Hanwha Total Petrochemical Co., Ltd.
and its subsidiaries

Consolidated financial statements
for the years ended December 31, 2021 and 2020
with the independent auditor's report

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Independent auditor's report

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

Opinion

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

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

Basis for opinion

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

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.

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

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

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

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

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

Ernst & Young Han Young

March 18, 2022

This audit report is effective as of March 18, 2022, the independent auditor's report date. Accordingly, certain material subsequent events or circumstances may have occurred during the period from the independent auditor's report date to the time this report is used. Such events and circumstances could significantly affect the accompanying consolidated financial statements and may result in modifications to this report.

Hanwha Total Petrochemical Co., Ltd.
and its subsidiaries

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

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

Jong Seo Kim & Thierry Boulfroy
Chief Executive Officers
Hanwha Total Petrochemical Co., Ltd.

Hanwha Total Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of financial position
as of December 31, 2021 and 2020

(Korean won)

	Notes		2021		2020
Assets					
Current assets:					
Cash and cash equivalents	3	₩	181,015,315,864	₩	231,451,124,896
Short-term investment securities	3		-		90,834,800,000
Trade and other accounts receivable, net	3,4,13, 22,24		794,291,436,567		606,333,255,566
Prepaid expenses			20,851,736,570		16,640,694,136
Other current assets			1,212,667,071		2,508,006,515
Inventories, net	5		1,856,113,596,189		1,061,699,446,067
Total current assets			2,853,484,752,261		2,009,467,327,180
Non-current assets:					
Long-term investment securities	3,6		8,458,871,766		16,870,305,966
Long-term loans, net	3,4		1,183,333,360		949,384,680
Long-term accounts receivable, net	3,4,24		42,088,244,197		3,538,133,847
Long-term prepaid expenses			801,723,057		54,402,395,386
Property, plant and equipment, net	7,8,23		4,474,108,177,289		4,530,968,329,898
Intangible assets, net	9,23		30,667,998,330		31,510,628,005
Defined benefit assets, net	12		6,470,790,095		4,725,934,016
Other non-current assets	3		14,500,000		15,500,000
Deferred tax assets	18		18,313,012,727		9,032,216,704
Total non-current assets			4,582,106,650,821		4,652,012,828,502
Total assets		**₩**	**7,435,591,403,082**	**₩**	**6,661,480,155,682**

(Continued)

Hanwha Total Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of financial position
as of December 31, 2021 and 2020 (cont'd)

(Korean won)

	Notes		2021		2020
Liabilities					
Current liabilities:					
Trade and other accounts payable	3,13,14,22	₩	997,068,571,045	₩	592,264,516,317
Short-term borrowings	3,4,10,21,24		520,880,396,330		94,768,700,797
Current portion of bonds payable and long-term borrowings	3,8,10, 21,24		324,144,876,464		603,994,382,294
Income tax payable			224,536,618,366		20,013,674,145
Other current liabilities	11		42,686,899,701		33,883,695,449
Total current liabilities			2,109,317,361,906		1,344,924,969,002
Non-current liabilities:					
Bonds payable, net	3,10,21,24		1,061,630,636,013		1,340,919,474,134
Long-term borrowings	3,8,10,21,24		410,080,778,963		508,678,257,589
Long-term accounts payable	3		180,772,009		78,199,855
Other non-current liabilities			10,435,273,405		10,099,605,540
Total non-current liabilities			1,482,327,460,390		1,859,775,537,118
Total liabilities			**3,591,644,822,296**		**3,204,700,506,120**
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		4,528,011,728		5,078,280,408
Retained earnings	16		2,878,693,682,391		2,490,976,482,487
			3,843,946,580,786		3,456,779,649,562
Non-controlling interests			-		-
Total equity			**3,843,946,580,786**		**3,456,779,649,562**
Total liabilities and equity		**₩**	**7,435,591,403,082**	**₩**	**6,661,480,155,682**

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

Hanwha Total Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of comprehensive income
for the years ended December 31, 2021 and 2020

(Korean won)

	Notes		2021		2020
Sales	17,22,23	₩	9,859,591,273,782	₩	6,812,198,771,460
Cost of goods sold	5,17,22		8,573,369,873,629		6,478,699,308,188
Gross profit			**1,286,221,400,153**		**333,499,463,272**
Selling and administrative expenses	15,17		293,330,316,218		234,188,068,446
Operating profit	23		**992,891,083,935**		**99,311,394,826**
Finance income	3,13,17		192,977,987,147		303,921,415,204
Finance costs	3,13,17		292,792,767,608		252,559,755,748
Other income	17		17,854,594,449		15,531,029,671
Other expenses	17		35,776,230,505		26,901,550,844
Profit before tax			**875,154,667,418**		**139,302,533,109**
Income tax expenses	18		227,171,201,216		29,849,478,299
Profit for the year	23	**₩**	**647,983,466,202**	**₩**	**109,453,054,810**
Other comprehensive income					
Other comprehensive income that may be reclassified to profit or loss in subsequent periods:					
Net gain on valuation of interest rate swaps	13		2,997,447,092		1,338,385,072
Exchange differences on translation of foreign operations			2,729,085,182		277,380,786
Net other comprehensive income that may be reclassified to profit or loss in subsequent periods			**5,726,532,274**		**1,615,765,858**
Other comprehensive income (loss) that will not be reclassified to profit or loss in subsequent periods:					
Remeasurement gain (loss) on net defined benefit liabilities (assets)	12		2,192,733,702		(4,873,901,110)
Net gain (loss) on valuation of financial instruments measured at FVOCI	6		(6,276,800,954)		5,362,916,419
Net other comprehensive income (loss) that will not be reclassified to profit or loss in subsequent periods			**(4,084,067,252)**		**489,015,309**
Other comprehensive income for the year, net of tax			**1,642,465,022**		**2,104,781,167**
Total comprehensive income for the year, net of tax		**₩**	**649,625,931,224**	**₩**	**111,557,835,977**
Profit for the year attributable to:					
Owners of the parent		₩	647,983,466,202	₩	109,453,054,810
Non-controlling interests			-		-
		₩	647,983,466,202	₩	109,453,054,810
Total comprehensive income for the year attributable to:					
Owners of the parent			649,625,931,224		111,557,835,977
Non-controlling interests			-		-
		₩	649,625,931,224	₩	111,557,835,977
Earnings per share:					
Basic and diluted, earnings per share	19	₩	33,810	₩	5,711

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

Hanwha Total Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of changes in equity
for the years ended December 31, 2021 and 2020
(Korean won)

	Issued capital	Share premium	Accumulated other comprehensive income(loss)	Retained earnings	Equity attributable to owners of the parent	Non-controlling interests	Total equity
As of January 1, 2020	**₩ 95,826,580,000**	**₩ 864,898,306,667**	**₩ (1,074,259,885)**	**₩ 2,638,563,186,803**	**₩ 3,598,213,813,585**	**₩ -**	**₩ 3,598,213,813,585**
Profit for the year	-	-	-	109,453,054,810	109,453,054,810	-	109,453,054,810
Net gain on valuation of interest rate swaps (Note 13)	-	-	1,338,385,072	-	1,338,385,072	-	1,338,385,072
Exchange differences on translation of foreign operations	-	-	277,380,786	-	277,380,786	-	277,380,786
Re-measurement gain on net defined benefit assets (Note 12)	-	-	-	(4,873,901,110)	(4,873,901,110)	-	(4,873,901,110)
Net gain on valuation of financial instruments measured at FVOCI (Note 6)	-	-	5,362,916,419	-	5,362,916,419	-	5,362,916,419
Reclassification of gain on valuation of financial instruments measured at FVOCI	-	-	(826,141,984)	826,141,984	-	-	-
Total comprehensive income for the year	-	-	6,152,540,293	105,405,295,684	111,557,835,977	-	111,557,835,977
Annual dividends (Note 20)	-	-	-	(222,992,000,000)	(222,992,000,000)	-	(222,992,000,000)
Interim dividends (Note 20)	-	-	-	(30,000,000,000)	(30,000,000,000)	-	(30,000,000,000)
As of December 31, 2020	**₩ 95,826,580,000**	**₩ 864,898,306,667**	**₩ 5,078,280,408**	**₩ 2,490,976,482,487**	**₩ 3,456,779,649,562**	**₩ -**	**₩ 3,456,779,649,562**
As of January 1, 2021	**₩ 95,826,580,000**	**₩ 864,898,306,667**	**₩ 5,078,280,408**	**₩ 2,490,976,482,487**	**₩ 3,456,779,649,562**	**₩ -**	**₩ 3,456,779,649,562**
Profit for the year	-	-	-	647,983,466,202	647,983,466,202	-	647,983,466,202
Net gain on valuation of interest rate swaps (Note 13)	-	-	2,997,447,092	-	2,997,447,092	-	2,997,447,092
Exchange differences on translation of foreign operations	-	-	2,729,085,182	-	2,729,085,182	-	2,729,085,182
Re-measurement gain on net defined benefit assets (Note 12)	-	-	-	2,192,733,702	2,192,733,702	-	2,192,733,702
Net loss on valuation of financial instruments measured at FVOCI (Note 6)	-	-	(6,276,800,954)	-	(6,276,800,954)	-	(6,276,800,954)
Total comprehensive income for the year	-	-	(550,268,680)	650,176,199,904	649,625,931,224	-	649,625,931,224
Annual dividends (Note 20)	-	-	-	(57,459,000,000)	(57,459,000,000)	-	(57,459,000,000)
Interim dividends (Note 20)	-	-	-	(205,000,000,000)	(205,000,000,000)	-	(205,000,000,000)
As of December 31, 2021	**₩ 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**

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

Hanwha Total Petrochemical Co., Ltd. and its subsidiaries
Consolidated statements of cash flows
for the years ended December 31, 2021 and 2020
(Korean won)

	2021	2020
Cash flows from operating activities:		
Profit for the year	₩ 647,983,466,202	₩ 109,453,054,810
Non-cash adjustments to reconcile profit for the year to net cash flows provided by operating activities (Note 21)	816,147,388,301	434,626,870,442
Working capital adjustments (Note 21)	(617,561,459,137)	210,822,386,009
Interest received	1,020,528,706	1,922,565,069
Income tax paid	(31,617,960,423)	(53,099,889,290)
Net cash flows provided by operating activities	**815,971,963,649**	**703,724,987,040**
Cash flows from investing activities:		
Decrease in short-term investment securities	90,887,150,000	-
Increase in short-term investment securities	-	(90,854,400,000)
Decrease in long-term loans	56,051,320	73,591,023
Increase in long-term loans	(290,000,000)	(760,000,000)
Proceeds from disposal of long-term investment securities	130,694,155	2,311,852,469
Acquisition of long-term investment securities	-	(1,087,200)
Decrease in long-term accounts receivable	96,244,261	524,927,119
Increase in long-term accounts receivable	(255,864,288)	(259,876,000)
Decrease in long-term financial assets	1,000,000	-
Proceeds from disposal of property, plant and equipment	1,882,767,980	2,627,523,903
Acquisition of property, plant and equipment	(337,983,267,231)	(507,587,603,994)
Proceeds from disposal of intangible assets	-	1,664,090,905
Acquisition of intangible assets	-	(460,998,006)
Settlement of derivatives	(26,182,303,225)	78,392,543,484
Dividends received	242,297,460	175,767,495
Decrease in deposits received	(123,201,233)	-
Net cash flows used in investing activities	**(271,538,430,801)**	**(514,153,668,802)**
Cash flows from financing activities:		
Net increase (decrease) in short-term borrowings (Note 21)	225,991,274,920	(38,220,860,861)
Repayment of current portion of bonds payable and long-term borrowings (Note 21)	(605,254,620,578)	(425,114,985,055)
Increase in long-term borrowings (Note 21)	100,000,000,000	500,000,000,000
Repayment of long-term borrowings (Note 21)	-	(50,265,000,000)
Interest paid	(54,121,285,197)	(60,320,652,153)
Dividends paid	(262,459,000,000)	(252,992,000,000)
Net cash flows used in financing activities	**(595,843,630,855)**	**(326,913,498,069)**
Net decrease in cash and cash equivalents	**(51,410,098,007)**	**(137,342,179,831)**
Cash and cash equivalents as of January 1	**231,451,124,896**	**368,644,459,888**
Net foreign exchange difference	**974,288,975**	**148,844,839**
Cash and cash equivalents as of December 31	**₩ 181,015,315,864**	**₩ 231,451,124,896**

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

1. General information

Corporate information

Hanwha Total 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") (currently, Hanwha Impact Corporation) 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, 2021, the issued and outstanding shares of the Company are equally owned by TotalEnergies Holdings and Hanwha Impact Corporation (formerly, Hanwha General Chemical Co., Ltd.)

