

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES

Consolidated Financial Statements

December 31, 2022 and 2021

(With Independent Auditors' Report Thereon)

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Independent Auditors' Report

Based on a report originally issued in Korean

To the Board of Directors and Stockholders of
Hanwha Solutions Corporation:

Opinion

We have audited the consolidated financial statements of Hanwha Solutions Corporation and its subsidiaries ("the Group"), which comprise the consolidated statements of financial position as of December 31, 2022 and 2021, the consolidated statements of comprehensive income, changes in equity and cash flows for the years then ended, and notes to the consolidated financial statements, comprising significant accounting policies and other explanatory information.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2022 and 2021, and its consolidated financial performance and its consolidated cash flows for the year then ended in accordance with Korean International Financial Reporting Standards ("K-IFRS").

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 *Auditors' Responsibilities for the Audit of the Consolidated Financial Statements* section of our report. We are independent of the Group in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in Republic of Korea, and we have fulfilled our 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 is that matter that, in our professional judgement, was of most significance in our audit of the consolidated financial statements as of and for the year ended December 31, 2022. This matter was 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 this matter.

- Assessment of goodwill impairment

Impairment testing of goodwill Regarding cash-generating unit consisting of Q Energy Mediterranee and its subsidiaries, in which the goodwill was allocated, as described in Note 18 to the consolidated financial statements, an impairment test was conducted in accordance with K-IFRS 1036 Impairment of Assets during the current period. As of the end of the current period, the carrying amount of the goodwill is KRW 800,856 million.

The Group conducts the impairment test on cash generating units with allocated goodwill every year. The Group measures the amount of impairment of the cash-generating unit that needs to be impaired as the difference between the carrying amount and the higher of the cash-generating unit's value-in-use and its fair value less costs to sell. The estimation of value-in-use of the cash-generating unit involves the significant judgement of management on the key assumptions such as sales growth rate, discount rate, permanent growth rate, and others. Therefore, we identified the assessment of goodwill impairment as a key audit matter.

The audit procedures for the key audit matter include followings:

- Confirm the independence, objectivity and competence of the external valuation experts;
- Engaging our valuation specialists to assist us in evaluating the key assumptions (sales growth rate, discount rate, permanent growth rate, etc.) used for impairment test, and impairment test methodology;
- Compare the financial data used for impairment test with the mid to long-term business plans approved by the management;
- Assess the progress and existence of underlying data (such as renewable energy projects) included in valuation through a test method;



- Assess the completeness of the disclosures of notes to consolidated financial statements related to impairment of assets

Other Matter

The procedures and practices utilized in the Republic of Korea to audit such consolidated financial statements may differ from those generally accepted and applied in other countries.

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 the Standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

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

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

Auditors' 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 auditors' 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 Company's internal control.



- Evaluate the appropriateness of accounting policies used in the preparation of the consolidated financial statements 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 auditors' report to the related disclosures in the separate financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' 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 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 auditors' report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partner on the audit resulting in this independent auditors' report is Dae-jin Kim.

KPMG Samjory Accounting Corp.

Seoul, Korea
March 15, 2023

This report is effective as of March 15, 2023, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statement and notes thereto. Accordingly, the readers of the audit report should understand that the above audit report has not been updated to reflect the impact of such subsequent events or circumstances, if any.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
 Consolidated Statements of Financial Position
 As of December 31, 2022 and 2021

In won

	<u>Note</u>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Assets			
Current assets:			
Cash and cash equivalents	5, 6, 7, 9	₩ 2,548,379,660,490	1,567,162,571,367
Other financial assets	5, 6, 7, 11, 56	339,937,234,843	229,553,165,289
Trade receivables and other receivables	5, 6, 7, 8, 10, 56	2,195,999,363,307	1,631,758,622,607
Other current assets	12	373,671,029,647	331,309,259,734
Inventories	13	3,060,107,831,877	2,231,502,356,819
Current income tax assets		17,946,307,931	16,788,568,009
Non-current assets held for sale	20	37,254,006,572	65,885,387,264
		<u>8,573,295,434,667</u>	<u>6,073,959,931,089</u>
Non-current assets:			
FVTPL – financial assets	6, 7, 14	94,921,893,890	33,628,555,019
FVTOCI – financial assets	6, 7, 14	56,660,048,935	56,186,275,865
Other financial assets	5, 6, 7, 11, 56	300,439,752,297	209,559,134,922
Long-term trade receivables and other receivables	5, 6, 7, 10, 56	6,215,610,234	2,839,139,559
Investments in associates and joint ventures	15, 56	3,744,627,560,311	3,438,403,013,136
Investment property	16	199,762,831,011	212,427,637,717
Property, plant and equipment	17	6,879,451,517,358	6,451,599,071,822
Intangible assets	18	1,644,437,623,282	1,580,566,861,451
Right-of-use assets	19	405,920,544,099	381,095,528,884
Other non-current assets	12	100,645,647,526	35,937,956,734
Deferred tax assets	53	201,291,727,783	121,326,658,470
		<u>13,634,374,756,726</u>	<u>12,523,569,833,579</u>
Finance business assets:			
Cash and cash equivalents	27, 28	67,788,636,608	84,367,726,864
FVTPL – financial assets	27, 29, 32	170,808,506,806	96,183,771,956
FVTOCI – financial assets	27, 29	1,492,153,533	1,492,153,533
Financial assets at amortized cost	27, 30	1,225,921,497,314	1,099,170,123,176
Other financial assets	27, 28, 31	134,640,829,741	117,153,453,692
Property, plant and equipment	34	3,697,657,652	3,363,729,642
Intangible assets	35	5,531,909,556	1,901,534,879
Right-of-use assets	36	180,403,850	613,373,090
Other assets	33	12,890,900,897	4,044,807,806
Deferred tax assets	53	1,074,725,627	1,751,754,876
		<u>1,624,027,221,584</u>	<u>1,410,042,429,514</u>
Total assets		<u>₩ 23,831,697,412,977</u>	<u>20,007,572,194,182</u>

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Consolidated Statements of Financial Position, Continued
As of December 31, 2022 and 2021

In won

	<u>Note</u>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Liabilities			
Current liabilities:			
Trade payables and other payables	5, 6, 7, 21, 56	₩ 2,388,214,422,278	2,441,732,749,591
Short-term borrowings	5, 6, 7, 8, 22	3,002,810,540,989	2,611,134,177,317
Other financial liabilities	5, 6, 7, 19, 23	537,936,849,654	292,209,368,234
Provisions	26	47,834,553,573	54,458,109,317
Other current liabilities	24	446,062,634,395	296,577,676,097
Current income tax liabilities		385,632,429,534	91,777,621,545
		<u>6,808,491,430,423</u>	<u>5,787,889,702,101</u>
Non-current liabilities:			
Long-term trade payables and other payables	5, 6, 7, 21, 56	39,968,985,880	173,506,004,180
Long-term borrowings	5, 6, 7, 22	4,205,362,605,876	3,263,692,515,386
Other financial liabilities	5, 6, 7, 19, 23	633,645,507,978	469,362,495,237
Net defined benefit liabilities	25	397,180,313,951	455,223,009,098
Long-term employee benefits		29,635,392,983	26,716,231,237
Provisions	26	127,508,705,923	112,192,697,790
Other non-current liabilities	24	22,412,346,949	5,879,963,273
Deferred tax liabilities	53	229,718,216,921	267,905,030,821
		<u>5,685,432,076,461</u>	<u>4,774,477,947,022</u>
Finance business liabilities:			
Deposits	27, 37	1,409,686,759,700	1,224,148,714,191
Other financial liabilities	27, 36, 40	23,948,102,175	15,818,976,930
Provisions	39	77,276,505	110,057,671
Net defined benefit liabilities(assets)	38	(187,020,708)	(55,921,931)
Long-term employee benefits		215,115,300	186,475,963
Other liabilities	41	5,430,532,033	2,577,660,412
Current income tax liabilities		1,691,581,754	1,171,462,590
		<u>1,440,862,346,759</u>	<u>1,243,957,425,826</u>
Total liabilities		<u>13,934,785,853,643</u>	<u>11,806,325,074,949</u>
Equity			
Capital stock	42	978,240,655,000	978,240,655,000
Capital surplus	42	2,320,051,132,051	2,003,249,459,042
Capital adjustments	43	(154,153,939,884)	(24,175,632,263)
Accumulated other comprehensive income	44	215,027,701,694	150,692,884,947
Retained earnings	45	5,561,405,443,543	5,051,413,697,545
Equity attributable to owner of the Company		<u>8,920,570,992,404</u>	<u>8,159,421,064,271</u>
Non-controlling interests	60	976,340,566,930	41,826,054,962
Total equity		<u>9,896,911,559,334</u>	<u>8,201,247,119,233</u>
Total liabilities and equity		<u>₩ 23,831,697,412,977</u>	<u>20,007,572,194,182</u>

See accompanying notes to the consolidated financial statements.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Consolidated Statements of Comprehensive Income
For the years ended December 31, 2022 and 2021

In won

	<u>Note</u>	<u>2022</u>	<u>2021</u>
Revenue	47, 56, 58, 59		
Non-financial business		₩ 13,563,492,579,270	10,706,126,080,154
Finance business		<u>90,455,525,636</u>	<u>19,066,304,668</u>
		<u>13,653,948,104,906</u>	<u>10,725,192,384,822</u>
Cost of sales	48, 50, 56		
Non-financial business		10,783,041,404,284	8,515,657,376,628
Finance business		<u>69,531,455,543</u>	<u>13,354,968,403</u>
		<u>10,852,572,859,827</u>	<u>8,529,012,345,031</u>
Gross profit		<u>2,801,375,245,079</u>	<u>2,196,180,039,791</u>
Selling and administrative expenses	49, 50	<u>1,835,127,864,969</u>	<u>1,457,832,384,499</u>
Operating income	58	<u>966,247,380,110</u>	<u>738,347,655,292</u>
Other non-operating income	51	915,012,587,429	659,787,086,180
Other non-operating expenses	51	(1,019,691,804,420)	(680,045,466,635)
Financial income	52	35,720,812,352	21,900,950,463
Financial expenses	52	(226,175,690,104)	(147,547,827,644)
Share of profit of associates and joint ventures	15	<u>(101,874,421,823)</u>	<u>262,895,885,097</u>
Non-operating income (loss)		<u>(397,008,516,566)</u>	<u>116,990,627,461</u>
Profit before income tax expense		<u>569,238,863,544</u>	<u>855,338,282,753</u>
Income tax expenses	53	<u>202,823,571,589</u>	<u>239,010,062,357</u>
Gain or loss in purchasing power	4	<u>(392,140,843)</u>	<u>-</u>
Net income for the period		<u>₩ 366,023,151,112</u>	<u>616,328,220,396</u>

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Consolidated Statements of Comprehensive Income, Continued
For the years ended December 31, 2022 and 2021

In won

	Note	2022	2021
Other comprehensive income (loss)			
Items that are or may be reclassified to profit or loss:			
Share of other comprehensive income of associates and joint ventures	₩	70,703,116,044	141,510,702,321
Gain (loss) on valuation of FVTOCI-financial assets (debt instrument)		(1,603,613,011)	(126,571,020)
Gain on valuation of cash flow hedges		2,988,529,606	197,595,523
Currency translation adjustments		26,146,788,053	124,328,633,651
Items that will not be reclassified to profit or loss:			
Share of other comprehensive income of associates and joint ventures		69,875,372,695	(25,167,245,854)
Gain (loss) on valuation of FVTOCI-financial assets (equity instrument)		(5,626,226,639)	9,425,109,740
Remeasurement of net defined benefit liabilities		50,224,172,837	19,119,830,442
Share of remeasurements of net defined benefit liabilities of associates and joint ventures		6,100,972,867	3,981,155,863
Total comprehensive income	₩	<u>584,832,263,564</u>	<u>889,597,431,062</u>
Net income attributable to:			
Owners of the Company		359,146,279,412	619,050,614,652
Non-controlling interests		6,876,871,700	(2,722,394,256)
Total comprehensive income attributable to:			
Owners of the Company		580,491,977,245	886,195,655,943
Non-controlling interests		4,340,286,319	3,401,775,119
Earnings per share from continuing operations attributable to the owners of the Company			
Basic and diluted earnings per common share	54	₩	1,873
Basic and diluted earnings per preferred share			3,320
			3,370

See accompanying notes to the consolidated financial statements.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Consolidated Statements of Change in Equity
For the years ended December 31, 2022 and 2021

In won

	Capital stock	Consolidated capital surplus	Consolidated capital adjustment	Consolidated accumulated other comprehensive income (loss)	Consolidated retained earnings	Non-controlling interests	Total
Balance at January 1, 2021	₩ 821,170,655,000	798,470,151,101	(10,328,159,475)	(110,009,596,397)	4,429,789,179,026	38,623,261,244	5,967,715,490,499
Total comprehensive income (loss):							
Net income	-	-	-	-	619,050,614,652	(2,722,394,256)	616,328,220,396
Other comprehensive income (loss)							
Items subsequently reclassified to profit (loss):							
Gain (loss) on valuation of FVTOCI-financial assets (debt instrument)	-	-	-	(126,571,021)	-	1	(126,571,020)
Share of other comprehensive income of associates and joint ventures	-	-	-	141,510,702,727	-	(406)	141,510,702,321
Gain (loss) on valuation of cash flow hedges	-	-	-	197,595,523	-	-	197,595,523
Currency translation adjustments	-	-	-	118,456,706,717	-	5,871,926,934	124,328,633,651
Items not subsequently reclassified to net profit (loss):							
Gain (loss) on valuation of FVTOCI-financial assets (equity instrument)	-	-	-	9,425,104,700	-	5,040	9,425,109,740
Share of other comprehensive income of associates and joint ventures	-	-	-	(25,167,245,854)	-	-	(25,167,245,854)
Replacement from accumulated other comprehensive income to retained earnings	-	-	-	16,371,425,423	(16,371,425,423)	-	-
Remeasurement of net defined benefit liabilities	-	-	-	-	18,867,592,636	252,237,806	19,119,830,442
Share of remeasurements of net defined benefit liabilities of associates and joint ventures	-	-	-	-	3,981,155,863	-	3,981,155,863
Transactions with shareholders:							
Increase in paid-in capital	157,070,000,000	1,181,597,430,096	-	-	-	-	1,338,667,430,096
Acquisition of treasury stock	-	-	(13,771,491,411)	-	-	-	(13,771,491,411)
Incineration of treasury stock	-	31,468,651	25,960,200	-	-	-	57,428,851
Changes in scope of consolidation:							
Proceeds from acquisition of subsidiaries	-	(12,193,853,731)	-	-	-	927,263,034	(11,266,590,697)
Changes in ownership interests in subsidiaries that do not result in a loss of control:							
Changes in ownership interests in subsidiaries	-	20,360,742,725	-	-	-	19,542,737	20,380,285,462
Share-based payment	-	13,420,347,375	-	-	-	-	13,420,347,375
Others	-	1,563,172,825	(101,941,577)	34,763,129	(3,903,419,209)	(1,145,787,172)	(3,553,212,004)
Balance at December 31, 2021	₩ 978,240,655,000	2,003,249,459,042	(24,175,632,263)	150,692,884,947	5,051,413,697,545	41,826,054,962	8,201,247,119,233

HANWHA SOLUTION CORPORATION AND SUBSIDIARIES
Consolidated Statements of Change in Equity, Continued
For the years ended December 31, 2022 and 2021

In won

		Capital stock	Consolidated capital surplus	Consolidated capital adjustment	Consolidated accumulated other comprehensive income (loss)	Consolidated retained earnings	Non-controlling interests	Total
Balance at January 1, 2022	₩	978,240,655,000	2,003,249,459,042	(24,175,632,263)	150,692,884,947	5,051,413,697,545	41,826,054,962	8,201,247,119,233
Effect of restatement in accordance with K-IFRS No. 1029		-	23,144,752,199	-	-	14,654,047,210	-	37,798,799,409
Total comprehensive income (loss):								
Net income		-	-	-	-	359,146,279,412	6,876,871,700	366,023,151,112
Other comprehensive income (loss)								
Items subsequently reclassified to profit (loss):								
Gain (loss) on valuation of FVTOCI-financial assets (debt instrument)		-	-	-	(1,603,613,009)	-	(2)	(1,603,613,011)
Share of other comprehensive income of associates and joint ventures		-	-	-	70,703,116,044	-	-	70,703,116,044
Gain (loss) on valuation of cash flow hedges		-	-	-	2,988,529,606	-	-	2,988,529,606
Currency translation adjustments		-	-	-	28,703,664,196	-	(2,556,876,143)	26,146,788,053
Items not subsequently reclassified to net profit (loss):								
Gain (loss) on valuation of FVTOCI-financial assets (equity instrument)		-	-	-	(5,626,225,808)	-	(831)	(5,626,226,639)
Share of other comprehensive income of associates and joint ventures		-	-	-	69,875,372,695	-	-	69,875,372,695
Replacement from accumulated other comprehensive income to retained earnings		-	-	-	(100,704,972,163)	100,704,972,163	-	-
Remeasurement of net defined benefit liabilities		-	-	-	-	50,203,881,242	20,291,595	50,224,172,837
Share of remeasurements of net defined benefit liabilities of associates and joint ventures		-	-	-	-	6,100,972,867	-	6,100,972,867
Transactions with shareholders:								
Acquisition of treasury stock		-	-	(90,875,535,740)	-	-	-	(90,875,535,740)
Changes in scope of consolidation:								
Effect of a business combination		-	-	(39,324,595,763)	-	-	-	(39,324,595,763)
Changes in ownership interests in subsidiaries that do not result in a loss of control:								
Changes in ownership interests in subsidiaries		-	318,436,234,559	-	-	-	917,541,438,211	1,235,977,672,770
Share-based payment		-	18,023,313,967	176,308,247	-	-	-	18,199,622,214
Others		-	(42,802,627,716)	45,515,635	(1,054,814)	(20,818,406,896)	12,632,787,438	(50,943,786,353)
Balance at December 31, 2022	₩	<u>978,240,655,000</u>	<u>2,320,051,132,051</u>	<u>(154,153,939,884)</u>	<u>215,027,701,694</u>	<u>5,561,405,443,543</u>	<u>976,340,566,930</u>	<u>9,896,911,559,334</u>

See accompanying notes to the consolidated financial statements.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Consolidated Statements of Cash Flows
For the years ended December 31, 2022 and 2021

In won

	Note	2022	2021
Cash flows from operating activities:			
Cash generated from operating activities	57	₩ 282,386,458,994	1,364,853,760,279
Interest and dividends received from finance business		79,062,950,153	15,892,837,896
Payment of interest from finance business		(26,007,416,758)	(5,481,251,038)
Income taxes paid		(219,725,269,080)	(384,374,663,356)
Net cash provided by operating activities		115,716,723,309	990,890,683,781
Cash flows from investing activities:			
Interest received		12,531,776,558	23,527,623,159
Dividends received		54,430,482,656	208,983,503,741
Proceeds from disposal of FVTOCI-financial assets		847,067,400	3,563,192,811
Proceeds from disposal of other financial assets		232,457,863,299	121,147,732,666
Proceeds from disposal of investment in associates and joint ventures		1,055,354,950	214,760,174,315
Proceeds from disposal of investment in subsidiaries		269,607,571	1,041,570
Receipt of government grants		2,715,303,449	747,139,930
Proceeds from disposal of investment property		-	357,736,000
Proceeds from disposal of plant, property and equipment		13,549,833,628	33,113,460,530
Proceeds from disposal of intangible assets		1,641,995,520	4,494,145,277
Proceeds from disposal of assets held for sale		59,570,606,257	653,453,881,020
Acquisition of FVTOCI-financial assets		(5,355,049,363)	-
Acquisition of other financial assets		(364,111,276,073)	(328,144,095,990)
Acquisition of investment in associates and joint ventures		(459,349,168,334)	(607,106,848,899)
Acquisition of investment property		-	(11,476,572,121)
Acquisition of property, plant and equipment		(902,923,087,644)	(812,670,935,548)
Acquisition of intangible assets		(39,062,982,499)	(10,012,991,694)
Acquisition of investment in subsidiaries		(26,375,778,277)	(1,149,690,090,423)
Decrease due to business combination		(58,473,005,656)	-
Net cash used in investing activities		(1,476,580,456,558)	(1,654,951,903,656)
Cash flows from financing activities:			
Proceeds from borrowings		5,436,465,524,355	4,055,427,094,863
Increase of other financial liabilities		8,806,409,155	1,420,525,536
Increase in paid-in capital		-	1,338,667,430,096
Changes in non-controlling interests		1,352,000,990,576	-
Proceeds from disposal of treasury stock		232,835,609	-
Repayment of borrowings		(4,132,633,396,595)	(4,126,608,372,104)
Decrease of other financial liabilities		(44,521,152)	(5,578,411,902)
Payment of interest		(154,490,362,194)	(87,899,494,339)
Lease payment		(97,155,572,031)	(85,351,934,788)
Acquisition of treasury stock		(90,875,535,740)	(13,772,288,760)
Net cash provided by financing activities		2,322,306,371,983	1,076,304,548,602
Net increase (decrease) in cash and cash equivalents		961,442,638,734	412,243,328,727
Cash and cash equivalents at January 1		1,651,530,298,231	1,199,836,790,880
Effects of exchange rate changes on the balance of cash held in foreign currencies		3,195,360,133	39,450,178,624
Cash and cash equivalents at December 31	₩	2,616,168,297,098	1,651,530,298,231

See accompanying notes to the consolidated financial statements.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES

Notes to the Consolidated Financial Statements

For the years ended December, 2022 and 2021

1. General

Hanwha Solutions Corporation and its subsidiaries (the "Group") was incorporated on April 27, 1974, under the laws of the Republic of Korea. The Group is mainly engaged in the manufacturing and commercialization of synthetic resins, such as caustic soda, PVC, and LLDPE, other petrochemical products other and photovoltaic module, photovoltaic power plant, department store and real estate development. The Group's headquarters is located at Janggyo-dong, Jung-gu, Seoul and its manufacturing facilities are located in Ulsan and the petrochemical complex in Yeo-su, Jeolla Namdo, Eum-seong and Jincheon, Choongchung Bukdo and Sejong Republic of Korea. The consolidated financial statements for the year ended December 31, 2022, represent ownership interests of the Group and its subsidiaries in associates and joint ventures.

