SK Chemicals Co., Ltd. and its subsidiaries

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

SK Chemicals Co., Ltd.
and its subsidiaries

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Independent auditor's report

(English Translation of a Report Originally Issued in Korean)

The Shareholders and Board of Directors

SK Chemicals Co., Ltd.

Opinion

We have audited the consolidated financial statements of SK Chemicals 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 profit or loss and other 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 International Financial Reporting Standards as adopted by the Republic of Korea ("KIFRS").

Basis for opinion

We conducted our audits in accordance with Korean Standards on Auditing ("KSAs"). Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the consolidated financial statements section of our report. We are independent of the Group in accordance with the ethical requirements that are relevant to our audits 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.

Key audit matters

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

Timing of export sales recognition

As described in Note 28, sales from the company's export transactions during the current period amounted to 880,154 million, accounting for 42.1% of the total sales. Export sales are subject to various performance obligations depending on the contract and export conditions with the customer and requires management's judgment on the timing of revenue recognition because the timing of the transfer of control of each good or service is different. Therefore, considering the possibility of incurring error from Group's judgment or intentional misstatement in recognition of export sales cut-off, we selected appropriateness of timing of revenue recognition related to export sales as key audit matter.

In this regard, the main audit procedures we have performed are as follows.

- Understanding and evaluation of accounting policies, accounting processes, and internal control related to the Company's export transactions cut-off
- Review of contracts by major sales transaction types (identification of performance obligations, review of contract conditions by performance obligations, appropriateness of the timing of revenue recognition)
- Comparing between the time of occurrence of sales and the time of recognition of the Company's sales using sampling methods for export transactions that occurred before and after the end of the reporting period.

Revenue recognition of C(D)MO contracts
As stated in Note 24, the Group recognizes sales of KRW 214,907 million from the contract to provide C(D)MO production services for the COIVD-19 vaccine. The C(D)MO business consists of technology transfer procedures, regulatory approval procedures, commercial production procedures, and R&D services. The Group recognizes revenue over the period when the control of biopharmaceuticals and intellectual property rights generated by the Group is transferred to the customer. Revenue recognition of C(D)MO contracts was selected as a key audit matter as the amount of revenue from the C(D)MO business is significant to the financial statements, and significant management judgement is required to determine the timing and amount of revenue recognition.

In this regard, the main audit procedures we have performed are as follows.

- Assessed the appropriateness of accounting policies related to revenue recognition
- Evaluated the internal controls related to determining the amount and timing of revenue recognition
- Evaluated contracts for each project on a sample basis to evaluate the appropriateness of the accounting treatment for revenue recognition
- Assessed the appropriateness of determining the timing of revenue recognition and amount on a sample basis
- Performed an independent recalculation to verify project progress and contract assets and contract liabilities on a sample basis

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 the consolidated financial statements that are free from material misstatement, whether due to fraud or error.

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

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

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

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

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

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

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

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

The partner in charge of the audit resulting in this independent auditor's report is Tae Hwan Kim.

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 date of the independent auditor's report to the time this report is used. Such events and circumstances could significantly affect the accompanying consolidated financial statements and may result in modifications to this report.

SK Chemicals 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		2,784,058,669,420	923,286,317,987
Cash and cash equivalents		255,615,367,155	86,764,151,843
Short-term financial assets	5, 9, 35	1,794,156,437,313	339,928,469,816
Trade and other accounts receivables	5, 6, 23, 25, 35	366,865,111,272	233,192,607,955
Inventories	7	349,299,225,904	252,930,309,986
Contract assets	21	-	979,914,679
Other current assets	5, 8, 19, 35	18,122,527,776	9,490,863,708
Non-current assets		1,171,573,724,836	1,196,680,638,899
Long-term financial assets	5, 9	21,142,500,000	32,500,000
Other investment assets	5, 10, 35	35,081,486,249	24,492,063,443
Investment in an associate and a joint venture	11	16,328,276,602	9,104,020,171
Property, plant and equipment	12, 24, 27	999,245,763,243	1,069,999,627,343
Right-of-use assets	13, 27	15,386,726,242	16,101,459,538
Intangible assets	14, 27	44,422,323,845	36,955,864,384
Investment properties	15, 27	17,212,277,612	17,055,665,021
Other non-current assets	5, 8, 20, 23, 35	11,327,379,952	2,344,511,421
Deferred income tax assets	31	11,426,991,091	20,594,927,578
Total Assets		3,955,632,394,256	2,119,966,956,886
Liabilities			
Current liabilities		1,086,649,251,139	645,679,130,159
Trade and other payables	5, 16, 23, 25, 34, 35	452,892,821,032	232,021,734,019
Short-term borrowings	5, 6, 17, 33, 34	11,671,373,163	107,636,902,688
Current portion of long-term liabilities	5, 17, 33, 34	207,864,113,268	96,947,494,138
Current portion of lease liabilities	5, 13, 33, 34	2,788,637,923	3,038,108,909
Current portion of contract liabilities	21	114,455,430,866	96,226,901,452
Current portion of provisions	22, 24	22,437,979,100	-
Income tax payable	31	174,009,868,314	69,339,226,370
Other current liabilities	5, 18, 19, 34	100,529,027,473	40,468,762,583
Non-current liabilities		302,245,734,599	515,355,033,495
Bonds payable	5, 17, 23, 33, 34	256,063,406,698	460,480,569,890
Long-term borrowings	5, 17, 23, 33, 34	-	31,135,000,000
Lease liabilities	5, 13, 33	8,343,522,232	9,392,925,411
Net employee defined benefit liabilities	20	4,869,971,132	7,643,269,177
Other non-current liabilities	5, 18, 23, 34, 35	2,629,873,359	4,085,315,565
Deferred tax liability	31	30,338,961,178	2,617,953,452
Total Liabilities		1,388,894,985,738	1,161,034,163,654
Equity			
Shares owned by the parent company		2,053,541,812,523	952,877,954,864
Issued capital	26	98,681,045,000	66,000,330,000
Capital surplus	26	1,192,768,791,273	264,314,596,680
Other components of equity	26	(21,346,012,463)	(18,117,669,311)
Accumulated other comprehensive income(loss)	26	2,937,290,315	(2,624,096,023)
Retained earnings	26	780,500,698,398	643,304,793,518
Non-controlling interest	1	513,195,595,995	6,054,838,368
Total equity		2,566,737,408,518	958,932,793,232
Total liabilities and equity		3,955,632,394,256	2,119,966,956,886

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

SK Chemicals Co., Ltd. and its subsidiaries
Consolidated statements of profit or loss and other comprehensive income
for the years ended December 31, 2021 and 2020

(Korean won)

	Notes	2021	2020
Revenue	25, 27, 28	2,089,631,876,416	1,198,780,770,389
Cost of sales	25, 29	1,208,252,148,242	810,782,693,273
Gross profit		881,379,728,174	387,998,077,116
Selling and administrative expenses	29	326,193,817,735	232,640,102,759
Operating profit	27	555,185,910,439	155,357,974,357
Other income	25, 30	27,409,549,709	12,567,892,627
Other expenses	25, 30	44,231,104,316	27,815,467,546
Financial income	5, 30	62,588,844,094	44,134,696,501
Finance cost	5, 30	63,950,494,455	60,130,736,952
Equity method gains on joint venture investment	11	1,618,945,234	1,757,212,860
Profit before tax from continuing operation		538,621,650,705	125,871,571,847
Income tax expenses from continuing operation	31	168,012,085,990	35,924,417,422
Profit for the year from continuing operation		370,609,564,715	89,947,154,425
Profit (loss) before tax from discontinued operation	36	(134,418,662,607)	218,381,756,938
Income tax expenses from discontinued operation	31, 36	(32,552,435,910)	53,167,701,588
Profit (loss) for the year from discontinued operation	36	(101,866,226,697)	165,214,055,350
Profit before income tax		404,202,988,098	344,253,328,785
Income tax expense	31	135,459,650,080	89,092,119,010
Profit for the year		268,743,338,018	255,161,209,775
Other comprehensive loss		(251,006,594)	(2,877,570,874)
Other comprehensive loss to be reclassified to profit or loss in subsequent periods			
Equity adjustments in equity method		66,701,118	307,469,584
Gain (loss) from translation of foreign operations		4,238,697,803	(194,585,531)
Gain (loss) on valuation of derivatives		1,194,758,118	(145,731,021)
Other comprehensive loss not to be reclassified to profit or loss in subsequent periods			
Remeasurement loss on defined benefit plans		(5,751,163,633)	(2,844,723,906)
Total comprehensive income, net of tax		268,492,331,424	252,283,638,901
Consolidated profit (loss) from continuing operation attributable to			
Equity-holders of the parent		270,006,042,994	89,106,714,563
Non-controlling interests		100,603,521,721	840,439,862
Consolidated profit attributable to			
Equity-holders of the parent		168,139,816,297	254,320,769,913
Non-controlling interests		100,603,521,721	840,439,862
Total comprehensive income attributable to			
Equity-holders of the parent		168,640,349,018	251,484,529,872
Non-controlling interests		99,851,982,406	799,109,029
Earnings per share	32		
Basic and diluted, earnings for the year			
Basic earnings (loss) per ordinary share from continuing operation		14,007	4,533
Basic earnings (loss) per ordinary share from discontinued operation		(5,421)	8,414
Diluted earnings per ordinary share from continuing operation		13,921	4,523
Diluted earnings per ordinary share from discontinued operation		-	8,378
Basic earnings per preferred share			
Basic earnings (loss) per preferred share from continuing operation		11,909	4,576
Basic earnings (loss) per preferred share from discontinued operation		(3,273)	8,405

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

SK Chemicals Co., Ltd. and its subsidiaries
Consolidated Statements of changes in equity
for the years ended December 31, 2021 and 2020

(Korean won)

	Equity							
	Capital attributable to the owners of the parent company						Non-controlling interest	Total equity
	Capital	Capital surplus	Other capital	Accumulated other comprehensive income	Retained earnings	Total capital attributable to the owners of the parent company		
As of January 1, 2020	66,000,330,000	264,314,596,680	(9,889,506,203)	(2,594,106,840)	397,797,289,663	715,628,603,300	3,077,689,559	718,706,292,859
Profit for the year	-	-	-	-	254,320,769,913	254,320,769,913	840,439,862	255,161,209,775
Equity adjustments in equity method	-	-	-	307,469,584	-	307,469,584	-	307,469,584
Loss from translation of foreign operations	-	-	-	(194,585,531)	-	(194,585,531)	-	(194,585,531)
Loss on valuation of derivatives	-	-	-	(142,873,236)	-	(142,873,236)	(2,857,785)	(145,731,021)
Remeasurement loss on defined benefit plans	-	-	-	-	(2,806,250,858)	(2,806,250,858)	(38,473,048)	(2,844,723,906)
Stock options granted <Note 26>	-	-	561,602,700	-	-	561,602,700	575,453,503	1,137,056,203
Stock options exercised <Note 26>	-	-	(4,354,860,000)	-	-	(4,354,860,000)	-	(4,354,860,000)
Cash dividend <Note 26>	-	-	-	-	(6,007,015,200)	(6,007,015,200)	-	(6,007,015,200)
Acquisition of treasury stock <Note 26>	-	-	(4,434,905,808)	-	-	(4,434,905,808)	-	(4,434,905,808)
Changes in non-controlling interests <Note 26>	-	-	-	-	-	-	1,602,586,277	1,602,586,277
As of December 31, 2020	66,000,330,000	264,314,596,680	(18,117,669,311)	(2,624,096,023)	643,304,793,518	952,877,954,864	6,054,838,368	958,932,793,232
As of January 1, 2021	66,000,330,000	264,314,596,680	(18,117,669,311)	(2,624,096,023)	643,304,793,518	952,877,954,864	6,054,838,368	958,932,793,232
Profit for the year	-	-	-	-	168,139,816,297	168,139,816,297	100,603,521,721	268,743,338,018
Equity adjustments in equity method	-	-	-	66,701,118	-	66,701,118	-	66,701,118
Gain from translation of foreign operations	-	-	-	4,238,697,803	-	4,238,697,803	-	4,238,697,803
Gain on valuation of derivatives	-	-	-	988,795,267	-	988,795,267	205,962,851	1,194,758,118
Remeasurement loss on defined benefit plans	-	-	-	-	(4,793,661,467)	(4,793,661,467)	(957,502,166)	(5,751,163,633)
Capital increase without consideration <Note 26>	32,630,715,000	(33,234,375,813)	-	-	-	(603,660,813)	-	(603,660,813)
Stock options granted <Note 26>	-	-	125,936,990	-	-	125,936,990	-	125,936,990
Stock options exercised <Note 26>	50,000,000	861,558,500	(186,537,501)	-	-	725,020,999	-	725,020,999
Cash dividend <Note 26>	-	ss-	-	-	(26,150,249,950)	(26,150,249,950)	-	(26,150,249,950)
Acquisition of treasury stock <Note 26>	-	-	(3,167,742,641)	-	-	(3,167,742,641)	-	(3,167,742,641)
Changes in non-controlling interests <Note 26>	-	960,827,011,906	-	267,192,150	-	961,094,204,056	407,288,775,221	1,368,382,979,277
As of December 31, 2021	98,681,045,000	1,192,768,791,273	(21,346,012,463)	2,937,290,315	780,500,698,398	2,053,541,812,523	513,195,595,995	2,566,737,408,518

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

SK Chemicals 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	268,743,338,018	255,161,209,775
Non-cash adjustments to reconcile profit (loss) for the year to net cash flows provided by (used in) operating activities <Note 33>	352,160,892,583	(64,789,335,580)
Working capital adjustments <Note 33>	4,941,987,393	98,345,148,713
Interest received	1,351,693,026	897,067,477
Interest paid	(14,746,095,160)	(24,410,198,217)
Dividends received	3,757,950,000	2,910,840,000
Income tax paid	(106,893,301,118)	(21,105,152,844)
Net cash flows provided by operating activities	509,316,464,742	247,009,579,324
Cash flows from investment activities		
Business transfer	71,472,753,210	380,919,480,691
Decrease in short-term deposits		2,000,000
Decrease in short-term loan receivables	7,648,508,237	-
Decrease in long-term deposits	488,043,619	303,396,000
Decrease in long-term loan receivables	-	3,262,039,786
Recovery of long-term investment assets	25,000,000	-
Decrease in long-term financial assets	990,000,000	-
Disposal of tangible assets and right-of-use assets	1,436,420,016	47,890,722
Disposal of intangible assets	-	3,619,299,299
Receipt of government grant	85,756,878	1,002,110,507
Net increase in short-term financial assets	(1,460,408,834,006)	(247,074,693,315)
Increase in long-term financial Instrument	(22,100,000,000)	(2,262,345)
Increase in long-term loan deposits	(526,099,100)	(520,660,200)
Acquisition of long term financial assets	(9,470,668,489)	(2,500,000,000)
Acquisition of tangible assets	(138,187,398,984)	(93,315,628,368)
Acquisition of tangible assets due to borrowing cost	(1,087,644,835)	(1,532,379,847)
Acquisition of intangible assets	(6,650,456,470)	(2,311,777,141)
Discard and overhaul of tangible assets	(1,198,619,330)	-
Acquisition of investments in affiliates and joint ventures	(7,699,750,000)	-
Change in consolidation scope	(1,400,823,583)	(916,732,213)
Net cash flows provided by investing activities	1,566,583,812,837	40,982,083,576
Cash flows from financing activities		
Proceeds from short-term borrowings	14,823,630,881	116,000,000,000
Paid-In capital increase	725,021,000	-
Cash inflow from consolidated capital transactions	1,481,370,713,920	-
Repayment of short-term borrowings	(79,550,000,000)	(177,780,844,282)
Net decrease in short-term borrowings in foreign currency	(31,636,902,688)	(21,478,169,612)
Repayment of current portion of long-term borrowings	(1,003,200,000)	(104,401,400,000)
Repayment of current portion of bonds	(96,000,000,000)	(146,000,000,000)
Repayment of current portion of lease liabilities	(2,774,229,357)	(5,843,597,695)
Repayment of long-term borrowings	(32,059,000,000)	(30,625,000,000)
Settlement of derivatives transactions	(628,085,085)	-
Acquisition of treasury stock	(3,167,742,641)	(4,434,905,808)
Stock option exercised	-	(4,354,860,000)
Dividends paid	(26,148,257,500)	(6,006,549,700)
Net cash flows provided by (used in) financing activities	1,223,951,948,530	(384,925,327,097)
Net increase (decrease) in cash and cash equivalents	166,684,600,435	(96,933,664,197)
Cash and cash equivalents at the beginning of the year	86,764,151,843	183,975,936,156
Net foreign exchange difference	2,166,614,877	(278,120,116)
Cash and cash equivalents at the end of the year	255,615,367,155	86,764,151,843

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

1. General information

Controlling company
On December 1, 2017, SK Chemicals Co., Ltd. (the "Company" or the "Parent Company") was spun off from SK Discovery Co., Ltd. (formerly, SK Chemicals Co., Ltd.) as a newly established entity and it primarily engages in the manufacture and sale of co-polyester and related products and development, manufacture and sale of pharmaceuticals and vaccines. The ordinary shares of the Company were relisted and have been publicly traded on the Korea Exchange since January 5, 2018. The Company's headquarters is located in 310 Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea. The Company owns and operates factories in Ulsan, Cheongju.

On May 1, 2018, the Company merged by absorbing SK Petrochemical Co., Ltd., a wholly owned subsidiary. On July 1, 2018, the Company newly established SK Bioscience Co., Ltd., that primarily engages in the development, manufacture and sales of vaccine, through a split-off of its division. Furthermore, the Parent Company established SK Multi-Utility Co., Ltd. for the purposes of supplying utilities through a split-off on December 1, 2021, the date of split-off.

Details of the Company's major shareholders as of December 31, 2021 are as follows:

Name of shareholder	Ordinary shares		Preferred share	
	Number of shares	Equity ownership (%)	Number of shares	Equity ownership (%)
SK Discovery Co., Ltd.	6,137,781	34.83	-	-
Treasury stock	30,857	0.18	148,133	7.00
Others	11,452,142	64.99	1,967,296	93.00
Total	17,620,780	100.00	2,115,429	100.00

The consolidated financial statements for the year ended December 31, 2021 have been approved by the Group's Board of Directors on February 10, 2022 and will be finalized at the shareholders' meeting to be held on March 28, 2022.

1. General information(cont'd)

Subsidiaries

Subsidiaries included in the consolidation as of December 31, 2021 are as follows:

Name of subsidiaries	Country of domicile	Year end	Equity ownership (%)	Principal business activities
SK Chemicals (Suzhou) Co., Ltd. (* 1)	China	December	100.00	Resin manufacturing
SK Chemicals (Yantai) Co., Ltd. (* 2)	China	December	100.00	Resin manufacturing
SK Chemicals (Shanghai) Co., Ltd.	China	December	100.00	Management consulting
SK Bioscience Co., Ltd.	Korea	December	68.43	Pharmaceutical manufacturing
SK Multi-Utility Co., Ltd. (* 3)	Korea	December	100.00	Manufacturing
SK Chemicals Daejeong Co., Ltd.(* 2, 4)	Korea	December	50.00	Organic solvent manufacturing
SK Chemicals America	USA	December	100.00	Wholesale of plastic material
SK Chemicals GmbH	Germany	December	100.00	Wholesale of plastic material
SK Chemicals Malaysia(* 2)	Malaysia	December	100.00	Management consulting

(* 1) During the current period, we have executed a stock purchase and sales agreement to sell 100% of the shares of SK Chemicals (Suzhou) Co., Ltd. to Sumong Foods Co., Ltd. The closing date for the transaction will be in 2023.

(*2) During the prior reporting period, SK Chemicals (Yantai) Co., Ltd. was newly invested by the Parent Company and incorporated into a subsidiary.

(* 3) During the current period, it was incorporated as a subsidiary after being split off from the Parent Company.

(* 4) During the current period, the Parent Company sold 50% of the shares of its subsidiary of SK Chemicals Daejeong Co., Ltd. to Daejeong Chemicals & Metals Co., Ltd. It was determined that the Parent Company has control over SK Chemicals Daejeong Co., Ltd. based on the fact that the chief executive officer of the Parent Company serves as the chief executive officer even after the interest was sold, and the chief executive officer has the decision-making authority given a deadlock situation.

Summarized financial information of subsidiaries as of and for the years ended December 31, 2021 and 2020 (Korean won in thousands):

2021					
Name of company	Assets	Liabilities	Equity	Sales	Net income (loss)
SK Chemicals (Suzhou) Co., Ltd. (* 1)	-	-	-	15,934,633	1,346,878
SK Chemicals (Suzhou) Co., Ltd.	25,465,638	7,066,615	18,399,023	35,045,230	2,461,400
SK Chemicals (Yantai) Co., Ltd.	24,247,233	2,245,127	22,002,106	-	-
SK Chemicals (Shanghai) Co., Ltd.	2,174,992	1,493,935	681,057	2,773,581	486,308
SK Bioscience Co., Ltd.	2,110,122,672	508,810,724	1,601,311,948	929,000,930	355,139,277
SK Multi-Utility Co., Ltd.	182,621,118	21,676,862	160,944,256	11,002,552	351,591
SK Chemicals Daejeong Co., Ltd.	17,209,578	3,075,529	14,134,049	20,377,621	2,164,602
SK Chemicals America	39,381,426	33,995,418	5,386,008	68,385,738	1,289,819
SK Chemicals GmbH	53,335,110	48,126,903	5,208,207	98,190,065	2,198,288
SK Chemicals Malaysia	341,627	11,567	330,060	-	(45,419)
Total	2,454,899,394	626,502,680	1,828,396,714	1,180,710,350	365,392,744

(* 1) During the current period, the Parent Company lost control following the sale of its interest in SK Chemicals (Qingdao) Co., Ltd., a subsidiary, and excluded it from the list of subsidiaries, and this is profit and loss before the loss of the control.

1. General information(cont'd)

2020					
Name of company	Assets	Liabilities	Equity	Sales	Net income (loss)
SK Chemicals (Qingdao) Co., Ltd.	22,239,374	1,509,314	20,730,060	15,570,483	1,359,612
SK Chemicals (Suzhou) Co., Ltd.	20,463,797	6,287,411	14,176,386	32,630,887	1,615,590
SK Chemicals (Yantai) Co., Ltd.	11,173,322	111,592	11,061,730	-	-
SK Chemicals (Shanghai) Co., Ltd.	486,397	333,521	152,876	2,036,452	(4,751)
SK Bioscience Co., Ltd.	562,231,772	298,441,527	263,790,245	225,610,785	32,889,712
JSI Co., Ltd. (* 1)	-	-	-	9,309,398	41,061
SK Chemicals Daejeong Co., Ltd.	14,955,988	3,010,080	11,945,908	1,299,190	71,001
SK Chemicals America	23,366,061	19,649,249	3,716,812	66,475,750	1,337,597
SK Chemicals GmbH	35,679,505	32,551,007	3,128,498	86,468,851	2,047,672
SK Chemicals Malaysia	372,924	372,924	-	-	-
Total	690,969,140	362,266,625	328,702,515	439,401,796	39,357,494

(*1) During the current year, the Parent Company lost control due to the sale of some of the shares held in its subsidiary, JSI Co., Ltd. and was excluded from the consolidation scope. The profit or loss presented above is before loss of control.

Investment in joint ventures

Details of investment in joint ventures as of December 31, 2021 are as follows:

Company name	Country of domicile	Year end	Equity ownership (%)	Principal business activities
Entis Co., Ltd.	Republic of Korea	December	50.00	Manufacturing
JSI Co., Ltd. (* 1)	Republic of Korea	December	40.00	Manufacturing
HDC POLYALL Co., Ltd. (* 2)	Republic of Korea	December	20.00	Manufacturing
ST Green Energy	Singapore	December	50.00	Wholesale

(* 1) During the previous period, it was reclassified from a subsidiary to an affiliate as the control was lost following the partial sale of its interest.