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, 2021 and 2020 are as follows:

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

Summarized financial information of the consolidated subsidiaries as of and for the years ended December 31, 2021 and 2020, which has been included in the accompanying consolidated financial statements, is as follows (Korean won in thousands):

	2021					
Subsidiary	Assets	Liabilities	Equity	Revenue	Profit for the year	Total comprehensive income
Dongguan Hanwha Total Engineering Plastic Co., Ltd.	₩ 30,114,406	₩ 5,633,150	₩ 24,481,256	₩ 46,701,317	₩ 1,316,355	₩ 3,775,392
Hanwha Total Petrochemical Trading (Shanghai) Co., Ltd.	₩ 5,231,931	₩ 2,468,289	₩ 2,763,642	₩ 5,610,423	₩ 276,498	₩ 546,547

1. General information (cont'd)

	2020											
Subsidiary		Assets		Liabilities		Equity		Revenue		Profit for the year		Total comprehensive income
Dongguan Hanwha Total Engineering Plastic Co., Ltd.	₩	24,821,820	₩	4,115,955	₩	20,705,865	₩	36,762,976	₩	2,297,111	₩	2,512,305
Hanwha Total Petrochemical Trading (Shanghai) Co., Ltd.	₩	2,839,626	₩	622,531	₩	2,217,095	₩	4,952,319	₩	239,708	₩	301,895

There were no changes in the scope of consolidation for the years ended December 31, 2021 and 2020.

2. Basis of preparation and summary of significant accounting policies

Basis of preparation

The Group prepares its statutory consolidated financial statements in the Korean language in conformity with Korean International Financial Reporting Standards ("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, 2021 and 2020. 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
- 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 significant 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
- 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 balance sheet date. 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 significant 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 significant 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 significant 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 significant 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 significant 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
- 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.
- 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 significant 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 significant accounting policies (cont'd)

Property, plant and equipment

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 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	5~20
Vehicles and others	1~13

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 (calculated as the difference between the net disposal proceeds and the carrying amount 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 adjusted prospectively, if appropriate.

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:

	Years
Buildings	2~8
Structures	2~30
Machinery and equipment	2~10
Vehicles	2~8
Others	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" of the accounting policies section, right-of-use assets are also subject to impairment.

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

(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, 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 are 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.

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.

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

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 of 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.

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

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

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 significant 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
- 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
- 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 significant 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.

Significant 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 significant 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 significant 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

Except for the application of the new and amended standards described below, the Group applied for the first-time certain standards and amendments, which are effective for annual periods beginning on or after January 1, 2021.

Property, Plant and Equipment: Proceeds before Intended Use – Amendments to KIFRS 1016
The amendment prohibit entities deducting from the cost of an item of property, plant and equipment, any proceeds from selling items produced while bringing that asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Instead, an entity recognizes the proceeds from selling such items, and the costs of producing those items, in profit or loss.
The amendment is effective for annual reporting periods beginning on or after January 1, 2022 and must be applied retrospectively to items of property, plant and equipment made available for use on or after the beginning of the earliest period presented when the entity first applies the amendment.

In accordance with the amendments to KIFRS 1016, Property, Plant and Equipment, the Group is located in a location and condition to enable management to operate in the manner intended after the beginning of the earliest period shown in the financial statements to which the amendments are first applied. A transitional rule requiring that these amendments be applied retrospectively only to earlier tangible assets, with the cumulative effect of initial application being recognized by adjusting the opening balance of retained earnings (or other components of equity, as appropriate) at the beginning of the earliest period presented. The cumulative effect of retroactive application was recognized in retained earnings on January 1, 2020 (The beginning of the fiscal year when the amendment is applied for the first time.).

The early adoption effect due to the amendment of KIFRS 1016 "Property, Plant and Equipment" on the consolidated statements of financial position as of December 31, 2021 and 2020, the consolidated statements of comprehensive income and the consolidated statements of cash flow for the years then ended are as follows.

A. As of and for the year ended December 31, 2020

Consolidated statement of financial position

	2020 (before adjustment)	Adjustment	2020 (restated)
Property, plant and equipment, net	₩ 4,538,254,282,160	₩ (7,285,952,262)	₩ 4,530,968,329,898
Deferred tax assets	7,269,016,257	1,763,200,447	9,032,216,704
Total assets	6,667,002,907,497	(5,522,751,815)	6,661,480,155,682
Total liabilities	3,204,700,506,120	-	3,204,700,506,120
Retained earnings	2,496,499,234,302	(5,522,751,815)	2,490,976,482,487
Total equity	3,462,302,401,377	(5,522,751,815)	3,456,779,649,562

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

Consolidated statement of comprehensive income

	2020 (before adjustment)	Adjustment	2020 (restated)
Sales	₩ 6,762,650,159,635	₩ 49,548,611,825	₩ 6,812,198,771,460
Cost of goods sold	6,422,139,229,943	56,560,078,245	6,478,699,308,188
Selling and administrative expenses	234,073,691,177	114,377,269	234,188,068,446
Other income and expenses (*)	40,151,246,856	(160,108,573)	39,991,138,283
Profit before tax	146,588,485,371	(7,285,952,262)	139,302,533,109
Profit for the year	114,975,806,625	(5,522,751,815)	109,453,054,810
Earnings per share	5,999	(288)	5,711

(*) Other income and expenses include finance income, finance cost, other income, and other expenses from the consolidated statements of comprehensive income

Consolidated statement of cash flows

	2020 (before adjustment)	Adjustment	2020 (restated)
Cash flows from operating activities	₩ 711,404,440,071	₩ (7,679,453,031)	₩ 703,724,987,040
Profit for the year	114,975,806,625	(5,522,751,815)	109,453,054,810
Non-cash adjustments to reconcile profit for the year to net cash flows provided by operating activities	436,783,571,658	(2,156,701,216)	434,626,870,442
Cash flows from investing activities	(521,833,121,833)	7,679,453,031	(514,153,668,802)
Acquisition of property, plant and equipment	(515,267,057,025)	7,679,453,031	(507,587,603,994)
Cash flows from financing activities	(326,913,498,069)	-	(326,913,498,069)
Net decrease in cash and cash equivalents	(137,342,179,831)	-	(137,342,179,831)

B. As of and for the year ended December 31, 2021

Consolidated statement of financial position

	2021 (before adjustment)	Adjustment	2021 (restated)
Property, plant and equipment, net	₩ 4,475,579,131,437	₩ (1,470,954,148)	₩ 4,474,108,177,289
Deferred tax assets	17,957,041,823	355,970,904	18,313,012,727
Total assets	7,436,706,386,326	(1,114,983,244)	7,435,591,403,082
Total liabilities	3,591,644,822,296	-	3,591,644,822,296
Retained earnings	2,879,808,665,635	(1,114,983,244)	2,878,693,682,391
Total equity	3,845,061,564,030	(1,114,983,244)	3,843,946,580,786

Consolidated statement of comprehensive income

	2021 (before adjustment)	Adjustment	2021 (restated)
Sales	₩ 9,824,489,501,308	₩ 35,101,772,474	₩ 9,859,591,273,782
Cost of goods sold	8,544,440,571,791	28,929,301,838	8,573,369,873,629
Selling and administrative expenses	293,319,513,007	10,803,211	293,330,316,218
Other income and expenses (*)	(117,389,747,206)	(346,669,311)	(117,736,416,517)
Profit before tax	869,339,669,304	5,814,998,114	875,154,667,418
Profit for the year	643,575,697,632	4,407,768,570	647,983,466,202
Earnings per share	33,580	230	33,810

(*) Other income and expenses include finance income, finance cost, other income, and other expenses from the consolidated statements of comprehensive income

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

Consolidated statements of cash flows

	2021 (before adjustment)	Adjustment	2021 (restated)
Cash flows from operating activities	₩ 810,429,954,479	₩ 5,542,009,170	₩ 815,971,963,649
Profit for the year	643,575,697,632	4,407,768,570	647,983,466,202
Non-cash adjustments to reconcile profit for the year to net cash flows provided by operating activities	815,013,147,701	1,134,240,600	816,147,388,301
Cash flows from investing activities	(265,996,421,631)	(5,542,009,170)	(271,538,430,801)
Acquisition of property, plant and equipment	(332,441,258,061)	(5,542,009,170)	(337,983,267,231)
Cash flows from financing activities	(595,843,630,855)	-	(595,843,630,855)
Net decrease in cash and cash equivalents	(51,410,098,007)	-	(51,410,098,007)

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

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

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

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

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

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

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

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

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. The Group intends to adopt these new and amended standards and interpretations, if applicable, when they become effective.

KIFRS 1117 *Insurance Contracts*
In May 2017, the IASB issued IFRS 17 *Insurance Contracts*, a comprehensive new accounting standard for insurance contracts covering recognition and measurement, presentation and disclosure. Once effective, KIFRS 1117 will replace KIFRS 1104 *Insurance Contracts* (KIFRS 1104) that was issued in 2005. 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. In contrast to the requirements in KIFRS 1104, which are largely based on grandfathering previous local accounting policies, KIFRS 1117 provides a comprehensive model for insurance contracts, covering all relevant accounting aspects. The core of KIFRS 1117 is the general model, supplemented by:

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

KIFRS 1117 is effective for reporting periods beginning on or after January 1 2023, with comparative figures required. Early application is permitted, provided the entity also applies KIFRS 1109 and KIFRS 1115 on or before the date it first applies KIFRS 1117. This standard is not applicable to the Group.

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

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

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

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

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

Onerous Contracts – Costs of Fulfilling a Contract – Amendments to KIFRS 1037
The amendments specify which costs an entity needs to include when assessing whether a contract is onerous or loss-making. The amendments apply a "directly related cost approach". The costs that relate directly to a contract to provide goods or services include both incremental costs and an allocation of costs directly related to contract activities. General and administrative costs do not relate directly to a contract and are excluded unless they are explicitly chargeable to the counterparty under the contract. The amendments are effective for annual reporting periods beginning on or after January 1, 2022. The Group will apply these amendments to contracts for which it has not yet fulfilled all its obligations at the beginning of the annual reporting period in which it first applies the amendments.

Definition of Accounting Estimates - Amendments to KIFRS 1008
The amendments clarify the distinction between changes in accounting estimates and changes in accounting policies and the correction of errors. Also, they clarify how entities use measurement techniques and inputs to develop accounting estimates. The amendments are effective for annual reporting periods beginning on or after January 1, 2023 and apply to changes in accounting policies and changes in accounting estimates that occur on or after the start of that period. Earlier application is permitted as long as this fact is disclosed. The amendments are not expected to have a material impact on the Group.

Disclosure of Accounting Policies - Amendments to KIFRS 1001 and KIFRS Practice Statement 2
The amendments provide guidance and examples to help entities apply materiality judgements to accounting policy disclosures. The amendments aim to help entities provide accounting policy disclosures that are more useful by replacing the requirement for entities to disclose their 'significant' accounting policies with a requirement to disclose their 'material' accounting policies and adding guidance on how entities apply the concept of materiality in making decisions about accounting policy disclosures. The amendments to KIFRS 1001 are applicable for annual periods beginning on or after January 1, 2023 with earlier application permitted. Since the amendments to the Practice Statement 2 provide non-mandatory guidance on the application of the definition of material to accounting policy information, an effective date for these amendments is not necessary. The amendments are not expected to have a material impact on the Group.