The Group listed its stocks on the Korea Stock Exchange on June 19, 1974. The Group changed its name from Hanwha Petrochemical Co., Ltd. to Hanwha Chemical Corporation on March 19, 2010.

The Company changed its name to Hanwha Solutions Corporation after completing the merger with its subsidiary Hanwha Q CELLS & Advanced Materials Co., Ltd. on January 1, 2020 under Article 527-3 of the Commercial Law in Republic of Korea.

The Company absorbed Hanwha Galleria Co., Ltd. and merged with divisional business department of Hanwha City Development Co., Ltd. on April 1, 2021.

On December 1, 2022, the Company has split off the lightweight composite material business division and the solar material business division, and has established Hanwha Advanced Materials Co., Ltd.

(1) Details of subsidiaries

The Group's consolidated subsidiaries as of December 31, 2022 and 2021 are as follows:

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
Hanwha Solutions Corporation					
Gyeonggi Yongin Techno Valley Co., Ltd	Republic of Korea	December	Real estate industry	75%	75%
Gimhae Techno Valley Co.,Ltd	Republic of Korea	December	Real estate industry	80%	80%
SEOSAN TECHNO VALLEY	Republic of Korea	December	Real estate development and sales	65%	65%
West Ochang Techno Valley Co., Ltd.	Republic of Korea	December	Real estate industry	73%	73%
Anseong Techno Valley	Republic of Korea	December	Industrial park development	75%	75%
H-Valley Co.,Ltd.	Republic of Korea	December	Real estate sales	51%	51%
H-Techno Vallet Co., Ltd.	Republic of Korea	December	Real estate industry	80%	80%
The Second Yong In Techno Valley Co, Ltd	Republic of Korea	December	Real estate industry	70%	70%
Hanwha Galleria Timeworld Co., Ltd.	Republic of Korea	December	Department store	99.99%	99.99%
Hanwha B&B Co., Ltd.	Republic of Korea	December	Restaurant business	100%	100%
WOS Inc.	Republic of Korea	December	Manufacturing	100%	100%
HCC Holdings Co., Ltd.	Republic of Korea	December	Holding company	51%	-
HAM Holdings Inc.	Republic of Korea	December	Holding company	52.76%	-
NXEF CO.,LTD	Republic of Korea	December	E-commerce	100%	100%
Anseong Techno Logistics Co., Ltd.	Republic of Korea	December	Transportation and warehousing industry	100%	-
Hanwha Chemical Trading (Shanghai) Co., Ltd.	China	December	Trade	100%	100%
Hanwha Chemical Overseas Holdings, Co., Ltd.	Republic of Korea	December	Holding company	100%	100%

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
Hanwha Compound corporation	Republic of Korea	December	Manufacture and sale of packaging materials	100%	100%
Hanwha Global Asset Corporation	Republic of Korea	December	Holding company and others	100%	100%
Hanwha NxMD Corporation	Republic of Korea	December	Manufacturing	100%	-
Haeorum PV Plant Corporation	Republic of Korea	December	Solar photovoltaic power business	100%	100%
Hanwha City Development Co.,Ltd	Republic of Korea	December	Real estate sales	100%	100%
Hanwha Advanced Materials Corporation	Republic of Korea	December	Processing of synthetic resin	52.76%	-
Hadong Haetpinnaum Taeyanggwangbaljeon Co., Ltd.	Republic of Korea	December	Solar photovoltaic power business	100%	-
Gobokjumin Taeyanggwangbaljeon Co., Ltd.	Republic of Korea	December	Solar photovoltaic power plant industry	90%	-
HAMC Holdings Corp.	USA	December	Holding company	100%	100%
Hanwha International Corp.	USA	December	Holding company	100%	100%
Hanwha Chemical Malaysia Sdn. Bhd.	Malaysia	December	Trade	100%	100%
HANWHA CHEMICAL INDIA PRIVATE LIMITED	India	March	Trade	99.99%	99.99%
Hanwha Chemical (Thailand) Co., Ltd.	Thailand	December	Manufacture of compound	99.99%	99.99%
Hanwha Q CELLS Co., Ltd.	UK	December	Holding company	100%	100%
HANWHA SOLUTIONS USA HOLDINGS CORPORATION	USA	December	Holding company	100%	100%
HHR Development B GK	Japan	December	Real estate industry	100%	-
Q CELLS ASSET MANAGEMENT LIMITED	UK	December	Investment advisory	100%	100%
Q Energy Solutions SE	Germany	December	Holding company	100%	100%
Hanwha Cimarron Europe GmbH	Germany	December	Manufacturing	100%	-
Hanwha Solutions Insight Holdings Corporation	USA	December	Holding company	100%	-
HHR Development B GK					
H-SUMMIT	Japan	December	Real estate industry	100%	-
Hanwha NxMD Corporation					
Hanwha NxMD (Thailand) Co., Ltd.	Thailand	December	Manufacturing of communication modules	100%	-
HAM Holdings Corporation					
Hanwha Advanced Materials America LLC(*1)	USA	December	Manufacture of automobile parts	100%	100%
Hanwha Advanced Materials Beijing Co., Ltd.	China	December	Manufacture of automobile parts	100%	100%
Hanwha Advanced Materials Chongqing Co., Ltd.	China	December	Manufacture of automobile parts	100%	100%
Hanwha Advanced Materials Europe, s.r.o.	Czech	December	Manufacture of automobile parts	100%	100%
Hanwha Advanced Materials Georgia Inc.	USA	December	Manufacture of automobile parts	100%	-
Hanwha Advanced Materials Germany GmbH	Germany	December	Manufacture of automobile parts	100%	100%
Hanwha Advanced Materials Holdings USA LLC(*1)	USA	December	Holding company	100%	100%
Hanwha Advanced Materials Mexico S. De R.L. De C.V.(*1)	Mexico	December	Manufacture of automobile parts	100%	100%
Hanwha Advanced Materials Shanghai Co., Ltd.	China	December	Manufacture of automobile parts	100%	100%

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
Hanwha Advanced Materials USA Corp.(*1)	USA	December	Holding company	100%	100%
Hanwha America Development Inc.	USA	December	Holding company	100%	100%
Hanwha AZDEL, Inc.(*1)	USA	December	Manufacture of automobile parts	100%	100%
HCC Holdings Co., Ltd.					
Hanwha Chemical (Ningbo) Co., Ltd.	China	December	Manufacture of compound	100%	100%
Hanwha International Corp.					
Garnet Solar Power Generation Station 1, LLC(*1)	USA	December	Manufacture of automobile parts	100%	100%
Hanwha Holdings(USA), Inc.(*1)	USA	December	Holding company	61.52%	80%
Hanwha International LLC(*1)	USA	December	Trade	100%	100%
Hanwha Machinery Americas, Inc.(*1)	USA	December	Sales of machine tools	100%	100%
Hanwha Parcel O LLC(*1)	USA	December	Real estate development	100%	100%
Hanwha Property USA LLC(*1)	USA	December	Real estate development and management	100%	100%
Hanwha PVPLUS LLC(*1)	USA	December	Asset securitization	100%	100%
Hanwha Resources (USA) Corporation(*1)	USA	December	Oil and gas exploration	80%	80%
HANWHA TECHM USA LLC(*1)	USA	December	Manufacture of automobile parts	-	100%
Hanwha Village Market, LLC(*1)	USA	December	Real estate development	100%	100%
Hanwha West Properties LLC(*1)	USA	December	Real estate development	100%	100%
HQC Rock River Solar Holdings LLC(*1)	USA	December	Solar photovoltaic power business	100%	100%
HQC Rock River Solar Power Generation Station LLC(*1)	USA	December	Solar photovoltaic power business	100%	100%
Universal Bearings LLC(*1)	USA	December	Manufacture of bearings	100%	100%
HAMC Holdings Corp.					
Hanwha Cimarron LLC	USA	December	Manufacture of Hydrogen tank	100%	100%
HANWHA SOLUTIONS USA HOLDINGS CORPORATION					
HSHC FF INV LLC	USA	December	Holding company	100%	100%
HSHC LIBRA INV LLC	USA	December	Holding company	100%	100%
HSHC NAM INV LLC	USA	December	Holding company	100%	100%
HSHC NOV INV LLC	USA	December	Holding company	100%	-
HSHC ZIP INV LLC	USA	December	Holding company	100%	-
HSHC AMP INV LLC	USA	December	Holding company	100%	-

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
Hanwha Solutions Insight Holdings Corporation					
HSIH NHH INV LLC	USA	December	Manufacture of Beverage	100%	-
Hanwha Q CELLS Co., Ltd.					
Avenir el Divisadero SPA	Chile	December	Solar photovoltaic power business	100%	100%
Cabrero Solar SPA	Chile	December	Solar photovoltaic power business	-	100%
Centauro Solar SPA	Chile	December	Solar photovoltaic power business	-	100%
CE Cell Engineering GmbH	Germany	December	Manufacture of automobile parts	100%	-
DES Energy PV1 GmbH	Germany	December	Solar photovoltaic power business	100%	-
DES Energy PV 2 GmbH & Co.KG	Germany	December	Solar photovoltaic power business	100%	-
DES Energy Kom GmbH	Germany	December	Solar photovoltaic power business	100%	-
Draco Solar SPA	Chile	December	Solar photovoltaic power business	-	100%
Hanwha Q CELLS (Nantong) Co., Ltd.	China	December	Manufacture and sales of solar power facilities	100%	100%
Hanwha Q CELLS (Qidong) Co., Ltd.	China	December	Manufacture and sales of solar power facilities	100%	100%
Hanwha Q CELLS Australia Pty Ltd.	Australia	December	Manufacture of solar power facilities	100%	100%
Hanwha Q CELLS Chile SPA	Chile	December	Construction and sale of solar power generation facilities	100%	100%
Hanwha Q CELLS France SAS	France	December	Manufacture of automobile parts	100%	100%
Hanwha Q CELLS GmbH	Germany	December	Manufacture of solar power facilities	100%	100%
Hanwha Q CELLS Hong Kong Limited	Hongkong	December	Investment and international procurement	100%	100%
Hanwha Q CELLS Investment Co., Ltd.	UK	December	Holding company	100%	100%
Hanwha Q CELLS Malaysia Sdn. Bhd.	Malaysia	December	Manufacture of solar products	100%	100%
Hanwha Q CELLS Peru S.A.C	Peru	December	Solar photovoltaic power business	-	100%
HANWHA Q CELLS SOLAR POWER SDN. BHD.	Malaysia	December	sale of solar power facilities	100%	100%
Hanwha Q CELLS Technology (Shanghai) Co., Ltd.	China	December	sale of solar power facilities	100%	100%
Hanwha Q CELLS Til Til Uno SPA	Chile	December	Manufacture and sales of solar power system	100%	100%
Hanwha Q CELLS Turkey	Turkey	December	Construction and sale of solar power generation facilities	100%	100%
Hanwha Solar Electric Power Engineering Co., Ltd.	China	December	Manufacture and sales of solar power facilities	100%	100%
Hanwha Solarone (beipiao) Co., Ltd.	China	December	Solar photovoltaic power business	100%	100%
Hanwha SolarOne (Laiyang) Co., Ltd.	China	December	Solar photovoltaic power business	100%	100%
Hanwha SolarOne (Rugao) Co., Ltd.	China	December	Solar photovoltaic power business	100%	100%
Hanwha SolarOne GmbH	Germany	December	sale of solar power facilities	100%	100%
Hanwha SolarOne Investment Holding Ltd.	UK	December	Holding company	100%	100%

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
Hanwha SolarOne Power Generation (Wuxi) Co., Ltd.	China	December	Solar photovoltaic power business	100%	100%
Huoqiu Hanrui New Energy Power Generation Co., Ltd.	China	December	Solar photovoltaic power business	100%	100%
LYNQTECH GmbH	Germany	December	Solar photovoltaic power business	64.97%	-
PV Vallenar Uno SPA	Chile	December	Holding company	100%	100%
Q CELLS DO BRASIL CONSULTORIA EMPRESARIAL LTDA	Brazil	December	Solar photovoltaic power business	100%	100%
SFH Solarpark GmbH	Germany	December	Solar photovoltaic power business	100%	100%
Hanwha Global Asset Corporation					
Adelite Storage Project LLC	USA	December	Solar development	100%	-
Ardesia Storage Project LLC	USA	December	Solar development	100%	-
Axia Solar Corp.	USA	December	Solar photovoltaic power business	100%	100%
BT Cunningham Storage, LLC	USA	December	Solar development	-	100%
Camellia Storage Project LLC	USA	December	Solar development	100%	-
Coneflower Storage Project LLC	USA	December	Solar development	100%	-
CONIGLIO SOLAR CLASS B, LLC	USA	December	Solar development	100%	100%
Coniglio Solar Holdings, LLC	USA	December	Solar development	100%	100%
Daffodil Storage Project LLC	USA	December	Solar development	100%	-
Deergrass Energy Storage LLC	USA	December	Solar development	100%	-
EnFin Corp.	USA	December	Solar photovoltaic power business	100%	100%
Garnet Solar Power Generation Station 1, LLC(*1)	USA	December	Manufacture of automobile parts	100%	100%
HQC Solar Holdings 1, LLC	USA	December	Solar development	100%	100%
Hanwha Holdings(USA), Inc.(*1)	USA	December	Holding company	61.52%	80%
Hanwha Advanced Materials Holdings USA Inc.	USA	December	Holding company	-	100%
Hanwha International LLC(*1)	USA	December	Trade	100%	100%
Hanwha Machinery Americas, Inc.(*1)	USA	December	Sales of machine tools	100%	100%
Hanwha Parcel O LLC(*1)	USA	December	Real estate development	100%	100%
Hanwha Property USA LLC(*1)	USA	December	Real estate development and management	100%	100%
Hanwha PVPLUS LLC(*1)	USA	December	Asset securitization	100%	100%
Hanwha Q CELLS Americas Holdings. Corp.	USA	December	Providing integrated solutions for solar energy-related projects	100%	100%
Hanwha Q CELLS EPC USA, LLC	USA	December	Solar energy generation projects	100%	100%
Hanwha Q CELLS Servicios Comerciales, S DE RL DE CV	Mexico	December	Solar energy generation projects	100%	100%

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
HANWHA Q CELLS US O&M LLC	USA	December	Solar development	100%	100%
Hanwha Q CELLS USA Corp.	USA	December	Providing integrated solutions for solar energy-related projects	100%	100%
Hanwha Q CELLS USA, INC.	USA	December	Solar development	100%	100%
Hanwha Resources (USA) Corporation(*1)	USA	December	Oil and gas exploration	80%	80%
HANWHA TECHM USA LLC(*1)	USA	December	Manufacture of automobile parts	-	100%
Hanwha Village Market, LLC(*1)	USA	December	Real estate development	100%	100%
Hanwha West Properties LLC(*1)	USA	December	Real estate development	100%	100%
HESAL System Solutions USA LLC	USA	December	Solar photovoltaic power business	100%	-
HES America Ltd.	USA	December	Solar photovoltaic power business	100%	100%
HQ MEX, LLC	Mexico	December	Solar energy generation projects	100%	100%
HQ MEXICO HOLDINGS S DE RL DE CV	Mexico	December	Providing integrated solutions for solar energy-related projects	100%	100%
HQ MEXICO Solar I S DE RL DE CV	Mexico	December	Solar energy generation projects	100%	100%
HQ MEXICO Solar II S DE RL DE CV	Mexico	December	Solar energy generation projects	100%	100%
HQC Maywood, LLC	USA	December	Solar photovoltaic power business	100%	100%
HQC Rock River Solar Holdings LLC(*1)	USA	December	Solar photovoltaic power business	100%	100%
HQC Rock River Solar Power Generation Station LLC(*1)	USA	December	Solar photovoltaic power business	100%	100%
HSEA HVES, LLC	USA	December	Solar energy generation projects	100%	100%
HSESM American Union LLC	USA	December	Solar energy generation projects	100%	100%
HSESM LeGrandUHS LLC	USA	December	Solar energy generation projects	100%	100%
HSESM PlanadaES LLC	USA	December	Solar energy generation projects	100%	100%
Johnson City Solar, LLC	USA	December	Solar development	100%	100%
Johnson City Storage, LLC	USA	December	Solar development	100%	100%
Kalaeloa Renewable Energy Park, LLC	USA	December	Solar energy generation projects	100%	100%
Kellam Solar Class B, LLC	USA	December	Solar development	100%	100%
Kellam Solar Holdings, LLC	USA	December	Solar development	100%	100%
Lavender Storage Project LLC	USA	December	Solar development	100%	-
Petunia Storage Project LLC	USA	December	Solar development	100%	-
Plateau Solar, LLC	USA	December	Solar development	100%	100%
Plateau Storage, LLC	USA	December	Solar development	100%	100%
Ponderosa Energy Storage LLC	USA	December	Solar development	100%	-

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
Project Bolt Holdco LLC	USA	December	Solar development	100%	-
Purvis Solar, LLC	USA	December	Solar development	100%	100%
Purvis Storage, LLC	USA	December	Solar development	100%	100%
Ripsey Solar Holdings, LLC	USA	December	Solar development	100%	100%
Ryegrass Energy Park LLC	USA	December	Solar development	100%	-
Shoshana Storage Project LLC	USA	December	Solar development	100%	-
Solar FlexRack LLC	USA	December	Manufacturing of materials and components related to solar energy generation	80%	-
Solar Monkey 1, LLC	USA	December	Solar energy generation projects	100%	100%
Solar Monkey 2, LLC	USA	December	Solar energy generation projects	100%	100%
South Cheyenne Solar, LLC	USA	December	Solar development	100%	100%
Staghorn Energy Storage LLC	USA	December	Solar development	100%	-
Taormina Storage Project LLC	USA	December	Solar development	100%	-
Universal Bearings LLC(*1)	USA	December	Manufacture of bearings	100%	100%
Hanwha Q CELLS America Inc.	USA	December	Manufacture of solar power facilities	100%	100%
Abbot Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
Alondra Foods Project, LLC	USA	December	Solar photovoltaic power business	100%	-
Bartlett JFK Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
Bartlett Newark Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
BNS Willow Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
Brainum Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
Carco Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
CDG BNS 136, LLC	USA	December	Solar photovoltaic power business	100%	-
CDG BNS Commerce, LLC	USA	December	Solar photovoltaic power business	100%	-
CDG Forest Mall, LLC	USA	December	Solar photovoltaic power business	100%	-
CDG Innovo Queens, LLC	USA	December	Solar photovoltaic power business	100%	-
CDG Liberty Distributors, LLC	USA	December	Solar photovoltaic power business	100%	-
CDG MRP 136, LLC	USA	December	Solar photovoltaic power business	100%	-
Fairview Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
Geli Australia Pty Ltd	Australia	December	Energy management system	-	100%
Growing Energy Labs, Inc.	USA	December	Energy management system	100%	100%
Hanwha Q CELLS America Project Holdings LLC	USA	December	Investment in solar projects	100%	100%

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
Hanwha Q CELLS Canada, Corp.	Canada	December	Manufacture of solar power facilities	100%	100%
HAU Cheshire Project LLC	USA	December	Solar photovoltaic power business	100%	100%
HAU Newington Project LLC	USA	December	Solar photovoltaic power business	100%	100%
HQCA Energy Solutions LLC	USA	December	Solar photovoltaic power business	100%	100%
HQCA Grid Equity LLC	USA	December	Solar photovoltaic power business	100%	100%
Linden Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
Maurice Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
QCELLS ENABLE LLC	USA	December	Solar photovoltaic power business	100%	-
VGES Project LLC	USA	December	Solar photovoltaic power business	100%	100%
WPL10 Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
WPL4 Solar, LLC	USA	December	Solar photovoltaic power business	100%	-
5 CUT ROAD SOLAR PROJECT LLC	USA	December	Solar photovoltaic power business	100%	-
1050 DAY HILL RD PROJECT, LLC	USA	December	Solar photovoltaic power business	100%	-
HANWHA SAVINGS BANK CO, LTD.	Republic of Korea	December	Credit union	100%	100%
Goheung Q Power Solarfarm 1 Co., Ltd.	Republic of Korea	December	Solar energy generation projects	100%	100%
Youngam Q Power Solarfarm 1 Co., Ltd.	Republic of Korea	December	Electrical materials	100%	100%
Young Am Techno Solar Corporation	Republic of Korea	December	Solar energy generation projects	-	100%
Young Am Hae-oh-rm Solar Corporation	Republic of Korea	December	Solar energy generation projects	-	100%
Hi-pass Solar Corporation	Republic of Korea	December	Solar energy generation projects	100%	100%
Sunrise Solar	Republic of Korea	December	Solar energy generation projects	-	100%
Hae Sarang Solar Corporation	Republic of Korea	December	Solar energy generation projects	-	100%
Hanwha Q CELLS Turkey	-	-	-	-	-
Aslan Gunes Enerjisi A.S.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Hiprom Enerji Yatirimlari A.S.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Sema Enerji Uretim Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Alkin Enerji Uretim Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Kartal Enerji Uretim Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Mutlak Enerji Uretim Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Elcin Enerji Uretim Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Fnt Gida Turizm Ic Ve Dis Ticaret Sanayi Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Meva Muhendislik Bilisim Enerji Insaat Iletisim Turizm San.Ve Dis Tic. Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
Serimer Optik Medikal Kirtasiye Temizlik Insaat Ithalat Ihra cat Sanayi Tic. Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Marel Bilisim Muhendislik Enerji Insaat Iletisim Turizm Gida San. Ve Dis Tic. Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Fior Gunes Enerjisi Anonim Sirketi(*2)	Turkey	December	Solar photovoltaic power business	-	-
Toprakkale Altyapi ve Malzeme Hizmetleri A.S.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Ulu Gunes Enerjisi Anonim Sirketi(*2)	Turkey	December	Solar photovoltaic power business	-	-
Moravia Enerji Sanayi ve Ticaret Ltd. Sti.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Uno Enerji A.S.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Aceka 2 Gunes Enerjisi A.S.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Aceka 3 Gunes Enerjisi A.S.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Bilgidar 2 Gunes Enerjisi Limited Sirketi(*2)	Turkey	December	Solar photovoltaic power business	-	-
Buselik 2 Gunes Enerjisi Limited Sirketi(*2)	Turkey	December	Solar photovoltaic power business	-	-
Buselik 3 Gunes Enerjisi Limited Sirketi(*2)	Turkey	December	Solar photovoltaic power business	-	-
Dimetoka 2 Gunes Enerjisi Limited Sirketi(*2)	Turkey	December	Solar photovoltaic power business	-	-
Dimetoka 3 Gunes Enerjisi Limited Sirketi(*2)	Turkey	December	Solar photovoltaic power business	-	-
Isfahan 3 Gunes Enerjisi Limited Sirketi(*2)	Turkey	December	Solar photovoltaic power business	-	-
Onan 2 Gunes Enerji Uretim A.S.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Onan 3 Gunes Enerji Uretim A.S.(*2)	Turkey	December	Solar photovoltaic power business	-	-
Q ENERGY Solutions SE					
Q Energy Europe GmbH	Germany	December	Holding company	100%	-
Aberdeen Corporate Services S.L.	Spain	December	Solar photovoltaic power business	100%	-
Albany Directorship, S.L.	Spain	December	Solar photovoltaic power business	100%	-
ALDGATE EAST INVESTMENTS, SL	Spain	December	Solar photovoltaic power business	70%	70%
ALFAZ DIRECTORSHIP, SL	Spain	December	Solar photovoltaic power business	70%	70%
ALQUIZAR INVESTMENTS, SL	Spain	December	Solar photovoltaic power business	70%	70%
Amberes Corporate Services, S.L.	Spain	December	Solar photovoltaic power business	100%	-
ANNAPURNA SERVICIOS EMPRESARIALES, SL	Spain	December	Solar photovoltaic power business	70%	70%
Appleton Corporate Services, S.L.	Spain	December	Solar photovoltaic power business	100%	-
ARBECA SOLAR SLU	Spain	December	Solar photovoltaic power business	100%	100%
AZOR POWER SL	Spain	December	Solar photovoltaic power business	100%	100%
BENIF INVESTMENTS, SL	Spain	December	Solar photovoltaic power business	70%	70%