(* 2) During the current period, the Parent Company newly invested in the entity and the amount invested is classified as investments in affiliates and joint ventures.

1. General information(cont'd)

Changes in subsidiaries

As of December 31, 2021 and 2020, subsidiaries included in or excluded from the consolidation are as follows:

2021		
Classification	**Name of subsidiaries**	**Reason**
Included	SK Multi-Utility	Split-off
Excluded	SK Chemicals (Suzhou) Co., Ltd.	Disposal of whole shares

2020		
Classification	**Name of subsidiaries**	**Reason**
Included	SK Chemicals Daejeong Co., Ltd.	Acquisition after establishment
Included	SK Environmental Materials (Yantai) Co., Ltd.	Acquisition after establishment
Included	SK Chemicals Malaysia	Acquisition after establishment
Excluded	JSI Co., Ltd.	Disposal of some of shares

Non-controlling interests

Details of non-controlling interests in subsidiaries as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021			
Classification	**SK Bioscience Co., Ltd.**	**SK Chemicals Daejeong Co., Ltd.**	**Total**
Equity ownership attributable to NCI	31.57%	50.00%	
Total assets	2,110,122,672	17,209,578	2,127,332,250
Total liabilities	508,810,724	3,075,529	511,886,253
Net assets	1,601,311,948	14,134,049	1,615,445,997
Non-controlling interest	506,128,571	7,067,025	513,195,596

2020	
Classification	**SK Bioscience**
Equity ownership attributable to NCI	1.96%
Total assets	562,231,772
Total liabilities	298,441,527
Net assets	263,790,245
Non-controlling interest	6,054,838

1. General information(cont'd)

Financial performance of subsidiaries attributable to non-controlling interests for the years ended December 31, 2021 and 2020 is as follows (Korean won in thousands):

2021			
Classification	SK Bioscience Co., Ltd.	SK Chemicals Daejeong Co., Ltd.	Total
Equity ownership attributable to NCI	31.57%	50.00%	
Total comprehensive income (loss):			
Profit for the year	355,139,277	2,164,602	357,303,879
Other comprehensive income (loss)	(1,813,403)	23,539	(1,789,864)
Total comprehensive income	353,325,874	2,188,141	355,514,015
Profit attributable to non-controlling interests	99,693,785	909,737	100,603,522
Total comprehensive Income attributable to non-controlling interests	98,930,476	921,507	99,851,983
Consolidated statement of cash flows from:			
Operating activities	169,395,262	1,424,980	170,820,242
Investing activities	(448,887,031)	(169,359)	(449,056,390)
Financing activities	302,547,502	(531,523)	302,015,979
Effect of exchange rate fluctuations	7,025	-	7,025
Net change in cash and cash equivalents	23,062,758	724,098	23,786,856

2020			
Classification	SK Bioscience Co., Ltd.	JSI Co., Ltd. (* 1)	Total
Equity ownership attributable to NCI	1.96%	43.97%	
Total comprehensive income (loss):			
Profit for the year	32,889,712	41,061	32,930,773
Other comprehensive loss	(2,107,641)	-	(2,107,641)
Total comprehensive income	30,782,071	41,061	30,823,132
Profit attributable to non-controlling interests	822,383	18,057	840,440
Total comprehensive Income attributable to non-controlling interests	781,052	18,057	799,109
Consolidated statement of cash flows from:			
Operating activities	2,357,589	(156,740)	2,200,849
Investing activities	(2,119,702)	(256,610)	(2,376,312)
Financing activities	(30,176)	-	(30,176)
Net change in cash and cash equivalents	207,711	(413,350)	(205,639)

(*1) During the current year, the Parent Company lost control due to the sale of some of the shares held in its subsidiary, JSI Co., Ltd. and reclassified it from subsidiary to associate. The financial information presented above is before loss of control.

1. General information(cont'd)

Stock options granted by the subsidiaries

SK Bioscience Co., Ltd., a subsidiary of the Group, has given stock options to major executives, and details are as follows:

Grant date	Number of shares to issue	Exercise period	Exercise price	Fair value as of grant date
2018.12.11	546,270 shares	2021.12.12-2028.12.11	KRW 9,154/stock	KRW 1,649/stock

(*1) Due to capital increase without consideration and stock split during the current year, the number of shares to be issued was adjusted from 18,209 to 546,270 shares, the exercise price was adjusted from ₩274,621/share to ₩9,154/share, and the fair value of the grant date was adjusted from ₩49,465/share to ₩1,649/share.

The fair value of the stock option granted by SK Bioscience Co., Ltd. is calculated according to the binomial option pricing model, and the variables applied to the model are as follows (Korean won):

Classification	Portion granted on 2018.12.11
Stock price on the date of grant (*1)	KRW 9,154/stock
Exercise price (*1)	KRW 9,154/stock
Expected volatility	11.90%
Risk-free interest rate	1.94%

(*1) Due to capital increase without consideration and stock split during the current year, the stock price of the grant date and exercise price was adjusted from ₩274,621/share to ₩9,154/share.

Changes in stock options granted by SK Bioscience Co., Ltd. for the year ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021					
Grant date	Number of Shares to be issued		Valuation amount		
	Newly granted	Ending	Beginning	Increase	Ending (*1)
2018.12.11	546,270	546,270	900,710	-	900,710

(*1) The stock options granted by SK Bioscience Co., Ltd. are included in non-controlling interests of the Group.

2020					
Grant date	Number of Shares to be issued (* 1)		Valuation amount		
	Newly granted	Ending	Beginning	Increase	Ending
2018.12.11	546,270	546,270	325,256	575,454	900,710

(*1) Following the capital increase without consideration and the stock split during the previous period, the number of stocks to be issued was adjusted from 18,209 to 546,270.

2. Summary of significant accounting policies

Basis of consolidated financial statements preparation

The consolidated financial statements of the Company and its subsidiaries (collectively, the “Group”) have been prepared on historical cost basis, except when otherwise indicated and are presented in Korean won with all values rounded to the nearest thousands, except when otherwise indicated. The consolidated financial statements have been prepared on a historical cost basis, except for investment properties, land and buildings classified as property, plant and equipment, derivative financial instruments, debt and equity financial assets, contingent consideration and non-cash distribution liabilities that have been measured at fair value. The carrying values of recognized assets and liabilities that are designated as hedged items in fair value hedges that would otherwise be carried at amortized cost are adjusted to record changes in the fair values attributable to the risks that are being hedged in effective hedge relationships. The consolidated financial statements are presented in Korean won (KRW) and all values are rounded to the nearest thousands, except when otherwise indicated.

Basis of accounting standards

The Group prepares statutory financial statements in Korean in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (“KIFRS”) enacted by the *Act on External Audit of Stock Companies*. The accompanying consolidated financial statements have been translated into English from Korean financial statements. In the event of any differences in interpreting the financial statements or the independent auditor’s report thereon, Korean version, which is used for regulatory reporting purposes, shall prevail.

Basis of consolidation

The consolidated financial statements comprise the financial statements of the Group and its subsidiaries as of December 31, 2018. Control is achieved when the Group is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee. Specifically, the Group controls an investee if and only if the Group has:

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

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

- The contractual arrangement with the other vote holders of the investee
- Rights arising from other contractual arrangements
- The 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 statement of comprehensive income from the date the Group gains control until the date the Group ceases to control the subsidiary.

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

2. 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, as would be required if the Group had directly disposed of the related assets or liabilities

Business combinations and goodwill
Business combinations are accounted for using the acquisition method. The cost of an acquisition is measured as the aggregate of the consideration transferred, measured at acquisition date fair value and the amount of any non-controlling interest in the acquiree. For each business combination, the acquirer measures the non-controlling interest in the acquiree either at fair value or at the proportionate share of the acquiree's identifiable net assets. Acquisition costs incurred are expensed and included in selling and administrative expenses.

The Group determine that a business has been acquired when the group of activities and assets acquired includes input variables and substantive processes which contribute significantly to its ability to create outputs. It is considered substantive if (1) the acquired process (or set of processes) is crucial for the ability to continue to create outputs, and the acquired input variables include an organized labor with skills, knowledge or experience needed to carry out the relevant process (or set of processes), or (2) if the acquired process is deemed to significantly contribute to its ability to continue to produce an output or is considered unique or scarce, or to substitute, if any significant cost or effort is required, or if the ability to continue to produce outputs is delayed.

When the Group acquires a business, it assesses the financial assets and liabilities assumed for appropriate classification and designation in accordance with the contractual terms, economic circumstances and pertinent conditions as of the acquisition date. This includes the separation of embedded derivatives in host contracts by the acquiree. Any contingent consideration to be transferred by the acquirer will be recognized at fair value at the acquisition date. Contingent consideration classified as equity is not remeasured and its subsequent settlement is accounted for within equity. Contingent consideration classified as an asset or liability that is a financial instrument and within the scope of KIFRS 1109 Financial Instruments, is measured at fair value with the changes in fair value recognized in the statement of profit or loss in accordance with KIFRS 1109. Other contingent consideration that is not within the scope of KIFRS 1109 is measured at fair value at each reporting date with changes in fair value recognized in profit or loss.

Goodwill is initially measured at cost, being the excess of the aggregate of the consideration transferred and the amount recognized for non-controlling interests, and any previous interest held, over the net identifiable assets acquired and liabilities assumed. If the fair value of the net assets acquired is in excess of the aggregate consideration transferred, the Group re-assesses whether it has correctly identified all of the assets acquired and all of the liabilities assumed and reviews the procedures used to measure the amounts to be recognized at the acquisition date. If the re-assessment still results in an excess of the fair value of net assets acquired over the aggregate consideration transferred, then the gain is recognized in profit or loss.

After initial recognition, goodwill is measured at cost less any accumulated impairment losses. For the purpose of impairment testing, goodwill acquired in a business combination is, from the acquisition date, allocated to each of the Group's cash generating units that are expected to benefit from the combination, irrespective of whether other assets or liabilities of the acquiree are assigned to those units.

Where goodwill has been allocated to a cash-generating unit (CGU) and part of the operation within that unit is disposed of, the goodwill associated with the disposed operation is included in the carrying amount of the operation when determining the gain or loss on disposal. Goodwill disposed in these circumstances is measured based on the relative values of the disposed operation and the portion of the CGU retained.

2. Summary of significant accounting policies(cont'd)

Investment in an associate and joint ventures

An associate is an entity over which the Group has significant influence. Significant influence is the power to participate in the financial and operating policy decisions of the investee, but is not control or joint control over those policies.

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

Under the equity method, the investment in an associate or a joint venture is initially recognized at cost. The carrying amount of the investment is adjusted to recognize changes in the Group's share of net assets of the associate or joint venture since the acquisition date. Goodwill relating to the associate or joint venture is included in the carrying amount of the investment and is not tested for impairment separately.

The statement of profit or loss and other comprehensive income (loss) reflects the Group's share of the results of operations of the associate or joint venture. Any change in OCI of those investees is presented as part of the Group's OCI. In addition, when there has been a change recognized directly in the equity of the associate or joint venture, the Group recognizes its share of any changes, when applicable, in the statement of changes in equity. Unrealized gains and losses resulting from transactions between the Group and the associate or joint venture are eliminated to the extent of the interest in the associate or joint venture.

The aggregate of the Group's share of profit or loss of an associate and a joint venture is shown on the face of the statement of profit or loss and other comprehensive income (loss) outside operating profit and represents profit or loss after tax and non-controlling interests in the subsidiaries of the associate or joint venture.

The financial statements of the associate or joint venture are prepared for the same reporting period as the Group. When necessary, adjustments are made to bring the accounting policies in line with those of the Group.

After application of the equity method, the Group determines whether it is necessary to recognize an impairment loss on its investment in its associate or joint venture. At each reporting date, the Group determines whether there is objective evidence that the investment in the associate or joint venture is impaired. If there is such evidence, the Group calculates the amount of impairment as the difference between the recoverable amount of the associate or joint venture and its carrying value, and then recognizes the loss as 'Share of profit of an associate and a joint venture' in the statement of profit or loss and other comprehensive income (loss).

Under the equity method, the investment in an associate is initially recognized at cost and the carrying amount is increased or decreased to recognize the Group's share of the change in the net asset of the associate after the date of acquisition. Goodwill relating to the associate is included in the carrying amount of the investment and is neither amortized nor individually tested for impairment.

Foreign currency translation

The Group's consolidated financial statements are presented in Korean won, which is also its functional currency.

(1) Transactions and balances

Transactions in foreign currencies are initially recorded by the Group at their respective functional currency spot rates at the date the transaction first qualifies for recognition. Monetary assets and liabilities denominated in foreign currencies are retranslated at the functional currency spot rate of exchange at the reporting date.

Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rates 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 date when the fair value is determined. The gain or loss arising on translation of non-monetary items measured at fair value is treated in line with the recognition of the gain or loss on the 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 is also recognized in OCI or profit or loss, respectively).

2. Summary of significant accounting policies(cont'd)

In determining the spot exchange rate to use on initial recognition of the related asset, expense or income (or part of it) on the derecognition of a non-monetary asset or non-monetary liability relating to advance consideration, the date of the transaction is the date on which the Group initially recognizes the non-monetary asset or non-monetary liability arising from the advance consideration. If there are multiple payments or receipts in advance, the Group determines the transaction date for each payment or receipt of advance consideration.

(2) Foreign operations

The assets and liabilities of foreign operations are translated into Korean won at the rate of exchange prevailing at the reporting date and their statement of comprehensive incomes are translated at average exchange rate during the applicable period. The exchange differences arising on the translation are recognized in OCI. On disposal of a foreign operation, the gain or loss on translation of foreign operations recorded in OCI is reclassified to the comprehensive income. Any goodwill arising on the acquisition of a foreign operation and any fair value adjustments to the carrying amounts of assets and liabilities arising on the acquisition are treated as assets and liabilities of the foreign operation and translated at the spot rate of exchange at the reporting date.

Revenue from contract with customers
The Group has two business divisions: Green Chemicals and Life Science. The Green Chemicals business produces and sells PET resins, high-performance PETG resins, and industrial adhesives. The Life Science business is engaged in the pharmaceutical and vaccine businesses. Revenue from contracts with customers is recognized when control of the goods or services is transferred to the customer at an amount that reflects the consideration to which the Group expects to be entitled in exchange for those goods or services. The Group has generally concluded that it is the principal in its revenue arrangements, because it typically controls the goods or services before transferring them to the customer

(1) Sale of goods
Revenue from the sale of goods is recognized when the significant risks and rewards of ownership of the goods have passed to the buyer, usually on delivery of the goods. The normal credit term is in 180 days upon delivery. The Group considers whether there are other promises in the contract that are separate performance obligations to which a portion of the transaction price needs to be allocated (e.g., warranties, customer loyalty points). In determining the transaction price for the sale of equipment, the Group considers the effects of variable consideration, the existence of significant financing components, noncash consideration, and consideration payable to the customer (if any).

➢ Licensing: right to use
The license agreement is the right to use intellectual property that exists at the time of granting the license, which means that the customer can direct the use of the license at the time of transferring the license and can acquire most of the remaining benefits from the license. The Group recognizes that it is a duty to perform at one point if they have given customers licenses.

➢ Licensing: right to access
The Group provides licenses for pharmaceuticals to customers and receives consideration in return. The Group also provides research and other services to customers throughout the license period.

➢ Sales of vaccines and biopharmaceuticals
The sales profits from vaccines and biopharmaceuticals are generally recognized upon the delivery of the vaccines and biopharmaceuticals, when the control of the assets is transferred to the customer. The typical recovery period for receivables is 90 to 180 days after delivery. The Group shall consider whether other promises under the contracts are separate performance obligations for which a part of the consideration for the transaction must be allocated. In calculating the transaction price for the sale of goods, the Group consider variable consideration, significant financing factors, non-cash consideration and the consideration payable to the customers.

2. Summary of significant accounting policies(cont'd)

➢ Consigned production and development of vaccines and biopharmaceuticals.
The Group provides services such as production and development of vaccines and biopharmaceuticals and bioanalysis consigned by customers. There is no alternative purpose to the product produced, and there is an enforceable right to claim payment for the part that has been completed. This is because the Group may claim compensation for appropriate profit on the input costs if the contract is terminated by the customer. Revenues from contracts with customers are recognized at a point in time when a portion of performance obligations is completed and are recognized over a portion of contract period.The Group measure the rate of progress based on the output method or the input method by considering the characteristics of the goods or services promised to be transferred to the customer, and recognize the profits over a period of time. In accordance with the practical expedient method of Corporate Accounting Standard No. 1115, the transaction price allocated for the non-performed portion of the related contract was not disclosed.

➢ Joint type of contract
The Group recognizes joint type of contract if the counterparty contracts with the entity to participate in any activity or process, rather than to obtain the output of the entity's ordinary activities, and the parties share the risks and benefits arising from the activity or process. For the costs of collaborative agreements, intangible assets or costs are recognized depending on whether the conditions for identifiable, control, and future economic benefits are met, and the revenues are recognized based on the performance obligation identified according to the contract for the provision of distinguished goods or services, and the related consideration. The performance obligation does not include the obligation to share resources invested to participate in activities or processes that are the essence of a joint type of contract according to the contract.

① Variable consideration
If the contract includes variable consideration, the Group estimate the amount they will receive in consideration for transferring the promised goods to the customer. When the uncertainties associated with the variable consideration are later addressed, the variable consideration is estimated at the point of commencement of the contract and is included in the transaction price only to the extent that it is highly probable that a significant portion of the amount of accumulated profits recognized will not be returned. Some of the contracts for the sales of goods provide the customer with the right to return. The right to return corresponds to a variable consideration.

➢ Right of return
Certain contracts provide a customer with a right to return the goods within a specified period. The Group uses the expected value method to estimate the goods that will not be returned because this method best predicts the amount of variable consideration to which the Group will be entitled. The requirements in KIFRS 1115 on constraining estimates of variable consideration are also applied in order to determine the amount of variable consideration that can be included in the transaction price. For goods that are expected to be returned, instead of revenue, the Group recognizes a refund liability. A right of return asset (and corresponding adjustment to cost of sales) is also recognized for the right to recover products from a customer.

➢ Volume rebates
The Group provides retrospective volume rebates to certain customers once the quantity of products purchased during the period exceeds a threshold specified in the contract. Rebates are offset against amounts payable by the customer. To estimate the variable consideration for the expected future rebates, the Group applies the most likely amount method for contracts with a single-volume threshold and the expected value method for contracts with more than one volume threshold. The selected method that best predicts the amount of variable consideration is primarily driven by the number of volume thresholds contained in the contract. The Group then applies the requirements on constraining estimates of variable consideration and recognizes a refund liability for the expected future rebates.

② Significant financing component

The Group do not reflect the effect of a significant financial element on the promised consideration (amount) if the period between the point of transfer of the promised goods or services to the customer at the commencement of the contract and the payment of the consideration for the goods or services is expected to be less than a year.

2. Summary of significant accounting policies(cont'd)

(2) Contract balances

① Contract assets
A contract asset is the right to consideration in exchange for goods or services transferred to the customer. If the Group performs by transferring goods or services to a customer before the customer pays consideration or before payment is due, a contract asset is recognized for the earned consideration that is conditional. The contract assets are assessed for impairment.

② Trade receivables
A receivable is recognized when an amount of unconditional consideration is due for payment by and from the customer (that is, where only the lapse of time is required before the consideration is paid upon maturity). For the accounting policies related to financial assets, refer to Note *Financial instruments – Initial recognition and subsequent measurement*.

③ Contract liabilities
A contract liability is the obligation to transfer goods or services to a customer for which the Group has received consideration (or an amount of consideration is due) from the customer. If a customer pays consideration before the Group transfers goods or services to the customer, a contract liability is recognized when the payment is made or the payment is due (whichever is earlier). Contract liabilities are recognized as revenue when the Group performs under the contract.

(3) Costs to fulfill a contract

Costs to fulfill a contract are costs incurred in fulfilling a contract with customer. If the costs are related directly to a contract or to an anticipated contract that the entity can specifically identify, generate or enhance resources of the entity that will be used in satisfying (or in continuing to satisfy) performance obligations in the future, and are expected to be recovered, the costs are recognized as assets. And the costs to fulfill a contract are recognized as cost of sales based on percentage of completion. The Company presents these costs to fulfill a contract as inventories.

(4) Assets and liabilities arising from rights of return

① Right of return assets
Right of return asset represents the Group's right to recover the goods expected to be returned by customers. The asset is measured at the former carrying amount of the inventory, less any expected costs to recover the goods, including any potential decreases in the value of the returned goods.

② Refund liabilities
A refund liability is the obligation to refund some or all of the consideration received (or receivable) from the customer and is measured at the amount the Group ultimately expects it will have to return to the customer. The Group updates its estimates of refund liabilities (and the corresponding change in the transaction price) at the end of each reporting period. Refer to above accounting policy on variable consideration.

③ Cost to obtain a contract
The Group pays sales commission to its employees for each contract that they obtain for bundled sales of equipment and installation services. The Group has elected to apply the optional practical expedient for costs to obtain a contract which allows the Group to immediately expense sales commissions (included under employee benefits and part of cost of sales) because the amortisation period of the asset that the Group otherwise would have used is one year or less. As such, sales commissions are immediately recognized as an expense and included as part of employee benefits.

Refer to Note 3 for significant judgment, estimation and assumption related to revenue from contract with customers.

2. Summary of significant accounting policies(cont'd)

Government grants

Government grants are recognized where there is reasonable assurance that the grant will be received and all attached conditions will be complied with. When the grant relates to an expense item, it is recognized as income on a systematic basis over the periods that the related costs, for which it is intended to compensate, are expensed. When the grant relates to an asset, it is recognized as income in equal amounts over the expected useful life of the related asset.

When the Group receives grants of non-monetary assets, the asset and the grant are recorded at nominal amounts and released to profit or loss over the expected useful life of the asset, based on the pattern of consumption of the benefits of the underlying asset by equal annual instalments. When loans or similar assistance are provided by the government or related institutions, with an interest rate below the current applicable market rate, the effect of this preferential interest is regarded as a government grant. The loan or assistance is initially recognized and measured at fair value and the government grant is measured as the difference between the initial carrying value of the loan and the proceeds received.

Taxes

(1) Current income tax

Current income tax assets and liabilities for the current and prior periods 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 statements 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) Deferred tax

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

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 goodwill or 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 arrangements, 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, and the carry forward of unused tax credits and unused tax losses can be utilized, except:

- When the deferred tax asset relating to the deductible temporary difference 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.

2. Summary of significant accounting policies(cont'd)

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 reassessed at each reporting date and are recognized to the extent that it has become probable that future taxable profits will allow the deferred tax asset 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 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 other comprehensive income or directly in equity.

If the tax benefits acquired as a part of a business combination did not satisfy the separate recognition criteria at the relevant point in time, yet were recognized during the measurement period as a result of new information on the facts and circumstances existing on the date of acquisition, the relevant deferred tax benefits are recognized. The acquired deferred tax benefits recognized are applied to reduce the book amount of the goodwill related to the acquisition, and if the book amount of the goodwill is zero, the remaining deferred tax benefits are recognized as current profit or loss.

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

(3) Sales tax

Revenue, expenses and assets are recognized as the net amount deducting applicable sales tax. However, if the sales tax related to the purchase of an asset or service cannot be refunded by and from the tax authorities, it is recognized as part of the acquisition cost or part of the expense item, and the relevant receivables and liabilities are presented as the amount including the sales tax.

