the financial asset is held within a business model with the objective to hold financial assets in order to collect contractual cash flows; and
- the contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

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

Financial assets at fair value through OCI (debt instruments)
The Group measures debt instruments at fair value through OCI if both of the following conditions are met:
- the financial asset is held within a business model with the objective of both holding to collect contractual cash flows and selling; and
- the contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding.

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

Financial assets designated at fair value through OCI (equity instruments)
Upon initial recognition, the Group can elect to classify irrevocably its equity investments as equity instruments designated at fair value through OCI when they meet the definition of equity under KIFRS 1032 *Financial Instruments: Presentation* and are not held for trading. The classification is determined on an instrument-by-instrument basis.

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

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

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

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

2. Basis of preparation and summary of material accounting policies (cont'd)

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

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

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

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

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

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

Impairment of financial assets
Further disclosures relating to impairment of financial assets are also provided in the following notes:

	Notes
➢ Disclosures for significant assumptions	3
➢ Trade receivables	4

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

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

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

2. Basis of preparation and summary of material accounting policies (cont'd)

Financial liabilities

Initial recognition and measurement
Financial liabilities are classified, at initial recognition, as financial liabilities at fair value through profit or loss, loans and borrowings, payables, or as derivatives designated as hedging instruments in an effective hedge, as appropriate.

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

The Group's financial liabilities include trade and other accounts payable, loans and borrowings including bank overdrafts and derivative financial instruments.

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

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

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

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

Financial liabilities designated upon initial recognition at fair value through profit or loss are designated at the initial date of recognition, and only if the criteria in KIFRS 1109 are satisfied. The Group has not designated any financial liability as at fair value through profit or loss.

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

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

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

Offsetting of financial instruments
Financial assets and financial liabilities are offset and the net amount is reported in the consolidated statement of financial position if, and only if, (a) there is a currently enforceable legal right to offset the recognized amounts and (b) there is an intention to settle on a net basis, or to realize the assets and settle the liabilities simultaneously.

2. Basis of preparation and summary of material accounting policies (cont'd)

Derivative financial instruments and hedge accounting

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

For the purpose of hedge accounting, hedges are classified as:
- fair value hedges when hedging the exposure to changes in the fair value of a recognized asset or liability or an unrecognized firm commitment; or
- cash flow hedges when hedging the exposure to variability in cash flows that is either attributable to a particular risk associated with a recognized asset or liability or a highly probable forecast transaction or the foreign currency risk in an unrecognized firm commitment.

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

Before January 1, 2018, the documentation includes identification of the hedging instrument, the hedged item or transaction, the nature of the risk being hedged and how the Group will assess the effectiveness of changes in the hedging instrument's fair value in offsetting the exposure to changes in the hedged item's fair value or cash flows attributable to the hedged risk. Such hedges are expected to be highly effective in achieving offsetting changes in fair value or cash flows and are assessed on an ongoing basis to determine that they actually have been highly effective throughout the financial reporting periods for which they were designated.

Beginning January 1, 2018, the documentation includes identification of the hedging instrument, the hedged item, the nature of the risk being hedged and how the Group will assess whether the hedging relationship meets the hedge effectiveness requirements (including the analysis of sources of hedge ineffectiveness and how the hedge ratio is determined). A hedging relationship qualifies for hedge accounting if it meets all of the following effectiveness requirements:

- 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.

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

Fair value hedges
The change in the fair value of a hedging derivative is recognized in profit or loss. The change in the fair value of the hedged item attributable to the risk hedged is recorded as part of the carrying value of the hedged item and is also recognized in profit or loss.

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

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

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

2. Basis of preparation and summary of material accounting policies (cont'd)

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

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

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

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

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

Revenue from contracts with customers

(a) Sale of goods
For sale of goods contracts with customers, the Group generally expects that revenue is recognized when the control of the goods has passed to the buyer, usually on delivery of the goods. However, if the terms of the contract include inherent shipping and handling activities that occur after the transfer of the control to the customer, they are accounted for as separate promised services.

(b) Rendering of services
The shipping and handling services rendered prior to the control of the goods is transferred to a customer are order-related activities. However, if the control of goods has been transferred to the customer, shipping and handling services are provided in connection with the customer's goods, which indicates that the Group is rendering services to the customer. Accordingly, a portion of the proceeds from the sale of goods will be reclassified as revenue from rendering of services, and the timing of revenue recognition will depend on the transfer of control and the completion of the performance obligations.

Cash and cash equivalents
Cash and cash equivalents comprise cash at banks and on hand, short-term deposits and investments, with a maturity of three months or less from the date of acquisition, that can be readily convertible to a known amount of cash and be subject to an insignificant risk of changes in value.

Inventories
Inventories are valued at the lower of cost and net realizable value, with cost being determined using the moving-average method except for materials-in-transit which are determined using the specific identification cost method. Acquisition costs relating to inventory include purchase costs, conversion costs and other costs incurred to bring the inventory to its current location and present condition. The cost of finished goods and semi-finished goods include cost of raw materials, direct labor costs and other direct costs and manufacturing overheads. Net realizable value is the estimated selling price in the ordinary course of business, less estimated costs of completion and the estimated costs necessary to make the sale.

2. Basis of preparation and summary of material accounting policies (cont'd)

Property, plant and equipment

Land is measured at fair value based on the value assessed by an independent external appraiser. Revaluation is regularly performed at the end of the reporting period to ensure that the book value of the assets does not materially differ from their fair value.

If the book value of the assets increases due to revaluation, that increase is recognized as OCI, deducted from deferred taxes, and added to capital in the revaluation surplus account. However, if there was a revaluation decrease amount recognized in profit or loss for the same asset in the past, the revaluation increase is recognized in profit or loss up to that amount. If the book value of the assets decreases due to revaluation, that decrease is recognized in profit or loss, but if there is a remaining balance in the revaluation surplus for that asset, the revaluation decrease is recognized as OCI up to that amount.

Property, plant and equipment are stated at cost, net of accumulated depreciation and accumulated impairment losses, if any. Such cost includes the cost of replacing part of the property, plant and equipment and borrowing costs for long-term construction projects if the recognition criteria are met. When significant parts of property, plant and equipment are required to be replaced at intervals, the Group recognizes such parts as individual assets with specific useful lives and depreciates them accordingly. Likewise, when a major inspection is performed, its cost is recognized in the carrying amount of the property, plant and equipment as a replacement if the recognition criteria are satisfied. All other repair and maintenance costs are recognized in profit or loss as incurred.

Depreciation of property, plant and equipment is provided using the straight-line method over the estimated useful lives of the assets as follows:

	Years
Buildings	10~55
Structures	4~40
Machinery and equipment	2~20
Vehicles and others	1~25

An item of property, plant and equipment and any significant part initially recognized is derecognized upon disposal or when no future economic benefits are expected from its use or disposal. Any gain or loss arising on derecognition of the asset is included in the consolidated statement of comprehensive income when the asset is derecognized. The residual values, useful lives and methods of depreciation of property, plant and equipment are reviewed at each financial year end, and probable changes therein shall be treated as changes in accounting estimates.

Leases

The Group assesses at contract inception whether a contract is, or contains, a lease. That is, if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

Group as a lessee

The Group applies a single recognition and measurement approach for all leases, except for short-term leases and leases of low-value assets. The Group recognizes lease liabilities to make lease payments and right-of-use assets representing the right to use the underlying assets.

(a) Right-of-use assets

The Group recognizes right-of-use assets at the commencement date of the lease (i.e., the date the underlying asset is available for use). Right-of-use assets are measured at cost, less any accumulated depreciation and impairment losses and adjusted for any remeasurement of lease liabilities. The cost of right-of-use assets includes the amount of lease liabilities recognized, initial direct costs incurred, and lease payments made at or before the commencement date less any lease incentives received. Right-of-use assets are depreciated on a straight-line basis over the shorter of the lease term and the estimated useful lives of the assets, as follows:

2. Basis of preparation and summary of material accounting policies (cont'd)

	Years
Buildings	2~8
Structures	2~30
Machinery and equipment	2~10
Vehicles	2~8
Catalyst	2~4

If ownership of the leased asset transfers to the Group at the end of the lease term or the cost reflects the exercise of a purchase option, depreciation is calculated using the estimated useful life of the asset.

As described in **Impairment of non-financial assets** section in Note 2, right-of-use assets are also subject to impairment.

(b) Lease liabilities
At the commencement date of the lease, the Group recognizes lease liabilities measured at the present value of lease payments to be made over the lease term. The lease payments include fixed payments (including in-substance fixed payments) less any lease incentives receivable, variable lease payments that depend on an index or a rate, and amounts expected to be paid under residual value guarantees. The lease payments also include the exercise price of a purchase option reasonably certain to be exercised by the Group and payments of penalties for terminating the lease, if the lease term reflects the Group exercising the option to terminate. Variable lease payments that do not depend on an index or a rate are recognized as expenses (unless they are incurred to produce inventories) in the period in which the event or condition that triggers the payment occurs.

In calculating the present value of lease payments, the Group uses its incremental borrowing rate at the lease commencement date because the interest rate implicit in the lease is not readily determinable. After the commencement date, the amount of lease liabilities is increased to reflect the accretion of interest and reduced for the lease payments made. In addition, the carrying amount of lease liabilities is remeasured if there is a modification, a change in the lease term, a change in the lease payments (e.g., changes to future payments resulting from a change in an index or rate used to determine such lease payments) or a change in the assessment of an option to purchase the underlying asset.

The Group's lease liabilities are included in interest-bearing loans and borrowings (see Note 8 and 10).

(c) Short-term leases and leases of low-value assets
The Group applies the short-term lease recognition exemption to its short-term leases of some assets (i.e., those leases that have a lease term of 12 months or less from the commencement date and do not contain a purchase option). It also applies the lease of low-value assets recognition exemption to leases of office equipment that is considered to be low value. Lease payments on short-term leases and leases of low-value assets are recognized as expense on a straight-line basis over the lease term.

Intangible assets
Intangible assets acquired separately are measured at cost on initial recognition. The cost of intangible assets acquired in a business combination is their fair value at the date of acquisition. Following initial recognition, intangible assets are carried at cost less any accumulated amortization and accumulated impairment losses. Internally generated intangible assets, excluding capitalized development costs, are not capitalized and the related expenditure is reflected in the consolidated statement of comprehensive income in the year in which the expenditure is incurred.

The useful lives of intangible assets are assessed as either finite or indefinite. Intangible assets with finite lives are amortized over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. The amortization period and the amortization method for an intangible asset with a finite useful life are reviewed at least at the end of each reporting period. Changes in the expected useful life or the expected pattern of consumption of future economic benefits embodied in the asset are considered to modify the amortization period or method, as appropriate, and are treated as changes in accounting estimates. The amortization expense on intangible assets with finite lives is recognized in the consolidated statement of comprehensive income as the expense category that is consistent with the function of the intangible assets.

2. Basis of preparation and summary of material accounting policies (cont'd)

Intangible assets with indefinite useful lives are not amortized, but are tested for impairment annually, either individually or at the cash-generating unit level. The assessment of indefinite life is reviewed annually to determine whether the indefinite life continues to be supportable. If not, the change in useful life from indefinite to finite is made on a prospective basis. Intangible assets with definite useful lives are amortized based on the straight-line method over the estimated useful lives between 4 and 30 years.

Gains or losses arising from derecognition of an intangible asset are measured as the difference between the net disposal proceeds and the carrying amount of the asset and are recognized in profit or loss when the asset is derecognized.

Borrowing costs

Borrowing costs directly attributable to the acquisition, construction or production of an asset that necessarily takes a substantial period of time to get ready for its intended use or sale are capitalized as part of the cost of the respective asset. All other borrowing costs are expensed in the period in which they are incurred. Borrowing costs consist of interest and other costs that the Group incurs in connection with the borrowing of funds.

Impairment of non-financial assets

The Group assesses, at each reporting date, whether there is an indication that an asset may be impaired. If any indication exists, or when annual impairment testing for an asset is required, the Group estimates the asset's recoverable amount. An asset's recoverable amount is the higher of an asset's or cash-generating unit's (CGU) fair value less costs of disposal and its value in use. Recoverable amount is determined for an individual asset, unless the asset does not generate cash inflows that are largely independent of those from other assets or groups of assets. When the carrying amount of an asset or CGU exceeds its recoverable amount, the asset is considered impaired and is written down to its recoverable amount.

In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. In determining fair value less costs of disposal, recent market transactions are taken into account. If no such transactions can be identified, an appropriate valuation model is used. These calculations are corroborated by valuation multiples, quoted share prices for publicly traded companies or other available fair value indicators.

Impairment losses of continuing operations, including impairment on inventories, are recognized in the consolidated statement of comprehensive income in expense categories consistent with the function of the impaired asset, except for properties previously revalued with the revaluation taken to OCI. For such properties, the impairment is recognized in OCI up to the amount of any previous revaluation.

For assets excluding goodwill, an assessment is made at each reporting date to determine whether there is an indication that previously recognized impairment losses no longer exist or have decreased. If such indication exists, the Group estimates the asset's or CGU's recoverable amount. A previously recognized impairment loss is reversed only if there has been a change in the assumptions used to determine the asset's recoverable amount since the last impairment loss was recognized. The reversal is limited so that the carrying amount of the asset does not exceed its recoverable amount, nor exceed the carrying amount that would have been determined, net of depreciation, had no impairment loss been recognized for the asset in prior years. Such reversal is recognized in the consolidated statement of comprehensive income unless the asset is carried at a revalued amount, in which case, the reversal is treated as a revaluation increase.

Net defined benefit liabilities (assets)

The Group operates a defined benefit plan, under which amounts to be paid as retirement benefits are determined by reference to a formula based on the employees' earnings and years of service. The defined benefit asset or liability comprises the present value of the defined benefit obligations, less the fair value of plan assets out of which the obligations are to be settled.

The cost of providing benefits under the defined benefit plan is determined using the projected unit credit method. Re-measurements, comprising actuarial gains and losses and the return on plan assets (excluding net interest), are recognized immediately in the consolidated statement of financial position with a corresponding debit or credit to retained earnings through OCI in the period in which they occur. Re-measurements are not reclassified to profit or loss in subsequent periods.

2. Basis of preparation and summary of material accounting policies (cont'd)

Past service costs are recognized in profit or loss on the earlier of:

- the date of the plan amendment or curtailment; and
  the date that the Group recognizes restructuring-related costs or termination benefits.

Net interest is calculated by applying the discount rate to the net defined benefit liability or asset. The Group recognizes service costs and net interest expense or income in the net defined benefit obligation under 'cost of goods sold' and 'selling and administrative expenses' in the consolidated statement of comprehensive income.