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

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

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

KIFRS 1109 *Financial Instruments* – Fees in the '10 per cent' test for derecognition of financial liabilities
The amendment clarifies the fees that an entity includes when assessing whether the terms of a new or modified financial liability are substantially different from the terms of the original financial liability. These fees include only those paid or received between the borrower and the lender, including fees paid or received by either the borrower or lender on the other's behalf. An entity applies the amendment to financial liabilities that are modified or exchanged on or after the beginning of the annual reporting period in which the entity first applies the amendment.
The amendment is effective for annual reporting periods beginning on or after January 1, 2022 with earlier adoption permitted. The Group will apply the amendments to financial liabilities that are modified or exchanged on or after the beginning of the annual reporting period in which the entity first applies the amendment.
The amendments are not expected to have a material impact on the Group.

KIFRS 1041 *Agriculture* – Taxation in fair value measurements
The amendments remove the requirement in paragraph 22 of KIFRS 1041 that entities exclude cash flows for taxation when measuring the fair value of assets within the scope of KIFRS 1041.
An entity applies the amendment prospectively to fair value measurements on or after the beginning of the first annual reporting period beginning on or after January 1, 2022 with earlier adoption permitted.
The amendments are not expected to have a material impact on the Group.

3. Financial instruments

Financial assets as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

	Dec. 31, 2021				
	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	₩ -	₩ 181,015,316	₩ -	₩	₩ 181,015,316
Trade and other accounts receivable:					
Trade accounts receivable	-	700,256,014	-	-	700,256,014
Other accounts receivable	1,226,708	82,838,535	-	9,693,886	93,759,129
Accrued income	-	23,236	-	-	23,236
Guarantee deposits	-	253,058	-	-	253,058
	1,226,708	964,386,159	-	9,693,886	975,306,753
Non-current assets:					
Long-term investment securities	-	17,830	8,441,042	-	8,458,872
Long-term loans	-	1,183,333	-	-	1,183,333
Long-term accounts receivable:					
Long-term other accounts receivable	-	-	-	38,512,987	38,512,987
Refundable deposits	-	3,575,257	-	-	3,575,257
Other non-current assets:					
Long-term financial instruments	-	14,500	-	-	14,500
	-	4,790,920	8,441,042	38,512,987	51,744,949
	₩ 1,226,708	₩ 969,177,079	₩ 8,441,042	₩ 48,206,873	₩ 1,027,051,702

	Dec. 31, 2020				
	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	₩ -	₩ 231,451,125	₩ -	₩ -	₩ 231,451,125
Short-term investment securities	90,834,800	-	-	-	90,834,800
Trade and other accounts receivable:					
Trade accounts receivable	-	525,535,894	-	-	525,535,894
Other accounts receivable	9,597,212	62,018,799	-	9,038,019	80,654,030
Accrued income	25,642	7,555	-	-	33,197
Guarantee deposits	-	110,135	-	-	110,135
	100,457,654	819,123,508	-	9,038,019	928,619,181
Non-current assets:					
Long-term investment securities	-	148,505	16,721,801	-	16,870,306
Long-term loans	-	949,385	-	-	949,385
Long-term accounts receivable:					
Refundable deposits	-	3,538,134	-	-	3,538,134
Other non-current assets:					
Long-term financial instruments	-	15,500	-	-	15,500
	-	4,651,524	16,721,801	-	21,373,325
	₩ 100,457,654	₩ 823,775,032	₩ 16,721,801	₩ 9,038,019	₩ 949,992,506

3. Financial instruments (cont'd)

Financial liabilities as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

	Dec. 31, 2021		
	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Total
Current liabilities:			
Trade and other accounts payable:			
Trade accounts payable	₩ -	₩ 739,088,530	₩ 739,088,530
Other accounts payable	15,103,917	133,563,070	148,666,987
Accrued expenses	-	109,214,620	109,214,620
Deposits withheld	-	98,435	98,435
Short-term borrowings	-	520,880,396	520,880,396
Current portion of bonds payable and long-term borrowings	-	324,144,876	324,144,876
	15,103,917	1,826,989,927	1,842,093,844
Non-current liabilities:			
Bonds payable	-	1,061,630,636	1,061,630,636
Long-term borrowings	-	410,080,779	410,080,779
Long-term accounts payable	-	180,772	180,772
	-	1,471,892,187	1,471,892,187
	₩ 15,103,917	₩ 3,298,882,114	₩ 3,313,986,031

	Dec. 31, 2020			
	Financial liabilities at FVTPL	Financial liabilities designated as hedges	Financial liabilities at amortized costs	Total
Current liabilities:				
Trade and other accounts payable:				
Trade accounts payable	₩ -	₩ -	₩ 417,305,210	₩ 417,305,210
Other accounts payable	3,324,345	903,301	102,975,142	107,202,788
Accrued expenses	-	-	67,536,082	67,536,082
Deposits withheld	-	-	220,436	220,436
Short-term borrowings	-	-	94,768,701	94,768,701
Current portion of bonds payable and long-term borrowings	-	-	603,994,382	603,994,382
	3,324,345	903,301	1,286,799,953	1,291,027,599
Non-current liabilities:				
Bonds payable	-	-	1,340,919,474	1,340,919,474
Long-term borrowings	-	-	508,678,258	508,678,258
Long-term accounts payable	-	-	78,200	78,200
	-	-	1,849,675,932	1,849,675,932
	₩ 3,324,345	₩ 903,301	₩ 3,136,475,885	₩ 3,140,703,531

3. Financial instruments (cont'd)

Gains or losses by financial instrument for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021

	Financial assets			Financial liabilities		
	Financial assets at FVTPL	Financial assets at amortized cost	Financial assets designated as hedges	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Total
Interest income	₩ -	₩ 1,010,567	₩ -	₩ -	₩ -	₩ 1,010,567
Interest expenses	-	-	-	-	(50,411,980)	(50,411,980)
Gain on foreign exchange translation	-	1,164,832	36,117,741	-	1,631,530	38,914,103
Loss on foreign exchange translation	-	(451,531)	-	-	(40,426,307)	(40,877,838)
Gain (loss) on valuation of derivative instruments	1,226,708	-	-	(15,103,917)	-	(13,877,209)
Gain (loss) on settlement of derivative instruments	46,475,540	-	-	(79,488,514)	-	(33,012,974)

2020

	Financial assets		Financial liabilities		
	Financial assets at FVTPL	Financial assets at amortized cost	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Total
Interest income	₩ -	₩ 1,934,372	₩ -	₩ -	₩ 1,934,372
Interest expenses	-	-	-	(52,480,476)	(52,480,476)
Gain on foreign exchange translation	-	132,375	-	33,831,137	33,963,512
Loss on foreign exchange translation	-	(4,663,790)	(18,369,038)	(286,747)	(23,319,575)
Gain (loss) on valuation of derivative instruments	9,597,212	-	(3,324,345)	-	6,272,867
Gain (loss) on settlement of derivative instruments	131,917,780	-	(52,958,550)	-	78,959,230

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 a comparison by class of the carrying amounts and fair value of the Group's financial instruments (Korean won in thousands):

	Dec. 31, 2021		Dec. 31, 2020	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial assets:				
Cash and cash equivalents	₩ 181,015,316	₩ 181,015,316	₩ 231,451,125	₩ 231,451,125
Short-term investment securities	-	-	90,834,800	90,834,800
Trade and other accounts receivable:				
Trade accounts receivable	700,256,014	700,256,014	525,535,894	525,535,894
Other accounts receivable (derivative assets)	10,920,594	10,920,594	18,635,231	18,635,231
Other accounts receivable	82,838,535	82,838,535	62,018,799	62,018,799
Accrued income	23,236	23,236	33,197	33,197
Guarantee deposits	253,058	253,058	110,135	110,135
Long-term investment securities	8,458,872	8,458,872	16,870,306	16,870,306
Long-term loans	1,183,333	1,183,333	949,385	949,385
Long-term accounts receivable:				
Long-term other accounts receivable	38,512,987	38,512,987	-	-
Refundable deposits	3,575,257	3,575,257	3,538,134	3,538,134
Other non-current assets:				
Long-term financial instruments	14,500	14,500	15,500	15,500
	₩ 1,027,051,702	₩ 1,027,051,702	₩ 949,992,506	₩ 949,992,506

	Dec. 31, 2021		Dec. 31, 2020	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial liabilities:				
Trade and other accounts payable:				
Trade accounts payable	₩ 739,088,530	₩ 739,088,530	₩ 417,305,210	₩ 417,305,210
Other accounts payable (derivative liabilities)	15,103,917	15,103,917	4,227,646	4,227,646
Other accounts payable	133,563,070	133,563,070	102,975,142	102,975,142
Accrued expenses	109,214,620	109,214,620	67,536,082	67,536,082
Deposits withheld	98,435	98,435	220,436	220,436
Short-term borrowings	520,880,396	520,880,396	94,768,701	94,768,701
Current portion of bonds payable and long-term borrowings	324,144,876	324,144,876	603,994,382	603,994,382
Bonds payable	1,061,630,636	1,065,500,766	1,340,919,474	1,364,735,164
Long-term borrowings	410,080,779	410,080,779	508,678,258	508,678,258
Long-term accounts payable	180,772	180,772	78,200	78,200
	₩ 3,313,986,031	₩ 3,317,856,161	₩ 3,140,703,531	₩ 3,164,519,221

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

	Dec. 31, 2021			
	Level 1	Level 2	Level 3	Total
Assets and liabilities measured at fair value:				
Derivative assets (other accounts receivable)	₩ -	₩ 10,920,594	₩ -	₩ 10,920,594
Derivative assets (Long-term other accounts receivable)	-	38,512,987	-	38,512,987
Derivative liabilities (other accounts payable)	-	15,103,917	-	15,103,917
Long-term investment securities	-	-	8,441,042	8,441,042
Assets and liabilities for which fair values are disclosed:				
Cash and cash equivalents	8,267	181,007,049	-	181,015,316
Trade accounts receivable	-	-	700,256,014	700,256,014
Other accounts receivable	-	-	82,838,535	82,838,535
Accrued income	-	-	23,236	23,236
Guarantee deposits	-	-	253,058	253,058
Long-term investment securities	-	17,830	-	17,830
Long-term loans	-	-	1,183,333	1,183,333
Refundable deposits	-	-	3,575,257	3,575,257
Long-term financial instruments	-	14,500	-	14,500
Trade accounts payable	-	-	739,088,530	739,088,530
Other accounts payable	-	-	133,563,070	133,563,070
Accrued expenses	-	-	109,214,620	109,214,620
Deposits withheld	-	-	98,435	98,435
Short-term borrowings	-	520,880,396	-	520,880,396
Current portion of bonds payable and long-term borrowings	-	324,144,876	-	324,144,876
Bonds payable	-	1,061,630,636	-	1,061,630,636
Long-term borrowings	-	410,080,779	-	410,080,779
Long-term accounts payable	-	-	180,772	180,772

3. Financial instruments (cont'd)

	Dec. 31, 2020			
	Level 1	Level 2	Level 3	Total
Assets and liabilities measured at fair value:				
Derivative assets (other accounts receivable)	₩ -	₩ 18,635,231	₩ -	₩ 18,635,231
Derivative liabilities (other accounts payable)	-	4,227,646	-	4,227,646
Short-term investment securities	-	90,834,800	-	90,834,800
Long-term investment securities	-	-	16,721,801	16,721,801
Assets and liabilities for which fair values are disclosed:				
Cash and cash equivalents	14,155	231,436,970	-	231,451,125
Trade accounts receivable	-	-	525,535,894	525,535,894
Other accounts receivable	-	-	62,018,799	62,018,799
Accrued income	-	-	33,197	33,197
Guarantee deposits	-	-	110,135	110,135
Long-term investment securities	-	148,505	-	148,505
Long-term loans	-	-	949,385	949,385
Refundable deposits	-	-	3,538,134	3,538,134
Long-term financial instruments	-	15,500	-	15,500
Trade accounts payable	-	-	417,305,210	417,305,210
Other accounts payable	-	-	102,975,142	102,975,142
Accrued expenses	-	-	67,536,082	67,536,082
Deposits withheld	-	-	220,436	220,436
Short-term borrowings	-	94,768,701	-	94,768,701
Current portion of bonds payable and long-term borrowings	-	603,994,382	-	603,994,382
Bonds payable	-	1,340,919,474	-	1,340,919,474
Long-term borrowings	-	508,678,258	-	508,678,258
Long-term accounts payable	-	-	78,200	78,200

For the years ended December 31, 2021 and 2020, 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.