The net amount of the sales tax to be refunded by or payable to the tax authority is included in the receivables or liabilities in the statement of financial position.

Pensions and other post-employment benefit plans
The cost of providing benefits under the defined benefit plan is determined using the projected unit credit method. Remeasurements, comprising of actuarial gains and losses, the effect of the asset ceiling, excluding amounts included in net interest on the net defined benefit liability and the return on plan assets (excluding amounts included in net interest on the net defined benefit liability), are recognized immediately in the statement of financial position with a corresponding debit or credit to retained earnings through OCI in the period in which they occur. Remeasurements 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 related restructuring cost

Net interest is calculated by applying the discount rate to the net defined benefit liability or asset. The Group recognizes the following changes in the net defined benefit obligation under 'cost of sales' and 'selling and administrative expenses' in the statement of comprehensive income.

In addition, the Group operates a defined contribution plan for some employees, and the contribution is recognized as a cost when employees provide services.

2. Summary of significant accounting policies(cont'd)

Financial instruments – Initial recognition and subsequent measurement
A financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity.

(1) Financial assets

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

The classification of financial assets at initial recognition depends on the financial asset's contractual cash flow characteristics and the Group's business model for managing them. 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 (formatted transaction) of a financial asset that requires the transfer of a financial asset within a period frame set by market consensus or regulation is recognized at the transaction date. That is, the date on which the consolidation entity has agreed to buy or sell financial assets.

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
- Financial assets at fair value through profit or loss

① Financial assets at amortized cost (debt instruments)
This category is most related to the Group. 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 (EIR) method and are subject to impairment. Gains and losses are recognized in profit or loss when the asset is derecognized, modified or impaired.

② 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

2. Summary of significant accounting policies(cont'd)

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

③ 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 statement of profit or loss when the right of payment has been established, except when the Group benefits from such proceeds as a recovery of part of the cost of the financial asset, in which case, such gains are recorded in OCI. Equity instruments designated at fair value through OCI are not subject to impairment assessment.

The Group elected to classify irrevocably its non-listed equity investments under this category

④ 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 statement of financial position at fair value with net changes in fair value recognized in the consolidated statement of comprehensive income.

This category includes listed equity instruments that are not irrevocably elected to account for changes in derivatives and fair value in other comprehensive income.

Dividends on listed equity instruments are recognized in profit or loss when the right is determined.

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

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

2. Summary of significant accounting policies(cont'd)

Derecognition
A financial asset (or, where applicable, a part of a financial asset or part of a group of similar financial assets) is primarily derecognized (i.e., removed from the 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:

- Disclosures on the significant assumptions
- Financial assets at fair value through OCI
- Trade receivables including the debt instruments and contract assets measured at fair value through other comprehensive income

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

For debt instruments at fair value through OCI, the Group applies the low credit risk simplification. At every reporting date, the Group evaluates whether the debt instrument is considered to have low credit risk using all reasonable and supportable information that is available without undue cost or effort. In making that evaluation, the Group reassesses the internal credit rating of the debt instrument. In addition, the Group considers that there has been a significant increase in credit risk when contractual payments are more than 30 days past due.

2. Summary of significant accounting policies(cont'd)

The Group's debt instruments at fair value through OCI comprise solely of quoted bonds that are graded in the top investment category by the Credit Rating Agency and, therefore, are considered to be low credit risk investments. It is the Group's policy to measure ECLs on such instruments on a 12-month basis. However, when there has been a significant increase in credit risk since origination, the allowance will be based on the lifetime ECL. The Group uses the ratings from the Credit Rating Agency both to determine whether the debt instrument has significantly increased in credit risk and to estimate ECLs.

The Group considers a financial asset in default when contractual payments are 90 days past due. However, in certain cases, the Group may also consider a financial asset to be in default when internal or external information indicates that the Group is unlikely to receive the outstanding contractual amounts in full before taking into account any credit enhancements held by the Group. A financial asset is written off when there is no reasonable expectation of recovering the contractual cash flows.

(2) 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 at 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 the statement of profit or loss and other comprehensive income (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
This is the category most relevant to the Group. 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. The EIR amortization is included as finance costs in the statement of profit or loss and other comprehensive income (loss). This category generally applies to interest-bearing loans and borrowings.

2. Summary of significant accounting policies(cont'd)

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 the statements of comprehensive income.

(3) Offsetting of financial instruments

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

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 and non-financial assets that are measured at fair value or where fair values are disclosed, are summarized in Note 35.

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 principal or the most advantageous market must be accessible by the Group.

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.

A fair value measurement of a non-financial asset takes into account a market participant's ability to generate economic benefits by using the asset in its highest and best use or by selling it to another market participant that would use the asset in its highest and best use.

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.

All assets and liabilities for which fair value is measured or disclosed in the 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 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.

2. Summary of significant accounting policies (cont'd)

Derivative financial instruments and hedge accounting

(1) 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. Any gains or losses arising from changes in fair value on derivatives are taken directly to in the consolidated statements of profit or loss and other comprehensive loss, except for the effective portion of cash flow hedges, which is recognized in OCI.

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.

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 the statement of 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 the statement of profit or loss.

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

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

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

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

2. Summary of significant accounting policies (cont'd)

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 the currency forward contract is recognized as other expense and the ineffective portion relating to the product forward contract is recognized in other operating income or expenses. Refer to Note 23 for more details.

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 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.

Cash and cash equivalents
Cash and cash equivalents in the statement of financial position comprise cash at banks and on hand and short-term deposits with an original maturity of three months or less, net of outstanding bank overdrafts.

Inventories
Inventories are stated at the lower of cost or net realizable value, with cost being determined using the moving average method. The cost of inventories comprises purchase costs, conversion costs, and other costs such as transportation costs.

Property, plant and equipment
Property, plant and equipment is stated at cost, net of accumulated depreciation and accumulated impairment losses, if any. Such cost includes the cost of replacing part of the plant and equipment and borrowing costs for long-term construction projects if the recognition criteria are met. 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 the statement of comprehensive income 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:

Classification	Useful lives (years)
Building	19-40 years
Structure	19-40 years
Machinery	5-25 years
Vehicles	4-6 years
Others	3-6 years

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 statement of comprehensive income when the asset is derecognized.

2. Summary of significant accounting policies (cont'd)

The assets' residual values, useful lives and methods of depreciation are reviewed at each financial year end, and adjusted prospectively, if appropriate and also the impacts of health, safety and environmental laws and regulations are reviewed at the same time.

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 occur.

Investment properties
Investment properties are measured initially at cost, including transaction costs. Such cost includes the cost of replacing part of the plant and equipment if the recognition criteria are met. However, other costs incurred from ordinary management performance are expensed in the period in which they occur. Following the initial recognition, the investment real estate properties are appropriated at fair value reflective of the market conditions as of the end of the reporting period, and the profit or loss resulting from any changes in the fair value are reflected in profit or loss when incurred.

Investment properties are derecognized either when they have been disposed of or when they are permanently withdrawn from use and no future economic benefit is expected from their disposal. The difference between the net disposal proceeds and the carrying amount of the asset is recognized in the statement of profit or loss in the period of derecognition. The consideration (amount) to be included in the profit or loss arising from the derecognition of investment real estate properties is calculated in accordance with the requirements on the calculation of transaction price under KIFRS 1115.

Transfers are made to (or from) investment property only when there is a change in use. For a transfer from investment property to owner-occupied property, the deemed cost for subsequent accounting is the book value at the date of change in use. If owner-occupied property becomes an investment property, the Group accounts for such property in accordance with the policy stated under property, plant and equipment up to the date of change in use.

Lease
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.

(1) Accounting 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.

1) Right-of-use asset
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.

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.

The right-of-use assets are also subject to impairment. Refer to the accounting policies in Note 2-23 *Impairment of non-financial assets*.

2. Summary of significant accounting policies (cont'd)

2) 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.

3) Short-term leases and leases of low-value assets
The Group applies the short-term lease recognition exemption to its short-term leases of offices and vehicles, etc. (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.

(2) Accounting as a lessor
Leases in which the Group does not transfer substantially all the risks and rewards incidental to ownership of an asset are classified as operating leases. Rental income arising is accounted for on a straight-line basis over the lease terms and is included in revenue in the statement of profit or loss due to its operating nature. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognized over the lease term on the same basis as rental income. Contingent rents are recognized as revenue in the period in which they are earned.

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

An asset is current when it is:
- 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:
- 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 (liabilities) are classified as non-current assets (liabilities).

2. Summary of significant accounting policies (cont'd)

Cash dividend

The Group recognizes a liability to pay a dividend when the distribution is authorized and the distribution is no longer at the discretion of the Group. A distribution is authorized when it is approved by the shareholders. A corresponding amount is recognized directly in equity.

Intangible assets

Intangible assets acquired separately are measured on initial recognition at cost. 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 intangibles, excluding capitalized development costs, are not capitalized and related expenditure is reflected in the statements of comprehensive income in the period 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 is 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 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 statement of comprehensive income as the expense category that is consistent with the function of the intangible asset.

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.

Upon the derecognition of intangible assets, the Group reflect any profit or loss arising from the differences between the net sale amount and the book amount of the intangible assets when derecognized.

Research and development costs

The Group recognizes expenditure on research as an expense at the time of occurrence. However, in the case of development expenses related to individual projects, i) To use or sell intangible assets, the Group can present technical feasibility to complete the assets. ii) have the intention and ability to complete, use, or sell intangible assets. iii) sufficient resources are secured for this, iv) the Group can present how intangible assets can generate future economic benefits, v) Intangible asset-related expenditures incurred in the development stage are recorded as intangible assets only if they can be reliably measured.

Following initial recognition of the development expenditure as an asset, the asset is carried at cost less any accumulated amortization and accumulated impairment losses. Amortization of the asset begins when development is completed and the asset is available for use. It is amortized over the period of expected future benefit. Amortization is recorded in cost of sales. During the period of development, the asset is tested for impairment annually.

Patents and licenses

The patents have been granted for a period of 10 years by the relevant government agency with the option of renewal at the end of this period.

Amortization of intangible assets is provided using the straight-line method over the estimated useful lives of the assets as follows:

Classification	Useful lives (years)
Industrial property rights	5-10 years
Software	5 years
Development costs	10 years
Memberships	Not subject to amortization

2. Summary of significant accounting policies (cont'd)

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

The Group bases its impairment calculation on detailed budgets and forecast calculations, which are prepared separately for each of the Group's CGUs to which the individual assets are allocated. These budgets and forecast calculations generally cover a period of five years. For longer periods, a long-term growth rate is calculated and applied to project future cash flows after the fifth year.

Impairment losses of continuing operations, including impairment on inventories, are recognized in the 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 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 statement of comprehensive income unless the asset is carried at a revalued amount, in which case, the reversal is treated as a revaluation increase.

The following assets have specific characteristics for impairment testing:

(1) Goodwill

Goodwill is tested for impairment annually as of December 31 and when circumstances indicate that the carrying value may be impaired.

Impairment is determined for goodwill by assessing the recoverable amount of each CGU (or group of CGUs) to which the goodwill relates. When the recoverable amount of the CGU is less than it's carrying amount, an impairment loss is recognized. Impairment losses relating to goodwill cannot be reversed in future periods.

(2) Other intangible assets

Intangible assets with indefinite useful lives are tested for impairment annually as of December 31 at the CGU level, as appropriate, and when circumstances indicate that the carrying value may be impaired. The Group assess the areas where climate-related issues may have a significant impact, such as the introduction of legislation to regulate greenhouse gas emissions which may increase the manufacturing costs. Such issues related to climate change are included as the key assumptions if they have a material impact on the measurement of the recoverable amount.

2. Summary of significant accounting policies (cont'd)

Provisions

Provisions are recognized when the Group has a present obligation (legal or constructive) as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation. When the Group expects some or all of a provision to be reimbursed, for example, under an insurance contract, the reimbursement is recognized as a separate asset, but only when the reimbursement is virtually certain. The expense relating to a provision is presented in the statement of profit or loss and other comprehensive income (loss) net of any reimbursement.

If the effect of the time value of money is material, provisions are discounted using a current pre-tax rate that reflects, when appropriate, the risks specific to the liability. When discounting is used, the increase in the provision due to the passage of time is recognized as a finance cost.

Greenhouse gas emissions

The Group receives free emission rights as a result of emission trading schemes. The rights are received on an annual basis and, in return, the Group is required to remit rights equal to its actual emissions. The Group has adopted the net liability approach to the emission rights granted. Therefore, a provision is recognized only when actual emissions exceed the emission rights granted and still held. The emission costs are recognized as other operating costs. Where emission rights are purchased from other parties, they are recorded at cost, and treated as a reimbursement right, whereby they are matched to the emission liabilities and remeasured to fair value. The changes in fair value are recognized in the consolidated statement of profit or loss and other comprehensive income (loss).

Treasury shares

Own equity instruments that are reacquired (treasury shares) are recognized at cost and deducted from equity. No gain or loss is recognized in the statements of comprehensive income on the purchase, sale, issue or cancellation of the Group's own equity instruments. Any difference between the carrying amount and the consideration, if reissued, is recognized in share premium. Share options exercised during the reporting period are satisfied with treasury shares.

Convertible preferred shares

Convertible preference shares are separated into liability and equity components based on the terms of the contract.

On issuance of the convertible preference shares, the fair value of the liability component is determined using a market rate for an equivalent non-convertible instrument. This amount is classified as a financial liability measured at amortized cost (net of transaction costs) until it is extinguished on conversion or redemption.

The remainder of the proceeds is allocated to the conversion option that is recognized and included in equity. Transaction costs are deducted from equity, net of associated income tax. The carrying amount of the conversion option is not remeasured in subsequent years.

Transaction costs are apportioned between the liability and equity components of the convertible preference shares, based on the allocation of proceeds to the liability and equity components when the instruments are initially recognized.

Share-based payments

Employees (including senior executives) of the Group receive remuneration in the form of share-based payments, whereby employees render services as consideration for equity instruments (equity-settled transactions).

2. Summary of significant accounting policies (cont'd)

The cost of equity-settled transactions is determined by the fair value at the date when the grant is made using an appropriate valuation model. That cost is recognized in employee benefits expense, together with a corresponding increase in equity (other capital reserves), over the period in which the service and, where applicable, the performance conditions are fulfilled (the vesting period). The cumulative expense recognized for equity-settled transactions at each reporting date until the vesting date reflects the extent to which the vesting period has expired and the Group's best estimate of the number of equity instruments that will ultimately vest. The expense or credit in the statement of profit or loss and other comprehensive income (loss) for a period represents the movement in cumulative expense recognized as of the beginning and end of that period.

Service and non-market performance conditions are not taken into account when determining the grant date fair value of awards, but the likelihood of the conditions being met is assessed as part of the Group's best estimate of the number of equity instruments that will ultimately vest. Market performance conditions are reflected within the grant date fair value. Any other conditions attached to an award, but without an associated service requirement, are considered to be non-vesting conditions. Non-vesting conditions are reflected in the fair value of an award and lead to an immediate expensing of an award unless there are also service and/or performance conditions.

No expense is recognized for awards that do not ultimately vest because non-market performance and/or service conditions have not been met. Where awards include a market or non-vesting condition, the transactions are treated as vested irrespective of whether the market or non-vesting condition is satisfied, provided that all other performance and/or service conditions are satisfied.

When the terms of an equity-settled award are modified, the minimum expense recognized is the grant date fair value of the unmodified award, provided the original terms of the award are met. An additional expense, measured as of the date of modification, is recognized for any modification that increases the total fair value of the share-based payment transaction, or is otherwise beneficial to the employee.

Where an award is cancelled by the entity or by the counterparty, any remaining element of the fair value of the award is expensed immediately through profit or loss.

The dilutive effect of outstanding options is reflected as additional share dilution in the computation of diluted earnings per share.

Non-current assets held for sale and discontinued operations
The Group classify the non-current assets (or groups of assets for disposal) as held for sale if their book amount will be recovered primarily through the sale transaction or distribution rather than the continued use. The non-current assets and disposal groups classified as held for sale are measured at the fair value or the book amount, whichever is the lesser, after the deduction of the costs to sell. The costs to sell are the incremental costs (excluding the financial cost and the income tax expenses) directly reverted to the disposal of assets (or disposal group).

The condition for classification as held for sale is deemed to be satisfied if and when the sale is highly probable and the non-current asset (or disposal group) is available for immediate sale in its present condition. The measures required to complete the sale ought to demonstrate the fact that the sale is unlikely to be significantly altered or withdrawn, and the sale must be expected to be completed within 1 year of the asset being classified as held for sale.

Tangible and intangible assets classified as held for sale are neither depreciated nor amortized. Assets and liabilities classified as held for sale or for distribution are presented as separate current items in the statement of financial position.

The Group exclude the after-tax income from discontinued operations from the results of continuing operations, and present it as a single amount in the statement of income. Any additional matters related to the discontinued operations are disclosed under Note 36, and the amounts of discontinued operations are included unless otherwise provided under other notes to the financial statements.

3. 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 accompanying disclosures, and the disclosure of contingent liabilities. Uncertainty about these assumptions and estimates could result in outcomes that require a material adjustment to the carrying amount of assets or liabilities affected in future periods.

(1) Significant accounting judgements

In the process of applying the Group's accounting policies, management has made the following judgments, which have the most significant effect on the amounts recognized in the consolidated financial statements:

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

The Group included the renewal period as part of the lease term for leases of plant and machinery with shorter non-cancellable period (i.e., three to five years). The Group typically exercises its option to renew for these leases because there will be a significant negative effect on production if a replacement asset is not readily available. The renewal periods for leases of plant and machinery with longer non-cancellable periods (i.e., 10 to 15 years) are not included as part of the lease term as these are not reasonably certain to be exercised. In addition, the renewal options for leases of motor vehicles are not included as part of the lease term because the Group typically leases motor vehicles for not more than five years and, hence, is not exercising any renewal options. Furthermore, the periods covered by termination options are included as part of the lease term only when they are reasonably certain not to be exercised.

(2) Estimates and assumptions

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. The Group based its assumptions and estimates on parameters available when the separate financial statements were prepared. Existing circumstances and assumptions about future developments, however, may change due to market changes or circumstances arising beyond the control of the Group. Such changes are reflected in the assumptions when they occur.

Impairment of non-financial assets

The Group assesses, at each reporting date, whether there is an indication that an asset may be impaired. Goodwill and intangible assets with indefinite useful lives are tested for impairment annually, or when circumstances indicate that the carrying value may be impaired. Other non-financial assets are tested for impairment when circumstances indicate that its carrying amount may not be recoverable. In determining a value in use, management estimates future cash flows to be derived from the asset or CGU, and applies the appropriate discount rate to those future cash flows.

Pension benefits

The present value of the pension obligation is 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, mortality rates and future pension increases. Due to the complexities involved in the valuation 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.

3. Significant accounting judgments, estimates and assumptions(cont'd)

Provision for expected credit losses of trade receivables and contract assets
The Group uses a provision matrix to calculate ECLs for trade receivables and contract assets. The provision rates are based on days past due for the groupings of various customer segments that have similar loss patterns (i.e., by geography, product type, customer type and rating, and coverage by letters of credit and other forms of credit insurance).

Research and Development costs
Development costs are capitalized in accordance with the accounting policy as mentioned in Note 2 Initial capitalization of costs is based on management's judgment that technological and economic feasibility is confirmed, usually when a product development project has reached a defined milestone according to an established project management model. The new development project proceeds with the discovery of new drug candidate materials, previous clinical trials, phase 1 clinical trials, phase 2 clinical trials, phase 3 clinical trials, application for government approval, completion of government approval, and start selling products. In general, the Group recognizes expenditures incurred since the project entered phase 3 clinical trials as intangible assets and treats expenditures incurred in the previous phase as R&D expenses for the current year. In determining the amounts to be capitalized, management makes assumptions regarding the expected future cash generation of the project, discount rates to be applied and the expected period of benefits. As of December 31, 2019, the carrying amount of capitalized development costs was \15,221,386 thousand

Deferred tax assets
Deferred tax assets are recognized for unused tax losses to the extent that it is probable that taxable profit will be available against which the losses can be utilized. Significant management judgment is required to determine the amount of deferred tax assets that can be recognized, based upon the likely timing and the level of future taxable profits together with future tax planning strategies. Further details on taxes are disclosed in Note 31.

Fair value of financial instruments
The fair value of financial instruments without an active market was calculated by applying valuation techniques including the discounted cash flow method. When the observable market information is not available for the input factors used for such valuation techniques, the determination of fair value requires a considerable estimation. Such judgments include the consideration of input variables such as liquidity risk, credit risk and volatility. Changes in such factors may affect the fair value of financial instruments.

Share based payment
The Group measures the compensation cost of share based payment transaction based on the fair value of equity instrument at grant date and estimates the fair value by applying an appropriate valuation model considering the conditions for granting the equity instruments. In addition, the pricing factors that are most appropriate for the evaluation model, including the expected life of stock options, volatility, and dividend rate, shall be determined and assumptions are established about these factors. The assumptions and valuation models used to estimate the fair value of share-based payment transactions are provided under Note 26-3.

Lease - calculation of 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. The IBR therefore reflects what the Group 'would have to pay', which requires estimation when no observable rates are available or when they need to be adjusted to reflect the terms and conditions of the lease. The Group estimates the IBR using observable inputs when available and is required to make certain entity-specific estimates.

Uncertainties of the impact of COVID-19
Various prevention and control measures, including movement restrictions, are being implemented worldwide to block the spread of COVID-19, and as a result, the global economy is seeing far-reaching impacts. In addition, various types of government support policies are being announced to respond to COVID-19. Through reviewing the impact of the spread of COVID-19 on the financial statements of the Group, the Group determined that there will be an impact on the lower-of-cost-or-market approach to inventory (refer to Note 6) and the fixed asset impairment assessment (refer to Note 12) given the spread of COVID-19, etc., and accordingly, prepared the financial statements by reasonably estimating the impact of COVID-19 on the Company. However, significant uncertainties exist in estimating when COVID-19 will end and its impact on the Company.

4. New and amended standards and interpretations

(1) Application of new and amended standards

The Group applied the standards and amendments for the first time for the first fiscal year beginning on or after January 1, 2021. The Group has not applied early the standards, interpretations or the amendments which have been announced yet have not been enforced.

① 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.

② Amendments to KIFRS 1116 Covid-19 Related Rent Concessions beyond 30 June 2021

In 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, 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. 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) Standards issued but not yet effective

The details of the enacted or amended standards and interpretations which have been enacted or announced as of the date of approval for issuance of the financial statements of the Group, yet which have not yet been applied since the date of enforcement has not yet arrived, are as follows.

① 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 *Provisions, Contingent Liabilities, and Contingent Assets* 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.

4. New and amended standards and interpretations(cont'd)

② Property, Plant and Equipment: Proceeds before Intended Use – Amendments to KIFRS 1016
The amendment prohibits 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. The amendments are not expected to have a material impact on the Group.

③ 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 amendments are not expected to have a material impact on the Group.

④ 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.

⑤ Disclosure of Accounting Policies - Amendments to KIFRS 1001
The amendments provide guidance and examples to help entities apply materiality judgements to accounting policy disclosures. The amendments aim to help entities provide accounting policy disclosures that are more useful by replacing the requirement for entities to disclose their 'significant' accounting policies with a requirement to disclose their 'material' accounting policies and adding guidance on how entities apply the concept of materiality in making decisions about accounting policy disclosures. The amendments to KIFRS 1001 are applicable for annual periods beginning on or after January 1, 2023 with earlier application permitted. The amendments are not expected to have a material impact on the Group.