The Group operates a defined contribution plan for vested employees, and the obligation of contribution to the defined contribution plan is recognized as retirement benefits and reflected in current profit or loss unless the contribution is included in the cost of plan assets on the date of contribution. The Group recognizes a shortfall of the contribution as a liability and an excess contribution as an asset to an extent that the excess contribution reduces future payments or cash is refunded.

Provisions and contingent liabilities
Provisions are recognized when (a) the Group has a present obligation (legal or constructive) as a result of a past event, (b) it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and (c) a reliable estimate can be made of the amount of the obligation. The amount that the Group recognizes as a provision is the best estimate for the expenditures which are required to perform a current obligation at the end of reporting period, in consideration of unavoidable risks and uncertainties for related events and circumstances. If the effect of the time value of money is material, provisions are discounted using a current pre-tax rate that reflects, where appropriate, the risks specific to the liability.

In addition, if an event occurred in the past but the Group has a potential obligation of which the existence is identified when an uncertain future event occurs, or if the past event or transaction causes a current obligation but resources are not likely to flow out of the Group, or if an amount required to perform the current obligation cannot be reliably estimated, the Group recognizes a contingent liability and discloses it in Note 15.

Functional currency and foreign currency translation
The Group's consolidated financial statements are presented in Korean won, which is the Group's functional currency. Transactions in foreign currencies are initially recorded by the Group at the functional currency spot rates at the date the transaction first qualifies for recognition. Monetary assets and liabilities denominated in foreign currencies are translated at the functional currency spot rate of exchange at the reporting date. Differences arising on settlement or translation of monetary assets and liabilities are recognized in profit or loss. Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rates as at the dates of the initial transactions. Non-monetary items measured at fair value in a foreign currency are translated using the exchange rates at the dates when the fair value is determined. The gain or loss arising on translation of non-monetary items is treated in line with the recognition of gain or loss on change in fair value of the item (i.e. translation differences on items whose fair value gain or loss is recognized in OCI or profit or loss are also recognized in OCI or profit or loss, respectively).

Income taxes

Current income tax
Current income tax assets and liabilities for the current period are measured at the amount expected to be recovered from, or paid to, the taxation authorities. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted, at the reporting date in the countries where the Group operates and generates taxable income.

Current income tax relating to items recognized directly in equity is recognized in equity and not in the consolidated statement of comprehensive income. Management periodically evaluates positions taken in the tax returns with respect to situations in which applicable tax regulations are subject to interpretation and establishes provisions where appropriate.

2. Basis of preparation and summary of material accounting policies (cont'd)

Deferred tax

Deferred tax is provided using the liability method on temporary differences between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes at the reporting date.

Deferred tax liabilities are recognized for all taxable temporary differences, except:

- when the deferred tax liability arises from the initial recognition of goodwill;
- when the deferred tax liability arises from the initial recognition of an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss; and
- in respect of taxable temporary differences associated with investments in subsidiaries, associates and interests in joint ventures, when the timing of the reversal of the temporary differences can be controlled and it is probable that the temporary differences will not reverse in the foreseeable future.

Deferred tax assets are recognized for all deductible temporary differences, the carry forward of unused tax credits and any unused tax losses. Deferred tax assets are recognized to the extent that it is probable that taxable profit will be available against which the deductible temporary differences, the carry forward of unused tax credits and unused tax losses can be utilized, except:

- when the deferred tax asset arises from the initial recognition of an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss; and
- in respect of deductible temporary differences associated with investments in subsidiaries, associates and interests in joint ventures, deferred tax assets are recognized only to the extent that it is probable that the temporary differences will reverse in the foreseeable future and taxable profit will be available against which the temporary differences can be utilized.

The carrying amount of deferred tax assets is reviewed at each reporting date and reduced to the extent that it is no longer probable that sufficient taxable profit will be available to allow all or part of the deferred tax asset to be utilized. Unrecognized deferred tax assets are re-assessed at each reporting date and are recognized to the extent that it has become probable that future taxable profits will allow the deferred tax assets to be recovered.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply in the year when the asset is realized or the liability is settled, based on the tax rates (and tax laws) that have been enacted or substantively enacted at the reporting date.

Deferred tax relating to items recognized outside profit or loss is recognized outside profit or loss. Deferred tax items are recognized in correlation to the underlying transaction either in OCI or directly in equity.

Deferred tax assets and deferred tax liabilities are offset if a legally enforceable right exists to set off current tax assets against current tax liabilities and the deferred taxes relate to the same taxable entity and the same taxation authority.

Earnings per share

Basic earnings per share are calculated by dividing profit for the year attributable to owners of the parent by the weighted-average number of ordinary shares outstanding during the year.

Emission rights and emission liabilities

The Group is allocated emission allowances free of charge by the government in accordance with the Act on Allocation and Trading of Emission Allowances in the Republic of Korea. The emission allowances are allocated to the Group annually for the planned periods, and the Group is to deliver the equivalent quantity of emission allowances for actual emissions to the government.

The Group measures the emission allowances that it receives from the government free of charge at nil and measures any purchased emission allowances at cost.

In addition, emission allowances are derecognized in the consolidated statement of financial position when they are delivered to the government or sold.

2. Basis of preparation and summary of material accounting policies (cont'd)

An emission liability is recognized only where actual emissions exceed the allocated emission allowances, and the cost of emissions is recognized as cost of goods sold. The emission liability is measured by adding the following (1) and (2).

(1) The carrying value of emission allowances for the year to be delivered to the government
(2) The best estimate of expenditures, as at the end of a reporting period, in performing emission obligations exceeding the above emission allowances

Where the Group borrows a part of the allocated emission allowances for any of future periods to deliver to the government, it recognizes the borrowed portion as deferred revenue when derecognizing the liability and offsets the deferred revenue against the actual cost of emission, as it purchases the emission allowances to fill any shortfall in the period which the borrowed emission allowances belong to.

Material accounting judgments, estimates and assumptions
The preparation of the Group's consolidated financial statements requires management to make judgments, estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities, and the disclosure of contingent liabilities, at the end of the reporting period. However, uncertainty about these assumptions and estimates could result in outcomes that require a material adjustment to the carrying amount of the asset or liability in future periods.

The key assumptions concerning the future and other key sources of estimation uncertainty at the reporting date that have a material risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are described below.

Retirement benefit plans
The cost of the defined benefit plan and the present value of the defined benefit obligation are determined using actuarial valuations. An actuarial valuation involves making various assumptions that may differ from actual developments in the future. These include the determination of the discount rate, future salary increases and mortality rates. Due to the complexity of the valuation, the underlying assumptions and its long-term nature, a defined benefit obligation is highly sensitive to changes in these assumptions. All assumptions are reviewed at each reporting date.

Fair value of financial instruments
When the fair value of financial assets and financial liabilities recorded in the consolidated statement of financial position cannot be derived from active markets, their fair value is determined using valuation techniques including the discounted cash flow model. The inputs to these models are taken from observable markets where possible, but where this is not feasible, a degree of judgment is required in establishing fair values. The judgments include considerations of inputs such as liquidity risk, credit risk and volatility. Changes in assumptions about these factors could affect the reported fair value of financial instruments.

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

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

2. Basis of preparation and summary of material accounting policies (cont'd)

Leases - Estimating the incremental borrowing rate

The Group cannot readily determine the interest rate implicit in the lease, therefore, it uses its incremental borrowing rate (IBR) to measure lease liabilities. The IBR is the rate of interest that the Group would have to pay to borrow over a similar term, and with a similar security, the funds necessary to obtain an asset of a similar value to the right-of-use asset in a similar economic environment.

New and amended standards and interpretations

The Group applied for the first-time certain standards and amendments, which are effective for annual periods beginning on or after January 1, 2023. The Group has not early adopted any other standard, interpretation or amendment that has been issued but is not yet effective.

KIFRS 1117 *Insurance Contracts*

KIFRS 1117 *Insurance Contracts* is a comprehensive new accounting standard for insurance contracts covering recognition and measurement, presentation and disclosure. KIFRS 1117 replaces KIFRS 1104 *Insurance Contracts*. KIFRS 1117 applies to all types of insurance contracts (i.e., life, non-life, direct insurance and re-insurance), regardless of the type of entities that issue them, as well as to certain guarantees and financial instruments with discretionary participation features. A few scope exceptions will apply. The overall objective of KIFRS 1117 is to provide an accounting model for insurance contracts that is more useful and consistent for insurers covering all relevant accounting aspects. KIFRS 1117 is based on a general model, supplemented by:

- a specific adaptation for contracts with direct participation features (the variable fee approach); and
- a simplified approach (the premium allocation approach) mainly for short-duration contracts.

The new standard had no impact on the Group's consolidated financial statements.

***Definition of Accounting Estimates* - Amendments to KIFRS 1008**

The amendments to KIFRS 1008 clarify the distinction between changes in accounting estimates, changes in accounting policies and the correction of errors. They also clarify how entities use measurement techniques and inputs to develop accounting estimates. The amendments had no impact on the Group's consolidated financial statements.

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

The amendments to KIFRS 1001 and KIFRS Practice Statement 2 *Making Materiality Judgements* provide guidance and examples to help entities apply materiality judgements to accounting policy disclosures. The amendments aim to help entities provide accounting policy disclosures that are more useful by replacing the requirement for entities to disclose their 'significant' accounting policies with a requirement to disclose their 'material' accounting policies and adding guidance on how entities apply the concept of materiality in making decisions about accounting policy disclosures.
The amendments have had an impact on the Group's disclosures of accounting policies, but not on the measurement, recognition or presentation of any items in the Group's financial statements.

***Deferred Tax related to Assets and Liabilities arising from a Single Transaction* – Amendments to KIFRS 1012**

The amendments to KIFRS 1012 *Income Tax* narrow the scope of the initial recognition exception, so that it no longer applies to transactions that give rise to equal taxable and deductible temporary differences such as leases and decommissioning liabilities.

The amendments had no impact on the Group's consolidated financial statements.

2. Basis of preparation and summary of material accounting policies (cont'd)

***International Tax Reform—Pillar Two Model Rules* – Amendments to KIFRS 1012**
The amendments to KIFRS 1012 have been introduced in response to the OECD's BEPS Pillar Two Model Rules and include:
• a mandatory temporary exception to the recognition and disclosure of deferred taxes arising from the jurisdictional implementation of the Pillar Two Model Rules; and
• disclosure requirements for affected entities to help users of the financial statements better understand an entity's exposure to Pillar Two income taxes arising from that legislation, particularly before its effective date.

The mandatory temporary exception – the use of which is required to be disclosed – applies immediately. The remaining disclosure requirements apply for annual reporting periods beginning on or after January 1, 2023, but not for any interim periods ending on or before December 31, 2023.

The Group's revenue is over EUR 750million, which falls within the scope of the Pillar Two Model Rules, but the amendments had no impact on the Group's consolidated financial statements.

Amendments to KIFRS 1001- Disclosure of Valuation Gains and Losses of Financial Liabilities with Refixing Option

The amendments requires the disclosure of the book value of financial instrument with refixing option and gain or loss related thereto, when, and only when, all or part of the financial instrument is classified as a financial liability.

The amendments had no impact on the Group's financial statements.

Standards issued but not yet effective

The new and amended standards and interpretations that are issued, but not yet effective, up to the date of issuance of the Group's consolidated financial statements are disclosed below.

Amendments to KIFRS 1116: *Lease Liability in a Sale and Leaseback*
The amendments to KIFRS 1116 specify the requirements that a seller-lessee uses in measuring the lease liability arising in a sale and leaseback transaction, to ensure the seller-lessee does not recognize any amount of the gain or loss that relates to the right of use it retains.
The amendments are effective for annual reporting periods beginning on or after January 1, 2024 and must be applied retrospectively to sale and leaseback transactions entered into after the date of initial application of KIFRS 1116. Earlier application is permitted and that fact must be disclosed.
The amendments are not expected to have a material impact on the Group's consolidated financial statements.

Amendments to KIFRS 1001: *Classification of Liabilities as Current or Non-current*
The amendments to paragraphs 69 to 76 of KIFRS 1001 specify the requirements for classifying liabilities as current or non-current. The amendments clarify:

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

In addition, a requirement has been introduced to require disclosure when a liability arising from a loan agreement is classified as non-current and the entity's right to defer settlement is contingent on compliance with future covenants within twelve months.

The amendments are effective for annual reporting periods beginning on or after January 1, 2024 and must be applied retrospectively. The Group is currently assessing the impact the amendments will have on current practice and whether existing loan agreements may require renegotiation.

2. Basis of preparation and summary of material accounting policies (cont'd)

Supplier Finance Arrangements **- Amendments to KIFRS 1007 and KIFRS 1107**
The amendments to KIFRS 1007 *Statement of Cash Flows* and KIFRS 1107 *Financial Instruments: Disclosures* clarify the characteristics of supplier finance arrangements and require additional disclosure of such arrangements. The disclosure requirements in the amendments are intended to assist users of financial statements in understanding the effects of supplier finance arrangements on an entity's liabilities, cash flows and exposure to liquidity risk.
The amendments will be effective for annual reporting periods beginning on or after January 1, 2024. Early adoption is permitted, but will need to be disclosed.
The amendments are not expected to have a material impact on the Group's consolidated financial statements.

Amendments to KIFRS 1001: ***Disclosure of Virtual Assets***
These amendments mandate entities to disclose material information for the financial statement users such as the impact of holding and issuing virtual assets on their accounting policies and financial statements. The entities should separately disclose information related to holding virtual assets, holding them on behalf of the customers, and issuing them. The amendments will be effective for annual reporting periods beginning on or after January 1, 2024 and shall be applied retrospectively. The amendments are not expected to have a material impact on the Group's consolidated financial statements.

Lack of Exchangeability **- Amendments to KIFRS 1021 and KIFRS 1101**
The amendments to KIFRS 1021 *The Effects of Changes in Foreign Exchange Rates* and consequential amendments to KIFRS 1101 *First-time Adoption of IFRS* specify how an entity should assess whether a currency is exchangeable and how it should determine a spot exchange rate when exchangeability is lacking. The amendments require disclosure of information that enables users of financial statements to understand the risk and impact of a currency not being exchangeable.
The amendments apply to annual reporting periods beginning on or after January 1, 2025. Early application is permitted, in which case, an entity is required to disclose that fact.
The amendments are not expected to have a material impact on the Group's consolidated financial statements.

Changes in accounting policies

Revaluation of property, plant and equipment
The Group reassessed its accounting for property, plant and equipment with respect to measurement of a certain class of property, plant and equipment after initial recognition. The Group had previously measured all property, plant and equipment using the cost model described in Paragraph 30 of KIFRS 1016, whereby, after initial recognition of the asset classified as property, plant and equipment, the asset was carried at cost less accumulated depreciation and accumulated impairment losses.