Restricted deposits as of December 31, 2021 and 2020 consist of the following (Korean won in thousands):

	Dec 31, 2021	Dec 31, 2020	Description
Long-term financial instruments	₩ 14,500	₩ 15,500	Deposits to maintain the checking accounts

4. Trade and other accounts receivable

Trade and other accounts receivable as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

	Dec. 31, 2021		
	Costs	Allowance for doubtful accounts	Net book value
Trade accounts receivable	₩ 701,181,053	₩ (925,039)	₩ 700,256,014
Other receivables (*)	137,307,000	-	137,307,000
	₩ 838,488,053	₩ (925,039)	₩ 837,563,014

	Dec. 31, 2020		
	Costs	Allowance for doubtful accounts	Net book value
Trade accounts receivable	₩ 526,126,052	₩ (590,158)	₩ 525,535,894
Other receivables (*)	85,284,881	-	85,284,881
	₩ 611,410,933	₩ (590,158)	₩ 610,820,775

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

Allowance for doubtful accounts included in selling and administrative expenses amounted to ₩343,751 thousand for the years ended December 31, 2021 and reversal of allowance of doubtful accounts in selling and administrative expenses amounted to ₩64,382 thousand for the years ended December 31, 2020..

The aging analysis of trade and other accounts receivable as of December 31, 2021 and 2020 is as follows (Korean won in thousands):

	Dec. 31, 2021					
	Neither past due nor impaired	Past due but not impaired				
		Within 90 days	91 – 180 days	Over 180 days	Impaired	Total
Trade accounts receivable	₩ 694,212,106	₩ 5,435,356	₩ -	₩ 608,552	₩ 925,039	₩ 701,181,053
Other receivables (*)	87,873,419	-	-	-	-	87,873,419
	₩ 782,085,525	₩ 5,435,356	₩ -	₩ 608,552	₩ 925,039	₩ 789,054,472

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

	Dec. 31, 2020					
	Neither past due nor impaired	Past due but not impaired				
		Within 90 days	91 – 180 days	Over 180 days	Impaired	Total
Trade accounts receivable	₩ 523,704,998	₩ 1,793,216	₩ -	₩ 37,680	₩ 590,158	₩ 526,126,052
Other receivables (*)	66,649,650	-	-	-	-	66,649,650
	₩ 590,354,648	₩ 1,793,216	₩ -	₩ 37,680	₩ 590,158	₩ 592,775,702

(*) 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 years ended December 31, 2021 and 2020. 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, 2021 and 2020 are as follows (Korean won in thousands):

	Dec. 31, 2021	Dec. 31, 2020
Book value:		
Discounted trade accounts receivable	₩ 91,202,870	₩ 49,994,357
Related short-term borrowings	91,202,870	49,994,357

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

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

	Dec. 31, 2021		
	Costs	Valuation allowance	Net book value
Finished goods	₩ 527,580,864	₩ (14,384,124)	₩ 513,196,740
Semi-finished goods	155,208,431	-	155,208,431
Raw materials	372,466,455	-	372,466,455
Sub-materials	19,982,546	-	19,982,546
Supplies	68,076,891	-	68,076,891
By-products	70,630,315	(35,053)	70,595,262
Materials-in-transit	656,587,271	-	656,587,271
	₩ 1,870,532,773	₩ (14,419,177)	₩ 1,856,113,596

	Dec. 31, 2020		
	Costs	Valuation allowance	Net book value
Finished goods	₩ 207,075,196	₩ (4,491,245)	₩ 202,583,951
Semi-finished goods	100,826,796	(702,340)	100,124,456
Raw materials	232,784,587	-	232,784,587
Sub-materials	15,266,428	-	15,266,428
Supplies	124,635,106	-	124,635,106
By-products	41,149,531	-	41,149,531
Materials-in-transit	345,155,387	-	345,155,387
	₩ 1,066,893,031	₩ (5,193,585)	₩ 1,061,699,446

Loss on valuation of inventories recognized within the cost of goods sold amounted to ₩9,225,592 thousand and ₩199,050 thousand for the year ended December 31, 2021 and 2020, respectively.

6. Long-term investments securities

Long-term investments securities of the Group as of December 31, 2021 and 2020 are as following (Korean won in thousands):

	Dec. 31, 2021		Dec. 31, 2020
	Acquisition cost	Book value	Book value
Financial assets at FVOCI:			
Non-listed equity investments, etc.	₩ 8,674,725	₩ 8,441,042	₩ 16,721,801
Financial assets at amortized cost:			
National bonds	17,830	17,830	148,505
	₩ 8,692,555	₩ 8,458,872	₩ 16,870,306

Financial assets at FVOCI of the Group as of December 31, 2021 and 2020 are as following (Korean won in thousands):

	Dec. 31, 2021				
	Number of shares owned	Percentage of ownership (%)	Acquisition cost	Book value	Fair value
Daehan Oil Pipeline Corp.	448,699	2.26	₩ 8,674,609	₩ 8,440,926	₩ 8,440,926
Others			116	116	116
			₩ 8,674,725	₩ 8,441,042	₩ 8,441,042

	Dec. 31, 2020				
	Number of shares owned	Percentage of ownership (%)	Acquisition cost	Book value	Fair value
Daehan Oil Pipeline Corp.	448,699	2.26	₩ 8,674,609	₩ 16,721,693	₩ 16,721,693
Others			108	108	108
			₩ 8,674,717	₩ 16,721,801	₩ 16,721,801

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

	Valuation method	Key operating activities	Dec. 31, 2021	Inputs	Range
Financial assets at FVOCI	Discounted cash flow methods	Construction and operation of the pipeline	8,440,926	Cost of equity capital	16.43%

A sensitivity analysis on the changes in cost of equity capital, assuming a 1% increase and decrease in the discount rates as of December 31, 2021 are 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	₩ 677,984	₩ (562,220)

7. Property, plant and equipment

The acquisition costs and net book value of property, plant and equipment as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

	Dec. 31, 2021		
	Cost	Accumulated depreciation	Book value
Land	₩ 279,806,143	₩ -	₩ 279,806,143
Buildings	404,200,515	(85,089,849)	319,110,666
Structures	1,016,825,955	(440,283,213)	576,542,742
Machinery and equipment	6,003,199,883	(3,138,385,816)	2,864,814,067
Vehicles	15,622,113	(10,379,280)	5,242,833
Others	697,436,259	(382,768,918)	314,667,341
Construction-in-progress	113,924,386	-	113,924,386
	₩ 8,531,015,254	₩ (4,056,907,076)	₩ 4,474,108,178

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

	Dec. 31, 2020					
		Cost		Accumulated depreciation		Book value
Land	₩	280,045,470	₩	-	₩	280,045,470
Buildings		334,492,372		(73,210,741)		261,281,631
Structures		1,015,405,797		(405,687,092)		609,718,705
Machinery and equipment		5,518,781,714		(2,810,663,229)		2,708,118,485
Vehicles		13,581,930		(9,479,311)		4,102,619
Others		458,225,555		(295,114,160)		163,111,395
Construction-in-progress		504,590,025		-		504,590,025
	₩	8,125,122,863	₩	(3,594,154,533)	₩	4,530,968,330

Changes in the net book value of property, plant and equipment for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021											
		Jan. 1 (*1)		Acquisitions		Disposals		Transfers (*2)		Depreciation		Dec. 31
Land	₩	280,045,470	₩	253	₩	(542,707)	₩	303,127	₩	-	₩	279,806,143
Buildings		261,281,631		728,208		(2,616,125)		72,017,305		(12,300,353)		319,110,666
Structures		609,718,705		22,898		(47)		1,405,710		(34,604,524)		576,542,742
Machinery and equipment		2,708,118,485		-		(12,472,892)		502,121,343		(332,952,869)		2,864,814,067
Vehicles		4,102,619		10,335		-		3,232,612		(2,102,733)		5,242,833
Others (*3)		163,111,395		18,958,064		(8,674,562)		205,243,682		(63,971,238)		314,667,341
Construction-in-progress		504,590,025		276,689,912		-		(667,355,551)		-		113,924,386
	₩	4,530,968,330	₩	296,409,670	₩	(24,306,333)	₩	116,968,228	₩	(445,931,717)	₩	4,474,108,178

(*1) Includes the adoption of KIFRS 1016 amendment retrospectively (See Note 2)
(*2) Construction-in-progress that was reclassified to property, plant and equipment and intangible assets and, supplies and long-term prepaid expenses that was reclassified to property, plant, and equipment
(*3) Includes right-of-use assets

	2020											
		Jan. 1		Acquisitions (*3)		Disposals		Transfers (*1)		Depreciation (*3)		Dec. 31 (*3)
Land	₩	278,782,675	₩	1,120,643	₩	-	₩	142,152	₩	-	₩	280,045,470
Buildings		192,763,324		133,477		(196,065)		78,458,705		(9,877,810)		261,281,631
Structures		633,014,138		144,285		(11,088)		10,908,804		(34,337,434)		609,718,705
Machinery and equipment		2,576,527,488		1,553,426		(3,435,824)		439,957,502		(306,484,107)		2,708,118,485
Vehicles		3,233,353		13,545		(278)		2,259,478		(1,403,479)		4,102,619
Others (*2)		168,216,353		7,049,956		(10,762,822)		56,842,533		(58,234,625)		163,111,395
Construction-in-progress		665,286,483		435,994,135		-		(596,690,593)		-		504,590,025
	₩	4,517,823,814	₩	446,009,467	₩	(14,406,077)	₩	(8,121,419)	₩	(410,337,455)	₩	4,530,968,330

(*1) Construction-in-progress that was reclassified to property, plant and equipment and intangible assets, exchange rate effects
(*2) Includes right-of-use assets
(*3) Includes the adoption of KIFRS 1016 amendment retrospectively (See Note 2)

Capitalization of borrowing costs

Borrowing costs capitalized as part of property, plant and equipment amounted to ₩3,607,832 thousand and ₩9,823,404 thousand for the years ended December 31, 2021 and 2020, respectively. Capitalization interest rate is 2.29% and 2.34% for the years ended December 31, 2021 and 2020, respectively.

8. Leases

Changes in the net book value of right-of-use assets for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021					
	Right-of-use assets (*1)					
	Buildings	Structures	Machinery and equipment	Vehicles	Others	Total
As of January 1	₩ 1,854,660	₩ 18,988,809	₩ 454,725	₩ 7,936,924	₩ 4,140,041	₩ 33,375,159
Additions	2,830,783	1,533,510	-	3,392,698	-	7,756,991
Depreciation expenses	(1,326,108)	(1,165,245)	(76,855)	(2,216,163)	(1,840,018)	(6,624,389)
Termination of contracts	(27,875)	-	-	(850,865)	-	(878,740)
foreign currency translation	90,743	-	-	20,548	-	111,291
As of December 31	₩ 3,422,203	₩ 19,357,074	₩ 377,870	₩ 8,283,142	₩ 2,300,023	₩ 33,740,312

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

	2020					
	Right-of-use assets (*1)					
	Buildings	Structures	Machinery and equipment	Vehicles	Others	Total
As of January 1	₩ 1,571,779	₩ 19,735,824	₩ 531,580	₩ 7,132,141	₩ 5,980,059	₩ 34,951,383
Additions	1,379,653	-	-	3,077,080	-	4,456,733
Depreciation expenses	(1,096,772)	(747,015)	(76,855)	(1,963,484)	(1,840,018)	(5,724,144)
Termination of contracts	-	-	-	(308,813)	-	(308,813)
As of December 31	₩ 1,854,660	₩ 18,988,809	₩ 454,725	₩ 7,936,924	₩ 4,140,041	₩ 33,375,159

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

Changes in the net book value of lease liabilities for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021	2020
As of January 1	₩ 13,087,083	₩ 14,458,186
Additions	6,462,363	3,962,041
Interest expenses	332,826	278,237
Lease payments	(5,587,447)	(5,393,222)
Effects of foreign currency translation	279,761	(218,159)
As of December 31	14,574,586	13,087,083