4. New and amended standards and interpretations(cont'd)

⑥ 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.

⑦ Amendments to KIFRS 1012 - Income Tax - 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 deterred 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 and apply prospectively. The amendments are not expected to have a material impact on the Group.

(3) Annual Improvements to KIFRS 2018-2020

① 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 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.

5. Financial instruments

Financial assets

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

2021					
Classification	Financial assets at fair value through profit or loss	Financial assets at amortized cost	Financial assets at fair value through other comprehensive income	Hedging derivative financial assets	Total
Current assets:					
Short-term financial assets (* 1)	1,794,156,437	-	-	-	1,794,156,437
Trade and other accounts receivable	2,277,046	364,588,065	-	-	366,865,111
Other current assets (* 2)	-	178,067	-	-	178,067
Subtotal	1,796,433,483	364,766,132	-	-	2,161,199,615
Non-current assets:					
Long-term financial assets	-	21,142,500	-	-	21,142,500
Long-term investment assets	32,081,459	-	3,000,027	-	35,081,486
Other non-current assets (* 2)	368,001	1,274,378	-	1,639,873	3,282,252
Subtotal	32,449,460	22,416,878	3,000,027	1,639,873	59,506,238
Total	1,828,882,943	387,183,010	3,000,027	1,639,873	2,220,705,853

(* 1) Includes time deposits, withdrawals in financial institutions.
(* 2) Included are the short- and long-term security deposits and the derivative financial assets.

2020			
Classification	Financial assets at fair value through profit or loss	Financial assets at amortized cost	Total
Current assets:			
Short-term financial assets (* 1)	339,928,470	-	339,928,470
Trade and other accounts receivable (* 2)	287,361	232,905,247	233,192,608
Other current assets (* 3)	-	158,273	158,273
Subtotal	340,215,831	233,063,520	573,279,351
Non-current assets:			
Long-term financial assets	-	32,500	32,500
Long-term investment assets	24,492,063	-	24,492,063
Other non-current assets (* 3)	-	1,254,412	1,254,412
Subtotal	24,492,063	1,286,912	25,778,975
Total	364,707,894	234,350,432	599,058,326

(* 1) Includes time deposits, withdrawals in financial institutions.
(* 2) Employee stock ownership association loan to employees of SK Bioscience Co., Ltd., a subsidiary.

5. Financial instruments(cont'd)

Financial liabilities

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

2021			
Classification	Financial liabilities at fair value through profit or loss	Financial liabilities at amortized cost	Total
Current liabilities:			
Trade and other accounts payable	1,364,347	451,528,474	452,892,821
Short-term borrowings	-	11,671,373	11,671,373
Current portion of long-term liabilities	-	207,864,113	207,864,113
Current portion of lease liabilities (* 1)	-	2,788,638	2,788,638
Others (* 2)	-	11,830,767	11,830,767
Subtotal	1,364,347	685,683,365	687,047,712
Non-current liabilities:			
Bonds	-	256,063,407	256,063,407
Lease liabilities (* 1)	-	8,343,522	8,343,522
Others (* 2)	-	2,110,026	2,110,026
Subtotal	-	266,516,955	266,516,955
Total	1,364,347	952,200,320	953,564,667

(* 1) Lease liabilities correspond to liabilities recognized in accordance with KIFRS 1116.
(* 2) Included are the deposits received and the dividends payable.

5. Financial instruments(cont'd)

2020				
Classification	Financial assets measured at fair value through profit or loss	Financial liabilities measured at amortized cost	Hedging derivative financial liabilities	Total
Current liabilities:				
Trade and other accounts payables	3,911,928	228,109,806	-	232,021,734
Short-term borrowings	-	107,636,903	-	107,636,903
Current portion of long-term liabilities	-	96,947,494	-	96,947,494
Current portion of lease liabilities (* 1)	-	3,038,109	-	3,038,109
Others	-	20,116,134	-	20,116,134
Subtotal	3,911,928	455,848,446	-	459,760,374
Non-current liabilities:				
Bonds payable	-	460,480,570	-	460,480,570
Long-term borrowings	-	31,135,000	-	31,135,000
Lease liabilities (* 1)	-	9,392,925	-	9,392,925
Other(* 2)	-	-	3,617,387	3,617,387
Subtotal	-	501,008,495	3,617,387	504,625,882
Total	3,911,928	956,856,941	3,617,387	964,386,256

(* 1) Lease liabilities correspond to liabilities recognized in accordance with KIFRS 1116.
(* 2) Included are the short- and long-term security deposits and the derivative financial assets.

5. Financial instruments(cont'd)

Gains and losses by financial instrument

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

2021					
Classification (* 1)	Financial assets at fair value through profit or loss	Financial assets at amortized cost	Hedging derivative financial liabilities	financial liabilities at amortized cost	Total
Net income:					
Interest income (expense)	-	2,273,356	-	(10,600,102)	(8,326,746)
Loss on valuation of derivative instruments at FVPL	(6,357,019)	-	-	-	(6,357,019)
Gain on transaction of derivative instruments at FVPL	12,615,764	-	-	-	12,615,764
Dividend income	1,190,000	-	-	-	1,190,000
Gains or losses on foreign currency translation	-	(130,179)	-	(4,900,003)	(5,030,182)
Gain and loss on foreign currency transactions	-	11,025,512	-	(10,615,873)	409,639
Gains or losses on the valuation of derivatives	1,280,700	-	2,925,000	-	4,205,700
Gains or losses on the transaction of derivatives	(114,720)	-	45,915	-	(68,805)
Reversal of allowance	-	137,774	-	-	137,774
Other bad debt expenses	-	170,716	-	-	170,716
Subtotal	8,614,725	13,477,179	2,970,915	(26,115,978)	(1,053,159)
Other comprehensive income:					
Gains or losses on the valuation of derivatives (* 1)	-	-	1,194,758	-	1,194,758
Subtotal	-	-	1,194,758	-	1,194,758
Total	8,614,725	13,477,179	4,165,673	(26,115,978)	141,599

(* 1) The profits and losses from discontinued operations are not included.
(* 2) This amount is obtained from deducting the corporate tax.

5. Financial instruments(cont'd)

2020					
Classification (* 1)	**Financial assets at fair value through profit or loss**	**Financial assets at amortized cost**	**Hedging derivative financial liabilities**	**financial liabilities at amortized cost**	**Total**
Net income:					
Interest income (expense)	-	606,526	-	(19,074,586)	(18,468,060)
Loss on valuation of derivative instruments at FVPL	(1,026,682)	-	-	-	(1,026,682)
Gain on transaction of derivative instruments at FVPL	3,058,891	-	-	-	3,058,891
Dividend income	1,190,000	-	-	-	1,190,000
Gains or losses on foreign currency translation	-	(3,061,775)	-	11,022,932	7,961,157
Gain and loss on foreign currency transactions	-	(4,281,506)	-	1,631,098	(2,650,408)
Gains or losses on the valuation of derivatives	(3,624,567)	-	(3,490,000)	-	(7,114,567)
Gains or losses on the transaction of derivatives	1,053,628	-	-	-	1,053,628
Reversal of allowance	-	813,943	-	-	813,943
Other bad debt expenses	-	(3,660,948)	-	-	(3,660,948)
Subtotal	651,270	(9,583,760)	(3,490,000)	(6,420,556)	(18,843,046)
Other comprehensive income:					
Gains or losses on the valuation of derivatives (* 2)	-	-	(145,731)	-	(145,731)
Subtotal	-	-	(145,731)	-	(145,731)
Total	651,270	(9,583,760)	(3,635,731)	(6,420,556)	(18,988,777)

(* 1) The profits and losses from discontinued operations are not included.
(* 2) This amount is obtained from deducting the corporate tax.

5. Financial instruments(cont'd)

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

Classification	2021	2020	Details of the restriction
Non-current financial assets	32,500	32,500	Deposits for maintenance of checking accounts
	21,110,000	-	Provision of loan collateral of the treasury share association
Total	21,142,500	32,500	

6. Trade and other accounts receivable

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

Classification	2021	2020
Trade accounts and notes receivable	184,875,238	152,717,476
Less: allowance for doubtful accounts (AR)	(4,767,211)	(5,735,033)
Other receivables	183,517,371	78,804,538
Less: allowance for doubtful accounts (OR)	(232,871)	(109,347)
Short-term loans	3,750,000	11,260,343
Allowance on short-term loans	(3,750,000)	(4,050,000)
Accrued revenues	1,195,538	17,270
Derivative financial assets	2,277,046	287,361
Total	366,865,111	233,192,608

Details of changes in allowance for doubtful accounts for trade and other accounts receivable for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Beginning	9,894,380	10,128,090
Setting (Reversal) (* 1)	(214,347)	2,918,720
Write-off and others	28,829	(2,822,349)
Business transfer(* 2)	(958,780)	(106,242)
Change in consolidation scope	-	(223,839)
Ending	8,750,082	9,894,380

(* 1) ₩94,144 thousand of provision for bad debts incurred in the discontinued segment (prior year: reversal of provision for bad debts of ₩71,714 thousand) was reclassified as profit or loss on discontinued operations.
(* 2) During the current period, the composite material business division and the PPS business division were sold to Toray Advanced Materials Korea Inc. and HDC POLYALL Co., Ltd., respectively.

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

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

	2021	2020
Not yet due	329,933,375	198,722,371
< 3 months past due	40,867,330	37,272,957
3~6 months past due	250,000	2,614,060
> 6 months past due	4,564,488	4,477,600
Subtotal	375,615,193	243,086,988
Less: allowance for doubtful accounts	(8,750,082)	(9,894,380)
Deductions	366,865,111	233,192,608

If the transferred or discounted trade receivables do not meet the derecognition criteria of financial instruments, the Group continues to recognize the trade receivables and other receivables in the accounts as follows (Korean won in thousands):

Classification	2021	2020	Description
Trade receivables (* 1)	-	31,636,903	Obligation to the right of recourse

(*1) The Group recognizes short-term borrowings in the amount corresponding to nominal amount of trade receivables transferred or discounted. (refer to Note 17-2).

7. Inventories

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

2021			
Classification	**Cost**	**Valuation allowance**	**Book value**
Merchandise	19,738,982	(1,089,881)	18,649,101
Finished goods	113,932,193	(2,380,003)	111,552,190
Processed goods	28,932,174	(1,542,724)	27,389,450
Semi-finished goods	73,216,391	(2,385,624)	70,830,767
Work-in-progress	12,519,681	-	12,519,681
Raw materials	71,938,574	(3,052,841)	68,885,733
Supplies	32,683,672	(855,723)	31,827,949
Materials-in-transit	7,055,291	-	7,055,291
Others	589,064	-	589,064
Total (* 1)	360,606,022	(11,306,796)	349,299,226

(* 1) Included are KRW 36,960,182,000 for the amount of contract assets related to the CMOs and CDMOs (refer to Note 21).

2020			
Classification	**Acquisition cost**	**Assessment allowance**	**Book amount**
Goods	10,888,307	(183,423)	10,704,884
Products	103,529,541	(13,327,078)	90,202,463
Processed products	22,070,735	(1,908,652)	20,162,083
Half finished products (* 1)	35,530,817	(1,237,171)	34,293,646
Goods in process	10,125,679	-	10,125,679
Raw materials	63,997,986	(380,746)	63,617,240
Stored goods	18,454,093	(87,493)	18,366,600
Goods to arrive	4,633,956	-	4,633,956
Other inventories	823,759	-	823,759
Total (* 1)	270,054,873	(17,124,563)	252,930,310

(* 1) Included are KRW 15,662,393,000 for the amount of contract assets related to the CMOs and CDMOs (refer to Note 21).

Loss on valuation of inventories amount to ₩ 11,868 thousand for the year ended December 31, 2021 (2020: ₩ 16,515,084 thousand).

8. Other assets

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

Classification	2021	2020
Other current assets:		
Deposits	178,067	158,273
Advance payments	12,217,621	932,415
Prepaid expenses	4,905,473	3,727,953
Prepaid income tax	436,645	889,720
Prepaid VATs	317,678	125,789
Carbon emission right assets	45,025	-
Others	22,019	3,656,714
Total	18,122,528	9,490,864
Other non-current assets:		
Derivatives	2,007,874	64,870
Long-term Deposits	1,274,378	1,254,412
Long-term prepaid expenses	5,902	154,371
Net defined benefit assets (* 1)	7,103,496	-
Others	935,730	935,728
Total	11,327,380	2,409,381

(* 1) These are the net defined benefit assets which resulted from the accumulation of the defined benefit plan in excess of liabilities. There is no restrictive effect due to the ceiling on asset recognition for the current period.

9. Non-current financial assets

Non-current financial assets as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Short-term financial assets:		
Financial assets at fair value through profit or loss(* 1)	1,794,156,437	339,928,470
Long-term financial assets:		
Deposits	32,500	32,500
Time deposits (* 2)	21,110,000	-
Subtotal	21,142,500	32,500
Total	1,815,298,937	339,960,970

(* 1) Included are the money market financial instruments deposited with financial institutions and the overseas bonds.
(* 2) They are provided as a collateral for the treasury share association’s loans (refer to Note 5-4).

10. Long-term investment assets

Long-term investment assets as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021					
Classification	**Jan 1**	**Acquisition**	**Disposal**	**Valuation**	**Dec 31**
Financial assets at fair value through profit or loss					
Non-marketable securities					
Eastman Fibre Korea Co., Ltd. (EFKL) (* 1)	21,572,864	-	-	1,933,230	23,506,094
Incorporated association of Yongyeon industrial water management union of 4th manufacturing area	419,199	-	-	-	419,199
Standigm Co., Ltd. (* 2, 3)	-	3,000,008	-	-	3,000,008
Subtotal	21,992,063	3,000,008	-	1,933,230	26,925,301
Debt securities					
Korea Investment Bio Global Fund (* 4)	2,500,000	2,500,000	(25,000)	(789,475)	4,185,525
Sante Health Ventures IV, LP (* 2)	-	970,633	-	-	970,633
Subtotal	2,500,000	3,470,633	(25,000)	(789,475)	5,156,158
Financial assets at fair value through other comprehensive income:					
Unmarketable equity securities					
J2H Biotech Co., Ltd. (* 2)	-	1,500,052	-	-	1,500,052
Oncobix Co., Ltd. (* 2)	-	999,980	-	-	999,980
Citi Cells Co., Ltd. (* 2)	-	499,995	-	-	499,995
Subtotal	-	3,000,027	-	-	3,000,027
Total	24,492,063	9,470,668	(25,000)	1,143,755	35,081,486

(*1) The Group held put options for preferred shares of Eastman Fiber Korea Co., Ltd., and granted Eastman Chemical Korea B.V., the largest shareholder, the same amount of call options, and reflected the evaluation of investment assets in fair value.
(* 2) During the current period, the Group newly acquired redeemable convertible preferred stocks of Standigm Co., Ltd., common stocks of J2H Biotech Co., Ltd., common stocks of Oncobix Co., Ltd., and common stocks of Citi Cells Co., Ltd., and newly invested in Sante Health Ventures IV, LP.
(* 3) These are redeemable convertible preferred stocks (RCPS) with the right to convert to common stocks for 10 years from the date of completion of the transaction and the right to require redemption from the Group 3 years after the date of completion of the transaction.
(* 4) During the current period, the Group made additional investments in the Korea Investment Bio Global Fund and recovered a portion of the investments.

2020				
Classification	**Jan 1**	**Acquisition**	**Valuation**	**Dec 31**
Financial assets measured at fair value through profit or loss:				
Unmarketable equity securities				
Eastman Fiber Korea (EFKL) (Note 1)	22,956,859	-	(1,383,995)	21,572,864
Yongyeon Industrial District 4 Industrial Water Management Association	419,199	-	-	419,199
Subtotal	23,376,058	-	(1,383,995)	21,992,063
Debt securities				
Korea Investment Bio Global Fund	-	2,500,000	-	2,500,000
Total	23,376,058	2,500,000	(1,383,995)	24,492,063

(*1) The Group held put options for preferred shares of Eastman Fiber Korea Co., Ltd., and granted Eastman Chemical Korea B.V., the largest shareholder, the same amount of call options, and reflected the evaluation of investment assets in fair value.

11. Investment in subsidiaries and affiliates or joint ventures

Investment in subsidiaries and affiliates or joint ventures as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

Name of Company	Country of domicile	2021		2020	
		Equity ownership (%)	Book value	Equity ownership (%)	Book value
Entis Co., Ltd.	Korea	50.00	6,863,112	50.00	7,373,304
JSI Co., Ltd. (* 1)	Korea	40.00	534,172	40.00	451,933
HDC POLYALL Co., Ltd. (* 2, 3)	Korea	20.00	7,699,750	-	-
ST Green Energy	Singapore	50.00	1,231,243	50.00	1,278,783
Total			16,328,277		9,104,020

(*1) During the previous period, the Parent Company lost control due to the sale of some of the shares held in its subsidiary, JSI Co., Ltd. and reclassified it from subsidiary to affiliate.

(* 2) During the current period, the PPS Business Division was transferred to HDC POLYALL Co., Ltd., and the Parent Company acquired a 20% interest-1 share from HDC POLYALL Co., Ltd. The Group is determined to have influence over HDC POLYALL Co., Ltd. based on the fact that the Group can appoint 20% of the directors.

(* 3) The Group have put options for all of their interest in HDC POLYALL Co., Ltd.

Changes in investment in subsidiaries and affiliates or joint ventures for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021						
Name of company	Jan. 1	Acquisition	Equity gain (loss) on investments	Dividends	Others (* 1)	Dec.31
Entis Co., Ltd.	7,373,304	-	1,489,808	(2,000,000)	-	6,863,112
JSI Co., Ltd.	451,933	-	82,239	-	-	534,172
HDC POLYALL Co., Ltd.	-	7,699,750	-	-	-	7,699,750
ST Green Energy	1,278,783	385,515	46,898	(567,950)	87,996	1,231,242
Total	9,104,020	8,085,265	1,618,945	(2,567,950)	87,996	16,328,276

(*1) Changes by recognition of other comprehensive income.

2020					
Name of company	Jan. 1	Equity gain (loss) on investments	Dividends	Others (* 1)	Dec.31
Entis Co., Ltd.	7,421,945	951,359	(1,000,000)	-	7,373,304
JSI Co., Ltd.	-	93,627	-	358,306	451,933
ST Green Energy	1,354,463	712,227	(720,840)	(67,067)	1,278,783
Total	8,776,408	1,757,213	(1,720,840)	291,239	9,104,020

(*1) Changes by recognition of other comprehensive income.

11. Investment in subsidiaries and affiliates or joint ventures(cont'd)

Summarized financial information of investment in subsidiaries and affiliates or joint ventures as of and for the years ended December 31, 2021 and 2020 is as follows (Korean won in thousands):

2021							
Name of company	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Equity	Sales	Net income
Entis Co., Ltd.	20,184,219	2,416,784	8,874,781	-	13,726,222	48,033,806	2,688,305
JSI Co., Ltd.	3,525,486	7,643,890	11,937,952	1,540,304	(2,308,880)	13,313,925	197,546
HDC POLYALL Co., Ltd.	29,161,094	14,056,867	4,717,961	-	38,500,000	-	-
ST Green Energy	8,284,236	142,786	5,964,537	-	2,462,485	265,259,025	357,081

2020							
Name of company	Current assets	Non-current assets	Current liabilities	Non-current liabilities	Equity	Sales	Net income (loss)
Entis Co., Ltd.	19,914,948	2,588,114	6,998,284	758,170	14,746,608	35,963,005	1,902,718
JSI Co., Ltd.	3,021,864	8,265,789	12,257,156	1,544,974	(2,514,477)	12,292,622	(139,667)
ST Green Energy	6,993,744	179,274	4,615,453	-	2,557,565	164,534,888	1,690,118

12. Property, plant and equipment

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

2021								
Classification	Jan. 1	Additions	Disposals	Depreciation (* 1)	Impairment (* 1)	Business transfer (* 2)	Others (* 3)	Dec. 31
Land	203,507,833	488,849	-	-	-	(9,209,440)	(212,735)	194,574,507
Building	306,490,611	15,041,762	(636,626)	(9,973,602)	(9,271,731)	(957,498)	9,790,880	310,483,796
Structure	106,744,282	5,120,519	(212,859)	(3,399,839)	(3,105,329)	(75,485)	7,203,711	112,275,000
Machinery	359,739,076	36,593,481	(846,734)	(63,269,764)	(90,608,774)	(5,098,249)	40,668,327	277,177,363
Vehicles	299,301	-	(15)	(85,325)	-	(3,812)	2,004	212,153
Others	11,242,647	5,316,102	(58,804)	(4,720,345)	(435,328)	(209,101)	2,858,035	13,993,206
Construction in progress	81,085,394	76,679,578	(1,315,322)	-	-	(1,231,804)	(67,034,180)	88,183,666
Machineries in transit	890,483	3,719,246	-	-	-	-	(2,263,657)	2,346,072
Total	1,069,999,627	142,959,537	(3,070,360)	(81,448,875)	(103,421,162)	(16,785,389)	(8,987,615)	999,245,763

(*1) Profits and losses classified as discontinued operations are included.
(* 2)During the current period, the composite material business and the PPS business were transferred to Toray Advanced Materials Korea Inc. and HDC POLYALL Co., Ltd., respectively.
(*3) Consisted of reclassification of assets under construction and reclassification to investment properties and intangible assets and acquisition of tangible assets by the receipt of government subsidies.

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

2020									
Classification	Jan. 1	Additions	Disposals	Depreciation (* 1)	Impairment (* 1)	Business Transfer (* 2)	Change in consolidation range	Others (* 3)	Dec. 31End of period
Land	214,963,136	-	-	-	-	(6,638,976)	(2,870,910)	(1,945,417)	203,507,833
Building	310,658,423	2,919,005	(1,683,166)	(9,860,019)	(3,929,393)	(2,912,128)	(2,444,497)	13,742,386	306,490,611
Structure	101,979,280	6,925,914	(477,421)	(3,036,502)	(1,316,058)	(4,487,363)	-	7,156,432	106,744,282
Machinery	428,572,290	24,109,387	(3,641,782)	(71,547,638)	(42,702,920)	(10,513,440)	(1,145,651)	36,608,830	359,739,076
Vehicles	391,962	-	(2)	(93,188)	-	-	-	529	299,301
Others	10,802,405	4,001,271	(2,075)	(3,952,916)	(96,219)	(192,010)	(193,016)	875,207	11,242,647
Construction in progress	93,852,714	53,269,164	(2,501,107)	-	-	(2,324,475)	(26,400)	(61,184,502)	81,085,394
Machineries in transit	3,844,710	2,654,501	-	-	-	-	-	(5,608,728)	890,483
Total	1,165,064,920	93,879,242	(8,305,553)	(88,490,263)	(48,044,590)	(27,068,392)	(6,680,474)	(10,355,263)	1,069,999,627

(*1) Profits and losses classified as discontinued operations are included.
(*2) During the current reporting period, the Group sold the bioenergy business to SK Eco Prime Co., Ltd.
(*3) Consisted of reclassification of assets under construction and reclassification to investment properties and intangible assets and acquisition of tangible assets by the receipt of government subsidies.

Borrowing costs
Capitalized borrowing costs during the current year are ₩1,087,645 thousand (2020: ₩ 1,532,380 thousand). The capitalized interest rate used to calculate capitalizable borrowing costs is 2.85%~3.42% (2020: 2.74%~3.45%)

Insured assets
As of December 31, 2021 the Group carries comprehensive property insurance for property, plant and equipment for up to ₩2,453,647,973 thousand, CNY 134,812,452 (2020: ₩2,540,989,774 thousand, CNY 228,932,773)

Impairment loss on PPS business.
The Group conducted impairment test on the PPS business with consideration of the accumulated net loss during the current year and the uncertainty of the business due to COVID-19.