On August 31, 2023, the Group elected to change the method of accounting for land classified as property, plant and equipment, as the Group believes that the revaluation model provides more relevant information about the financial position of the land. In addition, available valuation techniques provide reliable estimates of the land and buildings' fair value. The Group applied the revaluation model prospectively.

After initial recognition, land is measured at its fair value at the date of the revaluation subject to uses the revaluation model.

3. Financial instruments

Details of financial assets as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023				
	Financial assets at FVTPL	Financial assets at amortized cost	Financial assets at FVOCI	Financial assets designated as hedges	Total
Current assets:					
Cash and cash equivalents	₩ -	₩ 144,980,560	₩ -	₩ -	₩ 144,980,560
Trade and other accounts receivable:					
Trade accounts receivable	-	869,962,209	-	-	869,962,209
Other accounts receivable	4,772,069	167,419,944	-	71,874,110	244,066,123
Accrued income	-	190,661	-	-	190,661
Guarantee deposits	-	76,515	-	-	76,515
	4,772,069	1,182,629,889	-	71,874,110	1,259,276,068
Non-current assets:					
Long-term investment securities	-	4,825	11,070,438	-	11,075,263
Long-term loans	-	711,739	-	-	711,739
Long-term accounts receivable:					
Long-term other accounts receivable	-	-	-	1,851,490	1,851,490
Refundable deposits	-	3,887,681	-	-	3,887,681
Other non-current assets:					
Long-term financial instruments	-	14,500	-	-	14,500
	-	4,618,745	11,070,438	1,851,490	17,540,673
	₩ 4,772,069	₩ 1,187,248,634	₩ 11,070,438	₩ 73,725,600	₩ 1,276,816,741

	Dec. 31, 2022				
	Financial assets at FVTPL	Financial assets at amortized cost	Financial assets at FVOCI	Financial assets designated as hedges	Total
Current assets:					
Cash and cash equivalents	₩ -	₩ 100,254,869	₩ -	₩ -	₩ 100,254,869
Trade and other accounts receivable:					
Trade accounts receivable	-	878,136,935	-	-	878,136,935
Other accounts receivable	1,863,983	190,896,679	-	14,998,444	207,759,106
Accrued income	-	112,177	-	-	112,177
Guarantee deposits	-	69,200	-	-	69,200
	1,863,983	1,169,469,860	-	14,998,444	1,186,332,287
Non-current assets:					
Long-term investment securities	-	4,825	10,820,949	-	10,825,774
Long-term loans	-	543,891	-	-	543,891
Long-term accounts receivable:					
Long-term other accounts receivable	-	-	-	52,647,848	52,647,848
Refundable deposits	-	3,554,753	-	-	3,554,753
Other non-current assets:					
Long-term financial instruments	-	14,500	-	-	14,500
	-	4,117,969	10,820,949	52,647,848	67,586,766
	₩ 1,863,983	₩ 1,173,587,829	₩ 10,820,949	₩ 67,646,292	₩ 1,253,919,053

3. Financial instruments (cont'd)

Financial liabilities as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023			
	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Financial liabilities designated as hedges	Total
Current liabilities:				
Trade and other accounts payable:				
Trade accounts payable	₩ -	₩ 840,097,062	₩ -	₩ 840,097,062
Other accounts payable	1,999,741	550,874,491	1,057,702	553,931,934
Accrued expenses(*)	-	57,556,632	-	57,556,632
Deposits withheld	-	93,195	-	93,195
Short-term borrowings	-	422,823,711	-	422,823,711
Current portion of bonds payable and long-term borrowings	-	905,720,694	-	905,720,694
	1,999,741	2,777,165,785	1,057,702	2,780,223,228
Non-current liabilities:				
Bonds payable	-	778,373,715	-	778,373,715
Long-term borrowings	-	336,133,014	-	336,133,014
Long-term accounts payable(*)	-	369,076	1,666,014	2,035,090
	-	1,114,875,805	1,666,014	1,116,541,819
	₩ 1,999,741	₩ 3,892,041,590	₩ 2,723,716	₩ 3,896,765,047

(*) Payables related to employee benefits are excluded.

	Dec. 31, 2022			
	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Financial liabilities designated as hedges	Total
Current liabilities:				
Trade and other accounts payable:				
Trade accounts payable	₩ -	₩ 961,310,381	₩ -	₩ 961,310,381
Other accounts payable	21,486,073	318,318,765	884,353	340,689,191
Accrued expenses(*)	-	60,162,581	-	60,162,581
Deposits withheld	-	100,613	-	100,613
Short-term borrowings	-	436,270,458	-	436,270,458
Current portion of bonds payable and long-term borrowings	-	633,638,700	-	633,638,700
	21,486,073	2,409,801,498	884,353	2,432,171,924
Non-current liabilities:				
Bonds payable	-	1,254,801,156	-	1,254,801,156
Long-term borrowings	-	283,847,558	-	283,847,558
Long-term accounts payable	-	253,825	1,147,784	1,401,609
	-	1,538,902,539	1,147,784	1,540,050,323
	₩ 21,486,073	₩ 3,948,704,037	₩ 2,032,137	₩ 3,972,222,247

(*) Payables related to employee benefits are excluded.

3. Financial instruments (cont'd)

Gains or losses by financial instrument for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023							
	Financial assets				Financial liabilities			
	Financial assets at FVTPL	Financial assets at amortized cost	Financial assets at FVOCI	Financial assets designated as hedges	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Financial liabilities designated as hedges	Total
Interest income	₩ -	₩ 8,129,139	₩	₩ -	₩ -	₩ -	₩ -	₩ 8,129,139
Interest expenses	-	-	-	-	-	(81,910,144)	-	(81,910,144)
Gain on foreign exchange translation	-	86,570	-	12,471,419	-	13,215,044	-	25,773,033
Loss on foreign exchange translation	-	(3,745,233)	-	-	-	(10,912,709)	-	(14,657,942)
Gain (loss) on settlement of derivative instruments	104,012,948	-	-	-	(108,711,392)	-	-	(4,698,444)
Gain (loss) on valuation of derivative instruments	4,772,069	-	-	-	(1,999,741)	-	-	2,772,328
Dividend income		-	845,798	-	-	-	-	845,798
Reversal of allowance for doubtful accounts	-	317,755	-	-	-	-	-	317,755
Loss on disposal of trade accounts receivable	-	(16,330,207)	-	-	-	-	-	(16,330,207)

	2022							
	Financial assets				Financial liabilities			
	Financial assets at FVTPL	Financial assets at amortized cost	Financial assets at FVOCI	Financial assets designated as hedges	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Financial liabilities designated as hedges	Total
Interest income	₩ -	₩ 5,747,579	₩ -	₩ -	₩ -	₩ -	₩ -	₩ 5,747,579
Interest expenses	-	-	-	-	-	(66,390,240)	-	(66,390,240)
Gain on foreign exchange translation	-	44,211	-	15,773,017	-	41,888,355	-	57,705,583
Loss on foreign exchange translation	-	(14,192,103)	-	-	-	(33,321,497)	(1,232,713)	(48,746,313)
Gain (loss) on settlement of derivative instruments	166,697,599	-	-	-	(179,263,930)	-	-	(12,566,331)
Gain (loss) on valuation of derivative instruments	1,863,983	-	-	-	(21,486,073)	-	-	(19,622,090)
Dividend income	-	-	538,439	-	-	-	-	538,439
Allowance for doubtful accounts	-	(65,540)	-	-	-	-	-	(65,540)
Loss on disposal of trade accounts receivable	-	(11,314,814)	-	-	-	-	-	(11,314,814)

Above gains or losses include selling and administrative expenses and finance income (costs) arising from the financial assets and liabilities.

3. Financial instruments (cont'd)

Set out below is the carrying amounts and fair value of the Group's each category of financial instruments (Korean won in thousands):

	Dec. 31, 2023		Dec. 31, 2022	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial assets:				
Cash and cash equivalents	₩ 144,980,560	₩ 144,980,560	₩ 100,254,869	₩ 100,254,869
Trade and other accounts receivable:				
Trade accounts receivable	869,962,209	869,962,209	878,136,935	878,136,935
Other accounts receivable – derivative assets	76,646,179	76,646,179	16,862,427	16,862,427
Other accounts receivable	167,419,944	167,419,944	190,896,679	190,896,679
Accrued income	190,661	190,661	112,177	112,177
Guarantee deposits	76,515	76,515	69,200	69,200
Long-term investment securities	11,075,263	11,075,263	10,825,774	10,825,774
Long-term loans	711,739	711,739	543,891	543,891
Long-term accounts receivable:				
Long-term other accounts receivable – derivative assets	1,851,490	1,851,490	52,647,848	52,647,848
Refundable deposits	3,887,681	3,887,681	3,554,753	3,554,753
Other non-current assets:				
Long-term financial instruments	14,500	14,500	14,500	14,500
	₩ 1,276,816,741	₩ 1,276,816,741	₩ 1,253,919,053	₩ 1,253,919,053

	Dec. 31, 2023		Dec. 31, 2022	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial liabilities:				
Trade and other accounts payable:				
Trade accounts payable	₩ 840,097,062	₩ 840,097,062	₩ 961,310,381	₩ 961,310,381
Other accounts payable – derivative liabilities	3,057,443	3,057,443	22,370,426	22,370,426
Other accounts payable	550,874,491	550,874,491	318,318,765	318,318,765
Accrued expenses	57,556,632	57,556,632	60,162,581	60,162,581
Deposits withheld	93,195	93,195	100,613	100,613
Short-term borrowings	422,823,711	422,823,711	436,270,458	436,270,458
Current portion of bonds payable and long-term borrowings	905,720,694	904,714,855	633,638,700	631,454,030
Bonds payable	778,373,715	775,919,115	1,254,801,156	1,221,494,416
Long-term borrowings	336,133,014	336,133,014	283,847,558	283,847,558
Long-term accounts payable – derivative liabilities	1,666,014	1,666,014	1,147,784	1,147,784
Long-term accounts payable	369,076	369,076	253,825	253,825
	₩ 3,896,765,047	₩ 3,893,304,608	₩ 3,972,222,247	₩ 3,936,730,837

3. Financial instruments (cont'd)

The fair value of the financial assets and liabilities is included at the amount at which the instrument could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale. The following methods and assumptions were used to estimate the fair values:

- The Group enters into derivative financial instruments with various counterparties, principally financial institutions with investment grade credit ratings. Derivatives valued using valuation techniques with market observable inputs are mainly interest rate swaps and foreign exchange forward contracts. The most frequently applied valuation techniques include forward pricing and swap models, using present value calculations. The models incorporate various inputs including the credit quality of counterparties, foreign exchange spot and forward rates, interest rate curves and forward rate curves of the underlying asset.
- The Group applied discount cash flow method, discounting future cash flows by appropriate discount rate to evaluate long-term investment securities.

Management assessed that the book value of financial instruments approximates their respective fair value except for derivative financial instruments.

The fair value hierarchy of financial instruments which are measured at fair value or of which fair value is disclosed as of December 31, 2023 and 2022 is as follows (Korean won in thousands):

	Dec. 31, 2023			
	Level 1	Level 2	Level 3	Total
Assets and liabilities measured at fair value:				
Other accounts receivable – derivative assets	₩ -	₩ 76,646,179	₩ -	₩ 76,646,179
Long-term other accounts receivable – derivative assets	-	1,851,490	-	1,851,490
Other accounts payable – derivative liabilities	-	3,057,443	-	3,057,443
Long-term other accounts payable – derivative liabilities	-	1,666,014	-	1,666,014
Long-term investment securities	-	-	11,070,438	11,070,438
Assets and liabilities for which fair values are disclosed:				
Cash and cash equivalents	4,500	144,976,060	-	144,980,560
Trade accounts receivable	-	-	869,962,209	869,962,209
Other accounts receivable	-	-	167,419,944	167,419,944
Accrued income	-	-	190,661	190,661
Guarantee deposits	-	-	76,515	76,515
Long-term investment securities	-	4,825	-	4,825
Long-term loans	-	-	711,739	711,739
Refundable deposits	-	-	3,887,681	3,887,681
Long-term financial instruments	-	14,500	-	14,500
Trade accounts payable	-	-	840,097,062	840,097,062
Other accounts payable	-	-	550,874,491	550,874,491
Accrued expenses	-	-	57,556,632	57,556,632
Deposits withheld	-	-	93,195	93,195
Short-term borrowings	-	422,823,711	-	422,823,711
Current portion of bonds payable and long-term borrowings	-	895,690,030	10,030,664	905,720,694
Bonds payable	-	778,373,715	-	778,373,715
Long-term borrowings	-	328,517,930	7,615,084	336,133,014
Long-term accounts payable	-	-	369,076	369,076

3. Financial instruments (cont'd)

	Dec. 31, 2022			
	Level 1	Level 2	Level 3	Total
Assets and liabilities measured at fair value:				
Other accounts receivable – derivative assets	₩ -	₩ 16,862,427	₩ -	₩ 16,862,427
Long-term other accounts receivable – derivative assets	-	52,647,848	-	52,647,848
Other accounts payable – derivative liabilities	-	22,370,426	-	22,370,426
Long-term other accounts payable – derivative liabilities	-	1,147,784	-	1,147,784
Long-term investment securities	-	-	10,820,949	10,820,949
Assets and liabilities for which fair values are disclosed:				
Cash and cash equivalents	4,500	100,250,369	-	100,254,869
Trade accounts receivable	-	-	878,136,935	878,136,935
Other accounts receivable	-	-	190,896,679	190,896,679
Accrued income	-	-	112,177	112,177
Guarantee deposits	-	-	69,200	69,200
Long-term investment securities	-	4,825	-	4,825
Long-term loans	-	-	543,891	543,891
Refundable deposits	-	-	3,554,753	3,554,753
Long-term financial instruments	-	14,500	-	14,500
Trade accounts payable	-	-	961,310,381	961,310,381
Other accounts payable	-	-	318,318,765	318,318,765
Accrued expenses	-	-	60,162,581	60,162,581
Deposits withheld	-	-	100,613	100,613
Short-term borrowings	-	436,270,458	-	436,270,458
Current portion of bonds payable and long-term borrowings	-	629,846,026	3,792,674	633,638,700
Bonds payable	-	1,254,801,156	-	1,254,801,156
Long-term borrowings	-	276,482,400	7,365,158	283,847,558
Long-term accounts payable	-	-	253,825	253,825

For each of the two years in the period ended December 31, 2023, there have been no transfers between level 1 and level 2 fair value measurements. Derivatives assets and liabilities that the Group holds are over-the-counter derivatives and are included in level 2 as all of the significant inputs used in the fair value measurement are directly or indirectly observable.