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

	Dec. 31, 2021	Dec. 31, 2020
Current liabilities:		
Lease liabilities	₩ 4,372,897	₩ 4,200,093
Non-current liabilities:		
Lease liabilities	10,201,689	8,886,991
Total lease liabilities:		
Within 1 year	4,372,897	4,200,093
1 year ~ 5 years	10,201,689	6,796,874
Over 5 years	-	2,090,117

8. Leases (cont'd)

The followings are the amounts recognized in profit or loss for the year ended December 31, 2021 and 2020 (Korean won in thousands):

		2021		2020
Short-term lease payments	₩	11,436,559	₩	11,906,122
Low-value lease payments		969,878		999,174
Depreciation of right-of-use assets		6,624,389		5,724,144
Interest expense of lease liabilities		332,826		278,237
Gain (loss) on foreign currency translation		279,761		(218,159)

9. Intangible assets

Changes in the net book value of intangible assets for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021									
		Jan. 1		Disposals		Transfers (*)		Amortization		Dec. 31
Patents	₩	1,326,238	₩	(73,147)	₩	218,697	₩	(243,128)	₩	1,228,660
Software		15,604,599		-		4,767,826		(7,148,410)		13,224,015
Facility use right		218,757		-		39,100		(4,073)		253,784
Land use right		1,071,477		-		122,365		(30,031)		1,163,811
Memberships		13,289,557		-		1,508,171		-		14,797,728
	₩	31,510,628	₩	(73,147)	₩	6,656,159	₩	(7,425,642)	₩	30,667,998

(*) Construction-in-progress that was reclassified to intangible assets and exchange rate effects

	2020											
		Jan. 1		Acquisitions		Disposals		Transfers (*)		Amortization		Dec. 31
Patents	₩	1,313,856	₩	-	₩	(36,302)	₩	286,610	₩	(237,926)	₩	1,326,238
Software		15,711,887		197,055		-		7,872,699		(8,177,042)		15,604,599
Facility use right		81,214		137,543		-		-		-		218,757
Land use right		1,091,700		-		-		8,699		(28,922)		1,071,477
Memberships		14,764,402		126,400		(1,602,394)		1,149		-		13,289,557
	₩	32,963,059	₩	460,998	₩	(1,638,696)	₩	8,169,157	₩	(8,443,890)	₩	31,510,628

(*) Construction-in-progress that was reclassified to intangible assets and exchange rate effects

Impairment testing of intangible assets with indefinite lives

The Group performed an impairment testing of memberships with indefinite lives and recognized no impairment loss for the years ended December 31, 2021 and 2020. Net realizable value of a membership is measured at the higher of net fair value or value in use, and if the net fair value cannot be reliably measured, net realizable value is measured at value in use.

10. Borrowings and bonds payable

Short-term borrowings as of December 31, 2021 and 2020 consist of the following (Korean won in thousands):

	Financial institution	Annual interest rates (%)	Dec. 31, 2021	Dec. 31, 2020
Bank overdrafts	Shinhan Bank	3.00	₩ 99,677,526	₩ 44,774,344
Commercial paper	Shinhan Bank	3-month CD + additional rate	330,000,000	-
Discounted trade accounts receivable (*)	Woori Bank and others	0.5~1.1	91,202,870	49,994,357
			₩ 520,880,396	₩ 94,768,701

(*) 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 has 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, 2021 and 2020 are as follows (Korean won in thousands):

Series	Issuance date	Maturity date	Annual interest rate (%)	Dec. 31, 2021	Dec. 31, 2020
18-3rd public placement bonds	2014.08.08	2021.08.08	-	-	100,000,000
19-2nd public placement bonds	2017.04.27	2022.04.27	2.53	80,000,000	80,000,000
20-1st public placement bonds	2018.03.02	2021.03.02	-	-	110,000,000
20-2nd public placement bonds	2018.03.02	2023.03.02	3.01	190,000,000	190,000,000
21-1st public placement bonds	2018.10.22	2021.10.22	-	-	160,000,000
21-2nd public placement bonds	2018.10.22	2023.10.20	2.52	140,000,000	140,000,000
21-3rd public placement bonds	2018.10.22	2025.10.22	2.65	100,000,000	100,000,000
23rd private placement bonds	2019.09.06	2022.09.06	1.26	100,000,000	100,000,000
24-1st public placement bonds	2019.10.16	2022.10.14	1.64	140,000,000	140,000,000
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
				910,000,000	1,280,000,000
Less: discount on bonds				(1,187,054)	(2,125,950)
Less: current portion				(319,771,979)	(369,794,290)
				₩ 589,040,967	₩ 908,079,760

Details of long-term bonds denominated in foreign currency as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

Series	Issuance date	Maturity date	Annual interest rate (%)	Dec. 31, 2021	Dec. 31, 2020
Foreign currency bonds	2019.01.23	2024.01.23	3.88	474,200,000	435,200,000
Less: discount on bonds				(1,610,331)	(2,360,286)
				₩ 472,589,669	₩ 432,839,714

10. Borrowings and bonds payable (cont'd)

Long-term borrowings as of December 31, 2021 and 2020 consist of the following (Korean won in thousands):

Series	Financial institution	Maturity date	Annual interest rates (%)	Dec. 31, 2021	Dec. 31, 2020
Facility loan	Mizuho Bank	2021.04.16	-	₩ -	₩ 100,000,000
Facility loan	Mizuho Bank	2024.04.16	1.65	100,000,000	-
Facility loan	Credit Agricole CIB	2023.02.06	1.79	150,000,000	150,000,000
Facility loan	Korea EXIM Bank	2023.05.08	1.74	150,000,000	150,000,000
Commercial paper	Shinhan Bank	2021.09.13	-	-	50,000,000
Commercial paper	Shinhan Bank	2021.09.13	-	-	80,000,000
Commercial paper	Shinhan Bank	2023.09.27	-	-	200,000,000
				400,000,000	730,000,000
Less: present value discounts				(120,910)	(208,732)
Less: current portion				-	(230,000,000)
				₩ 399,879,090	₩ 499,791,268

Details of lease liabilities as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

	Dec. 31, 2021	Dec. 31, 2020
Lease liabilities	₩ 14,574,586	₩ 13,087,083
Less: current portion	(4,372,897)	(4,200,093)
Non-current lease liabilities	₩ 10,201,689	₩ 8,886,990

11. Other current liabilities

Other current liabilities as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

	Dec. 31, 2021	Dec. 31, 2020
Advance receipts	₩ 33,890,583	₩ 29,553,321
Withholdings	8,796,317	4,330,374
	₩ 42,686,900	₩ 33,883,695

12. Net defined benefit assets

The components of defined benefit assets as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

	Dec. 31, 2021	Dec. 31, 2020
Present value of defined benefit obligations	₩ (177,818,347)	₩ (171,490,859)
Fair value of plan assets	184,289,137	176,216,793
	₩ 6,470,790	₩ 4,725,934

12. Net defined benefit assets (cont'd)

Gains and losses related to retirement benefit plans for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021	2020
Defined benefit plans:		
Current service cost	₩ 15,700,906	₩ 15,199,105
Interest cost	5,610,053	5,261,080
Expected return on plan assets	(5,635,080)	(5,026,955)
	15,675,879	15,433,230
Defined contribution plans:		
Retirement pension benefit	1,746,883	2,631,789
	₩ 17,422,762	₩ 18,065,019

Expenses recognized related to the retirement benefit plans for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021	2020
Cost of goods sold	₩ 12,446,665	₩ 12,448,673
selling and administrative expenses (including research and development)	4,976,097	5,616,346
	₩ 17,422,762	₩ 18,065,019

Changes in the present value of defined benefit obligations for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021	2020
As of January 1	₩ 171,490,859	₩ 165,197,587
Current service cost	15,700,906	15,199,105
Interest cost	5,610,053	5,261,080
Benefits paid	(8,513,991)	(16,522,635)
Re-measurement loss (gain) in OCI:		
Actuarial loss arising from changes in demographic assumptions	(951,176)	-
Actuarial loss arising from changes in financial assumptions	(9,136,207)	(1,366,121)
Experience adjustments	4,290,647	4,209,820
Others (transfer from/to affiliates)	(672,744)	(487,977)
As of December 31	₩ 177,818,347	₩ 171,490,859

Changes in the fair value of plan assets for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021	2020
As of January 1	₩ 176,216,793	₩ 163,127,778
Contribution by employer	13,000,000	25,000,000
Expected returns	5,635,080	5,026,955
Benefits paid	(7,108,856)	(13,442,451)
Re-measurement loss in OCI	(2,903,948)	(2,017,333)
Others (transfer from/to affiliates)	(549,932)	(1,478,156)
As of December 31	₩ 184,289,137	₩ 176,216,793

Composition of plan assets

Plan assets as of December 31, 2021 and 2020 are composed of interest-bearing and principal-guaranteed financial assets such as time deposits.

12. Net defined benefit assets (cont'd)

The principal assumptions used in actuarial calculation as of December 31, 2021 and 2020 are as follows:

	Dec. 31, 2021	Dec. 31, 2020
Discount rate (%)	3.82	3.35
Future salary increase rate (%)	4.23	4.39

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, 2021 and 2020, is as follows (Korean won in thousand):

	Dec. 31, 2021	
	Increase by 1% point	Decrease by 1% point
Discount rate	₩ (12,962,965)	₩ 15,107,775
Future salary increase rate	15,246,599	(13,303,969)

	Dec. 31, 2020	
	Increase by 1% point	Decrease by 1% point
Discount rate	₩ (14,442,100)	₩ 17,020,185
Future salary increase rate	17,091,244	(14,757,092)

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 which are not designated as hedging instruments as of December 31, 2021 and 2020 are presented as follows (Korean won in thousands and US dollar, except for contract exchange rate):

Dec. 31, 2021

Financial institution	Maturity date	Contract exchange rate	Contract amount		Fair value: Assets	Fair value: Liabilities
KB Bank	2022.01.21	1,183.78	USD	15,000,000	₩ 32,481	₩ -
DBS	2022.01.24~2022.01.27	1,187.05~1,191.78	USD	20,000,000	24,437	23,618
Mizuho Bank	2022.01.07~2022.01.28	1,184.16~1,192.32	USD	83,000,000	47,082	112,934
KDB Industrial Bank	2022.01.20~2022.01.27	1,187.07~1,187.08	USD	20,000,000	11,487	9,704
JP Morgan	2022.01.13~2022.01.28	1,174.29~1,186.70	USD	30,000,000	204,347	-
BOC	2022.01.20~2022.01.28	1,183.78~1,187.43	USD	35,000,000	44,525	12,696
Credit Agricole CIB	2022.01.13~2022.01.26	1,173.97~1,191.73	USD	79,000,000	254,187	72,195
KEB Hana Bank	2022.01.28	1,187.43	USD	15,000,000	-	18,989
SC Bank	2022.01.20~2022.01.28	1,188.99~1,191.92	USD	50,000,000	-	253,519
					₩ 618,546	₩ 503,655

Dec. 31, 2020

Financial institution	Maturity date	Contract exchange rate	Contract amount		Fair value: Assets	Fair value: Liabilities
KEB Hana Bank	2021.01.06~2021.01.19	1,100.90~1,107.50	USD	17,000,000	₩ 197,627	₩ 90,501
SC Bank	2021.01.06	1,086.40~1,101.77	USD	18,000,000	-	126,120
KB Bank	2021.01.12	1,086.02	USD	7,000,000	-	12,462
Mizuho Bank	2021.01.06~2021.01.28	1,085.17~1,107.32	USD	48,000,000	247,716	164,780
KDB Industrial Bank	2021.01.06	1,100.90	USD	7,000,000	-	90,400
Woori Bank	2021.01.06~2021.01.28	1,087.82~1,087.84	USD	20,000,000	1,734	1,515
Credit Agricole CIB	2021.01.06~2021.01.29	1,090.08~1,104.25	USD	74,000,000	190,373	757,794
					₩ 637,450	₩ 1,243,572

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

13. Derivative financial instruments (cont'd)

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, 2021, the Group entered into 2 commodity swaps for 1,760,000 barrels and 204,000 tons. In relation to the contracts, ₩608,162 thousand and ₩8,959,762 thousand are recognized as gain on valuation of derivative financial instruments for the years ended December 31, 2021 and 2020, respectively, and ₩14,600,262 thousand and ₩2,080,773 thousand are recognized as loss on valuation of derivative financial instruments for the years ended December 31, 2021 and 2020, respectively. As of December 31, 2021, the Group recorded ₩608,162 thousand and ₩8,959,762 thousand as other accounts receivable and ₩14,600,262 thousand and ₩2,080,773 thousand as other accounts payable as of December 31, 2021 and 2020, respectively.