Every year, the Group conducts impairment tests on tangible and intangible assets and cash-generating units if there is an indication of impairment. If there is impairment on individual assets, impairment tests are conducted by evaluating the value in use of independent cash-generating units. Impairment test was conducted on accumulation of operating losses in the PPS business sector and uncertainty caused by COVID-19.

In principle, the Group defines the business sector as cash generating unit, when the Group concludes that the cash inflows from other business sectors are almost independent and classified as the lowest level of identifiable cash inflows. The recoverable amount of an independent cash-generating unit was calculated based on price in the market which is traded with third party other than special relationships.

As a result, ₩103,421 million (2020: ₩48,445 million) of impairment loss on tangible assets was recognized for some facilities and individual assets related to the PPS business sector as losses from discontinued operation.

13. Lease

Right-of-use assets

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

2021							
Classification	Jan. 1	Acquisition	Disposal	Depreciation(*1)	Business transfer(*2)	Others(*3)	Dec. 31
Land	3,582,070	-	-	(78,980)	-	410,144	3,913,234
Building	3,955,244	387,046	(20,999)	(725,412)	(898,770)	93,898	2,791,007
Structure	3,334,722	13,640	-	(117,765)	-	-	3,230,597
Machinery	3,512,313	2,221,498	(1,700,000)	(814,392)	-	-	3,219,419
Vehicles	1,717,111	2,353,058	(490,799)	(1,351,527)	(7,905)	12,508	2,232,469
Total	16,101,460	4,975,242	(2,211,798)	(3,088,076)	(906,675)	516,550	15,386,726

(*1) It includes profits and losses classified as discontinued operations.
(*2) During the current period, the composite material business division was transferred to Toray Advanced Materials Korea Inc.
(*3) It consists of exchange rate fluctuations.

2020							
Classification	Jan. 1	Acquisition	Disposal	Depreciation(*1)	Business transfer(*2)	Others(*3)	Dec. 31
Land	-	3,444,874	-	-	-	137,196	3,582,070
Building	3,263,328	1,272,553	-	(582,837)	-	2,200	3,955,244
Structure	48,012,713	2,103,538	-	(822,795)	(45,958,734)	-	3,334,722
Machinery	4,426,770	-	-	(914,457)	-	-	3,512,313
Vehicles	2,479,889	1,018,571	(402,950)	(1,376,544)	(2,805)	950	1,717,111
Total	58,182,700	7,839,536	(402,950)	(3,696,633)	(45,961,539)	140,346	16,101,460

(*1) It includes profits and losses classified as discontinued operations.
(*2) During the current reporting period, the Company sold the bioenergy business to SK Eco Prime Co., Ltd.
(*3) It consists of exchange rate fluctuations.

Lease liabilities

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

Classification	2021		2020	
	Minimum lease payment	Present value	Minimum lease payment	Present value
Less than 1 year	2,835,307	2,788,638	3,104,689	3,038,109
2 years or less	2,276,326	2,174,335	2,524,550	2,361,766
5 years or less	3,414,156	3,015,212	4,537,220	3,848,561
More than 5 years	5,257,900	3,153,975	5,577,133	3,182,598
Total	13,783,689	11,132,160	15,743,592	12,431,034

13. Lease(cont'd)

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

Classification	2021	2020
As of January 1	12,431,034	58,470,887
Increase	4,975,242	4,394,662
Disposal	(2,652,966)	(425,898)
Interest expenses	474,321	1,264,886
Lease expense	(3,248,550)	(7,108,484)
Business transfer (* 1, 2)	(986,431)	(44,166,801)
Others (* 3)	139,510	1,782
As of December 31	11,132,160	12,431,034

(* 1) During the current period, the composite material business was transferred to Toray Advanced Materials Korea Inc.
(*2) During the previous period, the Group sold the bio-energy business to SK Eco Prime Co., Ltd.
(*3) Others consist of the effects of exchange rate changes.

Expenses recognized in the statement of profit or loss and other comprehensive income (loss) during the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Other operating expenses		
Short-term lease	931,275	682,534
Low-value asset lease	309,781	272,039
Variable lease payments	-	3,658,586
Depreciation and impairment		
Depreciation of right-if-use assets	3,088,076	3,696,633
Net financial cost		
interest expense of lease liabilities	474,321	1,264,886

The Group had a total cash outflow of ₩ 4,489,606 thousand for leases during the reporting period. (2020 : ₩ 11,712,643 thousand).

The Group has several lease agreements, including extension and termination options. These options are negotiated by management to provide flexibility in managing the leased asset portfolio and to meet business needs. Management applies important judgement when deciding whether these extension and termination options are reasonably certain to be exercised.

The Group as a lessor
The Group entered into an operation lease agreement for an investment property portfolio consisting of a specific office and manufacturing building. The terms of these leases range from 5 to 20 years. All leases include a clause that allows rent to be raised on an annual basis, depending on current market conditions. The lessee shall also guarantee the residual value of the property. The rental income recognized during the reporting period is ₩1,895,746 thousand (2020: ₩1,458,533 thousand).

13. Lease(cont'd)

Under a non-cancellable operating lease as of December 31, 2021 and 2020 the future minimum rental receivables are as follows (Korean won in thousands):

Classification	2021	2020
Less than 1 year	1,804,884	1,609,752
More than 1 year and less than 5 years	3,010,397	2,096,426
More than 5 years	10,470,680	3,722,319
Total	15,285,961	7,428,497

14. Intangible assets

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

2021							
Classification	Jan. 1	Acquisition	Disposal	Amortization (* 1)	Business transfer (* 2)	Others (* 3)	Dec. 31
Goodwill	86,234	-	-	-	-	-	86,234
Industrial property rights	6,790,551	136,964	(83,438)	(1,396,997)	(987,737)	1,496,705	5,956,048
Memberships	5,799,179	1,257,326	-	-	-	-	7,056,505
Development costs	15,221,386	180,178	-	(2,313,498)	-	-	13,088,066
Softwares	9,058,514	5,075,989	-	(4,590,164)	-	8,691,132	18,235,471
Total	36,955,864	6,650,457	(83,438)	(8,300,659)	(987,737)	10,187,837	44,422,324

(* 1) It includes profits and losses classified as discontinued operations.
(* 2) During the current period, the composite material business and the PPS business were transferred to Toray Advanced Materials Korea Inc. and HDC POLYALL Co., Ltd., respectively.
(* 3) Includes effects of transfers from construction in progress.

2020								
Classification	Jan. 1	Acquisition	Disposal	Amortization (* 1)	Change in consolidation range	Business transfer (* 2)	Others (* 3)	Dec. 31
Goodwill	86,234	-	-	-	-	-	-	86,234
Industrial property rights	4,387,018	52,499	(317,866)	(1,100,678)	(1)	(105,771)	3,875,350	6,790,551
Memberships	9,400,565	-	(3,546,386)	(55,000)	-	-	-	5,799,179
Development costs	17,534,884	-	-	(2,313,498)	-	-	-	15,221,386
Softwares	5,798,571	2,259,278	(90,051)	(2,445,686)	(3,333)	-	3,539,735	9,058,514
Other intangible assets	222,122	484	-	(8,195)	-	-	(214,411)	-
Total	37,429,394	2,312,261	(3,954,303)	(5,923,057)	(3,334)	(105,771)	7,200,674	36,955,864

(*1) It includes profits and losses classified as discontinued operations.
(*2) During the current reporting period, the Group sold the bioenergy business to SK Eco Prime Co., Ltd.
(*3) Includes effects of transfers from construction in progress.

14. Intangible assets(cont'd)

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

2021								
Stage	Category	Name	Amount of R&D costs that are capitalized (accumulated)			R&D cost		Remaining amortization period
			Phase 3 clinical trial	Sales approval	Total	Book value	Accumulated impairment losses	
Development completed	Genetic recombination	NBP601 (* 1)	-	5,100,000	5,100,000	2,550,000	-	5 years
	Vaccine	NBP607 (* 2)	4,354,658	-	4,354,658	1,998,900	-	4 years
	Vaccine	NBP608 Herpes Zoster (* 3)	10,199,115	-	10,199,115	6,034,477	-	6 years
	Vaccine	NBP608 Chickenpox (* 4)	3,486,768	-	3,486,768	2,324,511	-	7 years
Development in progress	Vaccine	GBP510 COVID-19 (* 5)	180,178	-	180,178	180,178	-	10 years
	Subtotal		18,220,719	5,100,000	23,320,719	13,088,066	-	

2020								
Stage	Category	Name	Amount of R&D costs that are capitalized (accumulated)			R&D cost		Remaining amortization period
			Phase 3 clinical trial	Sales approval	Total	Book value	Accumulated impairment losses	
Development completed	Genetic recombination	NBP601 (* 1)	-	5,100,000	5,100,000	3,060,000	-	6 years
	Vaccine	NBP607 (* 2)	4,354,658	-	4,354,658	2,433,809	-	5 years
	Vaccine	NBP608 Herpes Zoster (* 3)	10,199,115	-	10,199,115	7,054,387	-	7 years
	Vaccine	NBP608 Chickenpox (* 4)	3,486,768	-	3,486,768	2,673,190	-	8 years
	Subtotal		18,040,541	5,100,000	23,140,541	15,221,386	-	

(*1) The anti-hemophilic drug that is currently on sale after obtaining the sales approval in the USA, Europe and others.
(*2) The anti-influenza vaccine that is currently on sale since the sales approval in 2015.
(*3) The anti-herpes vaccine for adults that is currently on sale since the sales approval in 2017.
(*4) The chickenpox vaccine for infants that is currently on sale since the sales approval in 2018.
(*5) GBP 510 is a COVID-19 preventive vaccine product, which is currently undergoing the phase 3 clinical trial.

14. Intangible assets(cont'd)

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

2021						
Classification	NBP601	NBP607	NBP608		GBP510	Total
			Herpes	Varicella		
Jan. 1	3,060,000	2,433,809	7,054,387	2,673,190	-	15,221,386
Acquisition	-	-	-	-	180,178	180,178
Amortization	(510,000)	(434,909)	(1,019,910)	(348,679)	-	(2,313,498)
Dec. 31	2,550,000	1,998,900	6,034,477	2,324,511	180,178	13,088,066

2020					
Classification	NBP601	NBP607	NBP608		Total
			Herpes	Varicella	
Jan. 1	3,570,000	2,868,718	8,074,300	3,021,866	17,534,884
Amortization	(510,000)	(434,909)	(1,019,913)	(348,676)	(2,313,498)
Dec. 31	3,060,000	2,433,809	7,054,387	2,673,190	15,221,386

R&D expenses recognized in selling and administrative expenses during the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
R&D expenses recognized in selling and administrative expenses	138,034,837	65,903,940
Government subsidy, etc	(52,149,264)	(6,665,212)
Total	85,885,573	59,238,728

15. Investment properties

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

2021				
Classification	Jan. 1	Depreciation	Transfer (* 1)	Dec. 31
Land	16,521,136	-	276,270	16,797,406
Building	534,529	(37,448)	(82,209)	414,872
Total	17,055,665	(37,448)	194,061	17,212,278

(*1) These are the replacements of investment properties and the tangible assets of buildings, due to the execution of lease agreements for some land to Entis Co., Ltd. and others.

15. Investment properties(cont'd)

2020				
Classification	**Jan. 1**	**Depreciation**	**Transfer (* 1)**	**Dec. 31**
Land	14,575,719	-	1,945,417	16,521,136
Building	528,347	(46,131)	52,313	534,529
Total	15,104,066	(46,131)	1,997,730	17,055,665

(*1) It has been reclassified from tangible assets due to the lease agreement for SK D&D Co., Ltd.

Rental income from investment properties amounted to ₩1,895,746 thousand for the year ended December 31, 2021 (₩1,458,533 thousand for the year ended December 31, 2020), which includes the revenue from discontinued operations of ₩221,390 thousand for the year ended December 31, 2021 (₩59,701 thousand for the year ended December 31, 2020).

There was no significant difference between the fair value and the book value of investment properties.

16. Trade and other accounts payable

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

Classification	2021	2020
Trade accounts payable	168,149,443	83,729,567
Other accounts payable	212,524,106	98,908,020
Accrued expenses	70,854,925	45,472,219
Derivative financial liabilities	1,364,347	3,911,928
Total	452,892,821	232,021,734

17. Bonds payable and borrowings

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

Classification	2021	2020
Short-term borrowings	11,671,373	107,636,903
Current portion of long-term liabilities:		
Bonds payable	207,864,113	95,944,294
Long term borrowings	-	1,003,200
Subtotal	207,864,113	96,947,494
Bonds payable	256,063,407	460,480,570
Long-term borrowings	-	31,135,000
Total	475,598,893	696,199,967

17. Bonds payable and borrowings(cont'd)

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

Financial institution	Classification	2021 annual interest rate (%)	2021	2020
Korea Development Bank and	General bank borrowings	-	-	76,000,000
KEB Hana Bank and others	Trade receivable discounts	-	-	31,636,903
Coalition for Epidemic Preparedness Innovations (CEPI)	Other borrowings (* 1)	-	11,671,373	-
Total			11,671,373	107,636,903

(* 1) As a subsidy for the R&D support for the COVID-19 vaccine candidate substance of 'GBP510' undergoing development by the Group, there exists a repayment obligation at the point of commercialization.

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

Classification	Maturity date	2020 annual interest rate (%)	2021	2020
7-2nd	2021.07.27	-	-	11,000,000
2-2nd	2022.07.26	3.34	48,000,000	48,000,000
9-1st	2021.04.30	-	-	75,000,000
9-2nd	2023.04.30	3.52	66,000,000	66,000,000
10-1st	2021.10.30	-	-	10,000,000
10-2nd	2022.10.30	3.10	20,000,000	20,000,000
11-1st	2022.01.28	2.37	70,000,000	70,000,000
11-2nd	2024.01.31	2.91	80,000,000	80,000,000
12-1st	2022.10.30	2.17	70,000,000	70,000,000
12-2nd	2024.10.30	2.77	75,000,000	75,000,000
Foreign bond payable	2023.06.29	US 3M Libor + 1.88	35,565,000	32,640,000
Total			464,565,000	557,640,000
Less: discount on bonds payable			(637,480)	(1,215,136)
Less: current portion of bonds payable			(207,864,113)	(95,944,294)
			256,063,407	460,480,570

17. Bonds payable and borrowings(cont'd)

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

Lender	Details	Annual interest rate at end of current period (%)	2021	2020
Korea Development Bank	Energy facility loans	-	-	378,200
Shinhan Bank	Other facility loans	-	-	10,000,000
KEB Hana Bank	General bank borrowing	-	-	21,760,000
Subtotal			-	32,138,200
Less: current portion			-	(1,003,200)
			-	31,135,000

18. Other current liabilities

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

Classification	2021	2020
Other current liabilities		
Advances	42,053,815	16,346,313
Withholdings	46,003,224	3,822,983
Deposits received	11,827,891	20,115,250
Carbon emission liabilities	430,388	-
Dividends payables	2,876	884
Unearned revenue	210,833	183,333
Total	100,529,027	40,468,763
Other non-current liabilities		
Long term employee wage payables	519,847	467,929
Long-term deposits received	2,110,026	-
Derivative instruments liabilities	-	3,617,387
Total	2,629,873	4,085,316

19. Emission and liabilities

Details of annual quantity of allocated emission rights as of December 31, 2021 are as follows (Units in KAU):

Classification	2021	2022	2023	2024	2025	Total
Free allocation on emission	530,173	530,173	530,173	525,208	525,208	2,640,935

In addition, there are no greenhouse gas emission credits provided as collateral as of December 31, 2021.

Changes in emission rights for each exercise years within planned period are as follows (units in KAU and Korean won in thousands):

Classification	2021		2022		2023		2024		2025		Total	
	Quantity	Book Value	Quantity	Book Value	Quantity	Book Value	Quantity	Book Value	Quantity	Book Value	Quantity	Book Value
Allocated amount	669,373	-	653,951	-	653,951	-	648,986	-	648,986	-	3,275,247	-
Allocation	530,173	-	530,173	-	530,173	-	525,208	-	525,208	-	2,640,935	-
Additionally allocated (* 1)	139,200	-	139,200	-	139,200	-	139,200	-	139,200	-	696,000	-
Cancellation of allocation(* 1)	-	-	(15,422)	-	(15,422)	-	(15,422)	-	(15,422)	-	(61,688)	-
Changes due to emission rights trading	1,300	45,025	-	-	-	-	-	-	-	-	1,300	45,025
Purchased	1,300	45,025	-	-	-	-	-	-	-	-	1,300	45,025
Sold	-	-	-	-	-	-	-	-	-	-	-	-
Carried over from previous period	38,220	-	-	-	-	-	-	-	-	-	38,220	-
Carry forward to next period	-	-	-	-	-	-	-	-	-	-	-	-
End of period	708,893	45,025	653,951	-	653,951	-	648,986	-	648,986	-	3,314,767	45,025

(* 1) They are the estimates resulting from a split-off and the sale of business division, and may differ from the amount confirmed subsequently.

Changes in emission rights for the year ended December 31, 2021 and 2020 are as follows (units in KAU and Korean won in thousands):

Classification	2021	
	Quantity	Book Value
Beginning of period	-	-
Emission rights purchased	1,300	45,025
Emission rights sold	-	-
End of period	1,300	45,025

Classification	2021	
	Quantity	Book Value
Beginning of period	-	-
Emissions cost	12,170	430,388
End of period	12,170	430,388

The estimated emission quantity of greenhouse gases in the prior reporting year was 497,684tCO2-eq. The estimated emission quantity for the current year is 696,804tCO2-eq.

20. Employee benefit liabilities

The Group operates defined benefit pension plans for its employees, and the present value of the pension liability is determined using the projected unit credit method based on actuarial assumptions and on a discount basis by an independent actuary firm.

Changes in the carrying amount of employee benefit liabilities for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Changes in the defined benefit liabilities (assets):		
Beginning	7,643,269	7,945,076
Retirement benefits paid	(7,291,838)	712,635
Provision during the period	16,285,671	15,511,074
Re-measurement gain	8,268,658	3,752,753
Contributions to defined benefit plans	(26,000,000)	(19,500,000)
Transfer to affiliates and transfer to other accounts	(1,139,285)	(362,409)
Change in consolidation scope	-	(415,860)
Ending	(2,233,525)	7,643,269
Components in the statement of financial position:		
Present value of defined benefit obligation	131,211,458	134,670,576
Fair value of plan assets	(133,444,983)	(127,027,307)
Total	(2,233,525)	7,643,269
Defined benefit assets (* 1)	(7,103,496)	-
Defined benefit liabilities	4,869,971	7,643,269

(* 1) The net defined benefit assets were recognized as other non-current assets.

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

Classification	2021	2020
Current service cost	16,127,051	15,334,232
Interest expenses	2,513,358	2,240,352
Expected return on plan assets	(2,354,738)	(2,063,510)
Total	16,285,671	15,511,074

20. Employee benefit liabilities(cont'd)

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

Classification	2021	2020
Beginning	134,670,576	124,140,730
Current service cost	16,127,051	15,334,232
Interest cost	2,513,358	2,240,352
Re-measurement gain	7,788,672	3,814,044
Retirement benefits paid	(25,490,098)	(7,718,103)
Transfer to affiliates	(2,571,223)	217,891
Business transfer (*1)	(1,826,878)	(2,942,709)
Change in consolidation scope	-	(415,861)
Ending	131,211,458	134,670,576

(* 1) During the current period, the composite material business division was transferred to Toray Advanced Materials Korea Inc., and the PPS business division was transferred to HDC POLYALL Co., Ltd., while the bio-energy business division was sold to SK Eco Prime Co., Ltd. during the previous period.

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

Classification	2021	2020
Beginning	127,027,307	116,195,654
Expected return on plan assets	2,354,738	2,063,510
Re-measurement gain (loss)	(479,986)	61,291
Retirement benefits paid	(18,198,260)	(8,430,738)
Contribution	26,000,000	19,500,000
Transfer to affiliates	(1,431,938)	580,299
Business transfer (* 1)	(1,826,878)	(2,942,709)
Ending	133,444,983	127,027,307

(* 1) During the current period, the composite material business division was transferred to Toray Advanced Materials Korea Inc., and the PPS business division was transferred to HDC POLYALL Co., Ltd., while the bio-energy business division was sold to SK Eco Prime Co., Ltd. during the previous period.

As of December 31, 2021, plan assets consist of time deposits and others.

The principal assumptions used in actuarial calculation as of December 31, 2021 and 2010 are as follows (Korean won in thousands):

Classification	2021	2020
Discount rate	2.45%-2.60%	1.71%-2.09%
Expected rate of return on plan assets	2.45%-2.60%	1.71%-2.09%
Future salary rate of increase	4.77%-6.73%	2.00%-5.47%

20. Employee benefit liabilities(cont'd)

Details of re-measurement gains or loss as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Demographic assumptions	-	5,002,389
Financial assumptions	3,001,869	(3,417,672)
Experience adjustments	4,786,803	2,229,327
Re-measurement loss of plan assets	479,986	(61,291)
Total	8,268,658	3,752,753

The following table demonstrates a sensitivity analysis on the effect of changes in the principal assumptions used in actuarial calculation on the percent value of defined benefit obligation as of December 31, 2021 and 2020 (Korean won in thousands):

2021				
Classification	Effect of changes in the discount rate		Effect of changes in future salaries	
	Increase by 1% point	Decrease by 1% point	Increase by 1% point	Decrease by 1% point
Defined benefit obligations	(11,383,105)	13,373,362	13,274,159	(11,517,254)

2020				
Classification	Effect of changes in the discount rate		Effect of changes in future salaries	
	Increase by 1% point	Decrease by 1% point	Increase by 1% point	Decrease by 1% point
Defined benefit obligations	(12,346,039)	14,484,237	14,417,862	(12,514,634)

21. Contract assets and liability

Details of contract assets as of December 31, 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Inventories (* 1)	36,960,182	15,662,393
Contract assets	-	979,915
Contract liabilities	114,455,431	96,226,901

(* 1) The contractual performance cost, which is the Group's contract asset, and the unclaimed consideration are appropriated as inventories. The contractual performance cost included in the inventories includes the direct costs related to the production of the C(D)MO's finished products.

21. Contract assets and liability(cont'd)

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

2021						
Classification	Contract assets			Contract liabilities		
	The cost of executing the contract (*1)	Contract asset unclaimed (*2)	Gross total	Refund liabilities (*3)	Unearned revenue (* 4)	Gross total
Beginning	324,164	655,751	979,915	7,039,917	89,186,984	96,226,901
Increase(reversal)	(324,164)	(655,751)	(979,915)	(2,013,880)	20,252,844	18,238,964
Others(* 5)	-	-	-	(10,434)	-	(10,434)
Ending	-	-	-	5,015,603	109,439,828	114,455,431

2020						
Classification	Contract assets			Contract liabilities		
	The cost of executing the contract (*1)	Contract asset unclaimed (*2)	Gross total	Refund liabilities (*3)	Unearned revenue (* 4)	Gross total
Beginning	-	-	-	5,951,178	11,935,642	17,886,820
Increase(reversal)	324,164	655,751	979,915	1,069,678	77,251,342	78,321,020
Others(* 5)	-	-	-	19,061	-	19,061
Ending	324,164	655,751	979,915	7,039,917	89,186,984	96,226,901

(*1) It consists of the cost of technology transfer and prototype production activities to produce products ordered by customers. The activity was not included in the performance obligation and was recognized as a contract asset because it was not an activity that is mandatorily preceded to produce the product ordered by the customer or an activity that transfers goods or services to the customer.
(*2) It was recognized due to the difference between the level of performance obligation fulfilled based on the percentage-of-completion and the consideration charged to the customer.
(*3) The Group accounts for the contractual liability for the return on the expected return claim based on the past return experience rate for the sold product. All assumptions applied to the calculation of contract liabilities above were calculated based on the current available information on returns expected to occur during the returnable period for products sold under the current product sales level and returnable conditions.
(*4) The amounts received in advance from the customers related to the product production and relocation activities were recognized as the contract liabilities.
(*5) It consists of exchange rate fluctuations.