Deposits with restriction on use as of December 31, 2023 and 2022 consist of the following (Korean won in thousands):

	Dec. 31, 2023	Dec 31, 2022	Description
Long-term financial instruments	₩ 14,500	₩ 14,500	Deposits to maintain the checking accounts

4. Trade and other accounts receivable

Details of trade and other accounts receivable as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023		
	Costs	Allowance for doubtful accounts	Net book value
Trade accounts receivable	₩ 870,635,034	₩ (672,825)	₩ 869,962,209
Other receivables (*)	250,784,209	-	250,784,209
	₩ 1,121,419,243	₩ (672,825)	₩ 1,120,746,418

	Dec. 31, 2022		
	Costs	Allowance for doubtful accounts	Net book value
Trade accounts receivable	₩ 879,127,515	₩ (990,580)	₩ 878,136,935
Other receivables (*)	264,686,976	-	264,686,976
	₩ 1,143,814,491	₩ (990,580)	₩ 1,142,823,911

(*) Other receivables consist of other accounts receivable, accrued income, guarantee deposits, long-term loans and refundable deposits.

The Group has established a credit rating and credit limit system to estimate allowance for doubtful accounts by credit rating of customers. The allowance for doubtful account is established at the range from 1% to 5% of the balances of trade accounts receivable by credit ratings, excluding transaction with subsidiaries of Hanwha Group and TotalEnergies Group, government-owned companies, and major conglomerates (Samsung, Hyundai Motors, SK, LG, Lotte, etc.). For bad debts, 20% ~ 100% of the balances of trade accounts receivable are established as an allowance for doubtful accounts by considering factors such as collaterals and the status of customers (court receivership, composition and default). Receivables for which credit enhancement has been made by commercial insurance, payment guarantees, and letters of credit are excluded from the allowance for doubtful accounts.

A reversal of allowance for doubtful accounts included in selling and administrative expenses amounted to ₩317,755 thousand for the year then ended December 31, 2023 and allowance for doubtful accounts included in selling and administrative expenses amounted to ₩65,540 thousand for the year then ended December 31, 2022.

The aging analysis of trade and other accounts receivable as of December 31, 2023 and 2022 is as follows (Korean won in thousands):

	Dec. 31, 2023					
	Neither past due nor impaired	Past due but not impaired			Impaired	Total
		Within 90 days	91 – 180 days	Over 180 days		
Trade accounts receivable	₩ 869,376,249	₩ 398,815	₩ -	₩ 187,145	₩ 672,825	₩ 870,635,034
Other receivables (*)	172,286,540	-	-	-	-	172,286,540
	₩ 1,041,662,789	₩ 398,815	₩ -	₩ 187,145	₩ 672,825	₩ 1,042,921,574

(*) Financial assets at FVTPL relating to derivative instruments, such as forward currency contracts, are excluded from other receivables.

	Dec. 31, 2022					
	Neither past due nor impaired	Past due but not impaired			Impaired	Total
		Within 90 days	91 – 180 days	Over 180 days		
Trade accounts receivable	₩ 876,176,016	₩ 1,865,493	₩ -	₩ 95,426	₩ 990,580	₩ 879,127,515
Other receivables (*)	195,176,701	-	-	-	-	195,176,701
	₩ 1,071,352,717	₩ 1,865,493	₩ -	₩ 95,426	₩ 990,580	₩ 1,074,304,216

(*) Financial assets at FVTPL relating to derivative instruments, such as forward currency contracts, are excluded from other receivables.

4. Trade and other accounts receivable (cont'd)

The Group discounted trade accounts receivable pursuant to export bill discount agreements entered into with various financial institutions during the each of the two years in the period ended December 31, 2023. As the Group retains the risks and rewards relating to the provision of trade accounts receivable, the Group continues to recognize the discounted trade accounts receivable in its consolidated statements of financial position and recognizes short-term borrowings for the consideration received (See Note 10).

Discounted trade accounts receivable as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023	Dec. 31, 2022
Book value of discounted trade accounts receivable	₩ 52,823,711	₩ 66,270,458
Book value of related short-term borrowings	52,823,711	66,270,458

There is no significant difference between the book value and fair value of discounted trade accounts receivable and related short-term borrowings, respectively.

5. Inventories

Details of inventories as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023		
	Costs	Valuation allowance	Net book value
Finished goods	₩ 516,644,577	₩ (16,387,490)	₩ 500,257,087
Semi-finished goods	156,460,539	(8,609,254)	147,851,285
Raw materials	385,758,702	-	385,758,702
Sub-materials	21,236,947	-	21,236,947
Supplies	79,605,593	-	79,605,593
By-products	94,984,844	-	94,984,844
Materials-in-transit	472,453,292	-	472,453,292
	₩ 1,727,144,494	₩ (24,996,744)	₩ 1,702,147,750

	Dec. 31, 2022		
	Costs	Valuation allowance	Net book value
Finished goods	₩ 528,162,453	₩ (52,836,401)	₩ 475,326,052
Semi-finished goods	193,552,493	(13,104,728)	180,447,765
Raw materials	439,469,914	-	439,469,914
Sub-materials	22,556,044	-	22,556,044
Supplies	75,565,684	-	75,565,684
By-products	112,156,403	-	112,156,403
Materials-in-transit	564,779,590	-	564,779,590
	₩ 1,936,242,581	₩ (65,941,129)	₩ 1,870,301,452

Reversal of allowance for loss on valuation of inventories recognized within the cost of goods sold amounted to ₩40,944,385 thousand for the year then ended December 31, 2023 and loss on valuation of inventories amounted to ₩51,521,952 thousand for the year then ended December 31, 2022.

6. Long-term investments securities

Long-term investments securities of the Group as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023		Dec. 31, 2022
	Acquisition cost	Book value	Book value
Financial assets at FVOCI:			
Non-listed equity investments, etc.	₩ 8,674,745	₩ 11.070,438	₩ 10,820,949
Financial assets at amortized cost:			
National bonds	4,825	4,825	4,825
	₩ 8,679,570	₩ 11,075,263	₩ 10,825,774

Financial assets at FVOCI of the Group as of December 31, 2023 and 2022 are as follows (Korean won in thousands, except for the number of shares and percentage):

	Dec. 31, 2023				
	Number of shares owned	Percentage of ownership (%)	Acquisition cost	Book value	Fair value
Daehan Oil Pipeline Corp.	448,699	2.26	₩ 8,674,609	₩ 11,070,302	₩ 11,070,302
Others			136	136	136
			₩ 8,674,745	₩ 11,070,438	₩ 11,070,438

	Dec. 31, 2022				
	Number of shares owned	Percentage of ownership (%)	Acquisition cost	Book value	Fair value
Daehan Oil Pipeline Corp.	448,699	2.26	₩ 8,674,609	₩ 10,820,825	₩ 10,820,825
Others			124	124	124
			₩ 8,674,733	₩ 10,820,949	₩ 10,820,949

Valuation method and inputs used for valuation are as follows (Korean won in thousands):

	Valuation method	Key operating activities	Dec. 31, 2023	Inputs	Range
Financial assets at FVOCI	Discounted cash flow methods	Construction and operation of the pipeline	₩ 11,070,302	Cost of equity capital	17.18%

A sensitivity analysis on the effect of changes in primary assumptions used in the fair value measurements on the book value of financial assets at FVOCI is as follows (Korean won in thousands):

	Changes in book value	(-) 1% discount rate	(+) 1% discount rate
Changes in cost of equity capital	Increase (decrease) in financial assets at FVOCI	₩ 1,238,307	₩ (1,030,662)

7. Property, plant and equipment

The acquisition costs and net book value of property, plant and equipment as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023		
	Cost	Accumulated depreciation	Book value
Land	₩ 820,965,670	₩ -	₩ 820,965,670
Buildings	418,039,693	(110,982,254)	307,057,439
Structures	1,029,664,767	(507,707,353)	521,957,414
Machinery and equipment	6,221,220,508	(3,749,284,417)	2,471,936,091
Vehicles	16,436,452	(13,438,804)	2,997,648
Vehicles – government subsidiary	(115,000)	45,042	(69,958)
Others	704,767,342	(341,915,902)	362,851,440
Construction-in-progress	247,744,582	-	247,744,582
	₩ 9,458,724,014	₩ (4,723,283,688)	₩ 4,735,440,326

7. Property, plant and equipment (Cont'd)

	Dec. 31, 2022		
	Cost	Accumulated depreciation	Book value
Land	₩ 279,901,163	₩ -	₩ 279,901,163
Buildings	405,091,538	(97,936,848)	307,154,690
Structures	1,024,904,924	(474,293,019)	550,611,905
Machinery and equipment	6,066,370,359	(3,460,288,207)	2,606,082,152
Vehicles	16,119,291	(12,268,676)	3,850,615
Vehicles – government subsidiary	(115,000)	16,292	(98,708)
Others	731,600,593	(462,462,532)	269,138,061
Construction-in-progress	192,111,848	-	192,111,848
	₩ 8,715,984,716	₩ (4,507,232,990)	₩ 4,208,751,726

Changes in the net book value of property, plant and equipment for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023						
	Jan. 1	Acquisitions	Disposals	Revaluation(*3)	Transfers(*1)	Depreciation	Dec. 31
Land	₩ 279,901,163	₩ -	₩ (116,200)	₩ 541,180,707	₩ -	₩ -	₩ 820,965,670
Buildings	307,154,690	67,771	(441,642)	-	13,374,747	(13,098,127)	307,057,439
Structures	550,611,905	46,661	(8)	-	4,713,214	(33,414,358)	521,957,414
Machinery and equipment	2,606,082,152	62,570	(1,353,153)	-	186,500,082	(319,355,560)	2,471,936,091
Vehicles	3,850,615	12,946	-	-	927,332	(1,793,245)	2,997,648
Vehicles – government subsidiary	(98,708)	-	-	-	-	28,750	(69,958)
Others (*2)	269,138,061	24,534,054	(2,048,053)	-	170,134,051	(98,906,673)	362,851,440
Construction-in-progress	192,111,848	435,479,028	(108,878)	-	(379,737,416)	-	247,744,582
	₩ 4,208,751,726	₩ 460,203,030	₩ (4,067,934)	₩ 541,180,707	₩ (4,087,990)	₩ (466,539,213)	₩ 4,735,440,326

(*1) Includes transfer of construction-in-progress to property, plant and equipment and intangible assets, transfer of supplies to property, plant, and equipment, and the foreign exchange effect
(*2) Includes right-of-use assets (See Note 8)
(*3) Revaluation of land at fair value has been performed in the year ended December 31, 2023 (See Note 7)

	2022					
	Jan. 1	Acquisitions	Disposals	Transfers(*1)	Depreciation	Dec. 31
Land	₩ 279,806,143	₩ -	₩ -	₩ 95,020	₩ -	₩ 279,901,163
Buildings	319,110,666	245,136	(8,746)	723,028	(12,915,394)	307,154,690
Structures	576,542,742	80,584	-	8,192,131	(34,203,552)	550,611,905
Machinery and equipment	2,864,814,067	287,414	(287,775)	73,563,813	(332,295,367)	2,606,082,152
Vehicles	5,242,833	-	-	850,854	(2,243,072)	3,850,615
Vehicles – government subsidiary	-	(115,000)	-	-	16,292	(98,708)
Others (*2)	314,667,341	11,962,219	(698,573)	28,767,944	(85,560,870)	269,138,061
Construction-in-progress	113,924,386	185,357,510	(424,762)	(106,745,286)	-	192,111,848
	₩ 4,474,108,178	₩ 197,817,863	₩ (1,419,856)	₩ 5,447,504	₩ (467,201,963)	₩ 4,208,751,726

(*1) Includes transfer of construction-in-progress to property, plant and equipment and intangible assets, transfer of supplies to property, plant, and equipment, and the foreign exchange effect
(*2) Includes right-of-use assets (See Note 8)

Capitalization of borrowing costs

Borrowing costs capitalized as part of property, plant and equipment amounted to ₩3,911,878 thousand and ₩1,978,136 thousand for each of the two years in the period ended December 31, 2023, respectively. Capitalization interest rate is 3.13% and 2.42% for each of the two years in the period ended December 31, 2023, respectively.

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

Revaluation of land

Management determined that land constitutes one class of property, plant and equipment, based on the nature, characteristics and risks of the asset. Fair value of the properties was determined using the Officially Assessed Land Price (OALP) Standard. The valuations have been performed by the valuer, Pacific Appraisal, and are based on proprietary databases of prices of transactions for properties of similar nature, location and condition.

For the year then ended December 31, 2023, net gain on revaluation of land amounts to ₩ 541,181 million, of which gain on revaluation of land amounting to ₩546,280 million (before income tax) is recognized in other comprehensive income, and loss on revaluation of land recognized in profit or loss is ₩ 5,099 million (before income tax).

Details of significant unobservable valuation input are as follows (Korean won in thousands):

Significant unobservable valuation input:		Range
Price per square meter	₩	241- 242

Significant increases (decreases) in estimated price per square meter in isolation would result in a significantly higher (lower) fair value on a linear basis.

		Dec. 31, 2023
As of January 1	₩	279,901,163
Level 3 revaluation gain recognized due to change in accounting policy		541,180,707
Disposal of land		(116,200)
As of December 31		820,965,670

Using the cost method, the book value is as follows:

		Dec. 31, 2023
Cost	₩	279,793,023
Net book value		279,793,023

The levels of fair value measurements of land as of December 31, 2023 are as follows (Korean won in thousands):

	Dec. 31, 2023							
	Level 1		Level 2		Level 3		Total	
Land	₩	-	₩	-	₩	820,965,670	₩	820,965,670

8. Leases

Changes in the net book value of right-of-use assets for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2032					
	Right-of-use assets (*1)					
	Buildings	Structures	Machinery and equipment	Vehicles	Others	Total
As of January 1	₩ 2,785,347	₩ 18,191,829	₩ 301,015	₩ 7,240,403	₩ 460,005	₩ 28,978,599
Additions	3,956,437	1,908,223	-	1,390,460	6,458,813	13,713,933
Depreciation expenses	(1,363,590)	(1,166,921)	(76,855)	(2,459,942)	(1,622,591)	(6,689,899)
Termination of contracts	(166,657)	-	-	(208,880)	-	(375,537)
Foreign currency translation	2,352	-	-	(3,200)	-	(848)
As of December 31	₩ 5,213,889	₩ 18,933,131	₩ 224,160	₩ 5,958,841	₩ 5,296,227	₩ 35,626,248

(*1) Included in other property, plant and equipment (See Note 7)

	2022					
	Right-of-use assets (*1)					
	Buildings	Structures	Machinery and equipment	Vehicles	Others	Total
As of January 1	₩ 3,422,203	₩ 19,357,074	₩ 377,870	₩ 8,283,142	₩ 2,300,023	₩ 33,740,312
Additions	1,108,706	-	-	1,906,286	-	3,014,992
Depreciation expenses	(1,493,263)	(1,165,245)	(76,855)	(2,491,177)	(1,840,018)	(7,066,558)
Termination of contracts	(208,933)	-	-	(453,839)	-	(662,772)
Foreign currency translation	(43,366)	-	-	(4,009)	-	(47,375)
As of December 31	₩ 2,785,347	₩ 18,191,829	₩ 301,015	₩ 7,240,403	₩ 460,005	₩ 28,978,599

(*1) Included in other property, plant and equipment (See Note 7).