Details of the 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, 2021 and 2020 are as follows (Korean won in thousands and USD)

			Contract amount		Interest rate		2021	
Financial institution	Contract date	Maturity date	Notional amount (USD)	Swapped amount (KRW)	Received – fixed USD rate	Paid – fixed KRW rate	Valuation gain	Receivable
Credit Agricole CIB	2019.01.23	2024.01.23	100,000,000	112,400,000	3.88%	2.38%	₩ 9,490,776	₩ 11,172,173
KDB Industrial Bank	2019.01.23	2024.01.23	100,000,000	112,300,000	3.88%	2.38%	8,965,160	10,966,999
KEB Hana Bank	2019.01.23	2024.01.23	200,000,000	224,420,000	3.88%	2.28%	17,661,805	22,697,924
			400,000,000	449,120,000			₩ 36,117,741	₩ 44,837,096

			Contract amount		Interest rate		2020	
Financial institution	Contract date	Maturity date	Notional amount (USD)	Swapped amount (KRW)	Received – fixed USD rate	Paid – fixed KRW rate	Valuation gain	Receivable
Credit Agricole CIB	2019.01.23	2024.01.23	100,000,000	112,400,000	3.88%	2.38%	₩ (4,541,305)	₩ 1,681,397
KDB Industrial Bank	2019.01.23	2024.01.23	100,000,000	112,300,000	3.88%	2.38%	(4,536,877)	2,001,839
KEB Hana Bank	2019.01.23	2024.01.23	200,000,000	224,420,000	3.88%	2.28%	(9,290,856)	5,036,119
			400,000,000	449,120,000			₩ (18,369,038)	₩ 8,719,355

In relation to the currency swaps above, the Group recognized ₩39,000,000 thousand of loss on foreign currency translation (2020: ₩27,920,000 thousand of gain on foreign currency translation) in respect to bonds denominated in foreign currencies and ₩36,117,741 thousand of gain on foreign currency translation (2020: ₩18,369,038 thousand of loss on foreign currency translation) from valuation of currency swaps for the year ended December 31, 2021.

13. Derivative financial instruments (cont'd)

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, 2021 and 2020 are as follows (Korean won in thousands):

						Dec. 31, 2021	
Financial institution	Contract date	Maturity	Contract amount	Received – variable interest rate	Paid – swap interest rate	Valuation gain (loss)	Receivables (payables)
Shinhan Bank	2018.09.13	2021.09.13	₩ 50,000,000	3-month CD	1.93%	₩ 347,423	₩ -
	2018.09.13	2021.09.13	80,000,000	3-month CD	1.93%	555,878	-
	2020.09.28	2023.09.27	200,000,000	3-month CD	0.89%	2,413,023	2,731,687
	2021.09.24	2024.09.24	130,000,000	3-month CD	1.66%	638,092	638,092
			₩ 460,000,000			₩ 3,954,416	₩ 3,369,779

(*) hedged items (see Note 10)

						Dec. 31, 2020
Financial institution	Contract date	Maturity	Contract amount	Received – variable interest rate	Paid – swap interest rate	Receivables (payables)
Shinhan Bank	2018.09.13	2021.09.13	₩ 50,000,000	3-month CD	1.93%	₩ (347,423)
	2018.09.13	2021.09.13	80,000,000	3-month CD	1.93%	(555,878)
	2020.09.28	2023.09.27	200,000,000	3-month CD	0.89%	318,664
	2021.09.24	2024.09.24	130,000,000	3-month CD	1.66%	-
			₩ 460,000,000			₩ (584,637)

(*) hedged items (see Note 10)

14. Emission liabilities

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

Detail of annual emission allowances allocated and estimated greenhouse gas emissions as of December 31, 2021 is 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 ending December 31, 2021 is 4,905,517 ton.

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

	2021	2020
January 1	₩ 7,682,964	₩ -
Changes in estimation (prior year settlement)	(1,636,805)	-
Decrease (submitted to the government)	(6,046,159)	-
Increase (cost of emissions recognized)	4,065,642	7,682,964
December 31	₩ 4,065,642	₩ 7,682,964

Changes in emission allowances for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands, except for quantity information):

	2020		2021		Total	
	Quantity	Book value	Quantity	Book value	Quantity	Book value
January 1	5,029,563	₩ -	4,696,165	₩ -	9,725,728	₩ -
Allocated emission allowance	(93,522)	-	93,522	-	-	-
Submitted to the government	(4,755,474)	-	-	-	(4,755,474)	-
Sold	(180,567)	-	49,121	1,490,184	(131,446)	1,490,184
December 31	-	₩ -	4,838,808	₩ 1,490,184	4,838,808	₩ 1,490,184

15. Commitments and contingencies

The following table presents the available lines of credit from financial institutions as of December 31, 2021 and 2020 (Korean won in thousands and US dollar):

	Dec. 31, 2021				
	Financial institution		Korean won		US dollar
Bank overdrafts	Woori Bank and others	₩	14,800,000	USD	-
Line of credit for general borrowings	Woori Bank and others		724,000,000		20,000,000
Line of credit and nego for export and import financing	Woori Bank and others		290,000,000		852,000,000
Line of credit for export bill discounts	Woori Bank and others		-		130,000,000
		₩	1,028,800,000	USD	1,002,000,000

	Dec. 31, 2020				
	Financial institution		Korean won		US dollar
Bank overdrafts	Woori Bank and others	₩	14,800,000	USD	-
Line of credit for general borrowings	Woori Bank and others		724,000,000		20,000,000
Line of credit and nego for export and import financing	Woori Bank and others		290,000,000		889,060,000
Line of credit for export bill discounts	Woori Bank and others		-		140,000,000
		₩	1,028,800,000	USD	1,049,060,000

The Group has provided a blank check to Korea National Oil Corporation as collateral in connection with petroleum import duty as of December 31, 2021.

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 ₩29.6 billion and ₩20.3 billion to Hanwha Corporation and TotalEnergies SE for the years ended December 31, 2021 and 2020, respectively.

As of December 31, 2021, the Group is provided with guarantees from Seoul Guarantee Insurance for trade receivables credit insurance and the total amount of guarantee is ₩492.7 billion (2020: ₩494 billion).

As of December 31, 2021, the Group has one pending lawsuit with total claim against the Group amounting to ₩100 million, and its outcome is uncertain.

Summary of major contracts as of December 31, 2021 are as follows:

Contract name	Contractor	Description	Contract date	Expiration date	Country
Plant gas trading and utilities supply contract	AIRFIRST (formerly, Linde Korea)	Sale of air separation equipment and gas supply	1999.04.03	2033.01.29	United Kingdom
Utilities supply contract	Hanwha Impact Corporation (formerly, Hanwha General Chemical Co., Ltd.)	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	2022.11.30	Republic of Korea
Business contract	Industrial Technology Services Co., Ltd.	Maintenance section	2019.10.01	2023.09.30	Republic of Korea
Hydrogen supply contract	Hanwha Energy Corporation	Hydrogen gas supply contract	2018.05.17	2028.05.16	Republic of Korea
Co-development contract and service contract	Total Research and Technology Feluy Hanwha Solution	Co-development and service contract for POE commercial technology	2021.08.09	*	Belgium Republic of Korea
EPC Contract for POE pilot Project construction	HANWHA E&C	POE Pilot Project construction contract	2021.08.27	2023.05.31	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, 2021 and 2020, the number of ordinary shares issued and outstanding is 19,165,316 shares amounting to ₩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 Korean Commercial Code.

Accumulated other comprehensive income (loss) of the Group as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

	Dec. 31, 2021	Dec. 31, 2020
Net gain(loss) on valuation of interest rate swaps	₩ 2,554,292	₩ (443,155)
Net gain(loss) on valuation of financial instruments measured at FVOCI	(177,132)	6,099,669
Exchange differences on translation of foreign operations	2,150,852	(578,234)
	₩ 4,528,012	₩ 5,078,280

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

	Dec. 31, 2021	Dec. 31, 2020
Appropriated retained earnings: Legal reserve (*1)	₩ 47,913,290	₩ 47,913,290
Unappropriated retained earnings	2,830,780,392	2,443,063,192
	₩ 2,878,693,682	₩ 2,490,976,482

(*1) In accordance with the Korean Commercial Code, an amount equal to at least 10% of cash dividends declared at the annual ordinary shareholders' meeting is required to be appropriated as a legal reserve until such reserve equals 50% of issued capital. The legal reserve may not be utilized for cash dividends but may only be used to offset a deficit, if any, or be transferred to issued capital. The legal reserve has reached 50% of issued capital as of December 31, 2021 and 2020.

17. Income and expenses

Revenue from contracts with customers

Revenue for the years ended December 31, 2021 and 2020 is as follows (Korean won in thousands):

	2021	2020
Revenue from contracts with customers:		
Sale of goods, etc.	₩ 9,666,726,210	₩ 6,714,447,411
Sale of service	192,865,064	97,751,360
	₩ 9,859,591,274	₩ 6,812,198,771

The following table provides the information of sales for the years ended December 31, 2021 and 2020 disaggregated by primary geographical market and timing of revenue recognition (Korean won in thousands).

	2021	2020
Primary geographical market:		
Export	₩ 5,252,923,762	₩ 3,738,754,628
Domestic	4,606,667,512	3,073,444,143
	₩ 9,859,591,274	₩ 6,812,198,771
Timing of revenue recognition:		
At a point in time	₩ 9,666,726,210	₩ 6,714,447,411
Over time	192,865,064	97,751,360
	₩ 9,859,591,274	₩ 6,812,198,771

Details of selling and administrative expenses for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021	2020
Salaries	₩ 51,125,107	₩ 39,447,724
Retirement benefits	3,487,465	4,234,438
Employee welfare	23,592,922	24,164,846
Printing	1,056,735	1,049,550
Travel	866,528	764,150
Communications	494,351	521,828
Training	1,729,179	2,060,360
Supplies	946,521	1,016,639
Repairs	1,244,489	1,029,872
Entertainment	2,852,248	2,528,297
Meeting	482,762	552,366
Vehicle maintenance	542,020	540,094
Transportation	35,295,473	9,522,572
Taxes and dues	4,794,365	3,622,390
Insurance	1,380,265	1,823,849
Commissions and fees	45,805,140	35,133,703
Rents	12,401,462	12,894,377
Market research	2,775,600	2,903,034
Research and development	37,026,658	31,474,813
Depreciation	10,896,396	10,021,028
Amortization of intangible assets	5,142,481	5,712,369
Advertising	2,307,719	1,291,182
Samples	530,222	475,294
Events	932,409	979,086
Packaging	26,694,020	23,033,621
Electronic data processing	17,530,891	16,446,380
Others	1,053,137	1,008,588
(Reversal of) Allowance for doubtful accounts	343,751	(64,382)
	₩ 293,330,316	₩ 234,188,068

17. Income and expenses (cont'd)

Details of finance income for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

		2021		2020
Interest income	₩	1,010,567	₩	1,934,372
Gain on foreign currency transactions		105,351,069		126,508,540
Gain on foreign currency translation		38,914,103		33,963,512
Gain on settlement of derivative instruments		46,475,540		131,917,780
Gain on valuation of derivative instruments		1,226,708		9,597,212
	₩	192,977,987	₩	303,921,416

Details of finance costs for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

		2021		2020
Interest expenses	₩	50,411,980	₩	52,480,476
Loss on foreign currency transactions		106,910,519		120,476,810
Loss on foreign currency translation		40,877,838		23,319,575
Loss on settlement of derivative instruments		79,488,514		52,958,550
Loss on valuation of derivative instruments		15,103,917		3,324,345
	₩	292,792,768	₩	252,559,756