22. Provisions

The provisions as of December 31, 2021 is as follows (Korean won in thousands):

Classification	2021
Provisions for contribution (* 1)	21,281,360
Provisions for PFAD (* 2)	1,156,619
Total	22,437,979

(* 1) Since the possibility of paying damage relief contribution in accordance with the Special Act on Remedy for Damage Caused by Humidifier Disinfectants has increased, the Group established provisions for contribution based on the best estimates possible.
(* 2) The Group have concluded a commitment promising to compensate SK Eco Prime Co., Ltd. if the gap between the price of PFAD and the prices of soybean oil and palm oil is widened more than a certain spread in relation to the transfer of the bio-energy business during the previous period, and accordingly, the Group established provisions thereon.

23. Financial instruments risk management and derivative instruments asset

The Group is exposed to certain risks in connection with their ongoing business operations. The major risks managed using derivatives are the foreign exchange risk, commodity price risk and the interest rate risk. The Group' risk management strategies and risk management methods are explained under Note 34 below.

Financial instruments risk management

Hedge of foreign exchange risk
As of the end of the current year, the Group has currency swap contracts designated as hedging instruments to hedge foreign currency risk on foreign currency borrowing and foreign currency bonds. The final maturity of foreign currency bonds is expected to come in June 2023. The terms and conditions of the above currency swap deal are consistent with the repayment schedule of foreign currency loans and foreign currency bonds. The parties to the contract enter into currency swap deals with cash, which effectively reduces the credit risk associated with the contract (i.e. the credit risk of the counterparty and the Group). As a result, the hedge was evaluated very effectively.

Hedge of interest rate risk
The Group borrows funds at fixed and variable interest rates, and thus is exposed to interest rate risk. To manage interest rate risk, the Group maintains an appropriate balance between fixed-rate and floating-rate loans and enters into an interest rate swap contract. Under the interest rate swap contract, the Group exchanges the calculated difference by applying the difference between fixed and variable interest rates to the predetermined nominal principal. Such a contract would allow the Group to mitigate the risk of cash flow variability of the variable-rate liability resulting from changes in interest rates. Hedge activities are regularly assessed and the optimal hedging strategy is applied to properly adjust the current interest rate status and defined risk characteristics.

Others
The Group is exposed to foreign currency risk for some of its sales and purchases in accordance with international transactions. To reduce this risk, the Group regularly monitors net exposure to key currencies ($, €, ￥) based on expected sales and purchases over the next 12 months. The Group enters into a foreign currency forward contract to avoid this exposure.

The Group has not designated the foreign currency forward contracts as a hedge for business purpose. Consequently, changes in the fair value of all forward contracts are recognized in profit or loss.

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

Classification	Details	2021	2020
Derivative instruments not designated as the hedging instruments:			
Current derivative instruments asset	Foreign exchange forward contracts	2,277,046	287,361
Current derivative instruments liabilities	Foreign exchange forward contracts	1,364,347	3,911,928
Non-current derivative instrument assets	Put Option	368,001	-
Derivative instruments designated as the hedging instruments:			
Non-current derivative instruments asset	Currency interest rate swap	1,639,873	-
Non-current derivative instruments liabilities	Currency interest rate swap	-	3,617,387

23. Financial instruments risk management and derivative instruments asset(cont'd)

Derivatives not designated as hedging instruments for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

Financial institution	Position	Contract notional amount	Fair value
KEB Hana Bank and others	Buy	209,645,994	738,048
	Sell	391,502,994	174,651
Total		601,148,988	912,699

Financial institution	Position	Contract notional amount	Fair value
KEB Hana Bank and others	Buy	85,930,268	(3,735,180)
	Sell	54,312,215	110,613
Total		140,242,483	(3,624,567)

As of December 31, 2021, the details of the non-current derivative financial instruments not designated as the hedging instruments by the Group is as follows (Korean won in thousands):

Classification	Type	Fair value
Derivative assets (* 1)	Put option for SK Chemicals Daejeong Co., Ltd.'s common stocks	368,001

(* 1) Represents a put option allowing asset holders to sell SK Chemicals Daejeong Co., Ltd.'s investment in its subsidiaries to Daejeong Chemicals & Metals Co., Ltd.

23. Financial instruments risk management and derivative instruments asset(cont'd)

Derivatives designated as hedging instruments as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021	
Classification	**Details**
Contractor	KEB Hana Bank
Hedged item	Floating rate foreign currency bond(Notional amount USD 30,000,000)
Contract period	2018.06. 29-2023.06. 29
Buy/Sell	Buy
Purpose of transaction	Hedge of foreign currency risk and interest rate fluctuation risk
Contract amount	33,645,000
Fair value	1,639,873
Gain or loss on valuation:	
Amount of profit and loss reclassification	2,925,000
Other comprehensive gains and losses (* 1)	1,256,961

(* 1) This amount is obtained from deducting the corporate tax.

2020		
Classification	**Details**	
Contractor	Hana Bank	
Hedged item	**Floating rate foreign currency bond(Notional amount USD 30,000,000)**	**Floating rate foreign currency bond(Notional amount USD 30,000,000)**
Contract period	2018.06. 29-2023.06. 29	2018.06. 29-2023.06. 29
Buy/Sell	Buy	Buy
Purpose of transaction	Hedge of foreign currency risk and interest rate fluctuation risk	
Contract amount	33,645,000	22,434,000
Fair value	(2,180,220)	(1,437,168)
Gain or loss on valuation:		
Amount of profit and loss reclassification	(3,490,000)	
Other comprehensive gains and losses (* 1)	(145,731)	

(* 1) This amount is obtained from deducting the corporate tax.

24. Commitment and Contingencies

Details of significant legal claim contingencies as of December 31, 2021 are as follows (Korean won in thousands):

Legal claim Details of litigations	Plaintiff	Defendant	Claim amount Litigation value	Status Note
Indemnity claims (Notes 1, 2)	Korea Environmental Industry and Technology Institute	The Company and others Parent company and 12 others	2,240,000	First trial 1st trial in progress
Indemnity claims (* 1, 2)	National Health Insurance Service	The Company and others Parent company and 12 others	6,970,000	First trial 1st trial in progress
Claims for damages (* 2)	Kang Chan-Ho and 299 others	The Company and others Parent company and 19 others	11,200,000	First trial 1st trial in progress
Claims for damages (* 2)	Aekyung Industrial Co., Ltd.	The Company Parent company	710,000	First trial 1st trial in progress
Claims for the prohibition of patent infringements and for damages	Novartis AG	The Company Parent company	27,500,000	First trial 1st trial in progress
Claims for the revocation of corrective order, etc.	Parent company and 1 others	Fair Trade Commission	113,000	Third trial 3rd trial in progress
Prohibition of patent infringements	Wyeth LLC, Pfizer Korea	SK Bioscience	300,000	First trial 1st trial in progress

(*1) As of December 31, 2021, a portion of the Group's land has been seized in connection with the above lawsuit.
(*2) Represents a civil lawsuit against humidifier disinfectant damage, in which the Group is a defendant. There are a number of other civil lawsuits in progress other than above case.

In addition to the above lawsuit, the Company has been indicted for violating the Special Act on the Protection of Humidifier Sterilization Damage for submitting a different opinion to the data submission request of the Ministry of Environment.

The Group is unable to reasonably estimate the ultimate outcome of such proceedings. Such uncertainty is not reflected on the Group's consolidated financial statements.

As of December 31, 2021, no assets were provided as collateral in connection with the borrowings from financial institutions.

24. Commitment and Contingencies(cont'd)

Other commitments

The Group has other commitments as of December 31, 2021 as follows:

Counterparty to the agreement	Details of the agreement
KEB Hana Bank and others	Facility loan and line of credit for up to ₩88,500 million, USD 53.2 million, Foreign currency and borrowing agreement
	Stand-by L/C and others amounting to USD 137.8 million and EUR 22.0million
	Derivative instrument limit commitments for up to USD 225.5 million, ₩11,000 million
Seoul Guarantee Insurance Company Ltd. and others	Performance guarantee for up to ₩38,032 million

Under the paragraph 1 of the Article 530-9 of the *Commercial Act*, the Company and SK Discovery Co., Ltd., the surviving entity after spin-off, are jointly and severally responsible for the repayment of the liabilities incurred before December 1, 2017.

Corrective action by the Fair Trade Commission
The Fair Trade Commission (FTC) determined that the labeling of humidifier disinfectants, before the Company was split, violated the Act on Fair Labeling and Advertising. Therefore, the Fair Trade Commission took corrective action, fined, and filed charges against the Company. The Company and SK Discovery shall jointly take corrective actions and pay for the fine.

Technology Transfer Agreement and Joint Development
The Group signed an agreement with Sanofi Pasteur Inc. of the United States on February 12, 2018 to transfer technology for producing cell-grown high-efficiency influenza vaccines, which is worth 155,000,000 USD. Some of these will be split and recognized as revenue until the end of the obligation based on clinical entry and authorization. The Group may receive sales commission based on terms and conditions.

In addition, the Group signed an agreement with Sanofi Pasteur Inc. on the joint development and sale of next-generation pneumonia-bacterial conjugate vaccines on March 19, 2014, which is worth of USD 45,000,000, including initial technical fees and milestones for each stage of development. The Group recognized it as a profit when it met the requirements for the right to be paid for each step in progress.

CMO and CDMO contracts.
The Group signed a COVID-19 vaccine CMO contract with AstraZeneca UK Limited on July 3, 2020, and the amount related to this contract is recognized in installments as revenue until the end of the contractual obligation.

The Group signed a COVID-19 vaccine CDMO contract with Novavax Inc. on August 11, 2020, and the amount related to this contract is recognized in installments as revenue until the end of the contract-related obligations. Meanwhile, on February 12, 2021, they executed an agreement with Novavax on granting the exclusive right to develop, produce, and sell the COVID-19 vaccine developed by Novavax in the target territories under the contract. On December 23, 2021, they secured the non-exclusive rights to Thailand and Vietnam based on a contract to change the existing contract, and added a CMO contract for 2022.

The Group has prepaid Novavax a portion of the license expenses incurred by and from the Novavax COVID-19 vaccine sold by the Group, and if the Ministry of Food and Drug Safety approves of the COVID-19 vaccine developed by Novavax, they will have the obligation to pay a portion of the remaining license expenses to Novavax in a lump sum (refer to Note 37).

The revenue which the Group recognized from the CMO and CDMO contracts for the current period was KRW 214,907 million.

24. Commitment and Contingencies(cont'd)

The Group purchased Palm Fatty Acid Distillate (PFADs) from ST Green Energy, a joint venture of the Group, and executed a contract with SK Eco Prime Co., Ltd. to supply PFADs. As part of the contract, a special agreement was executed to fix the weighted average spread between the PFADs and the soybean oil and palm oil, and the provisions for the expected losses were established.

On December 27, 2021, the Group executed a sales contract for a land located in Songdo-dong, Yeonsu-gu, Incheon, with the Incheon Free Economic Zone Authority for the purpose of newly building research facilities. The Group have must carry out all procedures, such as the facility construction plans and authorization of their use, within a certain period from the date of execution of the sales contract, and any failure to do so may result in the rescission of the sales contract.

As of December 31, 2021, the Group will proceed with the process of judgement of nullification as it has lost one promissory note of Shinhan Bank.

25. Related party disclosures

As of December 31, 2021, the Group's related parties are as follows, and there is no entity exercising control or having significant influence on the Group.

Classification	Name of Company
Companies exercising a significant influence	SK Discovery Co., Ltd.
Affiliates and joint ventures	Entis Co., Ltd., JSI Co., Ltd. (* 1), HDC POLYALL Co., Ltd. (* 2), ST Green Energy
Others	Subsidiaries and affiliates of SK Discovery Co., Ltd., affiliates of SK corporate group, etc. (* 3)

(* 1) During the previous period, these entities were reclassified from a subsidiary to an affiliate as the Group lost control over such entities, following the partial sale of the interest it held in these entities.
(* 2) During the current period, the Parent Company newly invested in the entity and investments in the entity was reclassified as investments in affiliates and joint ventures.
(* 3) The conglomerate affiliates that is also known as the Large-scale Business Group affiliates, designated by the Korea Fair Trade Commission are classified as related parties in accordance with the resolution of the Korean Securities and Futures Commission that those are related parties considering substance of the relationship as stipulated in paragraph 10 of KIFRS 1024.

25. Related party disclosures(cont'd)

Significant transactions with related parties for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021						
Related parties	**Entities**	**Sales (* 1)**	**Other income and sales of assets(* 1)**	**Purchase (* 1)**	**Other expenses and capital expenditures (* 1)**
A corporation with significant influence	SK Discovery Co., Ltd.	63,636	110,508	-	1,327,143
Associates and Joint ventures	Entis Co., Ltd.	1,268,092	3,779,346	3,492,735	538
	JSI Co., Ltd.	64,060	109,716	93,510	-
	ST Green Energy Pte.Ltd	-	589,952	-	213,882,734
Other related parties	SK Gas Co., Ltd.	541,806	-	6,211,366	4,199,736
	SK Plasma Co., Ltd.	1,720,195	1,236,564	353,017	13,512
	SK Advanced Co., Ltd.	3,903,094	1,129,639	7,279,652	274,293
	Huvis Corporation	12,481,991	135	22,414,559	17,450
	SK Eco Plant Co., Ltd. (* 2, 3)	-	-	-	10,378,517
	SK Networks Co., Ltd.	8,666,193	-	11,310,417	437,929
	SK Networks Hong Kong	-	-	24,191,033	-
	SKC Co., Ltd.	4,267,324	4,529	298,425	180,396
	SK Energy Co., Ltd.	14,661,175	-	265,271	1,386,994
	SK Geo Centric Co., Ltd. (* 4)	-	-	38,278,079	-
	SK Holdings Co., Ltd.	-	-	-	7,468,194
	SK Hynix Co., Ltd.	1,279,091	-	-	-
	Happynarae Co., Ltd.	-	-	2,575,144	11,117,424
	Others	4,047,899	-	389,640	8,701,138
Total		52,964,556	6,960,389	117,152,848	259,385,998

(*1) It includes the transaction amount with related parties reclassified to profit and loss on discontinued operations.
(* 2) The corporate name was changed from SK Engineering & Construction Co., Ltd. to SK Eco Plant Co., Ltd. during the current period.
(* 3) The Group has acquired the tangible assets of KRW 10,269,702,000 from SK Eco Plant Co., Ltd. during the current period.
(* 4) The corporate name was changed from SK Global Chemical Co., Ltd. to SK Geo Centric Co., Ltd. during the current period.

25. Related party disclosures(cont'd)

2020						
Related parties	**Entities**	**Sales (* 1)**	**Other income and sales of assets(* 1)**	**Purchase (* 1)**	**Other expenses and capital expenditures (* 1)**
A corporation with significant influence	SK Discovery Co., Ltd.	63,636	70,500	-	247,397
Associates and Joint ventures	JSI Co., Ltd.	21,000	28,241	50,577	-
	Entis Co., Ltd.	1,148,954	2,107,965	1,178,111	716
	ST Green Energy Pte.Ltd	-	732,590	67,899,861	96,452,407
Other related parties	SK Gas Co., Ltd.	260,450	-	5,477,198	876,279
	SK Plasma Co., Ltd.	2,213,741	738,211	7,936,713	23,420
	SK Advanced Co., Ltd.	3,800,806	641,550	6,801,326	266,933
	Huvis Corporation	6,528,398	-	13,208,780	37,202
	SK E&C Co., Ltd. (* 2)	-	-	-	11,062,810
	SK Networks Co., Ltd.	1,693,994	-	8,859,453	237,173
	SK Networks Hong Kong	-	-	15,992,056	32,330
	SK Incheon Petrochem Co., Ltd.	2,943,128	-	-	-
	SKC Co., Ltd.	2,334,459	50,281	51,272	878
	SK Energy Co., Ltd.	54,046,317	-	28,453	1,166,459
	SK Incheon Petrochem Co., Ltd.	-	-	46,117,502	-
	SK Holdings Co., Ltd.	-	-	-	8,568,470
	SK Hynix Co., Ltd.	1,544,198	-	-	-
	Happynarae Co., Ltd.	-	-	1,925,311	9,976,754
	Others	408,231	197,525	180,200	6,628,403
Total		77,007,312	4,566,863	175,706,813	135,577,631

(*1) It includes the transaction amount with related parties reclassified to profit and loss on discontinued operations.
(*2) The parent company acquired ₩11,062,810 thousand in tangible assets from SK Engineering & Construction Co., Ltd. during the current period.

25. Related party disclosures(cont'd)

Significant outstanding balances with related parties as of December 31, 2021 and 2020 as follows (Korean won in thousands):

2021					
Related parties	Entities	Receivables		Payables	
		Accounts receivable	Other Receivables	Accounts payable	Other payables
A corporation with Significant influence	SK Discovery Co., Ltd.	35,000	10,130	-	296,082
Associates and Joint ventures	Entis Co., Ltd.	148,675	508,511	240,062	-
	JSI Co., Ltd. (* 1)	15,488	3,750,000	-	-
	HDC POLYALL Co., Ltd.	-	1,161,028	-	-
	ST Green Energy Pte. Ltd.	-	22,002	-	104,850,770
Other related parties	SK Gas Co., Ltd.	25,488	480,972	880,110	2,632,712
	SK Plasma Co., Ltd.	87,777	5,476	-	-
	SK Advanced Co., Ltd.	499,893	324,728	639,037	3,076,508
	Huvis Corporation	-	-	3,423,392	-
	SK Eco Plant Co., Ltd. (* 2)	-	164,426	-	65,994
	SK Networks Co., Ltd.	-	-	1,393,244	26,800
	SK Network Hong Kong	-	968,739	13,714,225	325,133
	SKC Co., Ltd.	357,808	-	15,802	-
	SK Energy Co., Ltd.	2,298,473	-	-	235,672
	SK Geo Centric Co., Ltd. (* 3)	-	-	3,490,860	-
	SK Holdings Co., Ltd.	-	-	-	846,887
	SK Hynix Co., Ltd.	95,225	-	-	-
	Happynarae Co., Ltd.	-	-	189,005	1,245,508
	Others	591,149	40,373	138,996	829,975
Total		4,154,976	7,436,385	24,124,733	114,432,041

(* 1) The Group has recognized allowance for bad debts for the entire ₩3,750 million of loans to JSI Co., Ltd.

(* 2) The corporate name was changed from SK Engineering & Construction Co., Ltd. to SK Eco Plant Co., Ltd. during the current period.

(* 3) The corporate name was changed from SK Global Chemical Co., Ltd. to SK Geo Centric Co., Ltd. during the current period.

25. Related party disclosures(cont'd)

2020					
Related parties	Entities	Receivables		Payables	
		Accounts receivable	Other Receivables	Accounts payable	Other payables
A corporation with Significant influence	SK Discovery Co., Ltd.	35,000	-	-	198,443
Associates and Joint ventures	JSI Co., Ltd. (Note 1)	60,544	4,050,000	31,833	-
	Entis Co., Ltd.	146,038	324,898	133,056	7,059
	ST Green Energy Pte. Ltd.	-	11,750	-	76,971,937
Other related parties	SK Gas Co., Ltd.	23,875	215,832	442,194	2,776,747
	SK Plasma Co., Ltd.	114,907	64,086	1,283,097	2,310
	SK Advanced Co., Ltd.	343,549	39,844	499,592	3,178,359
	Huvis Corporation	367,360	-	3,853,602	-
	SK Networks Co., Ltd.	-	-	662,953	-
	SK Network Hong Kong	-	275,451	8,728,819	-
	SKC Co., Ltd.	486,268	-	28,200	-
	SK Energy Co., Ltd.	1,502,422	-	-	87,126
	SK Petrochem Co., Ltd.	-	-	2,494,270	-
	SK Holdings Co., Ltd.	-	-	-	712,348
	SK Hynix Co., Ltd.	115,292	-	-	2,797
	Happynarae Co., Ltd.	-	-	134,935	1,096,316
	Others	17,560	-	-	679,246
Total		3,212,815	4,981,861	18,292,551	85,712,688

(*1) The Group has recognized provision for bad debts for the entire ₩4,050 million of loans to JSI Co., Ltd.

Details of fund transactions with related parties during the current reporting period are as follows (Korean won in thousands):

① Contribution

Classification	Name of related parties	Investments
Affiliates and joint ventures	HDC POLYALL Co., Ltd.	7,699,750
	ST Green Energy	385,515

② Loans

Classification	Target companies	Jan 1, 2021	Recovered	Dec 31, 2021
SK Chemicals Co., Ltd.	JSI Co., Ltd. (* 1)	4,050,000	(300,000)	3,750,000

(*1) The Group has recognized provision for bad debts for the entire ₩ 3,750 million of loans to JSI Co., Ltd.

25. Related party disclosures(cont'd)

Classification	Target companies	Jan 1, 2020	Amounts lent (* 1)	Dec 31, 2020
SK Chemicals Co., Ltd.	JSI Co., Ltd.	-	4,050,000	4,050,000

(*1) The Group has recognized provision for bad debts for the entire ₩ 4,050 million of loans to JSI Co., Ltd.

Details of guarantees the Group has provided to the related parties as of December 31, 2021 and 2020 are as follows (US dollar):

2021				
Guarantee recipient	Amount of payment guaranteed		Description	Guarantor
	Currency	Amount		
ST Green Energy	USD	7,200,000	Trade facility	Hana Bank Singapore Branch
	USD	4,000,000		Development Bank of Singapore

2020				
Guarantee recipient	Amount of payment guaranteed		Description	Guarantor
	Currency	Amount		
ST Green Energy	USD	5,000,000	Trade facility	Hongkong & Shanghai Banking Corp.
	USD	4,000,000		Development Bank of Singapore

The details of the compensation made for the key senior management of the Group for the 2021 and 2020 are as follows. (Korean won in thousands):

Classification	2021	2020
Salaries	5,197,322	3,452,255
Provision for pension benefits	986,700	777,295
Share-based payment	93,252	640,726
Total	6,277,274	4,870,276

The Group's key management personnel includes registered directors and audit committee members

26. Equity

Details of equity as of December 31, 2021 and 2020 are as follows (Korean won in thousands except par value per share):

Classification	Unit	2021		2020	
		Ordinary share	Preferred share	Ordinary share	Preferred share
Authorized shares	Shares	40,000,000	10,000,000	40,000,000	10,000,000
Par value	KRW	5,000	5,000	5,000	5,000
Number of shares Issued	Shares	17,620,780	2,115,429	11,741,396	1,458,670
Issued capital(* 1)	Korean won in thousands	88,103,900	10,577,145	58,706,980	7,293,350

(* 1) The Group increased its capital by KRW 32,630,715,000 by executing a capital increase without consideration based on its capital surplus used as the financial resource.

Capital surplus

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

Classification	2021	2020
Paid-in capital in excess of par value (* 1)	235,917,593	268,290,410
Other capital surplus(* 2)	956,851,198	(3,975,813)
Total	1,192,768,791	264,314,597

(* 1) During the current period, the Group executed a capital increase without consideration by using the capital surplus as the financial resource.
(* 2) The Group sold a portion of its interest in SK Bioscience Co., Ltd., a subsidiary, and SK Bioscience Co., Ltd., a subsidiary, and executed a paid-in capital increase, while the amount of gains or losses on capital transactions are recognized as other capital surplus in relation to the capital increase.