Changes in the net book value of lease liabilities (included interest borrowings) for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	20222
As of January 1	₩ 11,157,832	₩ 14,574,586
Additions	13,417,801	2,448,761
Interest expenses	415,773	288,809
Lease payments	(7,248,658)	(6,133,580)
Foreign currency translation	(97,000)	(20,744)
As of December 31	17,645,748	11,157,832

The maturity analysis of lease liabilities as of December 31, 2023 and 2022 is as follows (Korean won in thousands):

	Dec. 31, 2023	Dec. 31, 2022
Total lease liabilities:		
Within 1 year	₩ 10,030,664	₩ 3,792,674
1 year ~ 5 years	7,615,084	7,365,158
Over 5 years	-	-

The followings are the amounts recognized in profit or loss for each of the two years in the period ended December 31, 2023 (Korean won in thousands):

	2023	2022
Short-term lease payments	₩ 13,607,080	₩ 11,207,556
Low-value lease payments	1,083,485	1,156,421
Depreciation of right-of-use assets	6,689,899	7,066,558
Interest expense of lease liabilities	415,773	288,809
Gain on foreign currency translation	97,000	20,744

9. Intangible assets

Changes in the net book value of intangible assets for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023					
	Jan. 1	Acquisitions	Disposals	Transfer (*)	Amortization	Dec. 31
Patents	₩ 1,164,320	₩ 200,000	₩ (69,460)	₩ 195,806	₩ (228,076)	₩ 1,262,590
Software	11,184,070	42,264	-	4,292,624	(5,323,254)	10,195,704
Facility use right	249,167	-	-	-	-	249,167
Land use right	1,102,984	-	-	(3,075)	(31,180)	1,068,729
Memberships	13,052,990	618,200	-	299,435	-	13,970,625
	₩ 26,753,531	₩ 860,464	₩ (69,460)	₩ 4,784,790	₩ (5,582,510)	₩ 26,746,815

(*) Includes transfer from construction-in-progress to intangible assets and exchange rate effects.

	2023					
	Jan. 1	Acquisitions	Disposals	Transfer (*)	Amortization	Dec. 31
Patents	₩ 1,228,660	₩ -	₩ (28,421)	₩ 204,198	₩ (240,117)	₩ 1,164,320
Software	13,224,015	-	-	4,957,207	(6,997,152)	11,184,070
Facility use right	253,784	30,410	-	(30,140)	(4,887)	249,167
Land use right	1,163,811	-	-	(28,403)	(32,424)	1,102,984
Memberships	14,797,728	100,000	(1,840,200)	(4,538)	-	13,052,990
	₩ 30,667,998	₩ 130,410	₩ (1,868,621)	₩ 5,098,324	₩ (7,274,580)	₩ 26,753,531

(*) Includes transfer from construction-in-progress to intangible assets and exchange rate effects.

The Group has performed an impairment test on membership rights, which are intangible assets with an indefinite useful life, and no impairment loss has been recognized for each of the two years in the period ended December 31, 2023. The recoverable amount of the membership right is the higher of the fair value less costs to sell and the value in use. If it is not possible to measure the fair value less costs to sell reliably, the recoverable amount is measured using the value in use.

10. Borrowings and bonds

Details of short-term borrowings as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Financial institution	Annual interest rates (%)	Dec. 31, 2023	Dec. 31, 2022
Commercial paper	Shinhan Bank	3-month CD + additional rate	₩ 370,000,000	₩ 370,000,000
Discounted trade accounts receivable(*)	Woori Bank and others	5.28 ~ 6.24	52,823,711	66,270,458
			₩ 422,823,711	₩ 436,270,458

(*) The Group entered into factoring contracts with financial institutions such as Shinhan Bank, Woori Bank, KEB Hana Bank, and others, and the amount of trade accounts receivable that have not yet matured but are factored to the financial institutions has been recognized as short-term borrowings in the consolidated statements of financial position (See Note 4).

Details of long-term bonds denominated in Korean won as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

Series	Issuance date	Maturity date	Annual interest rate (%)	Dec. 31, 2023	Dec. 31, 2022
20-2nd public placement bonds	2018.03.02	2023.03.02	3.01	₩ -	₩ 190,000,000
21-2nd public placement bonds	2018.10.22	2023.10.20	2.52	-	140,000,000
21-3rd public placement bonds	2018.10.22	2025.10.22	2.65	100,000,000	100,000,000
24-2nd public placement bonds	2019.10.16	2024.10.16	1.87	80,000,000	80,000,000
24-3rd public placement bonds	2019.10.16	2026.10.16	1.87	80,000,000	80,000,000
25-1st public placement bonds	2022.02.25	2025.02.25	3.07	220,000,000	220,000,000
25-2nd public placement bonds	2022.02.25	2027.02.25	3.19	70,000,000	70,000,000
26th private placement bonds	2022.04.25	2024.04.25	3.55	200,000,000	200,000,000
27-1st public placement bonds	2023.02.23	2025.02.23	4.20	50,000,000	-
27-2nd public placement bonds	2023.02.23	2026.02.23	4.19	130,000,000	-
27-3rd public placement bonds	2023.02.23	2028.02.23	4.53	130,000,000	-
				1,060,000,000	1,080,000,000
Less: discount on bonds				(1,680,158)	(1,411,964)
Less: current portion				(279,946,127)	(329,877,518)
				₩ 778,373,715	₩ 748,710,518

Details of long-term bonds denominated in foreign currency as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

Series	Issuance date	Maturity date	Annual interest rate (%)	Dec. 31, 2023	Dec. 31, 2022
Foreign currency bonds	2019.01.23	2024.01.23	3.88	₩ 515,760,000	₩ 506,920,000
Less: discount on bonds				(16,096)	(829,362)
Less: current portion				(515,743,904)	-
				₩ -	₩ 506,090,638

10. Borrowings and bonds (cont'd)

Details of long-term borrowings as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

Series	Financial institution	Maturity date	Annual interest rates (%)	Dec. 31, 2023	Dec. 31, 2022
Facility loan	Credit Agricole CIB	2023.02.06	1.79	₩ -	₩ 150,000,000
Facility loan	Korea EXIM Bank	2023.05.08	1.74	-	150,000,000
Facility loan	Mizuho Bank	2024.04.16	1.65	100,000,000	100,000,000
Facility loan	Credit Agricole CIB	2025.04.28	3.65	40,000,000	40,000,000
Facility loan	Mizuho Bank	2025.10.14	5.44	100,000,000	100,000,000
Facility loan	Credit Agricole CIB	2026.02.06	4.62	150,000,000	-
Commercial paper	Shinhan Bank London Branch	2025.05.02	1.10	38,517,930	36,482,400
				428,517,930	576,482,400
Less: present value discounts				-	(31,493)
Less: current portion				(100,000,000)	(299,968,507)
				₩ 328,517,930	₩ 276,482,400

Details of lease liabilities as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023	Dec. 31, 2022
Lease liabilities	₩ 17,645,748	₩ 11,157,832
Less: current portion	(10,030,664)	(3,792,674)
Non-current lease liabilities	₩ 7,615,084	₩ 7,365,158

11. Other current liabilities

Other current liabilities as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023	Dec. 31, 2022
Advance receipts	₩ 20,904,884	₩ 16,535,721
Withholdings	4,620,841	4,133,085
	₩ 25,525,725	₩ 20,668,806

12. Net defined benefit assets

The components of defined benefit assets as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023	Dec. 31, 2022
Present value of defined benefit obligations	₩ (178,122,743)	₩ (161,941,329)
Fair value of plan assets	216,003,559	219,394,922
	₩ 37,880,816	₩ 57,453,593

Gains and losses related to retirement benefit plans for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	2022
Defined benefit plans:		
Current service cost	₩ 13,224,435	₩ 15,101,839
Interest cost	9,624,316	6,574,015
Expected return on plan assets	(12,957,142)	(6,855,641)
	9,891,609	14,820,213
Defined contribution plans:		
Retirement pension benefit	2,419,505	2,358,118
	₩ 12,311,114	₩ 17,178,331

12. Net defined benefit assets (cont'd)

Expenses recognized related to the retirement benefit plans for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	2022
Cost of goods sold	₩ 8,423,953	₩ 12,014,292
Selling and administrative expenses (including research and development)	3,887,161	5,164,039
	₩ 12,311,114	₩ 17,178,331

Changes in the present value of defined benefit obligations for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	2022
As of January 1	₩ 161,941,329	₩ 177,818,347
Current service cost	13,224,435	15,101,839
Interest cost	9,624,316	6,574,015
Benefits paid	(19,647,476)	(12,901,297)
Re-measurement loss in OCI:		
Actuarial loss arising from changes in demographic assumptions	-	-
Actuarial loss arising from changes in financial assumptions	8,901,240	(29,081,976)
Experience adjustments	5,912,955	6,500,225
Others (transfer from/to affiliates)	(1,834,056)	(2,069,824)
As of December 31	₩ 178,122,743	₩ 161,941,329

Changes in the fair value of plan assets for each of the two years in the period ended December 31, 2023are as follows (Korean won in thousands):

	2023	2022
As of January 1	₩ 219,394,922	₩ 184,289,137
Contribution by employer	5,000,000	45,000,000
Expected returns	12,957,142	6,855,641
Benefits paid	(19,648,333)	(12,307,112)
Re-measurement loss in OCI	(2,190,142)	(3,331,972)
Others (transfer from/to affiliates)	489,970	(1,110,772)
As of December 31	₩ 216,003,559	₩ 219,394,922

Composition of plan assets
Plan assets as of December 31, 2023 and 2022 are composed of interest-bearing and principal-guaranteed financial assets such as time deposits.

The principal assumptions used in actuarial calculation as of December 31, 2023 and 2022 are as follows:

	Dec. 31, 2023	Dec. 31, 2022
Discount rate (%)	5.40	6.17
Future salary increase rate (%)	4.23	4.22

12. Net defined benefit assets (cont'd)

Sensitivity analyses of defined benefit obligations

The result of sensitivity analyses, which are determined based on a method that extrapolates the impact on the defined benefit obligations as a result of reasonable changes in key assumptions occurring as of December 31, 2023 and 2022, is as follows (Korean won in thousand):

	Dec. 31, 2023	
	Increase by 1% point	Decrease by 1% point
Discount rate	₩ (11,360,655)	₩ 13,124,992
Future salary increase rate	13,463,496	(11,826,400)

	Dec. 31, 2023	
	Increase by 1% point	Decrease by 1% point
Discount rate	₩ (9,735,525)	₩ 11,163,715
Future salary increase rate	11,540,908	(10,205,552)

13. Derivative financial instruments

The Group entered into forward currency contracts to hedge the risk of volatility in US dollar exchange rates. Details of outstanding forward currency contracts as of December 31, 2023 and 2022 are presented as follows (Korean won in thousands and US dollar, except for contract exchange rate):

Dec. 31, 2023

Financial institution	Maturity date	Contract exchange rate	Contract amount		Fair value: Assets	Fair value: Liabilities
Mizuho Bank	2024.01.18~2024.01.29	1,291.85~1,296.65	USD	60,000,000	-	372,085
Hana Bank	2024.01.19	1,292.60	USD	10,000,000	-	43,819
SC Bank	2024.01.22~2024.01.29	1,295.19~1,298.36	USD	30,000,000	-	266,091
HSBC	2024.01.31	1,293.12	USD	30,000,000	-	170,825
					₩ -	₩ 852,820

Dec. 31, 2022

Financial institution	Maturity date	Contract exchange rate	Contract amount		Fair value: Assets	Fair value: Liabilities
KB Bank	2023.01.03 ~ 2023.01.09	1,308.73 ~ 1,330.98	USD	20,000,000	₩ -	₩ 1,051,105
MUFG	2023.01.03 ~ 2023.02.03	1,268.10 ~ 1,308.75	USD	33,000,000	7,997	559,074
DBS	2023.01.17	1,310.73	USD	20,000,000	-	927,982
Mizuho Bank	2023.01.03 ~ 2023.01.09	1,268.18 ~ 1,318.38	USD	35,000,000	8,797	1,236,724
KDB Industrial Bank	2023.01.09	1,308.60	USD	10,000,000	-	413,310
Shinhan Bank	2023.01.03 ~ 2023.01.09	1,308.62 ~ 1,331.00	USD	20,000,000	-	1,026,864
JP Morgan	2023.01.17 ~ 2023.02.27	1,273.25 ~ 1,307.25	USD	35,000,000	-	831,239
BOC	2023.01.09	1,308.58	USD	10,000,000	-	413,586
Credit Agricole CIB	2023.01.03 ~ 2023.01.27	1,268.12 ~ 1,329.80	USD	88,000,000	36,742	2,838,447
Hana Bank	2023.01.09	1,308.67	USD	10,000,000	-	414,285
SC Bank	2023.01.03 ~ 2023.01.27	1,268.22 ~ 1,316.57	USD	77,000,000	9,768	1,689,609
HSBC	2023.01.03 ~ 2023.01.17	1,268.14 ~ 1,313.27	USD	65,000,000	12,594	1,932,436
Woori Bank	2023.01.03	1,331.00	USD	10,000,000	-	636,445
					₩ 75,898	₩ 13,971,106

Valuation gain (loss) on derivate instruments is recognized as finance income (costs) and derivative assets (liabilities) are included in other accounts receivable (payable).

Although the Group does not apply hedge accounting, the Group entered into commodity swaps for crude oil and petroleum products to hedge the exposure to variability in the future cash flows associated with price changes in petroleum products. As of December 31, 2023, the Group entered into three commodity swaps for 1,700,000 barrels and for 76,000 tons. In relation to the contracts, for the year then ended December 31, 2023, ₩4,772,069 thousand (December 31, 2022: ₩1,788,084 thousand) and ₩1,146,921 thousand (December 31, 2022: ₩7,514,967 thousand) are recognized as gain and loss on valuation of derivative financial instruments, respectively. As of December 31, 2023, ₩4,722,069 thousand (December 31, 2022: ₩1,788,084 thousand) and ₩1,146,921 thousand (December 31, 2022: 7,514,967 thousand) are recorded as other accounts receivable and other accounts payable, respectively.