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
BOLERO ENERGY, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
BURETE DIRECTORSHIP, SL	Spain	December	Solar photovoltaic power business	70%	70%
CABUYA CORPORATE SERVICES, SL	Spain	December	Solar photovoltaic power business	70%	70%
CAMPANA ENERGY, S.L.	Spain	December	Solar photovoltaic power business	-	100%
CANARY WHARF INVESTMENTS, SL	Spain	December	Solar photovoltaic power business	70%	70%
CANNING TOWN INVESTMENTS, SL	Spain	December	Solar photovoltaic power business	70%	70%
CAPRICORNIO ENERGY, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
CASTELLDANS SOLAR SLU	Spain	December	Solar photovoltaic power business	100%	100%
CASTELLNOU SOLAR SLU	Spain	December	Solar photovoltaic power business	100%	100%
CLAVE DE SOL ENERGY, S.L.U	Spain	December	Solar photovoltaic power business	100%	100%
COMBA DIRECTORSHIP, SL	Spain	December	Solar photovoltaic power business	70%	70%
CONVENT GARDEN INVESTMENTS, SL	Spain	December	Solar photovoltaic power business	70%	70%
DICKSON SERVICIOS EMPRESARIALES, SL	Spain	December	Solar photovoltaic power business	70%	70%
DIONISIO SUN, S.L.	Spain	December	Solar photovoltaic power business	-	100%
Don Rodrigo Hive SL	Spain	December	Solar photovoltaic power business	100%	100%
DONALLY CORPORATE SERVICES, SL	Spain	December	Solar photovoltaic power business	70%	70%
EMPER INVESTMENTS, SL	Spain	December	Solar photovoltaic power business	70%	70%
ENDINO SERVICIOS EMPRESARIALES, SL	Spain	December	Solar photovoltaic power business	70%	70%
ENVIRIA IPP DevCO1 GmbH & Co. KG	Germany	December	Solar photovoltaic power business	100%	100%
Enviria IPP DevCo 2 GmbH & Co. KG	Germany	December	Solar photovoltaic power business	100%	-
Bauernenergie Solarpark Illmersdorf UG Co.KG	Germany	December	Solar photovoltaic power business	100%	-
Espardell Directorship, SL	Spain	December	Solar photovoltaic power business	70%	70%
FAIRLEAD CORPORATE SERVICES, SL	Spain	December	Solar photovoltaic power business	70%	70%
FFNEV DESARROLLORS ESPANA I, SL	Spain	December	Solar photovoltaic power business	70%	70%
FFNEV DESARROLLORS ESPANA II, SL	Spain	December	Solar photovoltaic power business	70%	70%
GALAXY ENERGY, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
GALGO POWER, S.L.	Spain	December	Solar photovoltaic power business	100%	100%

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
GARDAYA INVESTMENTS, SL	Spain	December	Solar photovoltaic power business	70%	70%
GAVILAN POWER, S.L.U	Spain	December	Solar photovoltaic power business	100%	100%
GERIFALTE POWER, S.L.U	Spain	December	Solar photovoltaic power business	100%	100%
GREEN RIC ENERGY, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
Guadajoz Hive SL	Spain	December	Solar photovoltaic power business	100%	100%
HARRIER POWER, S.L.U	Spain	December	Solar photovoltaic power business	100%	100%
HESTIA SUN, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
HQC PORTUGAL HOLDINGS, LDA	Portugal	December	Solar photovoltaic power business	100%	100%
INCOGNITWORLD, LDA.	Portugal	December	Solar photovoltaic power business	100%	100%
INCOGNITWORLD 2, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
INCOGNITWORLD 3, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
INCOGNITWORLD 4, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
INCOGNITWORLD 5, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
IRON POWER ENERGY, S.L.U	Spain	December	Solar photovoltaic power business	100%	100%
ISIS SUN POWER S.L.	Spain	December	Solar photovoltaic power business	100%	100%
KADOK CORPORATE SERVICES, SL	Spain	December	Solar photovoltaic power business	70%	70%
KAMPALA CORPORATE SERVICES, SL	Spain	December	Solar photovoltaic power business	70%	70%
KMPT Solarpark Verwaltung GmbH	Germany	December	Manufacture of automobile parts	100%	100%
Las Coronadas Hive SL	Spain	December	Solar photovoltaic power business	100%	100%
LASTRAFI POWER, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
LEBREL POWER, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
LINE ENERGY, S.L.U	Spain	December	Solar photovoltaic power business	100%	100%
Malhada Green S.A	Portugal	December	Solar photovoltaic power business	100%	100%
MALHADA GREEN 2, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
MONTALBAN DIRECTORSHIP, SL	Spain	December	Solar photovoltaic power business	70%	70%
NEPAL SERVICIOS EMPRESARIALES, SL	Spain	December	Solar photovoltaic power business	70%	70%
NUN SUN POWER S.L.	Spain	December	Solar photovoltaic power business	100%	100%
NORWOOD CORPORATE SERVICES, S.L.	Spain	December	Solar photovoltaic power business	70%	70%
OTERO DIRECTORSHIP, SL	Spain	December	Solar photovoltaic power business	70%	70%
PALOMA POWER, S.L.	Spain	December	Solar photovoltaic power business	100%	100%

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
PODENCO POWER, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
PV Jagodne Sp. z.o.o.	Poland	December	Solar photovoltaic power business	100%	100%
Q CELLS Germany Holdings GmbH	Germany	December	Solar photovoltaic power business	100%	100%
Q ENERGY Europe NL Holdings B.V.	Dutch	December	Holding company	100%	-
QEE Solarpark Garwitz GmbH & Co. KG	Germany	December	Solar photovoltaic power business	100%	-
QEE Solarpark Matzlow GmbH & Co. KG	Germany	December	Solar photovoltaic power business	100%	-
QSUN PORTUGAL 2, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
QSUN PORTUGAL 3, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
QSUN PORTUGAL 4, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
QSUN PORTUGAL 5, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
QSUN PORTUGAL 6, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
QSUN PORTUGAL 7, UNIPessoal LDA	Portugal	December	Solar photovoltaic power business	100%	100%
QSUN 25 Sp. z o.o	Poland	December	Manufacture of automobile parts	100%	100%
REAL ENERGY POWER, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
REUS SOLAR SLU	Spain	December	Solar photovoltaic power business	100%	100%
RIMA ENERGY, S.L.U	Spain	December	Solar photovoltaic power business	100%	100%
Q CELLS SPAIN HOLDINGS, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
Q ENERGY (EUROPE) UK HOLDINGS LIMITED	UK	December	Holding company	100%	-
SILVER RIC ENERGY, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
SPRING POWER, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
Tomorrow Energy Ontwikkelung 31 B.V.	Dutch	December	Solar photovoltaic power business	100%	-
VALS ENERGY POWER, S.L.	Spain	December	Solar photovoltaic power business	100%	100%
VECIANA SOLAR SLU	Spain	December	Solar photovoltaic power business	100%	100%
Whinfield High Grange Solar Farm Limited	UK	December	Manufacture of automobile parts	100%	-
WSE Bradley Road Ltd	UK	December	Manufacture of automobile parts	100%	100%
Zonnepark de Weijer B.V.	Dutch	December	Manufacture of automobile parts	100%	-
Q Energy Mediterranee	France	December	Renewable energy business	100%	100%
CEPE BEL AIR SUD	France	December	Renewable energy business	100%	100%

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
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1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
CEPE BOIS DE L'AIGUILLE	France	December	Renewable energy business	100%	100%
CEPE Champs Carres S.A.R.L	France	December	Renewable energy business	100%	100%
CEPE CHAMPS PAILLE	France	December	Renewable energy business	100%	100%
CEPE CHARMONSEL	France	December	Renewable energy business	100%	100%
CEPE CHAUMES DES COMMUNES	France	December	Renewable energy business	100%	100%
CEPE Chesnots	France	December	Renewable energy business	100%	100%
CEPE COTE DES VAUZELLES	France	December	Renewable energy business	100%	100%
CEPE COTE RENARD	France	December	Renewable energy business	100%	100%
CEPE CROIX DE BERTHAULT	France	December	Renewable energy business	-	100%
CEPE CROIX DE L'ERABLE	France	December	Renewable energy business	-	100%
CEPE Croix des Trois	France	December	Renewable energy business	100%	100%
CEPE Croix du Picq	France	December	Renewable energy business	100%	100%
CEPE DE BRAQUETTE	France	December	Renewable energy business	100%	100%
CEPE DE CHATILLONNAIS	France	December	Renewable energy business	100%	100%
CEPE DE L'ESCUR	France	December	Renewable energy business	100%	100%
CEPE de Mirebellois	France	December	Renewable energy business	100%	100%
CEPE des Grunes S.A.R.L	France	December	Renewable energy business	100%	100%
CEPE du Souleilla S.A.R.L	France	December	Renewable energy business	100%	100%
CEPE Fleur du Nivernais S.A R.L	France	December	Renewable energy business	100%	100%
CEPE FORET DE MARSANNE	France	December	Renewable energy business	100%	100%
CEPE FOSSE A LOUP	France	December	Renewable energy business	100%	100%
CEPE FRETTEs	France	December	Renewable energy business	100%	100%
CEPE GRAND CERISIER	France	December	Renewable energy business	100%	100%
CEPE GRANDS COMMUNAUX	France	December	Renewable energy business	100%	100%
CEPE HAUT PERRON	France	December	Renewable energy business	100%	100%
CEPE LA TIRROYE	France	December	Renewable energy business	100%	100%
CEPE LE LANGROIS	France	December	Renewable energy business	100%	100%
CEPE LES LORETTES	France	December	Renewable energy business	100%	100%
CEPE LES VACANTS	France	December	Renewable energy business	100%	100%
CEPE MERELLEs	France	December	Renewable energy business	100%	100%

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1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
CEPE MONT DE CONDY	France	December	Renewable energy business	100%	100%
CEPE NOUVELLOIS	France	December	Renewable energy business	100%	100%
CEPE NOYER BERGER	France	December	Renewable energy business	100%	100%
CEPE ORAIN	France	December	Renewable energy business	100%	100%
CEPE Plaine de Pericaud	France	December	Renewable energy business	100%	100%
CEPE Plo du Laurier	France	December	Renewable energy business	100%	100%
CEPE RENOUVELLEMENT HAUT CABARDES	France	December	Renewable energy business	100%	100%
CEPE Sapinois	France	December	Renewable energy business	100%	-
CEPE Sud vesoul SARL	France	December	Renewable energy business	100%	100%
CEPE TERRIERS DE LA POINTE	France	December	Renewable energy business	100%	100%
CEPE TROIS PROVINCES	France	December	Renewable energy business	100%	100%
CEPE VAL D'YONNE EN FORTERRE	France	December	Renewable energy business	100%	100%
CEPE Val de Vingeanne EST	France	December	Renewable energy business	100%	100%
CEPE VENTS DE LOIRE	France	December	Renewable energy business	100%	100%
CEPES JUGE	France	December	Renewable energy business	100%	100%
Chaume Solar	France	December	Renewable energy business	100%	100%
CPES AUCHES	France	December	Renewable energy business	100%	100%
CPES BASSE MONTAGNE	France	December	Renewable energy business	100%	100%
CPES BOIS SOLEIL	France	December	Renewable energy business	100%	100%
CPES BORY	France	December	Renewable energy business	100%	100%
CPES BRECHE	France	December	Renewable energy business	100%	100%
CPES CAHUZAC SUR ADOUR	France	December	Renewable energy business	100%	100%
CPES CALENTA	France	December	Renewable energy business	100%	100%
CPES CAUSSES PERIGORD	France	December	Renewable energy business	100%	100%
CPES CHAMPS DE LA COUR	France	December	Renewable energy business	100%	100%
CPES CHAPUS	France	December	Renewable energy business	100%	100%
CPES COURSIADA	France	December	Renewable energy business	100%	100%
CPES COUSSEAU	France	December	Renewable energy business	100%	100%
CPES CRASSIER LAUDUN	France	December	Renewable energy business	100%	100%
CPES CROUEE	France	December	Renewable energy business	100%	100%

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1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
CPES FONT DE LA LEVE	France	December	Renewable energy business	100%	100%
CPES FONTANILLE	France	December	Renewable energy business	100%	100%
CPES GANDOLLE	France	December	Renewable energy business	100%	100%
CPES GARDIOLE	France	December	Renewable energy business	100%	100%
CPES GENEBRE	France	December	Renewable energy business	100%	100%
CPES GRAND OUSTATOU	France	December	Renewable energy business	100%	100%
CPES GRIFFOUL	France	December	Renewable energy business	100%	100%
CPES HOMME DE PIERRE	France	December	Renewable energy business	100%	100%
CPES Juncarot	France	December	Renewable energy business	100%	100%
CPES LA BREDE	France	December	Renewable energy business	100%	100%
CPES la Gineste	France	December	Renewable energy business	100%	100%
CPES LAC DE CLOYES	France	December	Renewable energy business	100%	100%
CPES LAC DE LONGCHAMPS	France	December	Renewable energy business	100%	100%
CPES LAC DE ROUAN	France	December	Renewable energy business	100%	100%
CPES LAROQUE	France	December	Renewable energy business	100%	100%
CPES LASCOURS	France	December	Renewable energy business	100%	100%
CPES LAURAGAIS	France	December	Renewable energy business	100%	100%
CPES LE PLAN	France	December	Renewable energy business	100%	100%
CPES LES CROUZOURETS	France	December	Renewable energy business	100%	100%
CPES LIBAROS	France	December	Renewable energy business	100%	100%
CPES LUE	France	December	Renewable energy business	100%	100%
CPES MAGNILS	France	December	Renewable energy business	100%	-
CPES MAS D'EN RAMIS	France	December	Renewable energy business	60%	100%
CPES MILHAT	France	December	Renewable energy business	100%	100%
CPES MONDONNE	France	December	Renewable energy business	100%	100%
CPES MORAS	France	December	Renewable energy business	100%	100%
CPES MORILLON	France	December	Renewable energy business	100%	100%
CPES MURES BASSES	France	December	Renewable energy business	100%	100%
CPES OMBRIPARK	France	December	Renewable energy business	100%	100%
CPES PASCARATE	France	December	Renewable energy business	100%	100%

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1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
CPES PAYS THIBERIEN	France	December	Renewable energy business	100%	100%
CPES PEROLERA	France	December	Renewable energy business	100%	100%
CPES PERRIERE	France	December	Renewable energy business	100%	100%
CPES PEYROLE LAC	France	December	Renewable energy business	100%	100%
CPES PLACE ROYALE	France	December	Renewable energy business	100%	100%
CPES PLAN DE BANON	France	December	Renewable energy business	100%	100%
CPES RENARDEYRE	France	December	Renewable energy business	100%	100%
CPES ROMEGUERAR	France	December	Renewable energy business	100%	100%
CPES RIVAILLES	France	December	Renewable energy business	100%	-
CPES SABLE ROUGE	France	December	Renewable energy business	100%	100%
CPES SAINT ANGE	France	December	Renewable energy business	100%	100%
CPES SEBENS	France	December	Renewable energy business	100%	100%
CPES SOLEIL ROUGE	France	December	Renewable energy business	-	100%
CPES SUR L'EPINE	France	December	Renewable energy business	100%	100%
CPES TALLER	France	December	Renewable energy business	100%	100%
CPES THUILIERES	France	December	Renewable energy business	100%	100%
CPES TREMEGE	France	December	Renewable energy business	100%	100%
CPES VILLAGE SOLAIRE	France	December	Renewable energy business	100%	100%
Cret meuron suisse	France	December	Renewable energy business	100%	100%
CSE AMPERE	France	December	Renewable energy business	100%	100%
CSE ARMAND	France	December	Renewable energy business	100%	100%
CSE COULOMB	France	December	Renewable energy business	100%	100%
CSE GAULARD	France	December	Renewable energy business	100%	100%
CSE JOULE	France	December	Renewable energy business	100%	100%
CSE LECLANCHE	France	December	Renewable energy business	100%	100%
CSE PLANTE	France	December	Renewable energy business	100%	100%
CSE TARASCON	France	December	Renewable energy business	100%	100%

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1. General, Continued

(1) Details of subsidiaries, continued

Company	Locations	Closing month	Main business	Percentage of ownership	
				December 31, 2022	December 31, 2021
CSE VOLTA	France	December	Renewable energy business	100%	100%
LASCOVENT	France	December	Renewable energy business	100%	100%
Les Eoliennes Entre Loire et Rhone	France	December	Renewable energy business	80%	80%
Q Energy France SAS	France	December	Renewable energy business	100%	100%
CPES LIGNE SOLAIRE HAUTE LANDE	France	December	Renewable energy business	100%	100%
CPES MARDALOU	France	December	Renewable energy business	100%	100%
NAUTILUS ENERGIES	France	December	Renewable energy business	100%	100%
CEPE BOIS DE LA LONDE	France	December	Renewable energy business	100%	100%
CPES LANDE DE MUSSET	France	December	Renewable energy business	100%	100%
Larrey des Vignes	France	December	Renewable energy business	100%	100%
SPV LOCANERGY TWO	France	December	Renewable energy business	100%	100%
C.P.E.S. VIGORDANE FLOTTANT	France	December	Renewable energy business	100%	-
CPES MALAGA	France	December	Renewable energy business	100%	-
CPES EMOROTS	France	December	Renewable energy business	100%	-
CPES GARENNES	France	December	Renewable energy business	100%	-
CEPE MELUSINE	France	December	Renewable energy business	100%	-
CPES LA GRANDE GORGE	France	December	Renewable energy business	100%	-
CPES MOUCHIT	France	December	Renewable energy business	100%	-
CPES RADAR	France	December	Renewable energy business	100%	-
CPES SIGNORET	France	December	Renewable energy business	100%	-
CPES LES PLAINES de Haute Montagne	France	December	Renewable energy business	100%	-
CPES MAS THIBERT	France	December	Renewable energy business	100%	-
CPES CHENET	France	December	Renewable energy business	100%	-
CPES Volieres Charente	France	December	Renewable energy business	100%	-
CPES Volieres Deux Sevres	France	December	Renewable energy business	100%	-
CPES Montans	France	December	Renewable energy business	100%	-
CPES Saint-Lys	France	December	Renewable energy business	100%	-
C.P.E.S. Volieres Sarraguzan	France	December	Renewable energy business	100%	-

(*1) Two or more intermediate parent companies hold shares, and the shareholding ratios stated are the effective shareholding ratios of all control combined

(*2) The Group does not own any shares. The Group was judged to be controlling by considering the power over the investee, its exposure to variable returns, and its ability to use power to affect its returns.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(2) Changes of scope of consolidation

Subsidiaries newly included in the consolidation and excluded from the consolidation for year ended December 31, 2022

(i) Subsidiaries newly included in the consolidation for year ended December 31, 2022, are as follows:

Company name	Reason
Hanwha Solutions Corporations	
HCC Holdings Co., Ltd.	
HAM Holdings Inc.	
Anseong Techno Logistics Co., Ltd.	
Hanwha NxMD Corporation	Newly established
Hanwha Advanced Materials Corporation	
Hanwha Cimarron Europe GmbH	
Hanwha Solutions Insight Holdings Corporation	
Hadong Haetpinnaum Taeyanggwangbalkeon Co., Ltd.	
HHR Development B GK	Newly acquired
Gobokjumin Taeyanggwangbaljeon Co., Ltd.	
HAM Holdings Corporation	
Hanwha Advanced Materials Georgia Inc.	Newly established
Hanwha NxMD Corporation	
Hanwha NxMD (Thailand) Co., Ltd.	Newly acquired
HHR Development B GK	
H-SUMMIT	Newly acquired
Hanwha Q CELLS Co., Ltd.	
DES Energy Kom GmbH	
DES Energy PV1 GmbH	
Chequen Solar SPA	
Caldera Solar Spa	Newly acquired
DES Energy PV 2 GmbH & Co.KG	
CE Cell Engineering GmbH	
LYNQTECH GmbH	
Hanwha Global Asset Corporation	
HESAL System Solutions USA LLC	
Adelite Storage Project LLC	
Ardesia Storage Project LLC	
Camellia Storage Project LLC	
Coneflower Storage Project LLC	
Deergrass Energy Storage LLC	Newly established
Lavender Storage Project LLC	
Petunia Storage Project LLC	
Ponderosa Energy Storage LLC	
Project Bolt Holdco LLC	
Ryegrass Energy Park LLC	

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(2) Changes of scope of consolidation, continued

(i) Subsidiaries newly included in the consolidation for year ended December 31, 2022, are as follows, continued

Company name	Reason
Hanwha Global Asset Corporation	
Shoshana Storage Project LLC	
Daffodil Storage Project LLC	
Taormina Storage Project LLC	
Staghorn Energy Storage LLC	Newly established
Alondra Foods Project, LLC	
5 CUT ROAD SOLAR PROJECT LLC	
1050 DAY HILL RD PROJECT, LLC	
Abbot Solar, LLC	
Bartlett JFK Solar, LLC	
Bartlett Newark Solar, LLC	
BNS Willow Solar, LLC	
Brainum Solar, LLC	
Carco Solar, LLC	
CDG BNS 136, LLC	
CDG BNS Commerce, LLC	
CDG Forest Mall, LLC	
CDG Innovo Queens, LLC	Newly acquired
CDG Liberty Distributors, LLC	
CDG MRP 136, LLC	
Fairview Solar, LLC	
Linden Solar, LLC	
Maurice Solar, LLC	
QCELLS ENABLE LLC	
WPL10 Solar, LLC	
WPL4 Solar, LLC	
Solar FlexRack LLC	
HANWHA SOLUTIONS USA HOLDINGS CORPORATION	
HSHC NOV INV LLC	
HSHC ZIP INV LLC	Newly established
HSHC AMP INV LLC	
Q ENERGY Solutions SE	
CEPE Sapinois	
CPES MAGNILS	
CPES RIVAILLES	
C.P.E.S. VIGORDANE FLOTTANT	Newly established
CPES MALAGA	
Q Energy Europe GmbH	
Q ENERGY (EUROPE) UK HOLDINGS LIMITED	

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(2) Changes of scope of consolidation, continued

(i) Subsidiaries newly included in the consolidation for year ended December 31, 2022, are as follows, continued

Company name	Reason
Q ENERGY Solutions SE	
Q ENERGY Europe NL Holdings B.V.	
QEE Solarpark Garwitz GmbH & Co. KG	
QEE Solarpark Matzlow GmbH & Co. KG	
CPES EMOROTS	
CPES GARENNES	
CEPE MELUSINE	
CPES LA GRANDE GORGE	
CPES MOUCHIT	
CPES RADAR	
CPES SIGNORET	Newly established
CPES LES PLAINES de Haute Montagne	
CPES MAS THIBERT	
CPES CHENET	
CPES Volieres Charente	
CPES Volieres Deux Sevres	
CPES Montans	
CPES Saint-Lys	
C.P.E.S. Volieres Sarraguzan	
<hr/>	
Aberdeen Corporate Services S.L.	
Albany Directorship, S.L.	
Amberes Corporate Services, S.L.	
Appleton Corporate Services, S.L.	
Bauernenergie Solarpark Illmersdorf UG Co.KG	Newly acquired
Enviria IPP DevCo 2 GmbH & Co. KG	
Tomorrow Energy Ontwikkelung 31 B.V.	
Whinfield High Grange Solar Farm Limited	
Zonnepark de Weijer B.V.	
Hanwha Solutions Insight Holdings Corporation	
HSIH NHH INV LLC	Newly established

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

1. General, Continued

(2) Changes of scope of consolidation, continued

(ii) Subsidiaries newly excluded from the consolidation for year ended December 31, 2022 are as follows:

Company name	Reason
HANWHA Global Asset Corporation	
Hanwha Advanced Materials Holdings USA Inc.	
Sunrise Solar	
Hae Sarang Solar Corporation	Merger Elimination
Young Am Techno Solar Corporation	
Young Am Hae-oh-rm Solar Corporation	
Geli Australia Pty Ltd	
BT Cunningham Storage, LLC	Share sales
Q ENERGY Solutions SE	
CPES SOLEIL ROUGE	
CEPE CROIX DE BERTHAULT	
CEPE CROIX DE L'ERABLE	Share sales
CAMPANA ENERGY, S.L.	
DIONISIO SUN, S.L.	
Hanwha Q CELLS Co., Ltd.	
Cabrero Solar SPA	
Centauro Solar SPA	
Draco Solar SPA	Share sales
Chequen Solar SpA	
Caldera Solar Spa	
Hanwha Q CELLS Peru S.A.C	
Hanwha International Corp., HANWHA Global Asset Corporation	
HANWHA TECHM USA LLC	Liquidation

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES

Notes to the Consolidated Financial Statements

For the years ended December, 2022 and 2021

1. General, Continued

(3) Financial information of major subsidiaries

The summary financial information of the major subsidiaries as of December 31, 2022 are as follows:

In thousand won

		<u>Assets</u>	<u>Liabilities</u>	<u>Equity</u>	<u>Revenue</u>	<u>Net income (loss)</u>
Gyeonggi Yongin Techno Valley Co., Ltd	₩	16,472,501	8,779,607	7,692,894	-	(650,612)
Gimhae Techno Valley Co.,Ltd		13,258,064	164	13,257,900	-	317,786
SEOSAN TECHNO VALLEY		12,749,189	413,406	12,335,783	-	131,125
West Ochang Techno Valley Co., Ltd.		91,812,097	96,740,723	(4,928,626)	-	(2,014,423)
Anseong Techno Valley		88,034,332	92,162,278	(4,127,946)	-	(1,192,434)
Gyeonggi Hwasung Bio Valley Co.,Ltd.		7,178,246	4,842,424	2,335,822	-	(186,243)
H-Techno Vallet Co., Ltd		6,193,391	3,065,894	3,127,497	-	(1,111,890)
The Second Yong In Techno Valley Co, Ltd		5,377,013	1,217,839	4,159,174	-	(41,608)
Hanwha Galleria Timeworld Co., Ltd.		332,810,308	143,780,078	189,030,230	137,105,252	6,580,149
Hanwha City Developemet Co.,Ltd		88,613,349	1,092,971	87,520,378	-	(2,007,231)
Hanwha B&B Co Ltd		6,080,803	3,254,858	2,825,945	9,395,560	(810,620)
HANWHA SAVINGS BANK CO, LTD.		1,624,027,222	1,440,862,347	183,164,875	90,455,526	17,116,529
Gobokjumin Taeyanggwangbaljeon Co., Ltd.		1,194,073	199,806	994,267	-	(5,733)
HCC Holdings Co., Ltd.		472,265,234	5,360,508	466,904,726	-	53,757,809
HAM Holdings Inc.		424,219,068	11,233,531	412,985,537	-	(6,365,759)
NXEF CO.,LTD		12,985,505	3,888,234	9,097,271	330,337	(3,802,572)
WOS Inc.		122,059,078	2,117,938	119,941,140	345,092	(4,711,252)
Anseong Techno Logistics Co., Ltd.		17,817,351	902,340	16,915,011	-	(901,119)
Hadong Haetpinnaum Taeyanggwangbalkeon Co., Ltd.		303,365	66,374	236,991	-	(63,009)
Hi-pass Solar Corporation		8,737,873	4,451,079	4,286,794	2,321,608	648,985
Hanwha Global Asset Corporation		903,779,798	16,112,966	887,666,832	-	(3,555,362)
Hanwha NxMD Corporation (*1)		129,886,216	22,064,937	107,821,279	20,404,682	(6,901,790)
Hanwha Advanced Materials Corporation		599,406,368	157,343,110	442,063,258	48,361,352	(5,752,784)
Hanwha Compound corporation		86,710,152	30,548,730	56,161,422	204,458,338	2,672,037
Hanwha Chemical Overseas Holdings, Co., Ltd.		99,995,975	8,569,692	91,426,283	-	36,636,570
Haeorum PV Plant Corporation		17,435,030	13,026,715	4,408,315	2,682,138	882,776
Hanwha Chemical Trading (Shanghai) Co., Ltd.		38,909,081	21,546,476	17,362,605	150,094,037	4,003,214
Hanwha Advanced Materials Beijing Co., Ltd.		31,188,362	5,410,950	25,777,412	13,802,726	(6,230,861)
Hanwha Advanced Materials Europe, s.r.o.		163,482,045	50,187,263	113,294,782	98,393,662	3,739,195
Hanwha Advanced Materials Mexico S. De R.L. De C.V.		46,008,750	42,860,425	3,148,325	50,859,401	1,585,253
Hanwha America Development Inc. (*2)		405,234,385	245,489,970	159,744,415	473,743,429	14,900,655
Hanwha Chemical (Ningbo) Co., Ltd.		399,592,600	32,584,279	367,008,321	502,116,320	34,615,848
Hanwha Chemical (Thailand) Co., Ltd.		42,322,361	3,677,055	38,645,306	39,279,740	2,553,239
Hanwha Chemical Malaysia Sdn. Bhd.		37,798,186	31,663,603	6,134,583	275,167,035	8,078,920
Hanwha Cimarron LLC		115,501,856	86,011,505	29,490,351	8,865,026	(17,918,273)
Hanwha Holdings(USA), Inc.(*3)		330,472,103	147,553,896	182,918,207	371,682,917	(10,648,295)
Hanwha International Corp.		63,711,413	532,350	63,179,063	-	32,818
Hanwha Q CELLS Americas Holdings. Corp.(*4)		3,097,049,606	2,265,520,737	831,528,869	2,308,559,223	107,043,297
Hanwha Q CELLS Australia Pty Ltd.		48,229,744	36,701,637	11,528,107	111,601,454	2,898,444
Hanwha Q CELLS Chile SpA		48,544,971	46,966,799	1,578,172	34,309,189	889,693
Hanwha Q CELLS Co., Ltd. (*5)		2,131,583,006	526,448,739	1,605,134,267	2,794,851,378	47,678,315
Hanwha Q CELLS GmbH		806,948,834	599,311,646	207,637,188	1,269,156,739	19,739,635
Hanwha Q CELLS Investment Co., Ltd.		753,639,136	100,002,881	653,636,255	-	1,348,255
Hanwha Q CELLS Malaysia Sdn. Bhd.		866,648,902	571,723,607	294,925,295	950,528,909	50,973,794
HANWHA SOLUTIONS USA HOLDINGS CORPORATION (*6)		179,807,612	127,590	179,680,022	-	(24,179,397)
Q Energy Europe GmbH (*7)		441,142,173	297,258,272	143,883,901	35,104,937	(3,628,492)
Q Energy Mediterranee (*8)		219,487,938	147,096,080	72,391,858	88,642,151	(10,431,044)
Q Energy Solutions SE		1,429,075,230	248,869,308	1,180,205,922	11,890,874	(3,729,779)

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES

Notes to the Consolidated Financial Statements

For the years ended December, 2022 and 2021

1. General, Continued

(3) Financial information of major subsidiaries, continued

- (*1) Consolidated financial information of NXMD Co., Ltd., an intermediate parent entity, and 1 subsidiaries.
- (*2) Consolidated financial information of Hanwha America Development Inc., an intermediate parent entity, and 4 subsidiaries.
- (*3) Consolidated financial information of Hanwha Holdings(USA), Inc., an intermediate parent entity, and 9 subsidiaries.
- (*4) Consolidated financial information of Hanwha Q CELLS Americas Holdings. Corp., an intermediate parent entity, and 82 subsidiaries.
- (*5) Consolidated financial information of Hanwha Q CELLS Co., Ltd., an intermediate parent entity, and 12 subsidiaries.
- (*6) Consolidated financial information of HANWHA SOLUTIONS USA HOLDINGS CORPORATION, an intermediate parent entity, and 6 subsidiaries.
- (*7) Consolidated financial information of Q Energy Europe GmbH, an intermediate parent entity, and 92 subsidiaries.
- (*8) Consolidated financial information of Q Energy Mediterranee, an intermediate parent entity, and 143 subsidiaries.

2. Basis of accounting

The consolidated financial statements have been prepared in accordance with Korean International Financial Reporting Standards ("K-IFRS"), as prescribed in the *Act on External Audits of Corporations in the Republic of Korea*.

The consolidated financial statements were authorized for issued by the Board of Directors on February 16 and March 2, 2023 and will be submitted for approval to the shareholder's meeting to be held on March 23, 2023.

(1) Application of accounting standards

The consolidated financial statements have been prepared on the historical cost basis except for the following material items in the statement of financial position:

- Derivative financial instruments measured at fair value
- Financial instruments measured at fair value through profit or loss
- Financial instruments measured at fair value through other comprehensive income
- Contingent considerations recognized in business combinations measured at fair value
- Liabilities for cash-settled share-based payments measured at fair value
- Liabilities for defined benefit plans recognized at the net of the present value of defined benefit obligations less the fair value of plan assets

(2) Functional and presentation currency

The financial statements of the controlling company and each subsidiary are prepared in the functional currency of the economic environment in which respective operation takes place. These consolidated financial statements are presented in Korean won, which is the controlling company's functional currency and the currency of the primary economic environment in which the Group operates.

(3) Use of estimates and judgements

The preparation of the consolidated financial statements in conformity with K-IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimates are revised and in any future periods affected.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES

Notes to the Consolidated Financial Statements

For the years ended December, 2022 and 2021

2. Basis of accounting, Continued

(3) Use of estimates and judgements, continued

1) Uncertainty in management's judgement and estimates and assumptions

Information about critical judgments in applying accounting policies that have the most significant effect on the amounts recognized in the financial statements is included in the following note.

Note 1 – General- Details of subsidiaries : Whether the Group has de facto control over subsidiary

Note 15 – Investments in Associates and Joint Ventures : Whether the Group has significant influence over an investee

Note 59 – Revenue : Performance obligations and revenue recognition policies

Note 19 – Leases : Whether the exercisability of the option to extend the lease is fairly certain

2) Uncertainties in assumptions and estimation

Information about assumptions and estimation uncertainties at the reporting date that have a significant risk of resulting in a material adjustment to the carrying amounts of assets and liabilities within the next financial year is included in the following notes:

Note 18 - Intangible Asset : Key assumptions of estimates applied to impairment testing of goodwill

3) Measurement of fair value

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities. The Group has an established control framework with respect to the measurement of fair values.

When measuring the fair value of an asset or a liability, the Group uses market observable data as far as possible. Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follow.

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs to an asset or liability that are observable either directly (e.g., price) or indirectly (e.g., derived from price), except for the quoted price included in Level 1.
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or a liability fall into different levels of the fair value hierarchy, then the fair value measurement is categorized in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement. The Group recognizes transfers between levels of the fair value hierarchy at the end of the reporting period during which the change has occurred.

Further information about the assumptions made in measuring fair values is included in Note 6.

3. Changes in Accounting Policies

The Group has adopted Onerous Contracts – Costs of Fulfilling a Contract (Amendments to K-IFRS No. 1037) from 1 January 2022. This resulted in a change in accounting policy for performing an onerous contracts assessment. Previously, the Group included only incremental costs to fulfil a contract when determining whether that contract was onerous. The revised policy is to include both incremental costs and an allocation of other direct costs.

The amendments apply prospectively to contracts existing at the date when the amendments are first applied. The Group has analyzed all contracts existing at 1 January 2022 and determined that none of them would be identified as onerous applying the revised accounting policy – i.e. there is no impact on the opening equity balances as at 1 January 2022 as a result of the change.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES

Notes to the Consolidated Financial Statements

For the years ended December, 2022 and 2021

4. Significant Accounting Policies

The significant accounting policies applied by the Group in the preparation of its separate financial statements are included below and the Group has consistently applied the accounting policies to all period presented in these consolidated financial statements, except for changes in accounting policies described in Note 3.

(1) Consolidation

1) Business Combination

The Group accounts for business combinations using the acquisition method when the acquired set of activities and assets meets the definition of a business and control is transferred to the Group. In determining whether a particular set of activities and assets is a business, the Group assesses whether the set of assets and activities acquired includes, at a minimum, an input and substantive process and whether the acquired set has the ability to produce outputs.

The Group has an option to apply a 'concentration test' that permits a simplified assessment of whether an acquired set of activities and assets is not a business. The optional concentration test is met if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets.

The consideration transferred in the acquisition is generally measured at fair value, as are the identifiable net assets acquired. Any goodwill that arises is tested annually for impairment. Any gain on a bargain purchase is recognized in profit or loss immediately. Transaction costs are expensed as incurred, except if related to the issue of debt or equity securities. The costs to issue debt or equity securities are recognized in accordance with K-IFRS No. 1032, 'Financial Instruments: Presentation' and K-IFRS No. 1109 'Financial Instruments: Recognition and Measurement'.

The consideration transferred does not include amounts related to the settlement of pre-existing relationships. Such amounts are generally recognized in profit or loss.

Any contingent consideration payable is measured at fair value at the acquisition date. If the contingent consideration is classified as equity, then it is not remeasured and settlement is accounted for within equity. Otherwise, subsequent changes in the fair value of the contingent consideration are recognized in profit or loss.

If share-based payment awards (replacement awards) are required to be exchanged for awards held by the acquiree's employees (acquiree's awards), then all or a portion of the amount of the acquirer's replacement awards is included in measuring the consideration transferred in the business combination. This determination is based on the market-based measure of the replacement awards compared with the market-based measure of the acquiree's awards and the extent to which the replacement awards relate to pre-combination service.

2) Subsidiaries

Subsidiaries are entities controlled by the Group. The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

3) Non-controlling interests

Non-controlling interests ("NCI") are measured at their proportionate share of the acquiree's identifiable net assets at the acquisition date.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

4. Significant Accounting Policies, Continued

(1) Consolidation, continued

4) Loss of control

When the Group loses control over a subsidiary, it derecognizes the assets and liabilities of the subsidiary, and any related NCI and other components of equity. Any resulting gain or loss is recognized in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

5) Interests in equity-accounted investees

The Group's interests in equity-accounted investees comprise interests in associates and joint ventures.

Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies. A joint venture is arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities.

Interests in associates and joint ventures are accounted for using the equity method. They are recognized initially at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and OCI of equity-accounted investees, until the date on which significant influence or joint control ceases.

6) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealized income and expenses arising from intra-group transactions (except gains (losses) on foreign currency translation), are eliminated. Unrealized gains arising from transactions with equity-accounted investees are eliminated against the investment to the extent of the Group's interest in the investee. Unrealized losses are eliminated in the same way as unrealized gains, but only to the extent that there is no evidence of impairment.

7) Acquisitions from entities under common control

In business combinations arising from transfers of interests in entities that are under the control of the shareholder that controls the Group, the assets and liabilities acquired are recognized at the carrying amounts in the Group controlling shareholder's consolidated financial statements. The components of equity of the acquired entities are added to the same components within Group equity except that any share capital of the acquired entities is recognized as part of share premium.

(2) Discontinued operations

A discontinued operation is a component of an entity that either has been disposed of, or is classified as held for sale, and

- represents a separate major line of business or geographical area of operations,
- is part of a single coordinated plan to dispose of a separate major line of business or geographical area of operations or
- is a subsidiary acquired exclusively with a view to resale

If there is a discontinued operation, the Group restates the statement of comprehensive income as if the operation were discontinued from the beginning of the comparative period.

(3) Cash and cash equivalents

The Group classifies investment assets with maturity within three months from the acquisition date as the cash and cash equivalents. Equity investments are excluded from cash equivalents unless they are, in substance, cash equivalents, for example in the case of preferred shares acquired within a short period of their maturity and with a specified redemption date.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

4. Significant Accounting Policies, Continued

(4) Inventories

The unit costs of inventories are determined by specific identification method for goods in transit, sales value reducing method for merchandise in the distribution sector (department store business), and the average method for other inventories. The cost of inventories shall comprise all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. Fixed production overheads, which are included in the finished goods, and work in progress, are allocated based on the normal capacity of the production facilities.

Inventories are measured at the lower of cost and net realizable value. The amount of any write-down of inventories to net realizable value and all losses of inventories are recognized as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realizable value, are recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

(5) Non-derivative financial assets

1) Recognition and initial measurement

The Group initially recognizes trade receivables and debt securities issued on the date on which they are originated. Other financial assets and financial liabilities are recognized on trade date, which is the date on which the Group becomes a party to the contractual provisions of the instrument.

A financial asset (unless it is a trade receivable without a significant financing component) or financial liability is initially measured at fair value plus, for an item not at FVTPL, transaction costs that are directly attributable to its acquisition or issue. A trade receivable without a significant financing component is initially measured at the transaction price.

2) Classification and subsequent measurement

(i) Classification

On initial recognition, a financial asset is classified as measured at: amortized cost, FVOCI or FVTPL.

Financial assets are not reclassified subsequent to their initial recognition unless the Group changes its business model for managing financial assets, in which case all affected financial assets are reclassified on the first day of the first reporting period following the change in the business model.

A financial asset is measured at amortized cost if it meets both of the following conditions and is not designated as at FVTPL:

- the asset is held within a business model whose objective is to hold assets to collect contractual cash flows; and
- the contractual terms of the financial asset give rise on specified dates to cash flows that are SPPI(Solely Payments of Principal and Interest).