Details of other income for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

		2021		2020
Gain on disposal of property, plant and equipment	₩	1,014,299	₩	497,264
Gain on disposal of intangible assets		-		217,449
Dividend income		242,297		175,767
Rental income		363,238		691,252
Miscellaneous gain		16,234,760		13,949,298
	₩	17,854,594	₩	15,531,030

Details of other expenses for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

		2021		2020
Loss on disposal of property, plant and equipment	₩	20,473,796	₩	13,796,317
Loss on disposal of intangible assets		73,147		192,054
Loss on disposal of trade accounts receivable		2,053,521		2,859,237
Donations		6,978,239		6,493,984
Miscellaneous loss		6,197,528		3,559,959
	₩	35,776,231	₩	26,901,551

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 the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

		2021		2020
Changes in finished goods and semi-finished goods	₩	(395,142,494)	₩	75,206,209
Use of raw materials and others		5,673,569,893		3,844,392,829
Salaries and other benefits		287,577,515		234,557,567
Depreciation		445,931,717		410,337,455
Amortization of intangible assets		7,425,642		8,443,890
Transportation		230,738,283		107,724,713
Advertising		2,311,869		1,291,182
Rents		12,440,769		12,959,137
Power		174,041,389		172,545,015
Utility		1,016,579,986		663,544,335
Supplies		78,651,355		75,042,017
Others		1,332,574,266		1,106,843,028
	₩	8,866,700,190	₩	6,712,887,377

Details of salaries and other benefits for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

		2021		2020
Salaries	₩	216,651,859	₩	163,341,998
Retirement benefits		17,456,648		18,130,335
Employee welfare		53,469,008		53,085,234
	₩	287,577,515	₩	234,557,567

18. Income taxes

The major components of income tax expenses for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

		2021		2020
Current income taxes	₩	237,358,887	₩	30,866,662
Additional income taxes of prior periods		(1,253,806)		(17,201)
Changes in deferred taxes		(9,280,796)		897,218
Income tax expenses charged directly to equity		346,916		(1,897,201)
Income tax expenses	₩	227,171,201	₩	29,849,478

Details of income tax expenses charged directly to equity for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

		2021		2020
Net loss on valuation of interest rate swaps	₩	(956,968)	₩	(497,548)
Re-measurement gain (loss) on net defined benefit liabilities		(700,055)		(12,869)
Net gain (loss) on valuation of financial instruments measured at FVOCI		2,003,939		(1,386,784)
	₩	346,916	₩	(1,897,201)

18. Income taxes (cont'd)

A reconciliation of profit before tax at the statutory tax rate to income tax expenses at the effective tax rate for the years ended December 31, 2021 and 2020 is as follows (Korean won in thousands):

	2021	2020
Profit before tax	₩ 875,154,667	₩ 139,302,533
Tax at the statutory tax rate (*)	230,305,534	33,249,213
Reconciling items:		
Non-deductible expenses and non-taxable income for tax purposes	547,140	824,256
Tax credits	(4,648,079)	(4,932,631)
Corporation tax refund, etc.	(1,253,806)	(17,201)
Additional income taxes for prior periods	886,626	763,828
Others (tax rate differences, etc.)	1,333,786	(37,987)
Income tax expenses at the effective tax rate (2021: 25.96%, 2020: 21.43%)	₩ 227,171,201	₩ 29,849,478

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

Significant changes in deferred tax assets (liabilities) for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021			
	Jan. 1	Recognized directly in profit or loss	Recognized directly in equity	Dec. 31
Defined benefit liabilities	₩ (1,343,926)	₩ 630,761	₩ (700,055)	₩ (1,413,220)
Property, plant and equipment	4,050,974	(638,876)	-	3,412,098
Accrued income	(8,034)	2,411	-	(5,623)
Capitalized interest costs	(1,416,470)	391,689	-	(1,024,781)
Loss (gain) on valuation of derivative instruments	141,481	-	(956,968)	(815,487)
Gain (loss) on foreign currency translation	(355)	-	-	(355)
Accrued expenses	8,737,834	8,498,295	-	17,236,129
Gain on valuation of financial instruments measured at FVOCI	(1,947,387)	-	2,003,939	56,552
Others	818,099	49,600	-	867,699
	₩ 9,032,216	₩ 8,933,880	₩ 346,916	₩ 18,313,012

18. Income taxes (cont'd)

	2020							
	Jan. 1		Recognized directly in profit or loss		Recognized directly in equity		Dec. 31	
Defined benefit liabilities	₩	(614,019)	₩	(717,038)	₩	(12,869)	₩	(1,343,926)
Property, plant and equipment (*)		1,230,859		2,820,115		-		4,050,974
Accrued income		(5,647)		(2,387)		-		(8,034)
Capitalized interest costs		(1,950,106)		533,636		-		(1,416,470)
Loss (gain) on valuation of derivative instruments		639,029		-		(497,548)		141,481
Gain (loss) on foreign currency translation		(388)		33		-		(355)
Accrued expenses		10,290,141		(1,552,307)		-		8,737,834
Gain on valuation of financial instruments measured at FVOCI		(560,603)		-		(1,386,784)		(1,947,387)
Others		900,168		(82,069)		-		818,099
	₩	9,929,434	₩	999,983	₩	(1,897,201)	₩	9,032,216

(*) Includes the adoption of KIFRS 1016 amendment retrospectively (See Note 2).

The Group applies the tax rates that are expected to apply in the year when 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 the years ended December 31, 2021 and 2020 are computed as follows (Korean won, except for number of shares):

	2021		2020	
Profit for the year attributable to owners of the parent	₩	647,983,466,202	₩	109,453,054,810
Weighted-average number of ordinary shares outstanding (*)		19,165,316 shares		19,165,316 shares
Basic earnings per share attributable to owners of the parent	₩	33,810	₩	5,711

(*) 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 the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands, except for dividends per share):

		2021		2020
Dividends attributable to owners of the parent:				
Interim dividends (2021: ₩10,696, 2020: ₩1,565 per share)	₩	205,000,000	₩	30,000,000
Annual dividends (2021: ₩23,012, 2020: ₩2,998 per share)		441,030,000		57,459,000
	₩	646,030,000	₩	87,459,000

The annual dividends will be finalized on March 31, 2022.

The Company's dividend payout ratios for the years ended December 31, 2021 and 2020 are computed as follows (Korean won in thousands):

		2021		2020
Dividends	₩	646,030,000	₩	87,459,000
Profit for the year		646,030,974		111,089,934
Dividend payout ratio		100.00%		78.73%

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 the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

Non-cash transaction adjustments

		2021		2020
Retirement benefits	₩	15,675,879	₩	15,433,230
Depreciation		445,931,717		410,337,455
Amortization of intangible assets		7,425,642		8,443,890
(Reversal of) Allowance for doubtful accounts		343,751		(64,382)
Gain on foreign currency translation		(38,914,103)		(33,963,512)
Loss on foreign currency translation		40,877,838		23,319,575
Gain on disposal of property, plant and equipment		(1,014,299)		(497,264)
Loss on disposal of property, plant and equipment		20,473,796		13,796,317
Gain on disposal of intangible assets		-		(217,449)
Loss on disposal of intangible assets		73,147		192,054
Finance income (interest income)		(1,010,567)		(1,934,372)
Finance costs (interest expenses)		50,411,980		52,480,476
Loss on disposal of trade accounts receivable		2,053,521		2,859,237
Gain on valuation of derivative instruments		(1,226,708)		(9,597,212)
Loss on valuation of derivative instruments		15,103,917		3,324,345
Gain on settlement of derivative instruments		(46,475,540)		(131,917,780)
Loss on settlement of derivative instruments		79,488,514		52,958,550
Dividend income		(242,297)		(175,767)
Income tax expenses		227,171,201		29,849,479
	₩	816,147,389	₩	434,626,870

21. Supplementary cash flow information (cont'd)

Working capital adjustments

	2021	2020
Trade accounts receivable	₩ (172,075,337)	₩ 163,340,462
Other accounts receivable	(16,733,909)	52,390,089
Other current assets	1,316,166	1,476,897
Prepaid expenses	(2,712,222)	(3,555,959)
Inventories	(832,279,440)	170,663,669
Long-term prepaid expenses	21,013,886	121,160
Trade accounts payable	318,372,216	(174,691,360)
Other accounts payable	27,540,231	(16,618,271)
Advance receipts	4,301,975	23,017,737
Withholdings	4,458,022	(244,917)
Accrued expenses	43,326,660	20,011,855
Other non-current liabilities	438,240	2,001,029
Retirement benefits transferred from/to affiliates	(122,914)	998,777
Payment of retirement benefits	(1,405,033)	(3,088,782)
Contributions to plan assets	(13,000,000)	(25,000,000)
	₩ (617,561,459)	₩ 210,822,386

Significant non-cash transactions for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021	2020
Transfer of construction-in-progress to property, plant and equipment and intangible assets	₩ 667,355,551	₩ 596,690,593
Reclassification of current portion of bonds payable and long-term borrowings	525,115,466	604,858,422
Changes in other accounts payable due to acquisition of property, plant and equipment	813,371	64,820,475

21. Supplementary cash flow information (cont'd)

Changes in liabilities arising from financing activities for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021						
	January 1	Acquisition of lease assets	Cash flows from financing activities	Foreign exchange rate movement	Amortization	Transfer	December 31
Current liabilities							
Short-term borrowings	₩ 94,768,701	₩ -	₩ 225,991,275	₩ 120,420	₩ -	₩ 200,000,000	₩ 520,880,396
Current portion of bonds payable and long-term borrowings	599,794,290	-	(600,000,000)	-	205,710	319,771,979	319,771,979
Lease liabilities	4,200,092	-	(5,254,620)	83,938	-	5,343,487	4,372,897
	698,763,083	-	(379,263,345)	204,358	205,710	525,115,466	845,025,272
Non-current liabilities							
Long-term borrowings	499,791,268	-	100,000,000	-	87,822	(200,000,000)	399,879,090
Bonds payable	1,340,919,474	-	-	39,000,000	1,483,141	(319,771,979)	1,061,630,636
Lease liabilities	8,886,990	6,462,363	-	195,823	-	(5,343,487)	10,201,689
	1,849,597,732	6,462,363	100,000,000	39,195,823	1,570,963	(525,115,466)	1,471,711,415
	₩ 2,548,360,815	₩ 6,462,363	₩ (279,263,345)	₩ 39,400,181	₩ 1,776,673	₩ -	₩ 2,316,736,687

	2020						
	January 1	Acquisition of lease assets	Cash flows from financing activities	Foreign exchange rate movement	Amortization	Transfer	December 31
Current liabilities							
Short-term borrowings	₩ 134,025,577	₩ -	₩ (38,220,861)	₩ (1,036,015)	₩ -	₩ -	₩ 94,768,701
Current portion of bonds payable and long-term borrowings	419,970,183	-	(420,000,000)	-	29,817	599,794,290	599,794,290
Lease liabilities	4,320,960	-	(5,114,985)	(70,015)	-	5,064,132	4,200,092
	558,316,720	-	(463,335,846)	(1,106,030)	29,817	604,858,422	698,763,083
Non-current liabilities							
Long-term borrowings	280,000,000	-	449,735,000	-	56,268	(230,000,000)	499,791,268
Bonds payable	1,736,815,858	-	-	(27,920,000)	1,817,906	(369,794,290)	1,340,919,474
Lease liabilities	10,137,226	3,962,041	-	(148,145)	-	(5,064,132)	8,886,990
	2,026,953,084	3,962,041	449,735,000	(28,068,145)	1,874,174	(604,858,422)	1,849,597,732
	₩ 2,585,269,804	₩ 3,962,041	₩ (13,600,846)	₩ (29,174,175)	₩ 1,903,991	₩ -	₩ 2,548,360,815

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 ₩1,483,121 thousand (₩1,262,253 thousand in 2020) and ₩438,274 thousand of retirement benefits in 2021 (₩487,056 thousand in 2020).

The related parties of the Company and their relationship with the Company as of December 31, 2021 are as follows:

Relationship	Related party
Jointly controlling entities	Hanwha Impact Corporation (formerly, Hanwha General Chemical Co., Ltd.)
	TotalEnergies Holdings UK Limited
Subsidiaries	Dongguan Hanwha Total Engineering Plastic Co., Ltd.
	Hanwha Total Petrochemical Trading (Shanghai) Co., Ltd.