13. Derivative financial instruments (cont'd)

Details of currency swap contracts entered into to hedge the risk of volatility in foreign currency exchange rates on borrowings denominated in foreign currencies to which the Group applies fair value hedge as of December 31, 2023 and 2022 are as follows (USD, EUR and Korean won in thousands):

			Contract amount		Interest rate		Dec. 31, 2023	
Financial institution	Contract date	Maturity date	Notional amount	Swapped amount (KRW)	Received – fixed USD, EUR rate	Paid – fixed KRW rate	Valuation gain	Receivables
Credit Agricole CIB	2019.01.23	2024.01.23	$ 100,000,000	112,400,000	3.88%	2.38%	₩ 2,641,135	₩ 17,305,370
KDB Industrial Bank	2019.01.23	2024.01.23	$ 100,000,000	112,300,000	3.88%	2.38%	2,545,783	17,613,161
Hana Bank	2019.01.23	2024.01.23	$ 200,000,000	224,420,000	3.88%	2.28%	4,863,543	35,523,343
Shinhan Bank	2022.05.04	2025.05.02	€ 27,000,000	36,180,000	1.10%	3.05%	2,420,958	1,188,245
				485,300,000			₩ 12,471,419	₩ 71,630,119

			Contract amount		Interest rate		Dec. 31, 2022	
Financial institution	Contract date	Maturity date	Notional amount	Swapped amount (KRW)	Received – fixed USD, EUR rate	Paid – fixed KRW rate	Valuation gain (loss)	Receivables (payables)
Credit Agricole CIB	2019.01.23	2024.01.23	$ 100,000,000	112,400,000	3.88%	2.38%	₩ 3,492,062	₩ 14,664,235
KDB Industrial Bank	2019.01.23	2024.01.23	$ 100,000,000	112,300,000	3.88%	2.38%	4,100,379	15,067,378
Hana Bank	2019.01.23	2024.01.23	$ 200,000,000	224,420,000	3.88%	2.28%	7,961,876	30,659,800
Shinhan Bank	2022.05.04	2025.05.02	€ 27,000,000	36,180,000	1.10%	3.05%	(1,232,713)	(1,232,713)
				485,300,000			₩ 14,321,604	₩ 59,158,700

In relation to currency swaps above, for the year then ended December 31, 2023, the Group recognized ₩10,875,530 thousand of loss on foreign currency translation (December 31, 2022: ₩33,241,100 thousand) in respect to bonds denominated in foreign currencies and ₩12,471,419 thousand of gain on foreign currency translation (December 31, 2022: ₩15,554,317 thousand of gain and ₩1,232,713 thousand of loss on foreign currency translation) by valuating currency swaps, respectively.

Details of the interest rate swap contracts entered into to hedge the risk of volatility in interest rates on borrowings to which the Group applies cash flow hedge as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

						Dec. 31, 2023		Dec. 31, 2022	
Financial institution	Contract date	Maturity	Contract amount	Received – variable interest rate	Paid – swap interest rate	Valuation loss	Receivables (payables)	Valuation gain (loss)	Receivables (payables)
Shinhan Bank (*)	2020.09.28	2023.09.27	₩ 200,000,000	3-month CD	0.89%	₩ (3,085,965)	₩ -	₩ 354,278	₩ 3,085,965
	2021.09.24	2024.09.24	130,000,000	3-month CD	1.66%	(2,940,287)	1,228,628	3,530,823	4,168,915
	2022.10.25	2025.10.24	40,000,000	3-month CD	4.49%	(26,454)	(825,878)	(799,424)	(799,424)
	2023.12.27	2026.09.28	200,000,000	3-month CD	3.27%	(1,030,985)	(1,030,985)	-	-
			₩ 370,000,000			₩ (7,083,691)	₩ (628,235)	₩ 3,085,677	6,455,456

(*) For detailed information about hedged items, see Note 10

14. Emission liabilities

In relation to greenhouse gas emissions, the Group recognizes estimated expenses for emissions exceeding the emission allowances granted, for which the Group can be held liable in future periods, as trade and other accounts payable.

Details of annual emission allowances allocated for free of charge and estimated greenhouse gas emissions as of December 31, 2023 are as follows (Unit : ton):

	2021	2022	2023	2024	2025	Total
Allocated emission allowance	4,696,165	4,696,165	4,696,165	4,652,182	4,652,182	23,392,859

The estimated greenhouse gas emissions for the year then ended December 31, 2023 is 4,497,235 ton.

Changes in emission liabilities for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	2022
As of January 1	₩ 1,943,780	₩ 4,065,642
Changes in estimation (prior year settlement)	(1,905,152)	(456,120)
Decrease (submitted to the government)	(38,628)	(3,609,522)
Increase (cost of emissions recognized)	-	1,943,780
As of December 31	₩ -	₩ 1,943,780

Changes in emission allowances for the year then ended December 31, 2023 are as follows (Korean won in thousands, except for quantity information):

	2022		2023		Total	
	Quantity	Book value	Quantity	Book value	Quantity	Book value
As of January 1	4,944,161	₩ 1,365,564	4,696,165	₩ -	9,640,326	₩ 1,365,564
Allocated emission allowance	(95,463)	(1,326,936)	95,463	1,326,936	-	-
Submitted to the government	(4,848,698)	(38,628)	-	-	(4,848,698)	(38,628)
As of December 31	-	₩ -	4,791,628	₩ 1,326,936	4,791,628	₩ 1,326,936

15. Commitments and contingencies

The following table presents the available lines of credit from financial institutions as of December 31, 2023 and 2022 (USD, EUR and Korean won in thousands):

	Dec. 31, 2023			
	Financial institution	Korean won	US dollar	EUR
Bank overdrafts	Woori Bank and others	₩ 14,800,000	$ -	€ -
Line of credit for general borrowings	Woori Bank and others	949,000,000	20,000,000	-
Line of credit and nego for export and import financing	Woori Bank and others	300,000,000	1,027,000,000	27,000,000
Line of credit for export bill discounts	Woori Bank and others	-	90,000,000	-
		₩ 1,263,800,000	$ 1,137,000,000	€ 27,000,000

	Dec. 31, 2022			
	Financial institution	Korean won	US dollar	EUR
Bank overdrafts	Woori Bank and others	₩ 14,800,000	$ -	€ -
Line of credit for general borrowings	Woori Bank and others	904,000,000	20,000,000	-
Line of credit and nego for export and import financing	Woori Bank and others	150,000,000	952,000,000	27,000,000
Line of credit for export bill discounts	Woori Bank and others	-	140,000,000	-
		₩ 1,068,800,000	$ 1,112,000,000	€ 27,000,000

The Group has provided a blank check to Korea National Oil Corporation as collateral in connection with petroleum import duty as of December 31, 2023.

The Group entered into a contract for trademark rights with Hanwha Corporation and TotalEnergies SE, effective from July 1, 2015. In accordance with the agreement, the Group paid fees amounting to ₩34.5 billion and ₩42.0 billion to Hanwha Corporation and TotalEnergies SE for each of the two years in the period ended December 31, 2023, respectively.

The Group received guarantee for the accounts receivable insurance from Seoul Guarantee Insurance amounting to ₩505.6 billion and ₩501.0 billion for each of the two years in the period ended December 31, 2023, respectively.

As of December 31, 2023, the Group has three pending lawsuits with total claim against the Group amounting to ₩1.56 billion, and its outcome is uncertain.

Summary of major contracts as of December 31, 2023 is as follows:

Contract name	Contractor	Description	Contract date	Expiration date	Country
Plant gas trading and utilities supply contract	AIRFIRST	Sale of air separation equipment and gas supply	1999.04.03	2033.01.29	United Kingdom
Utilities supply contract	Hanwha Impact Corporation	Utility supply	2000.12.18	2024.12.31	Republic of Korea
Contracted service contract	General Electric International, Inc	Supply of water treatment equipment parts and maintenance parts	2012.03.28	2031.12.31	United States of America
Second hydrogen gas sales contract	Hyundai Oilbank Co., Ltd.	Hydrogen gas supply contract	2013.01.16	2024.11.30	Republic of Korea
Business contract	ITS	Maintenance section	2021.10.01	2025.09.30	Republic of Korea
Hydrogen supply contract	Hanwha Energy Corporation	Hydrogen gas supply contract	2018.05.17	2028.05.13	Republic of Korea
Co-development contract and service contract	TotalEnergies Research and Technology Feluy Hanwha Solution	Co-development and service contract for POE commercial technology(*)	2021.08.09	*	Belgium Republic of Korea

(*) Co-develop contract: up to development of commercial technology package (initial development)
Service contract: 5 years from the initial development (however, 8 years in case of construction of commercial factory, possible to extend by mutual agreement)

16. Equity

In accordance with the Articles of Incorporation, the Company is authorized to issue 70 million ordinary shares, with a par value of ₩5,000 per share. As of December 31, 2023 and 2022, the number of ordinary shares issued and fully paid is 19,165,316 in the amount of ₩95,826,580 thousand.

Share premium of the Group represents issued capital in excess of par value and is restricted in use except for being used to offset a deficit or transferred to issued capital in accordance with the Korea Commercial Code.

Accumulated other comprehensive income (loss) of the Group as of December 31, 2023 and 2022 is as follows (Korean won in thousands):

	Dec. 31, 2023	Dec. 31, 2022
Net gain (loss) on valuation of interest rate swaps	₩ (476,202)	₩ 4,893,235
Net gain on valuation of financial instruments measured at FVOCI	1,815,935	1,626,832
Exchange differences on translation of foreign operations	1,307,464	1,441,358
Revaluation surplus at FVOCI	402,055,916	-
	₩ 404,703,113	₩ 7,961,425

Retained earnings as of December 31, 2023 and 2022 are as follows (Korean won in thousands):

	Dec. 31, 2023	Dec. 31, 2022
Appropriated retained earnings:		
Legal reserve (*)	₩ 47,913,290	₩ 47,913,290
Unappropriated retained earnings	2,311,700,666	2,473,128,629
	₩ 2,359,613,956	₩ 2,521,041,919

(*) Under the Commercial Law of the Republic of Korea, the Company must accumulate more than 10% of the cash dividend as a legal reserve by the end of each reporting period until it reaches 50% of the capital. This legal reserve can only be used to offset accumulated deficit or to be transferred to capital through the resolution of the general shareholders' meeting. As of December 31, 2023, the legal reserve of the Company has reached 50% of the capital, so there is no obligation to further accumulate it.

17. Income and expenses

Revenue from contracts with customers

Revenue for each of the two years in the period ended December 31, 2023 is as follows (Korean won in thousands):

	2023	2022
Revenue from contracts with customers:		
Sale of goods and others	₩ 11,368,609,621	₩ 13,773,079,103
Sale of service	113,051,257	218,150,384
	₩ 11,481,660,878	₩ 13,991,229,487

Revenue disaggregated by primary geographical market and timing of revenue recognition for each of the two years in the period ended December 31, 2023 is as follows (Korean won in thousands) :

	2023	2022
Primary geographical market:		
Export	₩ 6,497,462,735	₩ 7,712,740,039
Domestic	4,984,198,143	6,278,489,448
	₩ 11,481,660,878	₩ 13,991,229,487
Timing of revenue recognition:		
At a point in time	₩ 11,368,609,621	₩ 13,773,079,103
Over time	113,051,257	218,150,384
	₩ 11,481,660,878	₩ 13,991,229,487

17. Income and expenses (cont'd)

Details of selling and administrative expenses for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	2022
Salaries	₩ 55,507,229	₩ 47,307,935
Retirement benefits	2,858,797	3,734,374
Employee welfare	27,649,353	24,976,054
Printing	1,040,684	1,093,084
Travel	2,528,750	1,532,532
Communications	470,473	474,903
Training	3,543,994	2,737,697
Supplies	885,483	1,013,253
Repairs	1,181,466	1,176,896
Entertainment	2,237,730	2,420,561
Meeting	666,634	604,740
Vehicle maintenance	689,034	645,205
Transportation	20,953,993	36,173,582
Taxes and dues	4,257,188	4,956,072
Insurance	1,790,614	2,066,967
Commissions and fees	62,556,014	69,268,552
Rents	14,690,565	12,357,257
Market research	3,991,811	3,491,500
Research and development	47,184,181	38,554,066
Depreciation	9,911,307	10,269,042
Amortization of intangible assets	4,302,315	5,271,200
Advertising	5,556,559	4,934,687
Samples	599,551	1,167,951
Events	1,122,214	1,159,275
Packaging	26,146,221	25,480,956
Electronic data processing	17,478,976	17,779,049
Others	1,109,555	1,091,007
Allowance for doubtful accounts (Reversal of allowance for doubtful accounts)	(317,755)	65,540
	₩ 320,592,936	₩ 321,803,937

17. Income and expenses (cont'd)

Details of finance income for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	2022
Interest income	₩ 8,129,139	₩ 5,747,579
Gain on foreign currency transactions	205,458,233	338,632,542
Gain on foreign currency translation	25,773,033	57,705,583
Gain on settlement of derivative instruments	104,012,948	166,697,599
Gain on valuation of derivative instruments	4,772,069	1,863,983
	₩ 348,145,422	₩ 570,647,286

Details of finance costs for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	2022
Interest expenses	₩ 81,910,144	₩ 66,390,240
Loss on foreign currency transactions	209,120,332	369,847,290
Loss on foreign currency translation	14,657,942	48,746,313
Loss on settlement of derivative instruments	108,711,392	179,263,930
Loss on valuation of derivative instruments	1,999,741	21,486,073
	₩ 416,399,551	₩ 685,733,846

Details of other income for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	2022
Gain on disposal of property, plant and equipment	₩ 1,674,640	₩ 72,196
Gain on disposal of intangible assets	-	1
Dividend income	845,798	538,439
Rental income	435,650	407,118
Miscellaneous gain	12,051,410	8,994,812
	₩ 15,007,498	₩ 10,012,566

Details of other expenses for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023	2022
Loss on disposal of property, plant and equipment	₩ 1,544,177	₩ 754,804
Loss on revaluation of land	5,098,977	-
Loss on disposal of intangible assets	69,460	63,621
Impairment loss of emission rights	-	1,839,434
Loss on disposal of trade accounts receivable	16,330,207	11,314,814
Donations	9,709,519	7,383,482
Miscellaneous loss	8,827,862	6,859,418
	₩ 41,580,202	₩ 28,215,573

17. Income and expenses (cont'd)

Expenses by nature

Details of expenses classified based on nature of expenses in cost of goods sold and selling and administrative expenses for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

		2023		2022
Changes in finished goods and semi-finished goods	₩	24,837,004	₩	(28,929,788)
Use of raw materials and others		6,749,444,598		8,183,205,334
Salaries and other benefits		288,027,841		267,539,513
Depreciation		466,539,213		467,201,963
Amortization of intangible assets		5,582,510		7,274,580
Transportation		136,910,313		257,268,819
Advertising		5,561,497		4,950,280
Rents		14,745,978		12,413,402
Power		270,329,653		214,351,081
Utility		1,104,828,514		1,557,016,008
Supplies		56,345,565		58,403,044
Others		2,361,296,755		2,766,510,676
	₩	11,484,449,441	₩	13,767,204,912