A debt instrument is measured at FVOCI only if it meets both of the following conditions and is not designated as at FVTPL:

- the asset is held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets; and
- the contractual terms of the financial asset give rise on specified dates to cash flows that are SPPI(Solely Payments of Principal and Interest).

On initial recognition of an equity investment that is not held for trading, the Group may irrevocably elect to present subsequent changes in fair value in OCI. Once selected, it cannot be undone. This election is made on an investment-by-investment basis.

All other financial assets are classified as measured at FVTPL. These financial assets include all derivative financial assets. In addition, on initial recognition, the Group may irrevocably designate a financial asset that otherwise meets the requirements to be measured at amortized cost or at FVOCI as at FVTPL if doing so eliminates or significantly reduces an accounting mismatch that would otherwise arise. Once the Group designates a financial asset as at FVTPL, the Group will not reclassify those items to FVOCI subsequently.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

4. Significant Accounting Policies, Continued

(5) Non-derivative financial assets, continued

2) Classification and subsequent measurement, continued

(ii) Business model assessment

The Group makes an assessment of the objective of a business model in which an asset is held at a portfolio level because this best reflects the way the business is managed and information is provided to management. The information considered includes:

- the stated policies and objectives for the portfolio and the operation of those policies in practice. In particular, whether management's strategy focuses on earning contractual interest revenue, maintaining a particular interest rate profile, matching the duration of the financial assets to the duration of the liabilities that are funding those assets or realizing cash flows through the sale of the assets.;
- how the performance of the portfolio is evaluated and reported to the Group's management.;
- the risks that affect the performance of the business model (and the financial assets held within that business model) and its strategy for how those risks are managed.;
- how managers of the business are compensated (e.g. whether compensation is based on the fair value of the assets managed or the contractual cash flows collected).; and
- the frequency, volume and timing of sales in prior periods, the reasons for such sales and its expectations about future sales activity.

Transfers of financial assets to third parties in transactions that do not qualify for derecognition are not considered sales for this purpose, consistent with the Group's continuing recognition of the assets.

Financial assets that are held for trading or managed and whose performance is evaluated on a fair value basis are measured at FVTPL. because they are neither held to collect contractual cash flows nor held both to collect contractual cash flows and to sell financial assets.

(iii) Assessment of whether contractual cash flows are solely payments of principal and interest

For the purposes of this assessment, 'principal' is defined as the fair value of the financial asset on initial recognition. 'Interest' is defined as consideration for the time value of money and for the credit risk associated with the principal amount outstanding during a particular period of time and for other basic lending risks and costs (e.g. liquidity risk and administrative costs), as well as profit margin.

In assessing whether the contractual cash flows are SPPI, the Group considers the contractual terms of the instrument. This includes assessing whether the financial asset contains a contractual term that could change the timing or amount of contractual cash flows such that it would not meet this condition.

In making the assessment, the Group considers:

- contingent events that would change the amount and timing of cash flows;
- terms that may adjust the contractual coupon rate, including variable-rate features;
- prepayment and extension features; and
- terms that limit the Group's claim to cash flows from specified assets. (e.g. non-recourse features)

A prepayment feature is consistent with the solely payments of principal and interest criterion if the prepayment amount substantially represents unpaid amounts of principal and interest on the principal amount outstanding, which may include reasonable additional compensation for early termination of the contract.

Additionally, for a financial asset acquired at a discount or premium to its contractual par amount, a feature that permits or requires prepayment at an amount that substantially represents the contractual par amount plus accrued (but unpaid) contractual interest (which may also include reasonable additional compensation for early termination) is treated as consistent with this criterion if the fair value of the prepayment feature is insignificant at initial recognition.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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4. Significant Accounting Policies, Continued

(5) Non-derivative financial assets, continued

(iv) Subsequent measurement and gains and losses

Financial assets at FVTPL	These assets are subsequently measured at fair value. Net gains and losses, including any interest or dividend income, are recognized in profit or loss.
Financial assets at amortized cost	These assets are subsequently measured at amortized cost using the effective interest method. The amortized cost is reduced by impairment losses. Interest income, foreign exchange gains and losses and impairment are recognized in profit or loss. Any gain or loss on derecognition is recognized in profit or loss.
Debt investments at FVOCI	These assets are subsequently measured at fair value. Interest income calculated using the effective interest method, foreign exchange gains and losses and impairment are recognized in profit or loss. Other net gains and losses are recognized in OCI. On derecognition, gains and losses accumulated in OCI are reclassified to profit or loss.
Equity investments at FVOCI	These assets are subsequently measured at fair value. Dividends are recognized as income in profit or loss unless the dividend clearly represents a recovery of part of the cost of the investment. Other net gains and losses are recognized in OCI and are never reclassified to profit or loss.

3) Derecognition

(i) Financial assets

The Group derecognizes a financial asset when the contractual rights to the cash flows from the financial asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all of the risks and rewards of ownership of the financial asset are transferred or in which the Group neither transfers nor retains substantially all of the risks and rewards of ownership and it does not retain control of the financial asset.

The Group enters into transactions whereby it transfers assets recognized in its statement of financial position, but retains either all or substantially all of the risks and rewards of the transferred assets. In these cases, the transferred assets are not derecognized.

(ii) Interest rate benchmark reform

The Group replaces an existing interest rate benchmark with an alternative benchmark rate when changes are made to contractual cash flows of financial assets or financial liabilities measured at amortized cost as a result of interest rate benchmark reform. Changes to the basis for determining the contractual cash flows are required by interest rate benchmark reform if and only if both of the following conditions are met:

- the modification is required as a direct consequence of interest rate benchmark reform
- the new basis for determining the contractual cash flows is economically equivalent to the previous basis (i.e. the basis immediately preceding the modification)

If there are changes to the basis for determining the contractual cash flows of financial assets or financial liabilities in addition to changes required by interest rate benchmark reform, the Group first replaces an existing interest rate benchmark of financial assets and financial liabilities, and then applies the applicable requirements to account for additional changes.

4) Offsetting

Financial assets and financial liabilities are offset and the net amount presented in the statement of financial position when, and only when, the Group currently has a legally enforceable right to set off the amounts and it intends either to settle them on a net basis or to realize the asset and settle the liability simultaneously.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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4. Significant Accounting Policies, Continued

(6) Derivative financial instruments

1) Derivative financial instruments and hedge accounting

Derivatives are initially measured at fair value. Subsequent to initial recognition, derivatives are measured at fair value, and changes therein are generally recognized in profit or loss.

The Group designated derivatives as hedging instruments to hedge the risk of changes in the volatility of future cash flows due to changes in exchange rates and interest rates on floating rate bonds (FRN).

At inception of designated hedging relationships, the Group documents the risk management objective and strategy for undertaking the hedge. The Group also documents the economic relationship between the hedged item and the hedging instrument, including whether the changes in cash flows of the hedged item and hedging instrument are expected to offset each other.

2) Hedges directly affected by interest rate benchmark reform

When the basis for determining the contractual cash flows of the hedged item or hedging instrument changes as a result of IBOR reform and therefore there is no longer uncertainty arising about the cash flows of the hedged item or the hedging instrument, the Group amends the hedge documentation of that hedging relationship to reflect the change(s) required by IBOR reform.

- designating an alternative benchmark rate as the hedged risk;
- updating the description of the hedged item, including the description of the designated portion of the cash flows or fair value being hedged; or
- updating the description of the hedging instrument.

The Group amends the description of the hedging instrument only if the following conditions are met:

- it makes a change required by IBOR reform by using an approach other than changing the basis for determining the contractual cash flows of the hedging instrument;
- the chosen approach is economically equivalent to changing the basis for determining the contractual cash flows of the original hedging instrument; and
- the original hedging instrument is not derecognized.

Such changes in documentation are made by the end of the reporting period in which changes in hedged risk, hedged item, or hedging instrument are made in accordance with the interest rate benchmark reform. This change in documentation does not terminate the hedging relationship or designate a new hedging relationship.

In the event of the change in a hedging relationship or in addition to the change in the designation of a hedging relationship, the Group determines whether hedge accounting should be discontinued as a result of the interest rate benchmark reform. If it is determined that hedge accounting is not discontinued, the formal designation of the hedging relationship previously documented is changed to reflect the changes required in the interest rate benchmark reform.

When modifying the description of the hedged item in the hedge accounting document to reflect the changes required in the interest rate benchmark reform, in accounting for cash flow hedges, the amount accumulated in the cash flow hedge reserve is considered to be based on the alternative benchmark interest rate used to determine the hedged future cash flow.

In the case of a similarly discontinued cash flow hedge relationship, when the interest rate benchmark changes on which the hedged future cash flows were based, as required by the interest rate benchmark reform, for the purpose of accounting for the amount accumulated in the cash flow hedge reserve to determine whether a hedged future cash flow is expected to occur, the amount accumulated in the cash flow hedge reserve for the hedging relationship is considered to be based on the alternative benchmark interest rate on which the hedged future cash flow is based.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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4. Significant Accounting Policies, Continued

(6) Derivative financial instruments, continued

3) Cash flow hedges

When a derivative is designated as a cash flow hedging instrument, the effective portion of changes in the fair value of the derivative is recognized in OCI and accumulated in the hedging reserve. The effective portion of changes in the fair value of the derivative that is recognized in OCI is limited to the cumulative change in fair value of the hedged item, determined on a present value basis, from inception of the hedge. Any ineffective portion of changes in the fair value of the derivative is recognized immediately in profit or loss.

The Group designates only the changes in fair value of the spot element of forward exchange contracts as the hedging instrument in cash flow hedging relationships. The change in fair value of the forward element of forward exchange contracts (forward points) is separately accounted for as a cost of hedging and recognized in a costs of hedging reserve within equity.

When the hedged forecast transaction subsequently results in the recognition of a non-financial item such as inventory, the amount accumulated in the hedging reserve and the cost of hedging reserve is included directly in the initial cost of the non-financial item when it is recognized.

For other hedged expected transactions, the hedging reserve and the cost of hedging reserve are reclassified to profit or loss in the same period or in the period in which the expected hedged cash flows affect profit or loss.

If the hedge no longer meets the criteria for hedge accounting or the hedging instrument is sold, expires, is terminated or is exercised, then hedge accounting is discontinued prospectively.

In hedge transactions where non-financial items are recognized, the hedging reserve and the cost of hedging reserve are retained in the equity item until the non-financial item is initially recognized and included in the cost of the non-financial item when the cashflow hedge accounting is discontinued. For cash flow hedge transactions other than the above, the hedging reserve and the cost of hedging reserve are reclassified to profit or loss through reclassification adjustments during the period in which the hedged future expected cash flows affect profit or loss.

If the hedged future cash flows are no longer expected to occur, then the amounts that have been accumulated in the hedging reserve and the cost of hedging reserve are immediately reclassified to profit or loss.

(7) Impairment of financial assets

1) Financial assets and contract assets

The Group recognizes loss allowances for 'expected credit losses' (ECLs) on:

- financial assets measured at amortized cost
- debt investments measured at FVOCI; and
- contract assets defined by K-IFRS No.1115.

The Group measures loss allowances at an amount equal to lifetime ECLs, except for the following, which are measured at 12-month ECLs:

- Debt securities that are determined to have low credit risk at the reporting date
- Other debt securities and bank deposit for which credit risk (i.e. the risk of default occurring over the expected life of the financial instrument) has not increased significantly since initial recognition

The Group measured loss allowances for lifetime ECLs on trade receivables (including lease receivables) and contract assets.

When determining whether the credit risk of a financial asset has increased significantly since initial recognition and when estimating ECLs, the Group considers reasonable and supportable information that is relevant and available without undue cost or effort. This includes both quantitative and qualitative information and analysis, based on the Group's historical experience and informed credit assessment and including forward-looking information.

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4. Significant Accounting Policies, Continued

(7) Impairment of financial assets, continued

The Group considers a financial asset to be in default when:

- the debtor is unlikely to pay its credit obligations to the Group in full, without recourse by the Group to actions such as realizing security (if any is held)

Lifetime ECLs are the ECLs that result from all possible default events over the expected life of a financial instrument.

12-month ECLs are the portion of ECLs that result from default events that are possible within the 12 months after the reporting date (or a shorter period if the expected life of the instrument is less than 12 months).

The maximum period considered when estimating ECLs is the maximum contractual period over which the Group is exposed to credit risk.

2) Measurement of ECLs

ECLs are a probability-weighted estimate of credit losses. Credit losses are measured as the present value of all cash shortfalls (i.e. the difference between the cash flows due to the entity in accordance with the contract and the cash flows that the Group expects to receive). ECLs are discounted at the effective interest rate of the financial asset.

3) Credit-impaired financial assets

At each reporting date, the Group assesses whether financial assets carried at amortized cost and debt securities at FVOCI are credit-impaired. A financial asset is 'credit-impaired' when one or more events that have a detrimental impact on the estimated future cash flows of the financial asset have occurred.

Evidence that a financial asset is credit-impaired includes the following observable data:

- significant financial difficulty of the debtor;
- a breach of contract such as a default or being more than 90 days past due;
- the restructuring of a loan or advance by the Group on terms that the Group would not consider otherwise;
- it is probable that the debtor will enter bankruptcy or other financial reorganization; or
- the disappearance of an active market for a security because of financial difficulties.

4) Presentation of allowance for ECL in the statement of financial position

Loss allowances for financial assets measured at amortized cost are deducted from the gross carrying amount of the assets. For debt securities at FVOCI, the loss allowance is charged to profit or loss and is recognized in OCI.

5) Write-off

The gross carrying amount of a financial asset is written off when the Group has no reasonable expectations of recovering a financial asset in its entirety or a portion thereof. For corporate customers, the Group individually makes an assessment with respect to the timing and amount of write-off based on whether there is a reasonable expectation of recovery. The Group expects no significant recovery from the amount written off. However, financial assets that are written off could still be subject to enforcement activities in order to comply with the Group's procedures for recovery of amounts due.

(8) Property, plant and equipment

All items of property, plant and equipment are initially recorded at cost. The cost of property, plant and equipment includes expenditures arising directly from the construction or acquisition of the asset, any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management and the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

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4. Significant Accounting Policies, Continued

(8) Property, plant and equipment, continued

Subsequent to initial recognition, an item of property, plant and equipment shall be carried at its cost less any accumulated depreciation and any accumulated impairment losses.

Property, plant and equipment, except for land, are depreciated on a straight-line basis over estimated useful lives that appropriately reflect the pattern in which the asset's future economic benefits are expected to be consumed.

A component that is significant compared to the total cost of property, plant and equipment is depreciated separately.

Gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and are recognized net within other income in profit or loss.

The estimated useful lives of the Group's property, plant and equipment are as follows:

	Estimated useful lives (Years)
Buildings	5 ~ 60
Structures	8 ~ 50
Machinery	2 ~ 20
Vehicles	1 ~ 12
Tools and equipment	1 ~ 20
Other property, plant and equipment ("Other PP&Es")	1 ~ 12

Depreciation methods, useful lives and residual values are reviewed at the end of each reporting date and adjusted, if appropriate. If expectations differ from previous estimates, the changes are accounted for as a change in an accounting estimate.

Subsequent expenditures are capitalized only when it is probable that the economic benefits associated with the expenditure will flow to the Group.

(9) Intangible assets

Intangible assets are measured initially at cost and, subsequently, are carried at cost less accumulated amortization and accumulated impairment losses.

Amortization of intangible assets is calculated on a straight-line basis over the estimated useful lives of intangible assets, as described below, with nil residual value from the dated that they are available for use. However, as there are no foreseeable limits to the periods over which club memberships are expected to be available for use, this intangible asset is determined as having indefinite useful lives and not amortized.

	Estimated useful lives (Years)
Intellectual property rights	5 ~ 20
Membership	5 ~ 20
Other intangible assets	According to the respective contract period
Development costs	5 ~ 10

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4. Significant Accounting Policies, Continued

(9) Intangible assets, continued

Amortization periods and the amortization methods for intangible assets with finite useful lives are reviewed at the end of each reporting period. The useful lives of intangible assets that are not being amortized are reviewed at the end of each reporting period to determine whether events and circumstances continue to support indefinite useful life assessments for those assets. Changes are accounted for as changes in accounting estimates.

1) Research and development

Expenditures on research activities, undertaken with the prospect of gaining new scientific or technical knowledge and understanding, are recognized in profit or loss as incurred. Development expenditures are capitalized only if development costs can be measured reliably, the product or process is technically and commercially feasible, future economic benefits are probable, and the Group intends to and has sufficient resources to complete development and to use or sell the asset. Other development expenditures are recognized in profit or loss as incurred.

2) Intangible assets acquired in business combinations

The acquisition cost of an intangible asset acquired in a business combination and recognized separately from goodwill is measured at the acquisition date fair value, and the intangible asset acquired in a business combination after initial recognition is presented as the acquisition cost minus the accumulated amortization and impairment loss.

3) Subsequent expenditures

Subsequent expenditures are capitalized only when they increase the future economic benefits embodied in the specific asset to which it relates. All other expenditures, including expenditures on internally generated goodwill and brands, are recognized in profit or loss as incurred.

(10) Borrowing costs

The Group capitalizes borrowing costs directly attributable to the acquisition, construction or production of a qualifying asset as part of the cost of that asset. Other borrowing costs are recognized in expense as incurred. A qualifying asset is an asset that requires a substantial period of time to get ready for its intended use or sale. Financial assets and inventories that are manufactured or otherwise produced over a short period of time are not qualifying assets. Assets that are ready for their intended use or sale when acquired are not qualifying assets.

To the extent that the Group borrows funds specifically for the purpose of obtaining a qualifying asset, the Group determines the amount of borrowing costs eligible for capitalization as the actual borrowing costs incurred on that borrowing during the period less any investment income on the temporary investment of those borrowings. To the extent that the Group borrows funds generally and uses them for the purpose of obtaining a qualifying asset, the Group shall determine the amount of borrowing costs eligible for capitalization by applying a capitalization rate to the expenditures on that asset. The capitalization rate shall be the weighted average of the borrowing costs applicable to the borrowings of the Group that are outstanding during the period, other than borrowings made specifically for the purpose of obtaining a qualifying asset. The amount of borrowing costs that the Group capitalizes during a period shall not exceed the amount of borrowing costs incurred during that period.

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4. Significant Accounting Policies, Continued

(11) Government grants

Government grants are not recognized until there is reasonable assurance that the Group will comply with the grant's conditions and that the grant will be received.

Government grants whose primary condition is that the Group purchase, construct or otherwise acquire long-term assets are deducted in calculating the carrying amount of the asset. The grant is recognized in profit or loss over the life of a depreciable asset as a reduced depreciation expense.

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

Government grants that compensate for expenses or losses already incurred are recognized as other income during the period in which the right to receive government grants occurs. In this case, government grants are recognized when they become receivables.

(12) Investment property

Property held for the purpose of earning rentals or benefiting from capital appreciation is classified as investment property. Investment property is initially measured at its cost. Transaction costs are included in the initial measurement. Subsequently, investment property is carried at depreciated cost less any accumulated impairment losses.

Subsequent costs are recognized in the carrying amount of investment property at cost or, if appropriate, as separate items if it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of the replaced part is derecognized. The costs of the day-to-day servicing are recognized in profit or loss as incurred.

Investment property except for land, are depreciated on a straight-line basis over 5~60 years as estimated useful lives.

Depreciation methods, useful lives and residual values are reviewed at the end of each reporting date and adjusted, if appropriate. The change is accounted for as a change in an accounting estimate.

(13) Impairment of non-financial assets

The carrying amounts of the Group's non-financial assets, other than assets arising from employee benefits, inventories, deferred tax assets and non-current assets held for sale, are reviewed at the end of the reporting period to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Goodwill and intangible assets that have indefinite useful lives or that are not yet available for use, irrespective of whether there is any indication of impairment, are tested for impairment annually by comparing their recoverable amount to their carrying amount.

The Group estimates the recoverable amount of an individual asset, if it is impossible to measure the individual recoverable amount of an asset, then the Group estimates the recoverable amount of cash-generating unit ("CGU"). A CGU is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets. The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. The value in use is estimated by applying a proper discount rate that reflect current market assessments of the time value of money and the risks specific to the asset or CGU for which estimated future cash flows have not been adjusted, to the estimated future cash flows expected to be generated by the asset or CGU.

An impairment loss is recognized in profit or loss if the carrying amount of an asset or a CGU exceeds its recoverable amount.

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4. Significant Accounting Policies, Continued

(13) Impairment of non-financial assets, continued

Goodwill acquired in a business combination is allocated to each CGU that is expected to benefit from the synergies arising from the goodwill acquired. Any impairment identified at the CGU level will first reduce the carrying amount of goodwill and then be used to reduce the carrying amount of the other assets in the CGU on a pro rata basis. Except for impairment losses in respect of goodwill which are never reversed, an impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount shall not exceed the carrying amount that would have been determined, net of depreciation or amortization, if no impairment loss had been recognized.

(14) Leases

A contract is, or contains, a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

1) As a lessee

At commencement or on modification of a contract that contains a lease component, the Group allocates the consideration in the contract to each lease component on the basis of its relative stand-alone prices. However, for the leases of property the Group has elected not to separate non-lease components and account for the lease and non-lease components as a single lease component.

The Group recognizes a right-of-use asset and a lease liability at the lease commencement date. The right-of-use asset is initially measured at cost, which comprises the initial amount of the lease liability adjusted for any lease payments made at or before the commencement date, plus any initial direct costs incurred and an estimate of costs to dismantle and remove the underlying asset or to restore the underlying asset or the site on which it is located, less any lease incentives received.

The right-of-use asset is subsequently depreciated using the straight-line method from the commencement date to the end of the lease term, unless the lease transfers ownership of the underlying asset to the Group by the end of the lease term or the cost of the right-of-use asset reflects that the Group will exercise a purchase option. In that case the right-of-use asset will be depreciated over the useful life of the underlying asset, which is determined on the same basis as those of property and equipment. In addition, the right-of-use asset is periodically reduced by impairment losses, if any, and adjusted for certain remeasurements of the lease liability.