Other capital

Details of other capital adjustments as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Other capital adjustments(* 1)	(8,921,443)	(5,753,700)
Stock options (* 2)	1,831,164	1,891,764
Other capital adjustments	(14,255,733)	(14,255,733)
Total	(21,346,012)	(18,117,669)

(*1) The Group acquired the treasury shares at the market price due to the acquisition of single shares and the exercise of the shareholders' right to purchase shares. As of December 31, 2021, the Group holds 30,857 common shares and 148,133 preferred shares, and the acquisition price of ₩8,921,443 thousand is deducted from the equity.
(*3) There is no new stock option granted during the current period, and the stock compensation cost increased by ₩125,937 thousand and decreased by ₩186,538 thousand due to their exercises.

26. Equity(cont'd)

The Company has granted stock options to its key executives, and the details are as follows:

Grant date	Number of shares to issue (* 1)	Exercise period(* 2)	Strike price (* 2)	Fair value of grant date(* 1)
2018.3.6	29,988	2020.3.7 - 2025.3.6	71,785	15,864
2018.3.26 (1st)	22,491	2021.3.27 - 2025.3.26	72,009	16,226
2018.3.26 (2nd)	44,984	2022.3.27 - 2025.3.26	77,724	13,717
2019.3.25 (1st)	22,491	2021.3.26 - 2026.3.25	47,749	9,184
2019.3.25 (2nd)	22,492	2022.3.26 - 2026.3.25	51,517	7,856

(* 1) Following the capital increase without consideration during the current period, the number of shares to be issued and the exercise price have been adjusted, and the fair value on the date of grant has been applied with adjustments.
(*2) As of December 31, 2021, the weighted average remaining maturity of stock options not exercised is 3.54 years.

The fair value of the share option was calculated according to the binomial option pricing model. The variables applied to the model are as follows:

Classification	2018.3.6	2018.3.26 (1st)	2018.3.26 (2nd)	2019.3.25 (1st)	2019.3.25 (2nd)
Grant date stock price(* 1)	69,667	70,000	70,000	45,267	45,267
Strike price(* 1)	71,785	72,009	77,724	47,749	51,517
Expected variability	15.07%	15.75%	15.75%	18.37%	18.37%
Risk free rate	2.66%	2.57%	2.57%	1.92%	1.92%

(* 1) Following the capital increase without consideration during the current period, the number of shares to be issued and the exercise price has been adjusted, and the share price on the date of grant has been applied with adjustments.

Fluctuations of stock option of the current year are as follows:

Date of grant	Shares to be issued			Valuation price			
	2020	Exercise (* 3)	2021	2020	Increase	Exercise	2021
2018.3.6 (* 1)	29,988	-	29,988	475,721	-	-	475,721
2018.3.26 (1st) (* 1)	22,491	-	22,491	364,940	-	-	364,940
2018.3.26 (2nd) (* 2)	44,984	-	44,984	582,779	34,281	-	617,060
2019.3.6 (* 2)	10,000	(10,000)	-	170,993	15,545	(186,538)	-
2019.3.25 (1st) (* 1)	22,491	-	22,491	189,353	17,214	-	206,566
2019.3.25 (2nd) (* 2)	22,492	-	22,492	107,978	58,897	-	166,875
Total	152,446	(10,000)	142,446	1,891,764	125,937	(186,538)	1,831,163

(* 1) Following the capital increase without consideration during the current period, the number of shares to be issued has been adjusted.
(* 2) This is the number of shares before adjustment following the capital increase without consideration.
(* 3) The weighted average market price as of the exercise date of the exercised stock option is ₩366,604.

26. Equity(cont'd)

Accumulated other comprehensive income on a consolidated basis

Details of accumulated other comprehensive income as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Loss on valuation of derivatives	(204,395)	(1,460,383)
Unrealized gain on change in Equity Method Securities	362,323	295,623
Unrealized gain(loss) on foreign currency translation	2,779,362	(1,459,336)
Total	2,937,290	(2,624,096)

Retained earnings

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

Classification	2021	2020
Legal reserve (*1)	3,744,031	1,129,006
Unappropriated retained earnings (undisposed accumulated deficit)	776,756,667	642,175,788
Total	780,500,698	643,304,794

(*1) The Commercial Code of the Republic of Korea requires the Company to appropriate, as a legal reserve, an amount equal to a minimum of 10% of cash dividends paid until such reserve equals 50% of its issued capital stock. 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 capital based on the resolution of the general meeting of shareholders.

Dividends

Details of cash dividends proposed in accordance with the approval of the general meeting of shareholders for the year ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021		2020	
	Ordinary share	Preferred share	Ordinary share	Preferred share
Number of shares issued (Shares)	17,589,923 shares	1,967,296 shares	11,728,768 shares	1,313,519 shares
Par value	KRW 3,000	KRW 3,050	KRW 2,000	KRW 2,050
Dividend rate	60%	61%	40%	41%
Dividend	52,769,769	6,000,253	23,457,536	2,692,714

The Group paid ₩26,150,250 thousand in dividends for the fiscal period ending December 31, 2020 during April 2021.

27. Operating segment information

The Group has two reportable segments, as described below, which represent the Group's strategic business units. The strategic business units offer different products and services, and are managed separately as they require different technology and marketing strategies. For each of the strategic business units, the Group's chief operating decision maker reviews internal management reports at least on a quarterly basis.

The Group's reportable segments are as follows:

Classification	Goods (or services)
Green Chemicals Biz.	PET resin, DMT, information communication materials, highly functional PETG resin, polyester adhesive, and carbon fiber composite materials, etc.
Life Science Biz.	Medical supplies, medical equipment, etc.

Revenue and operating income of each reportable segment for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021				
Classification	Green Chemicals Biz.	Life Science Biz.	Others	Total
Revenue	1,037,059,042	1,229,179,081	(176,606,247)	2,089,631,876
Operating income (loss)	76,514,410	520,208,920	(41,537,420)	555,185,910
Depreciation (*1)	48,936,429	26,301,619	4,239,036	79,477,084

(*1) The sum of depreciation expenses on property, plant and equipment, investment properties, and right-of-use assets and amortization expenses on intangible assets

2020				
Classification	Green Chemicals Biz.	Life Science Biz.	Others	Total
Revenue	859,196,301	489,828,116	(150,243,647)	1,198,780,770
Operating income (loss)	67,404,290	90,065,304	(2,111,620)	155,357,974
Depreciation (*1)	44,897,135	23,563,336	3,936,305	72,396,776

(*1) The sum of depreciation expenses on property, plant and equipment, investment properties, and right-of-use assets and amortization expenses on intangible assets

Liabilities are not managed at the segment level, and accordingly, details of assets for each reportable segment as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021				
Classification	Green Chemicals Biz	Life Science Biz.	Others	Total
Total assets	1,253,284,965	2,308,476,688	393,870,741	3,955,632,394
Fixed assets (* 1)	649,534,607	318,777,394	107,955,090	1,076,267,091

(*1) Includes property, plant and equipment, intangible assets, right-of-use assets and investment properties.

2020				
Classification	Green Chemicals Biz	Life Science Biz.	Others	Total
Total assets	1,174,375,614	737,346,582	208,244,761	2,119,966,957
Fixed assets (* 1)	741,904,315	289,789,561	108,418,740	1,140,112,616

(*1) Includes property, plant and equipment, intangible assets, right-of-use assets and investment properties.

28. Revenue from Contracts with customers

The revenue from contracts with customers of the Group classified for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021				
Classification	**Green Chemicals Biz.**	**Life Science Biz.**	**Consolidation adjustments**	**Total**
Types of goods or services:				
Sales in manufactured goods	933,572,377	837,262,845	(149,396,471)	1,621,438,751
Sales in merchandised goods	12,483,917	122,904,023	(2,287,251)	133,100,689
Sales in service	53,458,469	258,598,086	(30,208,384)	281,848,171
Sales in others	37,544,278	10,414,127	5,285,860	53,244,265
Total	1,037,059,041	1,229,179,081	(176,606,246)	2,089,631,876
Geographical market(* 1):				
Domestic	241,918,032	962,920,723	4,639,122	1,209,477,877
China	210,645,705	8,054,815	(17,912,448)	200,788,072
Japan	75,546,462	-	-	75,546,462
Asia (excluding China and Japan)	106,442,488	433,572	-	106,876,060
Americas	149,229,544	52,308,426	(66,001,670)	135,536,300
Europe	212,391,738	205,374,018	(99,047,066)	318,718,690
Others	40,885,072	87,527	1,715,816	42,688,415
Total	1,037,059,041	1,229,179,081	(176,606,246)	2,089,631,876
Time of recognizing revenue:				
At a point of time	983,435,221	968,372,957	(146,397,862)	1,805,410,316
Over a period of time	53,623,820	260,806,124	(30,208,384)	284,221,560
Total	1,037,059,041	1,229,179,081	(176,606,246)	2,089,631,876

28. Revenue from Contracts with customers

2020				
Classification	Green Chemicals Biz.	Life Science Biz.	Consolidation adjustments	Total
Types of goods or services:				
Sales in manufactured goods	783,015,480	335,690,357	(140,769,515)	977,936,322
Sales in merchandised goods	17,699,145	121,659,021	(1,819,403)	137,538,763
Sales in service	23,394,790	10,420,347	(9,040,015)	24,775,122
Sales in others	35,086,886	22,058,391	1,385,286	58,530,563
Total	859,196,301	489,828,116	(150,243,647)	1,198,780,770
Geographical market:				
Domestic	207,451,501	417,215,106	(1,938,529)	622,728,078
China	169,121,094	7,525,501	(17,009,805)	159,636,790
Japan	64,182,042	-	-	64,182,042
Asia (excluding China and Japan)	71,498,212	5,816,245	-	77,314,457
Americas	134,231,335	17,657,707	(54,905,618)	96,983,424
Europe	177,198,782	41,566,960	(76,819,603)	141,946,139
Others	35,513,335	46,597	429,908	35,989,840
Total	859,196,301	489,828,116	(150,243,647)	1,198,780,770
Time of recognizing revenue:				
At a point of time	835,801,511	479,407,769	(141,203,632)	1,174,005,648
Over a period of time	23,394,790	10,420,347	(9,040,015)	24,775,122
Total	859,196,301	489,828,116	(150,243,647)	1,198,780,770

Meanwhile, only one customer accounted for over 10% of sales during the current period, and the sales amounted to ₩637,935,767 thousand

29. Operating income

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

Classification	2021	2020
Changes in inventories	(84,224,160)	18,966,991
Raw materials used	588,517,213	366,499,346
Cost of merchandise sold	119,317,547	124,002,340
Depreciation and amortization (* 1)	79,477,084	72,396,776
Salaries and wages	266,320,471	214,299,146
Transport and storage of oil expenses	85,603,728	59,774,097
Rental fees and service fees	283,692,054	48,000,741
Marketing fees	17,487,997	15,485,092
Others	178,254,032	123,998,268
Total	1,534,445,966	1,043,422,796

(* 1) It is the sum of the depreciation cost of tangible assets, investment properties and right-of-use assets, and the amortization cost of intangible assets.

29. Operating income(cont'd)

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

Classification	2021	2020
Salaries	89,351,692	72,936,178
Provision for pension benefits	11,486,142	7,749,697
Employee welfare benefits	16,450,601	11,158,214
Travel	5,236,622	4,652,442
Communication	727,550	686,656
Utilities	504,084	587,918
Taxes and dues	1,697,333	1,121,089
Rents	543,550	191,209
Share compensation expense	125,937	1,117,234
Depreciation	2,960,573	3,147,317
Repairs	451,069	452,162
Insurance	1,632,165	1,430,641
Entertainment	1,443,203	1,156,513
transport storage cost	38,765,213	14,396,184
Office supplies	801,899	539,134
Vehicle maintenance	985,633	892,738
Training	3,911,863	2,933,228
Printing	143,541	118,809
Rental fees and service fees	25,279,208	15,156,253
Research	85,885,573	59,238,728
Advertising and marketing	16,520,359	14,760,308
Sales commissions	9,997,011	10,146,476
Promotion	162,126	122,845
Samples	800,697	588,914
Packaging	4,199,813	3,484,016
Bad debt expenses(reversal)	(137,774)	(813,943)
Conference	536,025	542,494
Amortization	3,981,896	2,293,881
Miscellaneous expenses	1,750,214	1,852,768
Total	326,193,818	232,640,103

30. Non-operation income and expense

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

Classification	2021	2020
Other income:		
Gain on disposal of fixed assets	552,064	2,320
Gain on disposal of right of use assets	441,373	22,948
Gain on disposal of intangible assets	-	235,110
Gain on disposal of Investment in subsidiaries	-	2,041,764
Gains from sales of business divisions	3,966,975	-
Other reversals of allowance for bad debts	170,716	-
Miscellaneous income	22,278,422	10,265,751
Total	27,409,550	12,567,893
Other expenses:		
Loss on disposal of inventories	705	77,284
Loss on disposal of fixed assets	1,857,015	4,536,170
Loss on discard of fixed assets	1,198,619	-
Losses on disposal of right-of-use assets	182	-
Loss on disposal intangible assets	83,438	561,322
Other bad debt expenses	-	3,660,948
Donations	4,386,165	4,776,747
Miscellaneous expenses	36,704,980	14,202,997
Total	44,231,104	27,815,468

30. Non-operation income and expense(cont'd)

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

Classification	2021	2020
Financial income:		
Interest income	2,273,356	606,526
Gain on transaction of derivative instruments at FVPL	12,615,764	3,058,891
Gain on valuation of derivative instruments at FVPL	2,494,539	362,011
Dividends income	1,190,000	1,190,000
Gain on foreign currency transactions	23,749,997	21,643,082
Gain on foreign currency translation	1,152,887	11,325,143
Gain on settlement of derivatives	13,542,254	5,661,683
Gain on valuation of derivatives	5,570,047	287,361
Total	62,588,844	44,134,697
Financial cost:		
Interest expenses	10,600,102	19,074,586
Loss on valuation of derivative instruments at FVPL	8,851,558	1,388,693
Loss on foreign currency transactions	23,340,358	24,293,489
Loss on foreign currency translation	6,183,069	3,363,986
Loss on settlement of derivatives	13,611,059	4,608,055
Loss on valuation of derivatives	1,364,348	7,401,928
Total	63,950,494	60,130,737

31. Income tax

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

Classification	2021	2020
Current income tax	98,792,562	83,991,557
Adjustments of prior income tax recognized in the current year	(2,075,218)	(2,002,483)
Changes in deferred income taxes arising from temporary differences	36,888,944	6,194,193
Income tax reflected directly to equity	1,853,362	908,852
Income tax expense	135,459,650	89,092,119
Income tax expense from continuing operation	168,012,086	35,924,417
Income tax expense from discontinued operation	(32,552,436)	53,167,702

31. Income tax(cont'd)

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

Classification	2021	2020
Income tax expenses reflected directly to equity:		
Derivatives liabilities	(401,299)	46,526
Re-measurement loss on defined benefit obligation	1,993,004	908,029
Others	261,657	(45,703)
Total	1,853,362	908,852

A reconciliation of income tax expense applicable to loss before income taxes at the Korea statutory tax rate to income tax expense at the effective tax rate are as follows (Korean won in thousands):

Classification	2021	2020
Profit (Loss) before income tax of continuing operation	538,621,651	125,871,572
Profit before income tax of discontinued operation	(134,418,663)	218,381,757
Net profit before income tax	404,202,988	344,253,329
Corporate tax according to the applicable tax rate	136,297,240	84,735,884
Adjustments:		
Non-taxable revenue	(951,792)	(1,175,032)
Non-deductible expenses for tax purposes	1,038,829	784,233
Deferred tax effect from tax credit carried forward	(11,808,197)	(8,679,093)
Effect of unrecognized deferred tax in temporary differences	6,006,687	16,188,491
Adjustments of prior income tax recognized in the current year	(440,860)	(2,002,483)
Corporate tax effect on non-reflux income	3,458,416	-
Others (* 1)	1,859,327	(759,881)
Income tax expense	135,459,650	89,092,119
Income tax expense from continuing operation	168,012,086	35,924,417
Income tax expense from discontinued operation	(32,552,436)	53,167,702
Effective income tax rate	33.51%	25.88%

(*1) Others include unrecognized effect of deferred tax in the adjustments and temporary differences caused by mergers within the Group during the current and prior years.

31. Income tax(cont'd)

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

2021				
Classification	Jan. 1	Recognized in profit or loss	Recognized directly in equity	Dec. 31
Government subsidies	5,982,120	(1,548,423)	-	4,433,697
Provisions	2,335,646	(606,894)	-	1,728,752
Tangible assets	(29,279,396)	3,963,880	-	(25,315,516)
Right-of-use assets	(2,267,599)	(498,768)	-	(2,766,367)
Lease liabilities	2,332,426	612,201	-	2,944,627
Intangible assets	14,725,141	(3,074,323)	-	11,650,818
Inventory	5,079,665	1,718,000	-	6,797,665
Interest receivables	(108,343)	1,656,729	-	1,548,386
Accrued expenses	8,841,496	3,131,047	-	11,972,543
Derivatives	875,407	(960,014)	(401,299)	(485,906)
Securities	(663,938)	157,362	(21,295)	(527,871)
Temporary depreciation reserve	(3,154,481)	(2,987,038)	-	(6,141,519)
Provisions	-	5,523,006	-	5,523,006
Contract liabilities	(218,929)	697,455	-	478,526
Retirement allowance	139,765	(2,136,075)	1,993,004	(3,306)
Stock option	675,779	(14,665)	-	661,114
Money lent	34,927	(34,927)	-	-
Carried forward tax credit	16,004,994	(12,692,528)	-	3,312,466
Others	(3,357,705)	(31,648,331)	282,952	(34,723,084)
Total	17,976,975	(38,742,306)	1,853,362	(18,911,969)
Deferred income tax assets	20,594,928			11,426,991
Deferred income tax liabilities	(2,617,953)			(30,338,960)

31. Income tax(cont'd)

2020					
Classification	Jan. 1	Recognized in profit or loss	Recognized directly in equity	Change in consolidation scope	Dec. 31
Government subsidies	5,709,647	272,772	-	(299)	5,982,120
Provisions	3,234,885	(899,239)	-	-	2,335,646
Tangible assets	(31,458,169)	2,021,496	-	157,277	(29,279,396)
Right-of-use assets	(11,244,825)	8,977,226	-	-	(2,267,599)
Lease liabilities	11,399,223	(9,066,797)	-	-	2,332,426
Intangible assets	17,846,589	(3,121,448)	-	-	14,725,141
Inventory	9,522,153	(4,442,488)	-	-	5,079,665
Interest receivables	(13,780)	(94,563)	-	-	(108,343)
Accrued expenses	6,999,564	1,841,932	-	-	8,841,496
Derivatives	(15,699)	844,580	46,526	-	875,407
Securities	(1,059,886)	379,718	16,230	-	(663,938)
Temporary depreciation reserve	(2,731,218)	(423,263)	-	-	(3,154,481)
Contract liabilities	1,303,866	(1,522,795)	-	-	(218,929)
Retirement allowance	242,030	(925,098)	908,029	(85,196)	139,765
Stock options	488,927	186,852	-	-	675,779
Money lent	-	34,927	-	-	34,927
Donation	2,003,778	(2,003,778)	-	-	-
Tax credits carried forward	8,867,092	248,508	-	6,889,394	16,004,994
Others	(3,884,182)	588,410	(61,933)	-	(3,357,705)
Total	17,209,995	(7,103,048)	908,852	6,961,176	17,976,975
Deferred income tax assets	17,281,775				20,594,928
Deferred income tax liabilities	(71,780)				(2,617,953)

Significant management judgment is required to determine the amount of deferred tax assets that can be recognized, based upon the likely timing and the level of future taxable profits, overall economic condition, and industrial outlook. The Group reviews these factors on a regular basis. Deferred tax assets are recognized for deductible temporary differences as of December 31, 2021 as it is probable that taxable profit will be available against which the temporary differences can be utilized.

The tax effect of the amount of deductible temporary differences, unused tax losses, and unused tax credits for which no deferred tax asset is recognized in the statement of financial position is ₩54,689,781 thousand (2020 : ₩48,683,094 thousand)

32. Earnings per share

The Group's basic earnings (loss) per share for the years ended December 31, 2021 and 2020 is computed as follows (Korean won in thousands, except per share amounts):

Classification	2021	2020
Profit for the year	268,743,338	255,161,210
Loss for the year attributable to equity holders of the parent	168,139,816	254,320,770
Loss for the year attributable to non-controlling interest	100,603,522	840,440
Less: Preferred stock dividend	(6,008,027)	(2,792,565)
Less: Additional profit available for dividends attributable to preferred stocks	(11,003,502)	(23,731,997)
Operating Profit attributable to ordinary equity holders	151,128,287	227,796,208
Operating Profit (loss) from continuing operation attributable to ordinary equity holders	246,546,353	79,756,513
Operating Profit from discontinued operation attributable to ordinary equity holders	(95,418,066)	148,039,695
Operating Profit attributable to preferred equity holders	17,011,529	26,524,562
Operating Profit(loss) from continuing operation attributable to preferred equity holders	23,459,690	9,350,202
Operating Profit from discontinued operation attributable to preferred equity holders	(6,448,161)	17,174,360
Weighted average number of ordinary shares outstanding	17,601,765	17,593,634
Weighted average number of preferred shares outstanding	1,969,845	2,043,340
Basic earnings per ordinary share	8,586	12,948
Basic earnings (loss) per ordinary share from continuing operation	14,007	4,533
Basic earnings per ordinary share from discontinued operation	(5,421)	8,414
Basic earnings per preferred share (*1)	8,636	12,981
Basic earnings (loss) per preferred share from continuing operation	11,909	4,576
Basic earnings per preferred share from discontinued operation	(3,273)	8,405
Diluted earnings per ordinary share	8,535	12,844
Diluted earnings per ordinary share on continuing operations	13,921	4,523
Diluted earnings per common share on discontinued operations	-	8,378

(*1) The preferred shares were issued under the Commercial Law which was amended in 1997, and the preferred shareholders do not have a priority over ordinary shareholders but have the same rights as the ordinary shareholders when dividend or capital is distributed.

32. Earnings per share(cont'd)

The weighted average number of shares is the same as the number of shares issued as of December 31, 2021 and 2020.