Details of salaries and other benefits for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

		2023		2022
Salaries	₩	214,056,261	₩	193,144,501
Retirement benefits		12,317,823		17,178,331
Employee welfare		61,653,757		57,216,681
	₩	288,027,841	₩	267,539,513

18. Income taxes

The major components of income tax expense (benefits) for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

		2023		2022
Current income taxes	₩	1,042,260	₩	16,294,504
Additional income taxes of prior periods		4,360,002		798,641
Changes in deferred taxes		115,427,858		10,836,074
Income tax expenses charged directly to equity		(138,446,780)		(5,981,116)
Income tax expenses (benefits)	₩	(17,616,660)	₩	21,948,103

Details of income tax expense charged directly to equity for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

		2023		2022
Net loss (gain) on valuation of interest rate swaps	₩	1,714,253	₩	(746,733)
Defined benefit liabilities		4,115,050		(4,658,447)
Net gain on valuation of financial instruments measured at FVOCI		(60,374)		(575,936)
Gain on revaluation surplus at FVOCI		(144,215,709)		-
	₩	(138,446,780)	₩	(5,981,116)

18. Income taxes (cont'd)

A reconciliation of profit before tax at the statutory tax rate to income tax for each of the two years in the period ended December 31, 2023 is as follows (Korean won in thousands):

	2023	2022
Profit (loss) before tax	₩ (97,615,396)	₩ 90,735,008
Tax at the statutory tax rate (*)	(22,087,157)	21,495,872
Reconciling items:		
Non-deductible expenses and non-taxable income for tax purposes	1,113,534	367,449
Tax credits		(925,341)
Income tax refund, etc.	4,360,002	798,641
Additional income taxes for prior periods	-	185,064
Others (tax rate differences, etc.)	(1,003,039)	26,418
Income tax expenses (benefits) at the effective tax rate (2023: -, 2022: 24.19%) (**)	₩ (17,616,660)	₩ 21,948,103

(*) The Group is subject to corporate income taxes (including resident sur-taxes), at the aggregate rate of 9.9% (formerly 11%) on taxable income up to ₩200,000 thousand, 20.9% (formerly 22%) on taxable income from ₩200,000 thousand to ₩20,000,000 thousand, 23.1% (formerly 24.2%) on taxable income from ₩20,000,000 thousand to ₩300,000,000 thousand and 26.4% (formerly 27.5%) in excess of ₩300,000,000 thousand.

(**) As profit before income taxes for the year then ended December 31, 2023 is negative, effective tax rate is not calculated.

Significant changes in deferred tax assets (liabilities) for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023			
	Jan. 1	Recognized directly in profit or loss	Recognized directly in equity	Dec. 31
Defined benefit liabilities	₩ (11,564,467)	₩ (1,071,054)	₩ 4,115,050	₩ (8,520,471)
Property, plant and equipment	4,415,206	1,045,601	-	5,460,807
Accrued income	(27,147)	(18,993)	-	(46,140)
Capitalized interest costs	(706,973)	156,910	-	(550,063)
Loss (gain) on valuation of derivative instruments	(1,562,220)	-	1,714,253	152,033
Accrued expenses	16,043,120	(1,232,826)	-	14,810,294
Gain on valuation of financial instruments measured at FVOCI	(519,384)	-	(60,374)	(579,758)
Impairment loss of emission rights	445,143	(12,592)	-	432,551
Loss on revaluation of property, plant and equipment	-	1,346,130	-	1,346,130
Gain on revaluation of land at FVOCI	-	-	(144,215,709)	(144,215,709)
Others	953,661	1,601,381	-	2,555,042
Loss carryforward	-	21,204,365	-	21,204,365
	₩ 7,476,939	₩ 23,018,922	₩ (138,446,780)	₩ (107,950,919)

18. Income taxes (cont'd)

	2022							
		Jan. 1		Recognized directly In profit or loss		Recognized directly in equity		Dec. 31
Defined benefit liabilities	₩	(1,413,220)	₩	(5,492,800)	₩	(4,658,447)	₩	(11,564,467)
Property, plant and equipment		3,412,098		1,003,108		-		4,415,206
Accrued income		(5,623)		(21,524)		-		(27,147)
Capitalized interest costs		(1,024,781)		317,808		-		(706,973)
Gain on valuation of derivative instruments		(815,487)		-		(746,733)		(1,562,220)
Gain (loss) on foreign currency translation		(355)		355		-		-
Accrued expenses		17,236,129		(1,193,009)		-		16,043,120
Gain on valuation of financial instruments measured at FVOCI		56,552		-		(575,936)		(519,384)
Impairment loss of emission rights		-		445,143		-		445,143
Others		867,699		85,962		-		953,661
	₩	18,313,012	₩	(4,854,957)	₩	(5,981,116)	₩	7,476,939

The Group applies the tax rates that are expected to be applied for the year in which the asset is realized or the liability is settled for temporary differences.

19. Earnings per share

The Group's basic and diluted earnings per share for each of the two years in the period ended December 31, 2023are computed as follows (Korean won, except for number of shares):

		2023		2022
Profit (loss) for the year attributable to owners of the parent	₩	(79,998,735,854)	₩	68,786,904,289
Weighted-average number of ordinary shares outstanding		19,165,316 shares		19,165,316 shares
Basic earnings (loss) per share attributable to owners of the parent	₩	(4,174)	₩	3,589

As the Group has no potential dilutive ordinary shares, the basic and diluted earnings per share are the same.

20. Dividends

Details of dividends declared and paid for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands, except for dividends per share):

		2023		2022
Dividends attributable to owners of the Company:				
Interim dividends (2023: N/A, 2022: N/A)	₩	-	₩	-
Annual dividends (2023: N/A, 2022: ₩3,577 per share)		-		68,548,000
	₩	-	₩	68,548,000

The Company's dividend payout ratios for each of the two years in the period ended December 31, 2023are computed as follows (Korean won in thousands):

		2023		2022
Dividends	₩	-	₩	68,548,000
Profit for the year		-		68,548,802
Dividend payout ratio		-		100.00%

21. Supplementary cash flow information

Details of non-cash transaction and working capital adjustments to reconcile profit for the year to net cash flows provided by operating activities for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

Non-cash transaction adjustments

	2023	2022
Retirement benefits	₩ 9,891,608	₩ 14,820,213
Depreciation	466,539,213	467,201,963
Amortization of intangible assets	5,582,510	7,274,580
Allowance for doubtful accounts (Reversal of allowance for doubtful accounts)	(317,755)	65,540
Gain on foreign currency translation	(25,773,033)	(57,705,583)
Loss on foreign currency translation	14,657,942	48,746,313
Gain on disposal of property, plant and equipment	(1,674,640)	(72,196)
Loss on disposal of property, plant and equipment	1,544,177	754,804
Loss on revaluation of on property, plant and equipment	5,098,977	-
Gain on disposal of intangible assets	-	(1)
Loss on disposal of intangible assets	69,460	63,621
Impairment loss of emission rights	-	1,839,434
Finance income – interest income	(8,129,139)	(5,747,579)
Finance costs – interest expenses	81,910,144	66,390,240
Loss on disposal of trade accounts receivable	16,330,207	11,314,814
Gain on valuation of derivative instruments	(4,772,069)	(1,863,983)
Loss on valuation of derivative instruments	1,999,741	21,486,073
Gain on settlement of derivative instruments	(104,012,948)	(166,697,599)
Loss on settlement of derivative instruments	108,711,392	179,263,930
Dividend income	(845,798)	(538,439)
Income tax expenses (benefits)	(17,616,660)	21,948,103
	₩ 549,193,329	₩ 608,544,248

Working capital adjustments

	2023	2022
Trade accounts receivable	₩ (12,621,566)	₩ (199,104,970)
Other accounts receivable	22,029,550	(103,419,932)
Other current assets	(921,723)	(615,332)
Prepaid expenses	5,419,455	(10,919,951)
Inventories	231,796,455	(1,962,320)
Long-term prepaid expenses	244,599	143,961
Trade accounts payable	(104,627,356)	251,589,218
Other accounts payable	207,701,361	176,902,806
Accrual expenses	(1,523,606)	(16,630,120)
Advance receipts	4,369,008	(17,356,199)
Withholdings	505,782	(4,656,953)
Long-term other accounts payable	5,201,611	1,476,815
Other non-current liabilities	1,101,462	(2,287,921)
Retirement benefits transferred from/to affiliates	(2,324,025)	(959,052)
Payment of retirement benefits	857	(594,185)
Contributions to plan assets	(5,000,000)	(45,000,000)
	₩ 351,351,864	₩ 26,605,865

21. Supplementary cash flow information (cont'd)

Significant non-cash transactions for each of the two years in the period ended December 31, 2023are as follows (Korean won in thousands):

	2023	2022
Transfer of construction-in-progress to property, plant and equipment and intangible assets	₩ 379,737,416	₩ 106,745,286
Reclassification of current portion of bonds payable and long-term borrowings	889,455,476	633,526,844
Changes in other accounts payable due to acquisition of property, plant and equipment	358,905	(1,144,671)

Changes in liabilities arising from financing activities for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023						
	January 1	Acquisition of lease assets	Cash flows from financing activities	Foreign exchange rate movement	Amortization	Transfer	December 31
Current liabilities							
Short-term borrowings	₩ 436,270,458	₩ -	₩ (12,720,605)	₩ (726,142)	₩ -	₩ -	₩ 422,823,711
Current portion of bonds payable and long-term borrowings	629,846,025	-	(630,000,000)	8,840,000	918,324	886,085,681	895,690,030
Lease liabilities	3,792,674	9,701,080	(6,832,885)	-	-	3,369,795	10,030,664
	1,069,909,157	9,701,080	(649,553,490)	8,113,858	918,324	889,455,476	1,328,544,405
Non-current liabilities							
Long-term borrowings	276,482,400	-	150,000,000	2,035,530	-	(100,000,000)	328,517,930
Bonds payable	1,254,801,156	-	308,808,040	-	850,200	(786,085,681)	778,373,715
Lease liabilities	7,365,158	3,716,721	-	(97,000)	-	(3,369,795)	7,615,084
	1,538,648,714	3,716,721	458,808,040	1,938,530	850,200	(889,455,476)	1,114,506,729
	₩ 2,608,557,871	₩ 13,417,801	₩ (190,745,450)	₩ 10,052,388	₩ 1,768,524	₩ -	₩ 2,443,051,134

	2022						
	January 1	Acquisition of lease assets	Cash flows from financing activities	Foreign exchange rate movement	Amortization	Transfer	December 31
Current liabilities							
Short-term borrowings	₩ 520,880,396	₩ -	₩ (81,270,847)	₩ (3,339,091)	₩ -	₩ -	₩ 436,270,458
Current portion of bonds payable and long-term borrowings	319,771,979	-	(320,000,000)	-	407,237	629,666,809	629,846,025
Lease liabilities	4,372,897	1,391,448	(5,844,771)	13,065	-	3,860,035	3,792,674
	845,025,272	1,391,448	(407,115,618)	(3,326,026)	407,237	633,526,844	1,069,909,157
Non-current liabilities							
Long-term borrowings	399,879,090	-	175,961,300	521,100	36,797	(299,915,887)	276,482,400
Bonds payable	1,061,630,636	-	488,864,540	32,720,000	1,336,902	(329,750,922)	1,254,801,156
Lease liabilities	10,201,689	1,057,313	-	(33,809)	-	(3,860,035)	7,365,158
	1,471,711,415	1,057,313	664,825,840	33,207,291	1,373,699	(633,526,844)	1,538,648,714
	₩ 2,316,736,687	₩ 2,448,761	₩ 257,710,222	₩ 29,881,265	₩ 1,780,936	₩ -	₩ 2,608,557,871

22. Related party disclosures

Key management personnel are standing directors who have the authority and responsibility for planning, directing and controlling the business of the Group. Compensation for key management personnel consisted of salaries of ₩9,014,435 thousand and ₩5,203,444 thousand for each of the two years in the period ended December 31, 2023, respectively, and retirement benefits of ₩695,156 thousand and ₩1,143,057 thousand for each of the two years in the period ended December 31, 2023, respectively.

The companies that are in a parent-subsidiary relationship with the Company as of December 31, 2023 are as follows:

Relationship	Related party
Jointly controlling entities	Hanwha Impact Corporation
	TotalEnergies Holdings UK Limited

Relationship	Related party
Subsidiary	Dongguan Hanwha TotalEnergies Engineering Plastic Co., Ltd
	Hanwha TotalEnergies Petrochemical (Shanghai) Co., Ltd.

All transactions and outstanding balances between the Company and its subsidiaries are eliminated in the preparation of the consolidated financial statements of the Group.