The lease liability is initially measured at the present value of the lease payments that are not paid at the commencement date, discounted using the interest rate implicit in the lease or, if that rate cannot be readily determined, the Group's incremental borrowing rate. Generally, the Group uses its incremental borrowing rate as the discount rate.

The Group determines its incremental borrowing rate by obtaining interest rates from various external financing sources and makes certain adjustments to reflect the terms of the lease and type of the asset leased.

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

- fixed payments, including in-substance fixed payments;
- variable lease payments that depend on an index or a rate, initially measured using the index or rate as at the commencement date;
- amounts expected to be payable under a residual value guarantee; and
- the exercise price under a purchase option that the Group is reasonably certain to exercise, lease payments in an optional renewal period if the Group is reasonably certain to exercise an extension option, and penalties for early termination of a lease unless the Group is reasonably certain not to terminate early.

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4. Significant Accounting Policies, Continued

(14) Leases, continued

The lease liability is measured at amortized cost using the effective interest method. It is remeasured when there is a change in future lease payments arising from a change in an index or rate, if there is a change in the Group's estimate of the amount expected to be payable under a residual value guarantee, if the Group changes its assessment of whether it will exercise a purchase, extension or termination option or if there is a revised in-substance fixed lease payment.

When the lease liability is remeasured in this way, a corresponding adjustment is made to the carrying amount of the right-of-use asset, or is recorded in profit or loss if the carrying amount of the right-of-use asset has been reduced to zero.

In light of Phase 2 of the Interest rate benchmark reform the Group shall remeasure a lease liability by discounting the lease expense using a revised discount rate based on the alternative benchmark rate if the criteria used to estimate a lease expense is changed.

The Group presents right-of-use assets that do not meet the definition of investment property in 'property, plant and equipment' and lease liabilities in 'other debts' in the statement of financial position.

The Group has elected not to recognize right-of-use assets and lease liabilities for leases of low-value assets and short-term leases. The Group recognizes the lease payments associated with these leases as an expense on a straight-line basis over the lease term.

2) As a lessor

At inception or on modification of a contract that contains a lease component, the Group allocates the consideration in the contract to each lease component on the basis of their relative standalone prices.

When the Group acts as a lessor, it determines at lease inception whether each lease is a finance lease or an operating lease.

To classify each lease, the Group makes an overall assessment of whether the lease transfers substantially all of the risks and rewards incidental to ownership of the underlying asset. If this is the case, then the lease is a finance lease; if not, then it is an operating lease. As part of this assessment, the Group considers certain indicators such as whether the lease is for the major part of the economic life of the asset.

When the Group is an intermediate lessor, it accounts for its interests in the head lease and the sub-lease separately. It assesses the lease classification of a sub-lease with reference to the right-of-use asset arising from the head lease, not with reference to the underlying asset. If a head lease is a short-term lease to which the Group applies the exemption described above, then it classifies the sub-lease as an operating lease.

If an arrangement contains lease and non-lease components, then the Group applies K-IFRS No. 1115 to allocate the consideration in the contract.

The Group applies the derecognition and impairment requirements in K-IFRS No. 1109 to the net investment in the lease. The Group further regularly reviews estimated unguaranteed residual values used in calculating the gross investment in the lease.

The Group recognizes lease payments received under operating leases as income on a straight-line basis over the lease term as part of 'other revenue'.

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4. Significant Accounting Policies, Continued

(15) Non-current assets held for sale

Non-current assets, or disposal groups comprising assets and liabilities, are classified as held-for-sale if it is highly probable that they will be recovered primarily through sale rather than through continuing use. In order to be classified as held for sale, the asset (or disposal groups) must be available for immediate sale in its present condition and its sale must be highly probable. The assets or disposal groups that are classified as non-current assets held for sale are measured at the lower of their carrying amount and fair value less cost to sell. The Group recognizes an impairment loss for any initial or subsequent write-down of an asset (or disposal groups) to fair value less costs to sell, and a gain for any subsequent increase in fair value less costs to sell up to the cumulative impairment loss previously recognized in accordance with K-IFRS No. 1036, 'Impairment of Assets'.

Once non-current assets are classified as held-for-sale or part of disposal groups classified as held-for-sale, they are no longer amortized or depreciated.

(16) Non-derivative financial liabilities

The Group classifies non-derivative financial liabilities into financial liabilities measured at FVTPL or financial liabilities measured at amortized cost in accordance with the substance of the contractual arrangement and the definitions of financial liabilities. The Group recognizes financial liabilities in the statement of financial position when the Group becomes a party to the contractual provisions of the financial liability.

1) Financial liabilities measured at FVTPL

Financial liabilities measured at FVTPL include financial liabilities held for trading or designated as such upon initial recognition. Subsequent to initial recognition, financial liabilities at fair value through profit or loss are measured at fair value, and changes therein are recognized in profit or loss. Upon initial recognition, transaction costs that are directly attributable to the acquisition are recognized in profit or loss as incurred.

2) Other financial liabilities

Non-derivative financial liabilities that are not classified as financial liabilities through profit or loss are classified as other financial liabilities. At the date of initial recognition, other financial liabilities are measured at fair value less transaction costs that are directly attributable to the acquisition. Subsequent to initial recognition, financial liabilities are measured at amortized cost using the effective interest method and interest costs are recognized using the effective interest method.

3) Derecognition of financial liabilities

The Group derecognizes a financial liability when its contractual obligations are discharged, cancelled, or expire. The Group derecognizes a financial liability when its terms are modified and the cash flows of the modified liability are substantially different, in which case a new financial liability based on the modified terms is recognized at fair value.

On derecognition of a financial liability, the difference between the carrying amount extinguished and consideration paid including any non-cash assets transferred of liabilities assumed is recognized in profit or loss.

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4. Significant Accounting Policies, Continued

(17) Employee benefits

1) Short-term employee benefits

Short-term employee benefits are employee benefits that are due to be settled within 12 months after the end of the period in which the employees render the related service. When an employee has rendered service to the Group during an accounting period, the Group recognizes the undiscounted amount of short-term employee benefits expected to be paid in exchange for that service as gain or loss.

2) Other long-term employee benefits

Other long-term employee benefits include employee benefits that are settled beyond 12 months after the end of the period in which the employees render the related service. The Group's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognized in profit or loss in the period in which they arise.

3) Retirement benefits: Defined contribution plans

When an employee has rendered service to the Group during a period, the Group recognizes the contribution payable to a defined contribution plan in exchange for that service as a liability (accrued expense), after deducting any contribution already paid. If the contribution already paid exceeds the contribution due for service before the end of the reporting period, the Group recognizes that excess as an asset (prepaid expense) to the extent that the prepayment will lead to a reduction in future payments or a cash refund.

4) Retirement benefits: Defined benefit plans

The Group's net obligation in respect of defined benefit plans is calculated by estimating the amount of future benefit that employees have earned in return for their service in the current and prior periods, discounting that amount and deducting the fair value of any plan assets.

The calculation of defined benefit obligations is performed annually by an independent actuary using the projected unit credit method. When the calculation results in a potential asset for the Group, the recognized asset is limited to the present value of economic benefits available in the form of any future refunds from the plan or reductions in future contributions to the plan.

Remeasurements of the net defined benefit liability, which comprise actuarial gains and losses, the return on plan assets (excluding interest) and the effect of the asset ceiling (if any, excluding interest), are recognized immediately in OCI. The Group determines the net interest expense (income) on the net defined benefit liability (asset) for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period to the then-net defined benefit liability (asset), taking into account any changes in the net defined benefit liability (asset) during the period as a result of contributions and benefit payments. Net interest expense and other expenses related to defined benefit plans are recognized in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognized immediately in profit or loss. The Group recognizes gains and losses on the settlement of a defined benefit plan when the settlement occurs.

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4. Significant Accounting Policies, Continued

(17) Employee benefits, continued

5) Termination benefits

Termination benefits are expensed at the earlier of when the Group can no longer withdraw the offer of those benefits and when the Group recognizes costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the end of the reporting period, then they are discounted.

(18) Provisions

Provisions are recognized when the Group has a present legal or constructive obligation 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.

The risks and uncertainties that inevitably surround many events and circumstances are taken into account in reaching the best estimate of a provision. Where the effect of the time value of money is material, provisions are determined at the present value of the expected future cash flows.

Where some or all of the expenditures required to settle a provision are expected to be reimbursed by another party, the reimbursement shall be recognized when, and only when, it is virtually certain that reimbursement will be received if the entity settles the obligation. The reimbursement shall be treated as a separate asset.

Provisions are reviewed at the end of each reporting period and adjusted to reflect the current best estimates. If it is no longer probable that an outflow of resources embodying economic benefits will be required to settle the obligation, the provision is reversed.

Product warranty liabilities are recognized when the product is sold, and it was estimated by considering past warranty experience, warranty experience of overseas subsidiaries in the same industry, and set rate of the same industry. The Group estimates all possible outcomes and their associated probabilities by weighted averages.

A provision shall be used only for expenditures for which the provision was originally recognized.

(19) Emissions rights

The Group accounts for greenhouse gases emission right and the relevant liability as below pursuant to the Act on Allocation and Trading of Greenhouse Gas Emission

1) Greenhouse Gases Emission Right

Greenhouse gas emission rights comprise emission rights allocated free of charge by the government and emission rights purchased for a fee.

Free allocation emission rights are measured and recognized as zero (0), and purchase emission rights are recognized as acquisition costs by adding other costs that are directly related to acquisition and occur normally.

The Group classifies greenhouse gas emission rights held to fulfill the obligations stipulated by the relevant system as intangible assets and measures the cumulative amount of damage losses deducted from costs after initial recognition, and classifies them as current assets within one year from the end of the reporting period.

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4. Significant Accounting Policies, Continued

(19) Emissions rights, continued

Emissions held to obtain short-term trading gains are classified as current assets and measured at fair value at the end of each reporting period, and changes in fair value are recognized in profit or loss.

The Group accounts for greenhouse gases emission right and the relevant liability as below pursuant to *the Act on Allocation and Trading of Greenhouse Gas Emission*.

2) Emission liability

Emission liability is a present obligation of submitting emission rights to the government with regard to emission of greenhouse gas. The emission liability is measured by summing the expected expenditures required to fulfil the obligation for excess emission and carrying amount of emission rights held. Emissions liability is eliminated when submitted to the government.

(20) Foreign currency

1) Foreign currency transactions

Transactions in foreign currencies are translated to the functional currencies of the Group at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are translated to the functional currency using the reporting date's closing rate. Non-monetary assets and liabilities denominated in foreign currencies that are measured at fair value are retranslated to the functional currency at the exchange rate at the date that the fair value was determined. Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rate at the date of the transaction. Foreign currency differences are generally recognized in profit or loss and presented within finance costs.

However, foreign currency differences arising from the translation of the following items are recognized in OCI:

- an investment in equity securities designated as at FVOCI (except on impairment, in which case foreign currency differences that have been recognized in OCI are reclassified to profit or loss);
- a financial liability designated as a hedge of the net investment in a foreign operation to the extent that the hedge is effective; and
- qualifying cash flow hedges to the extent that the hedges are effective.

2) Foreign operations

If the presentation currency of the Group is different from a foreign operation's functional currency, the financial statements of the foreign operation are translated into the presentation currency using the following methods:

The assets and liabilities of foreign operations, whose functional currency is not the currency of a hyperinflationary economy, are translated to presentation currency at exchange rates at the reporting date. The income and expenses of foreign operations are translated to functional currency at exchange rates at the dates of the transactions. Foreign currency differences are recognized in other comprehensive income at reporting date and reclassified into profit or loss when the foreign operation is disposed.

If the functional currency of foreign operations is the currency of a hyperinflationary economies, all items (asset, liability, capital, income, expense) in the statement of financial position and statement of comprehensive income (excluding comparative financial statements and comparative statements of comprehensive income) are translated using the closing exchange rate of the reporting period. However, the comparative financial statements and comparative statements of comprehensive income are presented in the amounts reported in the prior year, which did not reflect the effects of changes in the level of inflation or exchange rates after the prior year. For Hanwha Q CELLS Turkey, a subsidiary of the Group, the functional currency is Turkish Lira, which is considered as a hyperinflationary economies according to IAS 29 due to cumulative inflation rate over 3 years ended in February 2022 has exceeded 100%. Therefore, the financial statements are restated by reflecting the changes in purchasing power of the functional currency as at December 31, 2022 in accordance with K-IFRS No. 1029 'Financial Reporting in Hyperinflationary Economies', and presented in unit of measure as of the end of reporting period.

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4. Significant Accounting Policies, Continued

(20) Foreign currency, continued

The current price index in Turkiye as of the end of reporting period has reflected the consumer price index, and the conversion factor used for translation in the restating the financial statements are as follows:

Base date(*1)	Consumer price index	Conversion factor
2022.12.31	1128.45	1
2022.06.30	977.90	1.15
2021.12.31	686.95	1.64
2020.12.31	504.81	2.24
2019.12.31	440.50	2.56
2018.12.31	393.88	2.86

(*1) This is the reference date according to the occurrence and payment timing for each item.

As monetary assets and monetary liabilities are already presented in monetary units as of December 31, 2022, they have not been restated. Non-monetary assets and liabilities have been restated using conversion factors that has considered Turkiye's consumer price index. The impact of hyperinflation on the company's monetary assets and liabilities is included in the "gain or loss of purchasing power" of consolidated statements of comprehensive income. During a period of hyperinflationary economies, holding excessive monetary assets compared to monetary liabilities results in a loss of purchasing power that leads to monetary losses. The monetary gain or loss arises from the difference resulted from restatement of items in non-monetary assets and liabilities, equity, and the consolidated statement of comprehensive income.

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition, are presented in functional currency of foreign operations, and translated in Korean won with other assets and liabilities of foreign operations by using closing exchange rate.

When the Group disposes all or part of foreign operations that the control, significant influence, or joint control is lost, the cumulative amount in the translation reserve related to that foreign operation is reclassified to profit or loss at the point in time of disposing gain or loss on disposal of the foreign operation. When the Group disposes of only part of its investment in an associate that includes a foreign operation while retaining control, the relevant proportion of the cumulative amount of foreign exchange differences recognized in other comprehensive income is reclassified as non-controlling interest of foreign operation, and in other cases, only proportion of cumulative amount of foreign exchange difference recognized in other comprehensive income upon disposal of foreign operation is reclassified to profit or loss.

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4. Significant Accounting Policies, Continued

(20) Foreign currency, continued

3) Translation of net investment in a foreign operation

The Group may have a monetary item that is receivable from or payable to a foreign operation. An item for which settlement is neither planned nor likely to occur in the foreseeable future is, in substance, a part of the Group's net investment in that foreign operation, and the difference arose from foreign currency shall be recognized initially in other comprehensive income and reclassified to profit or loss on disposal of the net investment.

(21) Equity capital

Ordinary shares are classified as equity. Incremental costs directly attributable to the issuance of ordinary shares and share options are recognized as a deduction from equity, net of any tax effects.

Preferred stocks are classified as equity if they do not have to be repaid, if they are repaid only at the company's option, or if the payment of dividends is determined at the Group's discretion. Dividends are recognized when dividends are approved at the Group's shareholders' meeting. The preferred stocks are classified as liability, if stockholders are able to claim a fixed or determinable amount of redemption on or after a certain date, or if the company is obligated to repay. Relevant dividends are recognized in profit or loss as they are considered as interest expense at the time of occurrence.

When the Group repurchases its share capital, the amount of the consideration paid is recognized as a deduction from equity and classified as treasury shares. The profits or losses from the purchase, disposal, reissue, or retirement of treasury shares are not recognized as current profit or loss. If the Group acquires and retains treasury shares, the consideration paid or received is directly recognized in equity.

(22) Share based payments

The Group has granted shares or share options to its employees. For equity-settled share-based payment transactions, the Group measures the goods or services received, and the corresponding increase in equity as a capital adjustment at the fair value of the goods or services received, unless that fair value cannot be estimated reliably. If the Group cannot reliably estimate the fair value of the goods or services received, the Group measures their value, and the corresponding increase in equity, indirectly, by reference to the fair value of the equity instruments granted.

In the case of cash-settled share-based payment transactions that pay cash for goods or services received, the goods or services received and the liabilities borne in return are measured at fair value and recognized as employee benefit costs and liabilities during the vesting period. In addition, until the liability is settled, the fair value of the liability is remeasured at the end of each reporting period and at the final settlement date, and changes in the fair value are recognized as salaries.

(23) Revenue from contracts with customers

The Group's accounting policies relating to revenue from contracts with customers is described in Note 59.

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4. Significant Accounting Policies, Continued

(24) Finance income and finance costs

The Group's finance income and finance costs include:

- interest income;
- interest expense;
- dividends income;
- the net gain or loss arising from the disposal of debt investments measured at FVOCI;
- the net gain or loss on financial assets at FVTPL;
- the foreign currency gain or loss on financial assets and financial liabilities;
- impairment losses (or subsequent gains) arising from debt investments measured at FVOCI or financial assets measured at amortized cost (or reversal of impairment loss);
- re-measured gains on the fair value of the existing interest in the acquiree in a business combination
- loss of fair value on contingent consideration classified as a financial liability
- hedge ineffectiveness recognized in profit or loss
- the reclassified net income or loss previously recognized in other comprehensive income in cash flow hedge of interest risk and exchange risk for borrowing liabilities
- reversal of financial guarantee contracts

Interest income or expense is recognized using the effective interest method. Dividend income is recognized in profit or loss on the date on which the Group's right to receive payment is established.

The effective interest rate is the rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial instrument to the gross carrying amount of the financial asset or the amortized cost of the financial liability.

In calculating interest income and expense, the effective interest rate is applied to the gross carrying amount of the asset (when the asset is not credit-impaired) or to the amortized cost of the liability. However, for financial assets that have become credit-impaired subsequent to initial recognition, interest income is calculated by applying the effective interest rate to the amortized cost of the financial asset. If the asset is no longer credit-impaired, then the calculation of interest income reverts to the gross basis.

(25) Income taxes

Income tax expense comprises current and deferred tax. Current tax and deferred tax are recognized in profit or loss except to the extent that it relates to a business combination, or items recognized directly in equity or in other comprehensive income.

The Group has determined whether interest and penalties related to income taxes meet the definition of income taxes or not, and accounted for them under K-IFRS No. 1012 'Income Taxes' if they meet the definition of income taxes, otherwise under K-IFRS No. 1037 'Provisions, Contingent Liabilities and Contingent Assets'.

1) Current tax

Current tax is the expected tax payable or receivable on the taxable profit or loss for the year, using tax rates enacted or substantively enacted at the end of the reporting period and any adjustment to tax payable in respect of prior years. The taxable profit is different from the accounting profit for the period since the taxable profit is calculated excluding the temporary differences, which will be taxable or deductible in determining taxable profit (tax loss) of future periods, and non-taxable or non-deductible items from the accounting profit.

Current tax assets and current tax liabilities can be offset only if the Group :

- has the legally enforceable right to set off the recognized amounts; and
- intends either to settle on a net basis or realize the assets and settle the liabilities simultaneously.

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4. Significant Accounting Policies, Continued

(25) Income taxes, continued

2) Deferred tax

The measurement of deferred tax liabilities and deferred tax assets reflects the tax consequences that would follow from the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities. The Group recognizes a deferred tax liability for all taxable temporary differences associated with investments in subsidiaries, associates, and interests in joint ventures, except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. The Group recognizes a deferred tax asset for all deductible temporary differences arising from investments in subsidiaries and associates, to the extent that it is probable that the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

The Group shall recognize a deferred tax asset for the carryforward of unused tax losses, unused tax credits, and deductible temporary differences to the extent that it is probable that sufficient future taxable profit will be available to utilize the unused tax losses, unused tax credits and deductible temporary differences.

The estimate of future taxable profit includes the expected expiry of the temporary differences.

The Group considers an expiry of existing temporary differences and the business plan in assessing the probable future taxable profit when taxable temporary differences are not be recognized as a deferred tax asset.

Temporary differences in relation to a right-of-use asset and a lease liability for a specific lease are regarded as a net package (the lease) for the purpose of recognizing deferred tax.

Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the related tax benefit will be realized; such reductions are reversed when the probability of future taxable profits improves.

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

The Group accounts for the tax consequences in the same way that it accounts for the future recovery (settlement) of the carrying amount of assets (liabilities) when assessing deferred tax assets and liabilities as of the end of the reporting period.

Deferred tax assets and liabilities are offset only if there is a legally enforceable right to offset the related current tax liabilities and assets, and they relate to income taxes levied by the same tax authority and they intend to settle current tax liabilities and assets on a net basis. The income tax consequences of dividends are recognized when a liability to pay the dividend is recognized.

(26) Earnings per shared

The Group presents basic and diluted earnings per share ("EPS") data for its ordinary shares. Basic EPS is calculated by dividing the profit or loss attributable to ordinary shareholders of the Group by the weighted average number of ordinary shares outstanding during the period, adjusted for own shares held. Diluted EPS is determined by adjusting the profit or loss attributable to ordinary shareholders and the weighted average number of ordinary shares outstanding, adjusted for own shares held, for the effects of all dilutive potential ordinary shares, which comprise convertible notes and share options granted to employees.

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4. Significant Accounting Policies, Continued

(27) New standards and interpretations not yet adopted

A number of new standards are effective for annual periods beginning after 1 January 2022 and earlier application is permitted; however, the Group has not early adopted the new or amended standards in preparing these consolidated financial statements.

1) Deferred Tax related to Assets and Liabilities arising from a Single Transaction (Amendments to K-IFRS No. 1012)

The amendments narrow the scope of the initial recognition exemption to exclude transactions that give rise to equal and offsetting temporary differences – e.g. leases and decommissioning liabilities. The amendments apply for annual reporting periods beginning on or after 1 January 2023. For leases and decommissioning liabilities, the associated deferred tax asset and liabilities will need to be recognized from the beginning of the earliest comparative period presented, with any cumulative effect recognized as an adjustment to retained earnings or other components of equity at that date. For all other transactions, the amendments apply to transactions that occur after the beginning of the earliest period presented.