22. Related party disclosures (cont'd)

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 in 2021 and 2020 and the related outstanding balances as of December 31, 2021 and 2020 arising from such transactions between the Group and its related parties are as follows (Korean won in thousands):

	2021				
Related party	Sales and others	Purchase of inventories and others	Purchase of non-current assets	Receivables	Payables
Joint controlling:					
Hanwha Impact Corporation (formerly, Hanwha General Chemical Co., Ltd.)	₩ 578,569,906	₩ 17,220,815	₩ 339,720	₩ 56,534,928	₩ 2,504,589
TotalEnergies Holdings UK Limited	-	1,429,934	-	-	86,140
Other related parties:					
Hanwha Corporation	126,165,210	16,828,289	-	18,815,420	4,691,736
Hanwha Construction Co., Ltd	-	480,400	117,354,452	-	3,441,293
Hanwha Life Insurance Co., Ltd.	2,647,895	5,876,738	-	152,987,599	22
Hanwha General Insurance Co., Ltd.	68,184	15,203,713	135,004	-	8,730,528
Carrot General Insurance Co., Ltd.	-	7,519,423	-	-	-
Hanwha Systems Co., Ltd.	37,666	16,195,004	2,927,180	4,582	5,248,377
Hanwha Power Systems Co., Ltd.	-	1,730,055	-	-	1,529,626
Hanwha Techwin Co., Ltd.	-	4,452,979	37,900	-	3,442,647
Hanwha Solution Corporation (*1)	119,124,461	6,772,068	-	14,777,833	1,021,697
Hanwha Hotels & Resorts Co.,Ltd.	1,375,817	2,081,822	1,490,000	888	30,930
Hanwha Energies Co., Ltd.	40,959,977	-	-	6,143,167	-
Hanwha Compound Co.,Ltd	1,831,122	4,002,021	-	170,861	427,327
Hanwha Q CELLS Japan Co., Ltd.	15,748,319	4,757,926	-	-	1,225,582
TRI Energy Global Pte. Ltd.	504,594,770	62,557,713	-	38,826,409	28,625
Hanwha International LLC	10,295,772	128,982	-	-	1,373,756
TotalEnergies Petrochemicals and Refining SA/NV (formerly, Total Petrochemicals and Refining SA/NV)	61,782,972	828,593	-	11,127,995	391,245
TotalEnergies SE (formerly, Total SE)	-	14,745,703	-	-	4,633,731
TotalEnergies Trading Asia Pte. Ltd. (formerly, Total Trading Asia Pte. Ltd.)	690,111,367	518,566,723	-	11,149,141	80,352,349
TOTSA TotalEnergies Trading SA (formerly, TOTSA Total Oil Trading SA)	9,958,326	34,461,607	-	2,152,708	5,018,459
TotalEnergies Petrochemicals (Hong Kong) Limited (formerly, Total Petrochemicals (Hong Kong) Limited)	3,338,686	4,835,731	-	622,553	-
TotalEnergies Petrochemicals and Refining USA, inc. (formerly Total Petrochemicals and Refining USA, inc.)	3,071,509	-	-	535,353	-
Total Petrochemicals (NINGBO) Ltd.	4,149,618	-	-	-	-
TotalEnergies Marketing Asia-Pacific (formerly, Total Oil Asia-Pacific Pte. Ltd)	2,537,100	-	-	76,092	-
Total Petroleum (Shanghai) Co.,Ltd	2,396,399	-	-	494,347	-
TotalEnergies Fluids (formerly, Total Fluids)	5,437,862	171,535	-	-	97
Total Petrochemicals (Shanghai) Ltd. Zhenjiang Branch	1,868,993	-	-	-	-
Others	222,632	679,168	151	120,430	90,085
	₩ 2,186,294,563	₩ 741,526,942	₩ 122,284,407	₩ 314,540,306	₩ 124,268,841

(*1) Hanwha Galleria Co., Ltd merged to Hanwha Solution Corporation in 2021 and Hanwha Solution Corporation has included transactions with Hanwha Galleria Co., Ltd. from the second quarter.

22. Related party disclosures (cont'd)

	2020				
Related party	Sales and others	Purchase of inventories and others	Purchase of non-current assets	Receivables	Payables
Joint controlling:					
Hanwha General Chemical Co., Ltd.	₩ 420,859,209	₩ 17,472,675	₩ -	₩ 36,100,605	₩ 1,907,533
Total Holdings UK Limited	-	1,348,584	-	-	84,770
Other related parties:					
Hanwha Corporation	73,596,138	10,898,228	3,396,000	13,626,869	31,528
Hanwha Construction Co., Ltd	-	123,000	239,339,776	-	13,292,110
Hanwha Life Insurance Co., Ltd.	2,988,793	5,830,929	-	149,330,361	25,230
Hanwha General Insurance Co., Ltd.	68,184	18,063,204	323,901	-	6,594,716
Hanwha Systems Co., Ltd.	41,875	15,269,843	2,176,290	3,560	4,350,204
Hanwha Solution Corporation	53,548,020	4,255,906	675,000	7,702,893	973,672
Hanwha Hotels & Resorts Co., Ltd.	-	1,521,036	492,904	-	-
Hanwha Galleria Co., Ltd	-	2,623,507	-	-	8,868
Hanwha Energy Corporation	31,437,157	-	-	3,349,512	-
Hanwha Estate Co., Ltd.	11,956	572,437	1,313,995	984	35,487
Hanwha Techwin Co., Ltd.	-	-	1,980,371	-	331,194
Hanwha Compound Co.,Ltd	1,581,573	3,007,662	-	335,328	794,029
Hanwha Q CELLS Japan Co., Ltd.	4,270,623	13,516,901	-	36,161	301,361
TRI Energy Global Pte. Ltd.	366,506,663	13,773,533	-	46,678,687	-
Hanwha Chemical (Thailand) Co.,Ltd.	12,592,788	-	-	1,291,707	-
Hanwha International LLC	1,141,698	586,842	1,024,672	-	275,802
Total Petrochemicals and Refining SA/NV	22,205,591	698,887	-	6,592,883	147,215
Total SE (formerly, Total S.A.)	-	10,108,985	-	4,621,900	-
Total Trading Asia Pte. Ltd.	470,577,653	576,302,827	-	10,299,554	3,424,941
TOTSA Total Oil Trading SA	47,642,581	17,729,098	-	3,742,829	-
Total Petrochemicals (Hong Kong) Limited	1,245,741	5,065,943	-	338,455	-
Total Petrochemicals and Refining USA	2,249,898	-	-	715,158	-
Total Petrochemicals (Ningbo) Co., Ltd.	6,818,066	-	-	-	451,228
Total Oil Asia-Pacific Pte Ltd	4,857,219	-	-	292,390	-
Total Gas & Power North America, Inc	16,015,681	-	-	-	-
Total Fluides	1,908,978	6,684	-	-	186
Others	1,638,203	728,002	679,893	436,032	377,993
	₩ 1,543,804,288	₩ 719,504,713	₩ 251,402,802	₩ 285,495,868	₩ 33,408,067

Terms and conditions of transactions with related parties

Outstanding balances at the year-end are unsecured, interest free and settled in cash. There have been no guarantees provided or received for any related party receivables or payables. For the years ended December 31, 2021 and 2020, the Group has not recognized any impairment of receivables relating to amounts owed by the related parties. This assessment is undertaken each financial year through examining the financial position of the related parties and the market in which the related parties operate.

23. Segment information

The financial information about geographic areas where the related parties are located for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

	2021							
		Korea		China		Consolidation elimination		Total
Sales	₩	9,846,060,225	₩	52,311,740	₩	-	₩	9,898,371,965
Inter-company sales		21,350,284		17,430,407		(38,780,691)		-
Net sales		9,824,709,941		34,881,333		-		9,859,591,274
Operating profit		990,502,307		2,029,138		359,639		992,891,084
Profit for the year		646,030,974		1,592,853		359,639		647,983,466
Non-current assets (*)		4,495,448,006		10,129,893		-		4,505,577,899

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

	2020							
		Korea		China		Consolidation elimination		Total
Sales	₩	6,804,951,555	₩	41,715,294	₩	-	₩	6,846,666,849
Inter-company sales		18,576,130		15,891,948		(34,468,078)		-
Net sales		6,786,375,425		25,823,346		-		6,812,198,771
Operating profit		96,297,929		3,145,143		(131,677)		99,311,395
Profit for the year		111,089,934		2,536,819		(4,173,698)		109,453,055
Non-current assets (*)		4,609,756,783		6,197,717		926,853		4,616,881,353

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

The group has no major client over 10% of total sales for the year ended December 31, 2021 and 2020.

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 to ₩330,000,000 thousand and ₩330,000,000 thousand as of December 31, 2021 and 2020, 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, 2021 and 2020 are as follows (US dollar and Korean won in thousands):

	2021			2020		
	Currency	Foreign currencies	In equivalent of Korean won	Currency	Foreign currencies	In equivalent of Korean won
Financial assets	USD	338,867	₩ 401,726,581	USD	327,757	₩ 356,599,373
	Others		42,126,087	Others		28,193,085
			₩ 443,852,668			₩ 384,792,458
Financial liabilities	USD	1,058,765	₩ 1,255,166,227	USD	753,688	₩ 820,012,969
	Others		10,968,426	Others		7,189,641
			₩ 1,266,134,653			₩ 827,202,610

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):

	2021		2020	
	(+) 10%	(-) 10%	(+) 10%	(-) 10%
Increase (decrease) in profit for the year	₩ (1,366,364)	₩ 1,366,364	₩ 2,347,988	₩ (2,347,988)

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, 2021, trade accounts receivable from the top five customers accounted for 26.4% or ₩184,695,584 thousand of total trade accounts receivable.

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):

	2021				
	Within 3 months	3 months ~ 1 year	1 year ~ 5 years	Over 5 years	Total
Bonds payable and borrowings (*)	₩ 520,880,396	₩ 320,000,000	₩ 1,464,200,000	₩ -	₩ 2,305,080,396

	2020				
	Within 3 months	3 months ~ 1 year	1 year ~ 5 years	Over 5 years	Total
Bonds payable and borrowings (*)	₩ 204,768,701	₩ 490,000,000	₩ 1,765,200,000	₩ 80,000,000	₩ 2,539,968,701

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

36.5% of the Group's financial liabilities will mature in less than one year as of December 31, 2021 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 years ended December 31, 2021 and 2020. The Group's debt-to-equity ratios as of December 31, 2021 and 2020 are 93.4% and 92.7%, respectively.

25. Uncertainty of the impact of Covid-19

In order to prevent the spread of Covid-19, a various prevention and control measures, including restrictions on traveling are being implemented worldwide, and as a result, the global economy has been extensively affected. In addition, governments are implementing various support measures to address Covid-19. The items that mainly impacted by the Covd-19 are collectability of trade accounts receivable (see Note 4) and impairment of property, plant and equipment and intangible assets (see Notes 7 and 9). The Group prepared its consolidated financial statements with reasonable estimates of the impact of Covid-19. However, significant accounting estimates and assumptions used in preparing the Group's consolidated financial statements may be adjusted depending on the changes arising from the uncertainties of Covid-19, and the ultimate impact on the Group's business, financial position and management performance is not estimable at the moment.

26. Approval of consolidated financial statements

The consolidated financial statements of the Group for the year ended December 31, 2021 were approved by the Company's Board of Directors on January 26, 2022.

27. Events after the reporting period

(1) In accordance with the decision of the board of directors on November 29, 2021, the Group issued public placement bonds, which are amounting to ₩290 billion on February 25, 2022.

(2) The ongoing armed conflict in Ukraine area which began in February 2022 and international sanctions imposed against Russia may impact sanctioned entities, entities doing business with Ukraine or Russia, as well as entities exposed directly or indirectly to industries or economy of Ukraine or Russia. The events described above represent non-adjusting events after the reporting period. The Group cannot make a reasonable estimation of financial impact of the recent conflict in Ukraine on the future events.