2021					
Classification	**Initial date**	**Closing date**	**Period**	**Number of shares**	**Weighted average number of ordinary shares outstanding during the period**
January 1	2021.1.1	2021.12.31	365	17,593,152	17,593,152
Exercise of stock option	2021.4.2	2021.12.31	274	15,000	11,260
Acquisition of treasury stocks	2021.11.9	2021.12.31	53	(18,229)	(2,647)
Number of weighted average common shares outstanding				17,589,923	17,601,765

2020					
Classification	**Initial date**	**Closing date**	**Period**	**Number of shares**	**Weighted average number of ordinary shares outstanding during the period**
January 1	2020.1.1	2020.12.31	366	17,594,574	17,594,574
Acquisition of treasury stocks	2020.5.4	2020.12.31	242	(1,422)	(940)
Number of weighted average common shares outstanding				17,593,152	17,593,634

Details of the calculation of the weighted average number of preferred shares in the current and prior years of the Group are as follows:

2021					
Classification	**Initial date**	**Closing date**	**Period**	**Number of shares**	**Weighted average number of preferred shares outstanding during the period**
January 1	2021.1.1	2021.12.31	365	1,970,278	1,970,278
Acquisition of treasury stocks	2021.11.9	2021.12.31	53	(2,982)	(433)
Number of weighted average preferred shares outstanding				1,967,296	1,969,845

32. Earnings per share(cont'd)

2020					
Classification	Initial date	Closing date	Period	Number of shares	Weighted average number of preferred shares outstanding during the period
January 1	2020.1.1	2020.12.31	366	2,185,929	2,185,929
Acquisition of treasury stocks	2020.5.4	2020.12.31	242	(215,651)	(142,589)
Number of weighted average preferred shares outstanding				1,970,278	2,043,340

Diluted earnings per share

The diluted earnings per share were calculated by applying the number of weighted average common shares outstanding adjusted under the assumption that all dilutive potential common shares will be converted into common shares. The dilutive potential common shares held by the Company include stock options. The number of stocks resulting from stock options is calculated by calculating the number of stocks to be acquired at fair value based on the monetary value of the exercise of the right added to the stock options, and by comparing this number of stocks with the number of stocks to be issued if the stock options are assumed to have been exercised.

Classification	2021	2020
Net income for common shares	246,546,353	79,756,512
Adjustments: stock options	80,629	258,039
Net income for common shares for calculation of diluted earnings per share	246,626,982	80,014,551
Number of weighted average common shares outstanding	17,601,765	17,593,634
Adjustments: stock options	114,250	97,272
Number of weighted average common shares outstanding for calculation of diluted earnings per share	17,716,015	17,690,906
Diluted earnings per share (KRW/share)	13,921	4,523

33. Consolidated statements of cash flows

Adjustments to cash flows generated from the operating activities for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021 (* 1)	2020 (* 1)
Income tax expense (benefit)	135,459,650	89,092,119
Interest income	(2,273,356)	(606,526)
Interest expenses	14,896,758	25,464,130
Loss from valuation of inventories	(11,868)	(16,515,084)
Loss on disposition of inventories	705	77,284
Provision for severance and retirement benefits	16,285,671	15,511,074
Bad debt expense(reversal)	(48,379)	(742,164)
Other bad debt expense	(165,967)	3,660,883
Depreciation(* 2)	84,574,399	92,233,027
Amortization	8,300,659	5,923,057
Gains on disposal of fixed assets	(552,066)	(3,167)
Gains on disposal of right-of-use assets	(441,373)	(22,948)
Losses on disposal of fixed assets	1,858,033	9,129,678
Losses on discard of fixed assets	1,198,619	-
Losses on disposal of right-of-use assets	182	-
Impairment losses on fixed assets	103,421,162	48,044,590
Gains on disposal of intangible assets	-	(235,110)
Losses on disposal of intangible assets	83,438	570,115
Gains on foreign currency translation	(1,152,887)	(11,325,143)
Losses on foreign currency translation	6,183,069	3,363,986
Gain on valuation of derivatives	(5,570,047)	(287,361)
Loss on valuation of derivatives	1,364,347	7,401,928
Dividend income	(1,190,000)	(1,190,000)
Gains on equity method	(1,618,945)	(1,757,213)
Gain on transaction of derivative instruments at FVPL	(12,615,764)	(3,058,891)
Gain on valuation of derivative instruments at FVPL	(2,494,539)	(362,011)
Loss on valuation of derivative instruments at FVPL	8,851,558	1,388,693
Share-based payments	125,937	1,137,056
Return on contract liability	-	(11,935,642)
Gain on sales of business	(4,232,942)	(319,194,304)
Gain (loss) on valuation of investments in subsidiaries	-	(2,041,764)
Others	1,924,839	1,490,372
Total	352,160,893	(64,789,336)

(* 1) Includes the profit and loss from discontinued operations.
(* 2) Includes Depreciation expenses of property, plant and equipment and investment properties and right-of-use assets.

33. Consolidated statements of cash flows(cont'd)

Details of changes in assets and liabilities from the operating activities for the years ended December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Accounts and notes receivable	(39,824,327)	(26,906,979)
Other receivables	(104,998,707)	(75,410,151)
Inventories	(129,195,959)	22,392,954
Other current assets	(8,701,737)	406,449
Long-term receivables	2,245,127	883,548
Other non-current assets	14,565	(249,686)
Accounts and notes payable	86,247,031	23,449,066
Other payables	127,623,279	59,684,354
Other current liabilities	59,746,275	25,024,478
Payment of severance and retirement benefits	(192,908)	712,635
Affiliates transferred in/out	-	(362,409)
Plan assets paid	(26,000,000)	(19,500,000)
Contract assets	979,915	(979,915)
Current portion of contract liabilities	18,238,965	90,256,661
Provisions	22,437,979	-
Transaction settlement of derivatives	(3,677,511)	(1,055,856)
Total	4,941,987	98,345,149

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

Classification	2021	2020
Transfer of construction-in-progress into other account	68,893,642	61,155,691
Acquisition of accounts payable for construction in progress	3,684,492	2,469,861
Current portion for long-term liabilities	207,752,001	95,891,553
Current portion for lease liabilities	1,763,669	3,551,124
Transfer of investment properties to tangible assets	82,210	-
Transfer of tangible assets to investment properties	276,270	1,997,730
Recognition of right-of-use assets and lease liabilities	7,662,853	3,935,684
Trade and other receivables written-off	116,518	2,674,230
Changes in accounts payable for retirement benefits	8,357,682	-
Accounts payable for investment in affiliates	385,515	-

33. Consolidated statements of cash flows(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						
Classification	Jan. 1	Cash flows in financing activities	Foreign currency translation	Business transfer (*1)	Others (* 2)	Dec. 31
Short-term borrowings	107,636,903	(96,363,272)	397,742	-	-	11,671,373
Current portion of long-term borrowings	1,003,200	(1,003,200)	-	-	-	-
Long-term borrowings	31,135,000	(32,059,000)	-	-	924,000	-
Current portion of bonds payable	95,944,294	(96,000,000)	-	-	207,919,819	207,864,113
Bonds	460,480,570	-	2,925,000	-	(207,342,163)	256,063,407
Current portion of lease liabilities	3,038,109	(2,774,229)	-	(133,332)	2,658,090	2,788,638
Lease liabilities	9,392,925	-	-	(853,100)	(196,303)	8,343,522
Total	708,631,001	(228,199,701)	3,322,742	(986,432)	3,963,443	486,731,053

(* 1) During the current period, the composite material business division was transferred to Toray Advanced Materials Korea Inc.
(*2) Others include the effect of reclassification of non-current portion of interest-bearing loans and borrowings, current portion of lease liabilities and installment purchase contracts due to the lapse of time and the effect of accrued interest on interest bearing loans and borrowings. The Group classifies interest paid as cash flows from operating activities.

2020							
Classification	Jan. 1	Cash flows in financing activities	Foreign currency translation	Change in consolidation range	Business transfer (* 1)	Others (* 2)	Dec. 31
Short-term borrowings	198,755,574	(83,259,014)	(2,024,199)	(9,955,300)	-	4,119,842	107,636,903
Current portion of long-term borrowings	95,651,400	(104,401,400)	-	-	-	9,753,200	1,003,200
Long-term borrowings	72,909,200	(30,625,000)	(1,396,000)	-	-	(9,753,200)	31,135,000
Current portion of bonds (net amount)	145,920,582	(146,000,000)	-	-	-	96,023,712	95,944,294
Bonds (net amount)	558,680,067	-	(2,094,000)	(800,000)	-	(95,305,497)	460,480,570
Current portion of lease liabilities	11,534,922	(5,843,598)	-	-	(8,724,390)	6,071,175	3,038,109
Lease liabilities	46,935,965	-	-	-	(35,442,411)	(2,100,629)	9,392,925
Total	1,130,387,710	(370,129,012)	(5,514,199)	(10,755,300)	(44,166,801)	8,808,603	708,631,001

(*1) During the current period, the Group sold the bioenergy business to SK Eco Prime Co., Ltd.
(*2) Others include the effect of reclassification of non-current portion of interest-bearing loans and borrowings, including obligations under lease liabilities and installment purchase contracts to current due to the passage of time and the effect of accrued but not yet paid interest on interest bearing loans and borrowings. The Group classifies interest paid as cash flows from operating activities.

34. Financial risk management objectives and policies

The Group’s major financial liabilities, excluding derivatives, consist of trade and other payables, borrowings and bonds. The main purpose of these financial liabilities is to raise funds for the operation of the Group. The Group's major financial assets include trade receivables and cash and short-term deposits directly derived from operating activities. The Group also has investments in debt and equity instruments and trade derivatives.

The Group is exposed to market risk, credit risk, and liquidity risk. The Group’s senior management supervises the management of such risks. All derivative activities for the purpose of risk management are carried out by a team of professionals equipped with the appropriate skills, experiences, and oversight. It is the policy of the Group to avoid conducting any trading of derivatives for speculative purposes.

Market risk
Market risk is the risk related to the fair value or future cash flows of financial instruments fluctuating due to changes in the market prices. Market risk consists of the following three types of risk: interest rate risk, foreign exchange risk and other price risk. The financial instruments affected by the market risk include borrowings and bonds, deposits, debt and equity investments and derivatives.

The following sensitivity analysis is related to the statement of financial position as of December 31, 2021 and 2020.

The sensitivity analysis has been prepared based on the designation of a hedging interest rate while the net amount of liabilities, fixed interest rate of liabilities and derivatives, variable interest rate and the ratio of foreign currency financial instruments were all constant as of December 31, 2021.

This analysis excludes the effect of movements of the market variables on the book values of retirement pensions and other post-retirement liabilities and provisions.

The following assumptions are required when calculating for the sensitivity analysis:
- ➢The sensitivity of the relevant income statement is the effect of an assumed change in each market risk. This is based on the financial assets and financial liabilities held at the end of the current and previous periods, including the effect of hedge accounting.

(1) Interest rate risk
The Group’s exposure to the risk of changes in market interest rates relates primarily to the Group’s borrowings with floating interest rates. The Group measures its interest rate risk by the fluctuation of interest rate of 1% point of floating rate borrowings, the above fluctuation ratio reflects the management's assessment of the reasonably possible interest rate fluctuation risk.

The Group ' changes in the market interest rate risk relate primarily to the Group ' long-term liabilities subject to the variable interest rates. The Group ' senior management manages the risk of fluctuations in the future cash flows of financial instruments related to fluctuations in the market interest rates by executing currency swap and interest rate swap contracts.

Details of borrowings with floating rates as of December 31, 2021 and 2020 are as follows (Korean won in thousands

Classification	2021	2020
Short-term borrowings	-	76,000,000
Long-term borrowings	-	10,378,200
Total	-	86,378,200

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

With all other variables held constant, the effect of changes of interest rate on profit before tax is as follows (Korean won in thousands).

Classification	2021		2020	
	Increase by 1% point	Decrease by 1% point	Increase by 1% point	Decrease by 1% point
Short-term borrowings	-	-	(760,000)	760,000
Long-term borrowings	-	-	(103,782)	103,782
Total	-	-	(863,782)	863,782

(2) Foreign currency risk

The Group's exposure to the risk of changes in foreign exchange rates relates primarily to the Group's operations in other countries. The book values of monetary assets and liabilities which are not presented in functional currency as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021		2020	
	Assets	Liabilities	Assets	Liabilities
USD	162,654,290	216,682,711	86,692,002	94,589,383
CNY	15,918,457	986,456	7,184,382	891,791
EUR	9,032,243	1,597,977	35,959,992	20,202,025
GBP	297,848	2,654	1,562	-
JPY	4,911,900	16,436	1,776,607	48,882
Total	192,814,737	219,286,234	131,614,545	115,732,081

(* 1) The foreign currency borrowings and foreign currency bonds for which currency swaps are executed are excluded since they are not exposed to the exchange risk.

The Group manages its foreign currency risk periodically. The impact on the Group's profit before income tax due to 5% change in foreign exchange rate is as follows (Korean won in thousands):

Classification	2021		2020	
	5% increase	5% decrease	5% increase	5% decrease
USD	(2,701,421)	2,701,421	(394,869)	394,869
CNY	746,600	(746,600)	314,630	(314,630)
EUR	371,713	(371,713)	787,898	(787,898)
GBP	14,760	(14,760)	78	(78)
JPY	244,773	(244,773)	86,386	(86,386)
Total	(1,323,575)	1,323,575	794,123	(794,123)

The Group measures the exchange risk of fluctuations in won on a regular basis, and effectively manages the exchange risk through currency exchange, which has a limited impact on profit or loss.

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

(3) Other price risk

Included among price risks other than the interest rate risk or foreign exchange risk is the risk of the fair value of financial instruments or future cash flows fluctuating due to fluctuations in the market prices. Since the Group has not traded equity instruments, there is no effect on the profit or loss due to other price fluctuation risks as of December 31, 2021. Furthermore, the Group is not significantly exposed to the risk of price fluctuations of specific instruments.

Credit risk

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

(1) Trade receivables and other receivables

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. Outstanding customer receivables are regularly monitored and any shipments to major customers are generally covered by letters of credit or other forms of credit insurance. The Group evaluates the impairment of trade receivables and other receivables at every reporting date. The maximum exposure to credit risk at the reporting date is the book value of financial assets (see Note 5).

(2) Other assets

Credit risks associated with the Group's other assets which consist of cash, short-term deposits and short-term and long-term loans arise from the default by the counterparties. Maximum exposure to credit risks will be the book value of the related other assets. The Group deposits its surplus funds with Woori Bank and other financial institutions whose credit ratings are high. Accordingly, credit risk related to financial institutions is considered low.

Liquidity risk

Liquidity risk is the risk of not being able to fund all contractual arrangements by maturity.

The Group maintains a short-term and long-term capital management plans to monitor its risk to a shortage of funds. The objective is to maintain continuity between budgeted cash outflows with actual outflows, and uses a liquidity planning tool to match the maturity profile for its financial liabilities and assets.

The maturity profile of financial liabilities based on contractual undiscounted payments as of December 31, 2021 and 2020 is as follows (Korean won in thousands):

2021					
Classification	**Within 1 year**	**1 to 2 years**	**2 to 5 years**	**Over 5 years**	**Total**
Trade and other accounts payables	452,892,821	-	-	-	452,892,821
Short-term borrowings	11,671,373	-	-	-	11,671,373
Current portion of long-term liabilities	208,000,000	-	-	-	208,000,000
Current portion of lease liabilities	2,835,307	-	-	-	2,835,307
Other current liabilities (* 1)	11,827,891	-	-	-	11,827,891
Bonds payable (* 2)	-	101,565,000	155,000,000	-	256,565,000
Lease liabilities	-	2,276,326	3,414,156	5,257,899	10,948,381
Other non-current liabilities (* 1)	-	2,110,026	-	-	2,110,026
Total	687,227,392	105,951,352	158,414,156	5,257,899	956,850,799

(* 1) Other current liabilities include deposits received.
(* 2) Included are the interest expenses.

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

2020					
Classification	Within 1 year	1 to 2 years	2 to 5 years	Over 5 years	Total
Trade and other accounts payables	231,930,603	-	-	-	231,930,603
Short-term borrowings	107,636,903	-	-	-	107,636,903
Current portion of long-term liabilities	97,003,200	-	-	-	97,003,200
Current portion of lease liabilities	3,104,689	-	-	-	3,104,689
Other current liabilities (* 1)	20,115,250	-	-	-	20,115,250
Bonds payable (* 2)	-	208,000,000	253,640,000	-	461,640,000
Long-term borrowings	-	1,875,000	29,260,000	-	31,135,000
Lease liabilities	-	2,524,550	4,537,220	5,577,133	12,638,903
Other non-current liabilities	-	-	3,617,387	-	3,617,387
Total	459,790,645	212,399,550	291,054,607	5,577,133	968,821,935

(* 1) Other current liabilities include deposits received.
(* 2) Included are the interest expenses.

Capital management
The primary objective of the Group's capital management is to ensure that the Group continues as a going concern and minimizes the cost of raging capital 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. To maintain the sound capital structure, the Group may adjust the dividend payment to shareholders, reduce share capital, or issue new shares. No changes were made in the objectives, policies or processes for managing capital for the year ended December 31, 2021.

Details of the Group's debt-to-equity ratio as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

Classification	2021	2020
Total liabilities	1,388,894,986	1,161,034,164
(Adjustments: cash and cash equivalents)	(255,615,367)	(86,764,152)
Adjusted liabilities	1,133,279,619	1,074,270,012
Shareholder's equity	2,566,737,409	958,932,793
Debt-to-equity ratio	44.15%	112.03%

35. Fair value

Fair value hierarchy
The Group uses the following hierarchy for determining and disclosure of the fair value of financial instruments by valuation technique:

Level 1: Inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at the measurement date;
Level 2: Inputs are inputs, other than quoted prices included within Level 1, that are observable for the asset or liability, either directly or indirectly; and
Level 3: Inputs are unobservable inputs for the asset or liability.

Details of fair value of financial instruments by hierarchy level as of December 31, 2021 and 2020 are as follows (Korean won in thousands):

2021				
Classification	**Level 1**	**Level 2**	**Level 3 (* 2)**	**Total**
Financial assets				
Trade and other accounts receivables (* 1)	-	2,277,046	-	2,277,046
Short-term financial assets	-	1,794,156,437	-	1,794,156,437
Long-term investment	-	-	35,081,486	35,081,486
Other non-current assets (* 1)		1,639,873	368,001	2,007,874
Total	-	1,798,073,356	35,449,487	1,833,522,843
Financial liabilities				
Trade and other accounts payables (* 1)	-	1,364,347	-	1,364,347
Total	-	1,364,347	-	1,364,347

(*1) The Group has not disclosed the fair value of financial instruments as their carrying values are reasonable approximate of the fair value.
(* 2) Unless otherwise specified, level 3 instruments consist of unlisted stocks and others, cost of which can be an appropriate estimate of their fair value (refer to Note 35-3).

2020				
Classification	**Level 1**	**Level 2**	**Level 3 (* 2)**	**Total**
Financial assets				
Short-term financial assets	-	339,928,470	-	339,928,470
Trade and other accounts receivables (* 1)	-	287,361	-	287,361
Long-term investment assets	-	-	24,492,063	24,492,063
Total	-	340,215,831	24,492,063	364,707,894
Financial liabilities				
Trade and other accounts payables (* 1)	-	3,911,928	-	3,911,928
Derivatives for hedging	-	3,617,387	-	3,617,387
Total	-	7,529,315	-	7,529,315

(* 1) The Group has not disclosed the fair value of financial instruments as their carrying values are reasonable approximate of the fair value.
(* 2) Unless otherwise specified, level 3 instruments consist of unlisted stocks and others, cost of which can be an appropriate estimate of their fair value (refer to Note 35-3).

35. Fair value(cont'd)

Valuation techniques

The valuation techniques used to measure the fair value of Level 3 for 2021 and 2020 are as follows.

2021				
Categories of financial instruments	Type	Fair value	Valuation techniques	Input variables
Derivatives assets	Put option for SK Chemicals Daejeong Co., Ltd.	368,001	Discounted cash flow method	Liquidation cash flow, weighted average cost of capital
Long-term investment assets	Eastman Fiber Korea Co., Ltd.'s preferred stocks	23,506,094	Expected price considering the value of call options and put options	Exchange rate

2020				
Categories of financial instruments	Type	Fair value	Valuation techniques	Input variables
Long-term investment assets	Eastman Fiber Korea Co., Ltd.'s preferred stocks	21,572,864	Expected price considering the value of call options and put options	Exchange rate

36. Business transfer and discontinued business.

The Group sold its bioenergy business to SK Eco Prime Co., Ltd. as of May 29, 2020 for the purpose of reorganizing portfolio and securing investment resources for future growth engines in accordance with the resolution of the Board of Directors on February 5, 2020. Furthermore, in line with the resolution of the board of directors on October 27, 2021, they sold the PPS business division to HDC POLYALL Co., Ltd., and aforementioned two cases of business transferred were classified as discontinued operations. Meanwhile, the statements of comprehensive income for the year ended December 31, 2020, presented for comparative purpose, have been restated to demonstrate the discontinued operations separated from the continuing operations.

The details of profit or loss from discontinued operations for the reporting period appropriated in the statement of comprehensive income in connection with the PPS business division are as follows.

Classification	2021	2020
Sales	33,477,032	15,928,438
Cost of goods sold	(50,292,941)	(53,613,934)
Gross profit	(16,815,909)	(37,685,496)
Selling and Administrative expenses	(9,984,908)	(11,389,485)
Operating profit	(26,800,817)	(49,074,981)
Other income	272,571	139,747
Other expenses	(103,870,851)	(52,647,069)
Financial income	11,123	-
Financial cost	(4,296,656)	(5,310,925)
Income tax expense	32,616,800	25,920,919
Net profit from discontinued operation	(102,067,830)	(80,972,309)
Profit before tax on disposal of discontinued operation	265,967	-
Related income tax expense	(64,364)	-
Profits on disposal of discontinued operations	201,603	-
Profit and loss from discontinued operations	(101,866,227)	(80,972,309)

The net cash flows from discontinued operation of PPS business as of December 31, 2021 and 2020 is as follows (Korean won in thousands):

Classification	2021	2020
Cash flows from operating activities	15,859,813	7,119,613
Cash flows from investment activities	37,904,391	(1,224,844)
Cash flows from financing activities	-	-
Net cash flows	53,764,204	5,894,769

36. Business transfer and discontinued business(cont'd)

The details of profit or loss from discontinued operations for the reporting period appropriated in the statement of comprehensive income in connection with the bio-energy business division are as follows.

Classification	2021	2020
Sales	-	161,714,128
Cost of goods sold	-	(138,905,635)
Gross profit	-	22,808,493
Selling and Administrative expenses	-	(7,179,203)
Operating profit	-	15,629,290
Other income	-	158,082
Other expenses	-	(8,628,073)
Financial cost	-	(1,078,618)
Income tax expense	-	(1,672,187)
Net profit from discontinued operation	-	4,408,494
Profit before tax on disposal of discontinued operation	-	319,194,304
Related income tax expense	-	(77,416,434)
Profits on disposal of discontinued operations	-	241,777,870
Profit and loss from discontinued operations	-	246,186,364

The net cash flows from discontinued operation of bio-energy business as of December 31, 2021 and 2020 is as follows (Korean won in thousands):

Classification	2021	2020
Cash flows from operating activities	-	4,504,108
Cash flows from investment activities	-	374,396,501
Cash flows from financing activities	-	(3,103,373)
Net cash flows	-	375,797,236

The Group sold its operations related to composite materials in their entirety to Toray Advanced Materials Korea Inc. during the current period. The calculation details of the profit from sales of the business division are as follows. (Korean won in thousands):

Classification	Consideration for transfer (* 1)	Transferred business				Profits from sales of business division
		Assets	Liabilities	Equity (* 2)	Net assets	
Composite materials business division	33,711,343	38,175,991	7,113,002	1,318,621	29,744,368	3,966,975

(* 1) The incidental expenses incurred during the transfer are included.
(* 2) This is the reclassification of other comprehensive income.

37. Events after the reporting period that do not require adjustments

① Novavax COVID-19 vaccine product license acquired in Korea
Novavax's COVID-19 vaccine produced by the Group under a contract with Novavax acquired product authorization from the Ministry of Food and Drug Safety of Korea on January 12, 2022.

② Receipt of a mediation proposal from the Mediation Committee for Damage Recovery of Humidifier Disinfectants
In March 2022, the Group received a mediation proposal from the 'Mediation Committee for Damage Recovery of Humidifier Disinfectants.' The Company is reviewing the mediation proposal, and nothing in relation to this has been confirmed to date.