2) Classification of Liabilities as Current or Non-Current (Amendments to K-IFRS No. 1001)

The amendments, as issued in 2020, aim to clarify the requirements on determining whether a liability is current or non-current, and apply for annual reporting periods beginning on or after 1 January 2023. However, the IASB has subsequently proposed further amendments to IAS 1 and the deferral of the effective date of the 2020 amendments to no earlier than 1 January 2024. Due to these ongoing developments, the Group is unable to determine the impact of these amendments on the consolidated financial statements in the period of initial application. The Group is closely monitoring the developments.

3) Other standards

The following new and amended standards are not expected to have a significant impact on the Group's consolidated financial statements.

- K-IFRS No. 1117 Insurance Contracts and amendments to K-IFRS No. 1117 Insurance Contracts.
- Disclosure of Accounting Policies (Amendments to K-IFRS No.1001).
- Definition of Accounting Estimates (Amendments to K-IFRS No. 1008).

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5. Financial risk management

(1) Financial risk factors

The finance department of the Group organizes access to domestic and international financial markets and monitors and manages financial risks related to the Group's operations through an internal risk report that analyzes the extent and magnitude of each risk. These risks include market risk (including foreign exchange risk and interest rate risk), credit risk and liquidity risk.

(i) Market risk

(a) Foreign exchange risk

The Group's foreign exchange risk arises when future forecast transactions and recognized assets and liabilities are denominated in a currency other than the functional currency, and the major foreign currencies for which the exchange position occurs are USD, EUR, JPY, THB and CNY.

The Group selects the foreign exchange risk management policy of each Group by considering the nature of the business and the existence of measures to cope with the exchange rate fluctuation risk of each Group being connected. In addition, the Group regularly evaluates, manages and reports the risks of foreign exchange exposure, using the foreign exchange risk management model, so that the maximum amount of loss for foreign exchange risk exposure is within the allowable range. The Group uses derivatives for foreign exchange risk management purposes, if necessary.

The following table shows the sensitivity for each foreign currency on income before income tax, with all other variables held constant as of December 31, 2022 and 2021, when exchange rates change by 1% for the foreign exchange positions held by the Group.

<i>In thousands of won</i>	2022		2021	
	1% increase	1% decrease	1% increase	1% decrease
USD	₩ 3,531,762	(3,531,762)	(4,700,592)	4,700,592
EUR	(2,023,512)	2,023,512	(969,562)	969,562
JPY	69,792	(69,792)	282,017	(282,017)
THB	12,287	(12,287)	-	-
CNY	(3,177,258)	3,177,258	74,269	(74,269)
	₩ (1,586,929)	1,586,929	(5,313,868)	5,313,868

The table above shows the sensitivity analysis performed on monetary assets and liabilities denominated in foreign currencies other than the Group's functional currency. The effect of changes in foreign exchange rates due to the hedging effectiveness of derivative instrument transactions was also considered.

(b) Interest rate risk

Interest rate risk is the risk that future changes in market interest rates will result in changes in interest income and interest costs, such as deposits and borrowing, mainly from deposits and borrowing in variable interest terms.

The goal of the Group's interest rate risk management is to maximize the value of the entity by seeking to minimize the uncertainty of interest rate changes and net interest costs.

As of December 31, 2022, if other variables are constant and interest rates on floating rate borrowing rise (falling) by 1%, the current period net income before corporate tax expense deduction is expected to have decreased (increased) by ₩37,924 million (December 31, 2021: ₩42,340 million).

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5. Financial risk management, Continued

(1) Financial risk factors, continued

(ii) Credit risk

The Group is exposed to credit risk that could result in financial loss to the other party due to the failure of one of the parties to the financial instrument to fulfill its obligations. The management of the Group is dealing with customers whose credit rating is above a certain level in order to manage credit risk. When a contract is made with a new customer, the Group evaluates the customer's creditworthiness by using financial information and information provided by the credit rating agency, and determines the credit limit based on this.

The Group's maximum exposure to credit risk is the carrying amount of all financial assets (excluding equity instruments), which include cash and cash equivalents deposited at financial institutions and trade receivables and other receivables.

As of December 31, 2022, the Group provides payment guarantees to related parties and others, and the maximum amount exposed to credit risk is ₩412,377 million.

(iii) Liquidity risk

The Group constantly monitors liquidity forecasts to ensure that the unused borrowing limit (see Note 55) is maintained at an appropriate level and that it does not violate the borrowing limit or agreement to meet the demand for operating funds. The forecast for liquidity considers those requirements when there are external legislation or legal requirements, such as the Group's financing plans, compliance with agreements, target financial ratios within the Group and restrictions on currencies.

(a) Expected cash flows of non-derivative liabilities by maturity

Maturity of cash flows analysis of non-derivative liabilities according to their remaining maturities as of December 31, 2022 and 2021 are as follows:

In thousands of won

		December 31, 2022			
		Within 1 year	1 to 5 years	Over 5 years	Total
Borrowings(*1)	₩	3,136,135,269	3,834,573,412	614,744,587	7,585,453,268
Trade payables and other payables(*1)		2,389,754,847	42,562,141	-	2,432,316,988
Other financial liabilities(*2)		500,626,517	342,946,382	324,739,398	1,168,312,297
	₩	<u>6,026,516,633</u>	<u>4,220,081,935</u>	<u>939,483,985</u>	<u>11,186,082,553</u>

(*1) Includes projected cash flows of related interest expense.

(*2) Projected cash flows from accrued interest and financial guarantee liabilities are not included.

In thousands of won

		December 31, 2021			
		Within 1 year	1 to 5 years	Over 5 years	Total
Borrowings(*1)	₩	2,700,138,247	2,871,413,833	540,579,027	6,112,131,107
Trade payables and other payables(*1)		2,443,208,483	179,864,370	-	2,623,072,853
Other financial liabilities(*2)		278,924,519	283,818,135	359,727,657	922,470,311
	₩	<u>5,422,271,249</u>	<u>3,335,096,338</u>	<u>900,306,684</u>	<u>9,657,674,271</u>

(*1) Includes projected cash flows of related interest expense.

(*2) Projected cash flows from accrued interest and financial guarantee liabilities are not included.

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5. Financial risk management, Continued

(1) Financial risk factors, continued

(iii) Liquidity risk, continued

(b) Expected cash flows of derivative liabilities by maturity

Expected cash flows of derivative liabilities by maturity as of December 31, 2022 and 2021 are as follows:

In thousands of won

		December 31, 2022			
		Within 1 year	1 to 5 years	Over 5 years	Total
Derivatives liabilities(*1)	₩	(32,947,455)	(5,137,385)	-	(38,084,840)

(*1) Even if derivatives settled gross were classified as assets, expected cash flows are included in the liquidity risk analysis. Derivatives settled on a gross basis whose prices have not yet been determined are reflected in the expected net cash flows.

In thousands of won

		December 31, 2021			
		Within 1 year	1 to 5 years	Over 5 years	Total
Derivatives liabilities(*1)	₩	(7,220,515)	(22,015,787)	-	(29,236,302)

(*1) Even if derivatives settled gross were classified as assets, expected cash flows are included in the liquidity risk analysis. Derivatives settled on a gross basis whose prices have not yet been determined are reflected in the expected net cash flows.

(c) In addition to the above financial liabilities, the Group enters into financial guarantee contracts and fund supplement agreements for related parties and employees. Therefore, additional payment obligations may arise within one year if the related parties and employees provided with the guarantee fail to fulfill their payment obligations, and the maximum amount of the related liquidity risk is ₩412,377 million (December 31, 2021: ₩127,686 million) (see Note 55. (3) and Note 56. (6)).

(2) Capital Risk Management

The Group's capital management objective is to sustain the ability, as a going concern, to consistently deliver profits to shareholders and other stakeholders and to maintain a robust capital structure to reduce the cost of capital. The Group uses the debt-to-equity ratio as an indicator to manage capital. This ratio is calculated by dividing total debt by total equity. Total debt and total equity are presented in the consolidated financial statements as "total liabilities" and "total equity," respectively.

The debt-to-equity ratio of the Group as of December 31, 2022 and 2021 is as follows:

In thousands of won

		December 31, 2022	December 31, 2021
Liabilities (A)	₩	13,934,785,854	11,806,325,075
Equity (B)		9,896,911,559	8,201,247,119
Debt Ratio (A/B)		140.80%	143.96%

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6. Fair value (Non-financial business)

(1) Fair value of financial instruments by category

Fair value and book value of financial instruments by category as of December 31, 2022 and 2021 are as follows:

In thousands of won

	December 31, 2022		December 31, 2021	
	Book value	Fair value(*1)	Book value	Fair value(*1)
Financial assets				
Cash and cash equivalents	₩ 2,548,379,660	2,548,379,660	1,567,162,571	1,567,162,571
FVTPL – income financial assets	94,921,894	94,921,894	33,628,555	33,628,555
FVTOCI – income financial assets	56,660,049	56,660,049	56,186,276	56,186,276
Trade receivables and other receivables	2,202,214,973	2,202,214,973	1,634,597,762	1,634,597,762
Other financial assets				
Derivative assets	166,859,077	166,859,077	34,518,536	34,518,536
Others	473,517,910	473,517,910	404,593,764	404,593,764
	₩ <u>5,542,553,563</u>	<u>5,542,553,563</u>	<u>3,730,687,464</u>	<u>3,730,687,464</u>
Financial liabilities				
Trade payables and other payables	₩ 2,428,183,408	2,428,183,408	2,615,238,754	2,615,238,754
Borrowings	7,208,173,147	7,113,412,485	5,874,826,693	5,871,624,910
Other financial liabilities				
Derivative liabilities	128,774,238	128,774,238	5,282,234	5,282,234
Others	1,042,808,120	1,042,808,120	756,289,629	756,289,629
	₩ <u>10,807,938,913</u>	<u>10,713,178,251</u>	<u>9,251,637,310</u>	<u>9,248,435,527</u>

(*1) The acquisition cost was measured at fair value for trade receivables and other receivables and non-listed shares whose fair value cannot be measured reliably because there is no active trading market or the difference between fair value and acquisition cost is not important.

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6. Fair value (Non-financial business), Continued

(2) Fair value hierarchy

Financial instruments that are measured at fair values are separated by hierarchy level and defined levels are as follows:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs to an asset or liability that are observable either directly (e.g., price) or indirectly (e.g., derived from price), except for the quoted price included in Level 1.
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

Financial instruments that are measured at fair values by hierarchy level as of December 31, 2022 and 2021 are as follows:

In thousands of won

		December 31, 2022			
		Level 1	Level 2	Level 3	Total
Recurring fair value measurements					
FVTPL – income financial assets	₩	-	3,122,362	91,799,532	94,921,894
FVTOCI – income financial assets		42,156,000	-	14,504,049	56,660,049
Derivative assets		-	107,054,078	59,805,000	166,859,078
Derivative liabilities		-	36,479,238	92,295,000	128,774,238
Trade payables and other payables					
- contingent consideration(*1)		-	-	37,406,845	37,406,845

(*1) The Group recognized contingent consideration related to the consideration transferred at fair value when acquiring equity in WOS Inc. for the years ended December 31, 2021 (see Note 55. (7))

In thousands of won

		December 31, 2021			
		Level 1	Level 2	Level 3	Total
Recurring fair value measurements					
FVTPL – income financial assets	₩	3,092,364	2,823,175	27,713,016	33,628,555
FVTOCI – income financial assets		44,680,297	-	11,505,979	56,186,276
Derivative assets		-	34,518,536	-	34,518,536
Derivative liabilities		-	5,282,234	-	5,282,234
Trade payables and other payables					
- contingent consideration(*1)		-	-	37,711,894	37,711,894

(*1) The Group recognized contingent consideration related to the consideration transferred at fair value when acquiring equity in WOS Inc. for the years ended December 31, 2021 (see Note 55. (7))

The fair value hierarchy was not disclosed for account receivables and other receivables whose book value was judged to be a reasonable approximation of fair value.

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6. Fair value (Non-financial business), Continued

(3) Valuation techniques and inputs used in the recurring fair value measurements of financial instruments categorized within Level 2 and Level 3 of the fair value hierarchy are as follows:

- Derivative instruments (currency forward, currency swap, interest rate swap)

Fair value of currency forwards is measured based on forward exchange rate quoted in the current market at the end of the reporting period, which has the same remaining period of derivatives to be measured. If the forward exchange rate, which has the same remaining period of currency forward, is not quoted in the current market, fair value is measured using estimates of similar period of forward exchange rate by applying interpolation method with quoted forward exchange rates. Fair value of currency forward, swap and interest rate swap, which has no quoted forward exchange rate, is measured based on reports received from banks. As the inputs used to measure fair value of derivative instruments are supported by observable market data, such as forward exchange rates, the Group classified the estimates of fair value measurements of the derivative instruments as Level 2 of the fair-value hierarchy.

- Unlisted equity securities

Fair value of unlisted equity securities is measured using discounted cash flow projection and certain assumptions not based on observable market prices or rates, such as sales growth rate, pretax operating income ratio and discount rate based on business plan and circumstance of industry are used to estimate the future cash flow. The weighted-average cost of capital used to discount the future cash flows, is calculated by applying the Capital Asset Pricing Model, using the data of similar listed companies. The Group determines that the effect of estimation and assumptions referred above affecting fair value of unlisted equity securities is significant and classifies fair value measurements of unlisted securities as Level 3 of the fair-value hierarchy.

- Contingent consideration

The fair value of contingent consideration is measured using a cash flow discount model, and some assumptions such as the feasibility of contingent consideration based on business plans and industry conditions and discount rates are used to estimate future cash flows. The discount rate used to discount future cash flows is the interest rate on corporate bonds considering the Group's credit rating and term coefficient. The Group classified the fair value measurement of the contingent consideration as Level 3 in the fair value hierarchy, judging that the effect of the above-mentioned major assumptions and estimates on the fair value of the contingent consideration is significant.

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6. Fair value (Non-financial business), Continued

(3) Valuation techniques and inputs used in the recurring fair value measurements of financial instruments categorized within Level 2 and Level 3 of the fair value hierarchy are as follows, continued:

- Share option agreement between shareholders

The fair value of share option agreement has been evaluated using the binomial model and Monte Carlo simulation method.

The binomial model is an evaluation model that derives the fair value of an option by assuming that the price of the underlying asset follows a binomial distribution. For modelling the binomial model, certain assumptions and estimates, such as volatility and risk-free interest rates, were used that were not based on observable market prices or ratios. The Group has determined that the significant assumptions and estimations mentioned above have a significant impact on the fair value of share option agreement, and has classified the fair value measurement of share option agreement as Level 3 in the fair value hierarchy.

The Monte Carlo simulation method is a way to probabilistically estimate the value of an option by using random numbers and increasing the number of simulations to approach uncertainty. To perform the simulation, some assumptions and estimations that do not rely on observable market prices or ratios, such as volatility and correlation coefficients, are used. The Group has determined that the significant assumptions and estimations mentioned above have a significant impact on the fair value of share option agreement, and has classified the fair value measurement of share option agreement as Level 3 in the fair value hierarchy.

(4) Changes in fair value of financial instruments classified as Level 3 for the years ended December 31, 2022 and 2021 are as follows :

In thousands of won

		December 31, 2022		December 31, 2021	
		Financial assets	Financial liabilities	Financial assets	Financial liabilities
Balance at 1 January	₩	39,218,995	(37,711,894)	16,167,303	-
Acquisition		44,280,730	-	5,801,434	(37,462,772)
Disposal		(1,000,000)	-	(3,292,350)	-
Total gain or loss for the period					
- Gains and losses included in other comprehensive income		(2,128,038)	-	113,629	-
- Gains and losses included in profit or loss		60,613,233	(91,989,951)	2,275,515	(249,122)
Others(*1)		25,123,661	-	18,153,464	-
Balance at 31 December	₩	<u>166,108,581</u>	<u>(129,701,845)</u>	<u>39,218,995</u>	<u>(37,711,894)</u>

(*1) Amounts were transferred from long-term deposits to financial assets measured at FVTPL.

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7. Financial instruments by category (Non-financial business)

(1) Carrying amount of financial instruments by category

(i) Carrying amount of financial assets by category as of December 31, 2022 and 2021 are as follows:

In thousands of won

	December 31, 2022			
	Financial assets at FVTPL	Financial assets at FVTOCI	Financial assets at amortized cost	Total
Current:				
Cash and cash equivalents	₩ -	-	2,548,379,660	2,548,379,660
Trade receivables and other receivables	-	35,557,653	2,160,441,710	2,195,999,363
Other financial assets	40,566,355	-	299,370,880	339,937,235
Non-current:				
FVTPL - financial assets	94,921,894	-	-	94,921,894
FVTOCI - financial assets	-	56,660,049	-	56,660,049
Trade receivables and other receivables	-	-	6,215,610	6,215,610
Other long-term financial assets	126,292,722	-	174,147,030	300,439,752
	₩ 261,780,971	92,217,702	5,188,554,890	5,542,553,563

In thousands of won

	December 31, 2021				
	Financial assets at FVTPL	Financial assets at FVTOCI	Financial assets at amortized cost	Others(*)	Total
Current:					
Cash and cash equivalents	₩ -	-	1,567,162,571	-	1,567,162,571
Trade receivables and other receivables	-	42,013,338	1,589,745,285	-	1,631,758,623
Other financial assets	11,160,984	-	217,415,895	976,286	229,553,165
Non-current:					
FVTPL - financial assets	33,628,555	-	-	-	33,628,555
FVTOCI - financial assets	-	56,186,276	-	-	56,186,276
Trade receivables and other receivables	-	-	2,839,139	-	2,839,139
Other long-term financial assets	22,381,266	-	187,177,869	-	209,559,135
	₩ 67,170,805	98,199,614	3,564,340,759	976,286	3,730,687,464

(*) Includes hedging derivative instruments.

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7. Financial instruments by category (Non-financial business), Continued

(1) Carrying amount of financial instruments by category, continued

(ii) Carrying amounts of financial liabilities by category as of December 31, 2022 and 2021 are as follows:

In thousands of won

		December 31, 2022			
		Financial liabilities FVTPL	Financial liabilities at amortized cost	Others(*1)	Total
Current:					
Trade payables and other payables	₩	-	2,388,214,422	-	2,388,214,422
Short-term borrowings		-	2,991,702,519	11,108,022	3,002,810,541
Other financial liabilities		4,126,699	530,317,950	3,492,201	537,936,850
Non-current:					
Trade payables and other payables		37,406,845	2,562,141	-	39,968,986
Long-term borrowings		-	4,205,362,606	-	4,205,362,606
Other long-term financial liabilities		121,155,338	512,490,170	-	633,645,508
	₩	<u>162,688,882</u>	<u>10,630,649,808</u>	<u>14,600,223</u>	<u>10,807,938,913</u>

(*1) Includes hedging derivative instruments and financial liabilities related to transfer transactions not qualified for derecognition

In thousands of won

		December 31, 2021			
		Financial liabilities FVTPL	Financial liabilities at amortized cost	Others(*1)	Total
Current:					
Trade payables and other payables	₩	4,902,203	2,436,830,547	-	2,441,732,750
Short-term borrowings		-	2,595,932,174	15,202,003	2,611,134,177
Other financial liabilities		4,916,756	287,284,318	8,294	292,209,368
Non-current:					
Trade payables and other payables		32,809,691	140,696,313	-	173,506,004
Long-term borrowings		-	3,263,692,516	-	3,263,692,516
Other long-term financial liabilities		365,478	468,997,017	-	469,362,495
	₩	<u>42,994,128</u>	<u>9,193,432,885</u>	<u>15,210,297</u>	<u>9,251,637,310</u>

(*1) Includes hedging derivative instruments, financial liabilities related to transfer transactions not qualified for derecognition, and financial guarantee liabilities.