Significant transactions for each of the two years in the period ended December 31, 2023 and the related outstanding balances as of December 31, 2023 and December 31, 2022 arising from such transactions between the Group and its related parties are as follows (Korean won in thousands):

22. Related party disclosures (cont'd)

	2023					
Related party	Sales and others	Disposal of non-current assets	Purchase of inventories and others	Acquisition of non-current assets	Receivables	Payables
Joint controlling entities:						
Hanwha Impact Corporation	₩ 821,906,577	₩ -	₩ 27,473,088	₩ -	₩ 68,909,317	₩ 3,361,212
TotalEnergies Holdings UK Limited	-	-	3,139,160	-	-	104,785
Other related parties:						
Hanwha Corporation	94,250,706	-	18,711,233	51,097,698	7,640,827	4,216,580
Hanwha Life Insurance Co., Ltd.	8,612,306	-	6,356,200	3,145,011	169,954,850	3,145,011
Hanwha General Insurance Co., Ltd.	-	-	21,649,954	-	-	8,287,255
Carrot General Insurance Co., Ltd.	-	-	1,459,590	-	-	-
Hanwha Systems Co., Ltd.	120,418	-	16,064,162	3,964,972	3,938	5,093,500
Hanwha Power Systems Co., Ltd.	-	-	6,536,878	4,274,057	-	4,104,524
Hanwha Solution Corporation	-	-	5,235,227	9,870	-	1,045,427
Hanwha Advanced Materials Co., Ltd.	69,403,234	-	-	-	1,452,560	-
Hanwha Energies Co., Ltd.	67,878,249	-	-	-	6,405,235	-
Hanwha Compound Co.,Ltd	2,983,848	-	5,990,178	-	196,710	1,045,350
Hanwha Hotels & Resorts Co.,Ltd.	15,019	568,400	1,468,088	616,000	1,120	69,294
Hanwha Galleria.(*1)	-	-	1,467,478	26,998	-	31,685
Hanwha Ocean	2,174,385		-	-	977,417	-
Hanwha Japan Co., Ltd. (Formerly, Hanwha Q Cells Japan Co., Ltd.)	4,730,746	-	2,632,989	148,858	34,150	1,572,519
Hanwha Energy Corporation Singapore Pte. Ltd. (*2)	9,134		2,525	-	-	-
TRI Energy Global Pte. Ltd. (*2)	11,283,952	-	-	-	-	-
Hanwha International LLC	583,935	-	288,998	38,995	-	27,941
Hanwha Europe GmbH	3,878,163		45,810	-	78,106	28,913
TotalEnergies Petrochemicals and Refining SA/NV	91,699,232	-	719,782	-	12,754,355	246,443
TotalEnergies SE	1,012,266	-	17,162,194	-	3,736,064	-
TotalEnergies Trading Asia Pte. Ltd.	973,796,833	-	782,996,291	-	30,389,138	80,623,372
TOTSA TotalEnergies Trading SA	19,668,161	-	31,030,318	-	7,644,328	1,146,921
TotalEnergies Petrochemicals (Hong Kong) Limited	9,158,943	-	4,665,954	-	1,798,830	917,847
TotalEnergies Marketing Asia-Pacific Middle East Pte. Ltd	5,650,891	-	-	-	292,687	-
TotalEnergies Fluids	3,917,777	-	-	-	579,777	-
TotalEnergies One Tech Belgium S.A. (Formerly, Total Research & Technology Feluy S.A.)	-	-	-	1,950,750	-	-
TotalEnergies Marketing (Shanghai) Co. Ltd. (Formerly, Total Petroleum (Shanghai) Co.,Ltd.)	3,431,293	-	-	-	170,459	-
TotalEnergies Petrochemicals (Shanghai) Co., Ltd. (Formerly, Total Petrochemicals (Shanghai) Ltd. Zhenjiang Branch)	3,977,844	-	-	-	-	1,369,548
Others	441,544	-	970,324	338,705	125,302	14,767
	₩ 2,200,585,456	₩ 568,400	₩ 956,066,421	₩ 65,611,914	₩ 313,145,170	₩ 116,452,894

(*1) As of March 2, 2023, Hanwha Galleria split off from Hanwha Solution.
(*2) As of March 31, 2023, TRI Energy Global Pte. Ltd. and Hanwha Energy Corporation Singapore Pte. Ltd. merged to Hanwha Energy Corporation Singapore Pte. Ltd, and the amounts of TRI Energy Global Pte. Ltd. above represents the transactions occurred before being merged.

22. Related party disclosures (cont'd)

	2022					
Related party	Sales and others	Disposal of non-current assets	Purchase of inventories and others	Acquisition of non-current assets	Receivables	Payables
Joint controlling entities:						
Hanwha Impact Corporation	₩ 881,341,690	₩ -	₩ 32,304,255	₩ 2,267,128	₩ 68,320,537	₩ 3,901,075
TotalEnergies Holdings UK Limited	-	-	2,905,458	-	-	110,557
Other related parties:						
Hanwha Corporation	134,594,004	-	23,663,053	22,128,696	12,815,719	10,533,093
Hanwha Construction Co., Ltd (*1)	-	-	256,800	51,827,488	-	1,487,239
Hanwha Life Insurance Co., Ltd.	3,271,080	-	5,753,930	-	175,310,097	1
Hanwha General Insurance Co., Ltd.	-	-	28,536,088	-	-	9,700,981
Carrot General Insurance Co., Ltd.	-	-	929,075	-	-	-
Hanwha Systems Co., Ltd.	57,939	-	16,626,301	1,180,120	4,201	4,583,624
Hanwha Power Systems Co., Ltd.	-	-	984,440	1,936,143	-	1,901,814
Hanwha Techwin Co., Ltd.	-	-	-	1,408,170	-	-
Hanwha Solution Corporation	155,468,537	-	6,495,860	-	-	992,746
Hanwha Advanced Materials Co., Ltd. (*2)	11,375,947	-	-	-	12,513,541	-
Hanwha Hotels & Resorts Co.,Ltd.	12,257	1,705,000	2,318,934	-	1,062	55,917
Hanwha Energies Co., Ltd.	75,030,911	-	-	-	8,731,843	-
Hanwha Compound Co.,Ltd	2,236,333	-	5,651,523	-	162,013	652,145
Hanwha Q CELLS Japan Co., Ltd.	5,241,124	-	2,998,307	-	-	1,027
TRI Energy Global Pte. Ltd.	489,513,464	-	235,653,952	-	13,941,951	-
Hanwha International LLC	4,287,938	-	344,048	-	-	-
TotalEnergies Petrochemicals and Refining SA/NV	112,211,370	-	383,546	-	11,812,449	199,894
TotalEnergies SE	-	-	20,900,226	-	-	6,152,054
TotalEnergies Trading Asia Pte. Ltd. (*3)	1,080,984,900	-	772,680,410	-	35,110,270	334,823,877
TOTSA TotalEnergies Trading SA	32,686,029	-	53,300,897	-	7,815,323	4,269,285
TotalEnergies Petrochemicals (Hong Kong) Limited	3,325,822	-	872,485	-	1,892,385	-
TotalEnergies Petrochemicals and Refining USA, inc.	4,294,149	-	-	-	-	-
TotalEnergies Marketing Asia-Pacific	5,221,256	-	-	-	342,039	-
Total Petroleum (Shanghai) Co.,Ltd	3,160,181	-	-	-	162,106	-
TotalEnergies Fluids	13,135,751	-	-	-	2,198,876	-
Total Petrochemicals (Shanghai) Ltd. Zhenjiang Branch	7,466,423	-	-	-	-	124
Others	833,167	-	498,970	-	122,846	60,682
	₩ 3,025,750,272	₩ 1,705,000	₩ 1,214,058,558	₩ 80,747,745	₩ 351,257,258	₩ 379,426,135

(*1) Hanwha Construction Co., Ltd. merged to Hanwha Corporation on November 1, 2022. Transactions with Hanwha Construction Co., Ltd. occurred from January 1, 2022 to October 31, 2022.
(*2) Hanwha Advanced Materials Co., Ltd. was split from Hanwha Solution Corporation on December 1, 2022.
(*3) Inventory swap transactions amount is included.

The Group paid ₩68,548 million and ₩441,030 million of dividends to its jointly controlling entities, Hanwha Impact and TotalEnergies Holdings UK Limited during the each of the two years in the period ended December 31, 2023, respectively.
As of December 31, 2023, receivables and payables are settled in cash on an unsecured and non-interest bearing basis. In addition, the Group does not provide any payment guarantees in relation to receivables and payables among related parties. Meanwhile, the Group has not recognized any impairment loss on receivables from related parties for the year ended December 31, 2023, and valuation of receivables from related parties is conducted every reporting period based on the review of the financial condition of the related parties and market conditions.

23. Segment information

The financial information about geographic areas where the related parties are located for each of the two years in the period ended December 31, 2023 are as follows (Korean won in thousands):

	2023			
	Korea	China	Consolidation elimination	Total
Sales	₩ 11,438,129,368	₩ 55,344,509	₩ -	₩ 11,493,473,877
Inter-company sales	4,728,379	7,084,620	(11,812,999)	-
Net sales	11,433,400,989	48,259,889	-	11,481,660,878
Operating profit	(5,827,570)	3,315,770	(276,763)	(2,788,563)
Profit (loss) for the period	(82,258,422)	2,536,449	(276,763)	(79,998,736)
Non-current assets (*)	4,753,746,416	8,759,146	-	4,762,505,562

(*) Financial instruments, deferred tax assets and others are excluded from the non-current assets.

	2022			
	Korea	China	Consolidation elimination	Total
Sales	₩ 13,958,692,890	₩ 55,773,059	₩ -	₩ 14,014,465,949
Inter-company sales	12,390,311	10,846,151	(23,236,462)	-
Net sales	13,946,302,579	44,926,908	-	13,991,229,487
Operating profit	220,610,319	2,731,031	683,225	224,024,575
Profit (loss) for the period	68,548,802	2,168,363	(1,930,261)	68,786,904
Non-current assets (*)	4,226,613,818	9,494,482	-	4,236,108,300

(*) Financial instruments, deferred tax assets and others are excluded from the non-current assets.

The Group has no single major client which makes up over 10% of its total sales for each of the two years in the period ended December 31, 2023.

24. Financial risk management objectives and policies

The Group's principal financial liabilities comprise borrowings, bonds payable, trade and other accounts payable. The main purpose of these financial liabilities is to finance the Group's operations. The Group also has various financial assets including trade and notes receivable and cash and cash equivalents that arise directly from its operations.

The Group is exposed to market risk, credit risk and liquidity risk and the Group's key management oversees the management of these risks. It is the Group's policy that no trading in derivatives for speculative purposes shall be undertaken.

(1) Market risk
Market risk is the risk that the fair value of future cash flows of a financial instrument will fluctuate because of changes in market prices. Market risks comprise three types of risk: interest rate risk, foreign currency risk and feedstock price risk.

1) Interest rate risk
Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The Group's exposure to the risk of changes in market interest rates relates primarily to the Group's long-term debt obligations with floating interest rates. The Group manages its interest rate risk by having a balanced portfolio of fixed and variable rate loans and borrowings with the interest rate swap contracts. Borrowings with floating interest rates (nominal amounts) are ₩370,000,000 thousand and ₩370,000,000 thousand as of December 31, 2023 and 2022, respectively. The impact of changes in market interest rates on the fair value of future cash flows of the Group's financial instruments, after taking into account the currency swap contracts, is not material.

24. Financial risk management objectives and policies (cont'd)

2) Foreign currency risk
Foreign currency risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates. The Group's exposure to the risk of changes in foreign exchange rates relates primarily to the Group's operating activities (when revenue or expense is denominated in a different currency from the Group's functional currency) and the Group's net investment in foreign subsidiaries. The Group manages its foreign currency risk periodically, especially by entering into currency forward and currency interest rate swap contracts.

Significant monetary assets and liabilities denominated in foreign currencies as of December 31, 2023 and 2022 are as follows (US dollar in thousands and Korean won in thousands):

	Dec. 31, 2023				Dec. 31, 2022			
	Currency	Foreign currencies	In equivalent of Korean won		Currency	Foreign currencies	In equivalent of Korean won	
Financial assets	USD	495,593	₩	639,018,079	USD	406,793	₩	515,528,994
	Others			38,399,821	Others			45,644,269
			₩	677,417,900			₩	561,173,263
Financial liabilities	USD	1,067,536	₩	1,376,480,931	USD	1,188,636	₩	1,506,358,108
	Others			11,708,447	Others			16,039,309
			₩	1,388,189,378			₩	1,522,397,417

The following table demonstrates the sensitivity to a reasonably possible change in the US dollar exchange rate, with all other variables held constant. The Group's exposure to foreign currency changes for all other currencies is not material (Korean won in thousands):

	2023				2022			
	(+) 10%		(-) 10%		(+) 10%		(-) 10%	
Increase (decrease) in profit for the year	₩	(4,634,774)	₩	4,634,774	₩	(3,709,290)	₩	3,709,290

3) Feedstock price risk
Feedstock price risk is the risk that the Group's income and cash flow will change due to the fluctuations in international market prices of the Group's feedstock including condensate. The Group entered into a commodity swap to hedge the risk of changes in feedstock. The commodity swap is exposed to the risk of changes in fair value. However, the price changes in fair value of the commodity swap can be offset with changes in operating margin. Therefore, the risk of changes in feedstock price is appropriately managed.

(2) Credit risk
Credit risk is the risk that counterparty will not meet its obligations under a financial instrument or customer contract, leading to a financial loss of the Group.

1) Trade and other accounts receivable
Customer credit risk is managed by each business unit subject to the Group's established policy, procedures and control relating to customer credit risk management. Credit quality of the customer is assessed based on an extensive credit rating scorecard and individual credit limits are defined in accordance with this assessment. As of December 31, 2023, trade accounts receivable from the top five customers accounted for 31.9% or ₩277,253,964 thousand of total trade accounts receivable.

As of December 31, 2023, the Group analyzes on an individual basis whether there is any impairment on the receivables from major customers. In addition, for small-size numerous receivables, the Group includes them in a group of financial assets with similar credit risk characteristics and reviews for impairment on a collective basis. The estimation of impairment is based on data on historical loss experience, and the maximum exposure to credit risk as of December 31, 2023 is the carrying amount of financial assets by category described in Note 3.

24. Financial risk management objectives and policies (cont'd)

2) Other financial assets
Credit risks associated with the Group's other financial assets which consist of bank deposits and long-term loans arise from the default by the counterparties. Maximum exposure to credit risks will be the carrying value of such financial assets. The Group deposits its surplus funds in the financial institutions whose credit ratings are high and, therefore, credit risks related to such financial institutions are considered limited.

(3) Liquidity risk
Liquidity risk refers to the risk that the Group may default on the contractual obligations that become due. The Group monitors its risk to a shortage of funds using a recurring liquidity planning tool.

The Group's objective is to maintain a balance between continuity of funding and flexibility through the use of bank overdrafts, bank borrowings and bonds. The table below summarizes the maturity profile of the Group's financial liabilities based on contractual undiscounted payments (Korean won in thousands):

	Dec. 31, 2023				
	Within 3 months	3 months ~ 1 year	1 year ~ 5 years	Over 5 years	Total
Bonds payable and borrowings (*)	₩ 938,583,711	₩ 380,000,000	₩ 1, 108,517,930	₩ -	₩ 2, 427,101,641

	Dec. 31, 2022				
	Within 3 months	3 months ~ 1 year	1 year ~ 5 years	Over 5 years	Total
Bonds payable and borrowings (*)	₩ 776,270,458	₩ 290,000,000	₩ 1,533,402,400	₩ -	₩ 2,599,672,858

(*) Lease liabilities are excluded from the bonds payable and borrowings.

54.4% of the Group's financial liabilities will mature in less than one year as of December 31, 2023 based on the carrying value of bonds payable and borrowings reflected in the consolidated financial statements. The Group assessed the concentration of risk with respect to refinancing its debt and concluded it to be manageable.

(4) Capital management
The primary objective of the Group's capital management is to ensure that it maintains a strong credit rating and healthy capital ratios in order to support its business and maximize shareholder value. The Group manages its capital structure and makes adjustments to it in light of changes in economic conditions. No changes were made in the objectives, policies or processes during the each of the two years in the period ended December 31, 2023. The Group's debt-to-equity ratios as of December 31, 2023 and 2022 are 109.6% and 115.7%, respectively.

25. Events after the reporting period

In accordance with the decision of the Board of Directors on December 13, 2023, the Group issued foreign public placement bonds amounting to $400 million (KRW 537.3 billion) on January 18, 2024.