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7. Financial instruments by category (Non-financial business), Continued

(2) Net profit or loss of financial instrument by category

Details of net profit or loss of financial instruments by category for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

	2022						Total
	Financial assets at FVTPL	Financial assets at FVTOCI	Financial assets at amortized cost	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Others	
Interest income	₩ -	-	33,047,245	-	-	-	33,047,245
Gain on foreign currency transactions	76,052,508	-	259,799,988	-	32,982,121	-	368,834,617
Gain on foreign currency translation	(2,756,624)	-	143,878,270	-	109,736,304	-	250,857,950
Interest expense	-	-	-	(746,730)	(225,428,960)	-	(226,175,690)
Loss on foreign currency transactions	-	-	(92,773,743)	-	(219,993,220)	-	(312,766,963)
Loss on foreign currency translation	-	-	(257,914,844)	-	(101,546,906)	-	(359,461,750)
Bad debt expense	-	-	(5,236,417)	-	-	-	(5,236,417)
Reversal of bad debt expense	-	-	20,256	-	-	-	20,256
Other bad debt expense	-	-	(1,337,838)	-	-	-	(1,337,838)
Reversal of other bad debt expense	-	-	591	-	-	-	591
Gain on valuation of FVTPL - financial assets	1,568,532	-	-	-	-	-	1,568,532
Loss on valuation of FVTPL - financial assets	(3,123,668)	-	-	-	-	-	(3,123,668)
Loss on disposal of financial instruments	(2,870,106)	(158,473)	-	-	-	-	(3,028,579)
Gain on valuation of derivatives	146,450,457	-	-	-	-	-	146,450,457
Gain on transactions of derivatives	70,120,621	-	-	-	-	-	70,120,621
Loss on valuation of derivatives	(133,797,835)	-	-	-	-	-	(133,797,835)
Loss on transactions of derivatives	(23,316,582)	-	-	-	-	-	(23,316,582)
Dividend income	1,473,443	422,697	-	-	-	-	1,896,140
Gain on valuation of non-controlling interest liability	-	-	-	-	-	777,427	777,427
Profit(loss) before income tax	129,800,746	264,224	79,483,508	(746,730)	(404,250,661)	777,427	(194,671,486)
Other comprehensive income:							-
Gain (loss) on valuation	-	(819,501)	-	-	-	-	(819,501)
Gain (loss) on valuation of derivatives	-	-	-	-	-	4,280,379	4,280,379
Comprehensive income before tax	₩ 129,800,746	(555,277)	79,483,508	(746,730)	(404,250,661)	5,057,806	(191,210,608)

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7. Financial instruments by category (Non-financial business), Continued

(2) Net profit or loss of financial instrument by category, continued

In thousands of won

	2021						
	Financial assets at FVTPL	Financial assets at FVTOCI	Financial assets at amortized cost	Financial liabilities at FVTPL	Financial liabilities at amortized cost	Others	Total
Interest income	₩ -	-	18,506,377	-	-	-	18,506,377
Gain on foreign currency transactions	20,327	-	112,218,095	-	6,479,939	(672)	118,717,689
Gain on foreign currency translation	56,717	-	125,370,664	-	6,498,088	-	131,925,469
Interest expense	(249,122)	-	-	(249,122)	(146,859,359)	(190,225)	(147,547,828)
Loss on foreign currency transactions	(451,517)	-	(12,971,705)	-	(104,545,364)	109	(117,968,477)
Loss on foreign currency translation	(45,492)	-	(3,344,696)	-	(217,496,194)	-	(220,886,382)
Bad debt expense	-	-	(12,160,799)	-	-	-	(12,160,799)
Other bad debt expense	-	-	(1,014,830)	-	-	-	(1,014,830)
Reversal of bad debt expense	-	-	16,445	-	-	-	16,445
Gain on valuation of FVTPL - financial assets	1,900,613	-	-	-	-	-	1,900,613
Loss on valuation of FVTPL - financial assets	(15,225)	-	-	-	-	-	(15,225)
Loss on disposal of FVTPL- financial assets	(123,756)	-	-	-	-	-	(123,756)
Loss on disposal of trade receivables	-	(558,112)	(1,537)	-	-	-	(559,649)
Gain on valuation of derivatives	95,787,657	-	-	-	-	2,730,000	98,517,657
Gain on transactions of derivatives	26,960,678	-	-	-	-	-	26,960,678
Loss on valuation of derivatives	(4,166,071)	-	-	-	-	-	(4,166,071)
Loss on transactions of derivatives	(49,791,172)	-	-	-	-	-	(49,791,172)
Dividend income	900,774	894,471	-	-	-	-	1,795,245
Profit(loss) before income tax	<u>70,784,411</u>	<u>336,359</u>	<u>226,618,014</u>	<u>(249,122)</u>	<u>(455,922,890)</u>	<u>2,539,212</u>	<u>(155,894,016)</u>
Other comprehensive income:							
Gain (loss) on valuation	-	6,429,490	-	-	-	-	6,429,490
Gain (loss) on valuation of derivatives	-	-	-	-	-	534,566	534,566
Comprehensive income before tax	<u>₩ 70,784,411</u>	<u>6,765,849</u>	<u>226,618,014</u>	<u>(249,122)</u>	<u>(455,922,890)</u>	<u>3,073,778</u>	<u>(148,929,960)</u>

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8. Transfers of financial assets (Non-financial business)

The Group transfers financial assets that are not derecognized in their entirety and counterparties of the related liabilities have recourse for the transferred assets.

All of the transferred financial assets as of December 31, 2022, are recognized as trade receivables and the related liabilities are accounted for as short-term borrowings. The carrying amounts and the fair value of transferred trade receivables and related liabilities as of December 31, 2022 and 2021 are ₩11,108 million and ₩15,202 million and the net position is nil.

9. Cash and cash equivalents (Non-financial business)

Restricted cash and cash equivalents provided as collateral for borrowings and others as of December 31, 2022 and 2021 are ₩110,993 million and ₩7,014 million(see Note 55).

10. Trade receivables and other receivables (Non-financial business)

(1) Trade receivables and other receivables as of December 31, 2022 and 2021 are as follows:

In thousands of won

	December 31, 2022		December 31, 2021	
	Current	Non-current	Current	Non-current
Trade receivables	₩ 2,237,507,925	2,011,337	1,723,616,713	2,875,372
Allowances for doubtful accounts	(182,039,132)	-	(181,088,186)	(12,081)
Less : present value discount	(9,647)	(48,289)	(9,647)	(57,937)
	<u>2,055,459,146</u>	<u>1,963,048</u>	<u>1,542,518,880</u>	<u>2,805,354</u>
Other receivables	142,887,169	6,019,869	90,610,016	1,861,598
Allowances for doubtful accounts	(2,346,952)	(1,416,140)	(1,370,273)	(1,416,140)
Less : present value discount	-	(351,167)	-	(411,673)
	<u>140,540,217</u>	<u>4,252,562</u>	<u>89,239,743</u>	<u>33,785</u>
	<u>₩ 2,195,999,363</u>	<u>6,215,610</u>	<u>1,631,758,623</u>	<u>2,839,139</u>

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10. Trade receivables and other receivables (Non-financial business), Continued

(2) The aging analysis of trade receivables and other receivables as of December 31, 2022 and 2021 are as follows:

In thousands of won

	December 31, 2022		December 31, 2021	
	Trade receivables	Other receivables	Trade receivables	Other receivables
Receivables not past due(*1): ₩	1,812,448,512	68,716,196	1,282,750,767	45,065,999
Past due but not impaired:				
Less than 3 months	177,865,916	58,573,920	172,838,933	27,834,229
Less than 6 months	29,826,565	2,723,399	33,608,293	1,524,847
Less than 1 year	35,785,798	2,791,603	32,874,964	6,685,078
Over 1 year	144,684,552	13,375,555	185,940,594	7,240,904
	<u>388,162,831</u>	<u>77,464,477</u>	<u>425,262,784</u>	<u>43,285,058</u>
Impaired(*1):				
Less than 3 months	126,333	-	353,352	738,411
Less than 6 months	781,428	34,000	2,730	-
Less than 1 year	2,356,672	155,577	50,782	-
Over 1 year	35,643,486	2,536,788	18,071,670	3,382,146
	<u>38,907,919</u>	<u>2,726,365</u>	<u>18,478,534</u>	<u>4,120,557</u>
Total(*2)	<u>₩ 2,239,519,262</u>	<u>148,907,038</u>	<u>1,726,492,085</u>	<u>92,471,614</u>

(*1) The above classification of non-impaired and impaired receivables is the result of the individual assessment.

(*2) The total amount of trade receivables and other receivables before deducting the present value discount.

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10. Trade receivables and other receivables (Non-financial business), Continued

(3) Credit risk and Loss allowance

(i) Changes in allowance for doubtful accounts for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

		2022		
		Non-impaired receivables	Impaired receivables	Total
Balance at 1 January, 2022	₩	162,723,560	21,163,120	183,886,680
Write-offs		(1,706,518)	(412,113)	(2,118,631)
Changes by increases or collecting of receivables		(13,245,615)	19,524,020	6,278,405
		(3,492,035)	(30,247)	(3,522,282)
		688	704,861	705,549
Changes in exchange rates and others		572,503	-	572,503
				-
Balance at 31 December, 2022(*1)	₩	144,852,583	40,949,641	185,802,224

(*1) As of December 31, 2022, the Group applies the practical expedient of K-IFRS 1109 and measures loss allowance of trade and other accounts receivable at lifetime expected credit losses.

In thousands of won

		2021		
		Non-impaired receivables	Impaired receivables	Total
Balance at 1 January, 2021	₩	145,314,694	17,483,666	162,798,360
Write-offs		(1,636,221)	(151,641)	(1,787,862)
Changes by increases or collecting of receivables		7,477,100	3,880,646	11,357,746
Changes in exchange rates and others		11,567,987	(49,551)	11,518,436
				-
Balance at 31 December, 2021(*1)	₩	162,723,560	21,163,120	183,886,680

(*1) As of December 31, 2021, the Group applies the practical expedient of K-IFRS 1109 and measures loss allowance of trade and other accounts receivable at lifetime expected credit losses.

(ii) Amounts recognized in profit or loss as Loss Allowances for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

		2022	2021
Loss Allowances			
Changes in allowances for impairment	₩	6,278,405	11,357,746

(4) Trade receivables and other receivables are provided as collateral for borrowings as of December 31, 2022 (see Note 55).

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11. Other financial assets (Non-financial business)

(1) Other financial assets as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	December 31, 2022		December 31, 2021	
	Current	Non-current	Current	Non-current
Financial instruments(*1)	₩ 183,509,250	9,706,507	202,991,330	9,922,440
Loans	7,726,797	23,583,249	5,037,381	17,946,978
Deposits	22,945,539	137,436,232	6,631,894	159,308,451
Accrued revenue	83,807,392	-	2,581,368	-
Derivative assets	40,566,355	126,292,722	12,137,270	22,381,266
Lease receivables	1,381,902	-	173,922	-
others	-	3,421,042	-	-
	₩ 339,937,235	300,439,752	229,553,165	209,559,135

(*1) As of December 31, 2022 other financial assets of ₩139,848 million(2021:₩194,064 million) are restricted to be used.

(2) Derivatives

The Group entered into currency forwards, cross currency swaps and other contracts to hedge exchange rate risk of trade receivables denominated in foreign currencies. In addition, it includes shareholder options agreements concluded with investors when selling shares held by the Group. Derivatives as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	December 31, 2022		December 31, 2021	
	Assets	Liabilities	Assets	Liabilities
Trading:				
Currency forwards	₩ 40,216,198	19,270,068	374,967	3,173,717
Currency swaps	62,500,704	9,716,969	32,763,854	2,108,517
Interest swaps	350,157	-	403,429	-
	103,067,059	28,987,037	33,542,250	5,282,234
Share option agreement				
Other derivatives(*1)	59,805,000	96,295,000	-	-
Fair value hedge				
Currency forwards	-	3,492,201	-	-
Cash flow hedge:				
Currency swaps	-	-	976,286	-
Interest swaps	3,987,018	-	-	-
	3,987,018	-	976,286	-
	₩ 166,859,077	128,774,238	34,518,536	5,282,234

(*1) It is the fair value of the option contract between shareholders entered into with the investor when the Group sells its share.

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11. Other financial assets (Non-financial business), Continued

(3) Impairment of other financial assets

For the purpose of impairment testing, government bonds and unsecured corporate bonds are considered to have low credit risk because the counterparty's credit rating is at least BBB-rated. Therefore, for the purpose of impairment testing for these financial assets, the allowance for losses was measured at the amount equivalent to the expected 12-month credit loss. Loans and leasehold deposits that are acquired before the initial application date of the related-party loans and lease deposits are measured at the initial date of application of K-IFRS 1109 to the extent that the credit risk has increased significantly after the initial recognition. For-sale financial assets are measured at the amount corresponding to the expected credit loss over the period until the financial assets are disposed of. Management is also considering the future outlook of the industry to which the issuer of the financial asset belongs when determining the expected credit loss through past experience of default, the financial condition of the counterparty, as well as reports from economists or financial analysts. There are no changes of estimates or assumptions used to estimate the allowance for losses on these financial assets for the years ended December 31, 2022.

(4) Other financial assets are provided as collateral for borrowings as of December 31, 2022 (see Note 55).

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12. Other assets (Non-financial business)

Other assets as of December 31, 2022 and 2021 are as follows:

In thousands of won

	December 31, 2022		December 31, 2021	
	Current	Non-current	Current	Non-current
Advance payments	₩ 277,110,223	72,668,756	281,034,363	4,048,924
Allowances for impairment	(115,810,128)	-	(118,886,654)	-
Prepaid expenses	59,115,232	3,603,342	41,274,482	3,858,302
Emission rights(*1)	2,994,038	-	4,229,097	-
Refundable assets(*2)	72,445	-	90,064	-
Contract assets	62,643,122	-	35,456,239	-
Prepaid construction cost	797,539	-	6,046,697	-
Prepaid value-added tax and others	86,748,559	24,373,550	82,064,972	28,030,731
	₩ <u>373,671,030</u>	<u>100,645,648</u>	<u>331,309,260</u>	<u>35,937,957</u>

(*1) Non-current emission rights are classified as intangible assets (see Note 18).

(*2) If the customer exercises the right to return the product under K-IFRS 1115, the Group includes a refund asset related to the right to collect the product from the customer (see Note 24.(2)).

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13. Inventories (Non-financial business)

(1) Inventories as of December 31, 2022 and 2021 are as follows:

	<i>In thousands of won</i>	December 31, 2022			December 31, 2021		
		Acquisition cost	Valuation reserve	Book value	Acquisition cost	Valuation reserve	Book value
Merchandise	₩	287,574,005	(7,229,408)	280,344,597	298,204,318	(3,006,926)	295,197,392
Finished goods		1,132,312,261	(35,373,715)	1,096,938,546	769,652,070	(20,264,981)	749,387,089
Half-finished goods		83,136,159	(823,472)	82,312,687	66,009,457	(9,406,743)	56,602,714
Work in process		585,559,206	-	585,559,206	271,274,490	-	271,274,490
Raw materials		443,206,632	(8,757,241)	434,449,391	425,476,561	(13,462,912)	412,013,649
Supplies		94,208,685	-	94,208,685	75,920,273	-	75,920,273
Goods in transit		486,294,720	-	486,294,720	371,106,750	-	371,106,750
	₩	<u>3,112,291,668</u>	<u>(52,183,836)</u>	<u>3,060,107,832</u>	<u>2,277,643,919</u>	<u>(46,141,562)</u>	<u>2,231,502,357</u>

(2) The loss on valuation of inventories included in cost of sales in the consolidated statement of comprehensive income for the year ended December 31, 2022, amounts to ₩52,184 million (December 31, 2021: ₩46,142 million).

(3) Borrowing costs capitalized as inventories are ₩2,554 million and the weighted-average capitalization rates of interest applied are 5.19% to 5.30%.

(4) Inventories are provided as collateral for borrowings as of December 31, 2022 (see Note 55).

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14. Fair value financial assets (Non-financial business)

(1) Fair value financial assets as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Profit or loss		
Equity securities		
Listed securities	₩ -	3,092,364
Unlisted securities	81,802,930	30,187,925
Beneficiary securities	12,674,938	-
Debt securities	444,026	348,266
	<u>94,921,894</u>	<u>33,628,555</u>
Other Comprehensive Income(*1)		
Equity securities		
Listed securities	42,156,000	44,680,297
Unlisted securities	14,504,049	11,505,979
	<u>56,660,049</u>	<u>56,186,276</u>
	<u>₩ 151,581,943</u>	<u>89,814,831</u>

(*1) The Group has employed an irrevocable option, designating equity instrument for the purpose of strategic investment, not for trading, as financial assets at FVTOCI.

(2) Changes in Fair value financial assets for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Balance at 1 January	₩ 89,814,831	53,319,368
Acquisition	89,250,599	14,823,854
Disposal	(1,644,575)	(193,503,979)
Valuation-FVTOCI	(819,501)	6,429,490
Valuation-FVTPL	(1,555,136)	1,885,388
Others(*1)	(23,464,275)	206,860,710
Balance at 31 December	<u>₩ 151,581,943</u>	<u>89,814,831</u>

(*1) Includes effects due to changes in scope of consolidation and exchange rate changes and impairment and others.

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15. Investments in associates and joint ventures (Non-financial business)

(1) Investments in associates and joint ventures as of December 31, 2022 and 2021 are as follows:

In thousands of won

Investees	Location	Closing Month	Main business	Ownership (%)	
				December 31, 2022	December 31, 2021
Associates:					
Smile Ventures Co., Ltd.(*4, 7)	Republic of Korea	December	Wholesale and retail	17.69%	17.69%
H2 Co., Ltd(*1, 4, 7)	Republic of Korea	December	ESS manufacturing and sales	12.38%	14.26%
HANWHA Eagles Professional Baseball Club	Republic of Korea	December	Sports club operating	50.00%	50.00%
Eagles Energy Co., Ltd.	Republic of Korea	December	Photovoltaic business	49.09%	49.09%
DaNAgreen Co.,Ltd.(*3, 4)	Republic of Korea	December	Biological research and development business	3.76%	-
Envisioning Climate Solutions Fund(*8)	Republic of Korea	December	Fund	-	22.49%
HANWHA FUND INVESTMENT 1 HO	Republic of Korea	December	Fund	20.00%	20.00%
Hanwha Impact Corporation	Republic of Korea	December	Manufacture of basic compound of petrochemicals	47.93%	47.93%
Hanwha Connect Co., Ltd.(formerly, Hanwha Station Development Co., Ltd.)	Republic of Korea	December	Rent business	48.32%	48.32%
Hanwha Hotels and Resort Co., Ltd.(*2)	Republic of Korea	December	Tourism and Lodge Industry	49.65%	47.98%
Ampcera Inc(*3, 4)	USA	December	Battery parts manufacturing	9.73%	-
Crystal Solar Inc.	USA	December	Solar Engineering	29.09%	29.09%
Finless Foods Inc.(*4)	USA	December	Manufacture of seafood	11.11%	11.11%
GRANSOLAR ATOTONILCO, S.A. DE C.V.	Mexico	December	Construction Business	20.00%	20.00%
GRANSOLAR OCOTLAN, S.A. DE C.V.	Mexico	December	Construction Business	20.00%	20.00%
International Polymers Company	Saudi Arabia	December	Manufacture of basic compound	25.00%	25.00%
Lancium Technologies Corporation(*4)	Canada	December	Software Development	12.74%	12.74%
Luxbon Solar S.A.(*6)	Luxembourg	December	Photovoltaic business	-	33.33%
REC Silicon ASA(*3)	Norway	December	Polysilicon manufacturing	21.33%	-
Simply Foods Inc.(*4)	USA	December	Cultured meat business	15.59%	15.59%
SwitchDin Pty Limited(*1, 4)	Australia	June	Development of Energy Management System	16.75%	20.16%
Joint ventures:					
Ulsan Complex City Development Co., Ltd.(*9)	Republic of Korea	December	Real estate development and sales	45.00%	45.00%
YEOCHUN NCC Co., Ltd.	Republic of Korea	December	Manufacture of basic compound	50.00%	50.00%
Burdur Enerji A.S.	Turkey	December	Photovoltaic business	50.00%	50.00%
CONIGLIO TAX EQUITY PARTNERSHIP, LLC(*5)	USA	December	Solar photovoltaic power business	67.20%	67.20%

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15. Investments in Associates and Joint Ventures (Non-financial business), Continued

(1) Investments in associates and joint ventures as of December 31, 2022 and 2021 are as follows, continued

In thousands of won

Investees	Location	Closing Month	Main business	Ownership (%)	
				December 31, 2022	December 31, 2021
Joint ventures:					
GK Summit Apollo Eleven(*3)	Japan	December	Other service business	50.00%	-
Gulf Advanced Cables Insulation Company	Saudi Arabia	December	Manufacture of cable	50.00%	50.00%
H Properties TMK(*3)	Japan	December	Other service business	50.00%	0.00%
HSP TW TE, LLC	USA	December	Photovoltaic business	50.00%	50.00%
JV Cooke Solar, LLC	USA	December	Solar photovoltaic power business	33.66%	33.66%
Kellam Tax Equity Partnership, LLC(*5)	USA	December	Solar photovoltaic power business	69.00%	69.00%
Lakeshore East Retail LLC	USA	December	Real estate	50.00%	50.00%
Parcel O LLC	USA	December	Real estate	50.00%	50.00%
Premium Hirafu Properties TMK(*3)	Japan	December	Other service business	50.00%	-
Q&G PV Solutions GmbH	Germany	December	Solar photovoltaic power business	50.00%	50.00%

(*1) The ratio of shareholding of the Group decreased due to an unequal paid-in capital increase for the years ended December 31, 2022.

(*2) The Group additionally acquired residual interests for the year ended December 31, 2022.

(*3) The associates and joint ventures were newly acquired for the year ended December 31, 2022.

(*4) As the Group has judged that it has significant influence as it has the authority to appoint the Board of Directors, it has classified as an investment in associate, etc.

(*5) The partnership contract jointly exercised major management decisions with other shareholders, so it was classified as associates, not subsidiaries.

(*6) The Group has completed the sale of its equity investment for the year ended December 31, 2022.

(*7) The effective share ratio is presented considering preferred shares with voting rights.

(*8) Due to the loss of significant influence, investments in associates has been excluded from the associates and accounted for as FVTPL.

(*9) It has been classified as a joint venture as the board resolution requires attendance and unanimous consent of all directors.

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15. Investments in Associates and Joint Ventures (Non-financial business), Continued

(2) Valuation of investments in associates and joint ventures under the equity method for the years ended December 31, 2022 and 2021 are as follows:

In thousand won

Investees	2022					
	Balance at 1 January 2022	Acquisition (Disposal)	Gain or loss on equity method investments	Other Comprehensive income (loss)	Other(*1)	Balance at 31 December 2022
Associates:						
Smile Ventures Co., Ltd.	₩ 2,949,127	-	(1,226,683)	-	-	1,722,444
H2 Co., Ltd	5,718,533	-	(424,863)	-	1,626,056	6,919,726
HANWHA Eagles Professional Baseball Club	73,161	-	(187,601)	-	114,440	-
Eagles Energy Co., Ltd.	3,296,134	-	419,781	-	-	3,715,915
DaNAgreen Co., Ltd.	-	1,092,624	(54,060)	-	-	1,038,564
Envisioning Climate Solutions Fund	2,179,434	-	-	-	(2,179,434)	-
HANWHA FUND INVESTMENT 1 HO	5,335,468	624,000	(34,957)	-	(1,060,000)	4,864,511
Hanwha Impact Corporation	1,964,247,371	-	51,598,193	118,131,937	5,664,870	2,139,642,371
Hanwha Connect Co., Ltd. (formerly, Hanwha Station Development Co., Ltd.)	78,836,024	-	2,023,635	3,269	(869,110)	79,993,818
Hanwha Hotels and Resort Co., Ltd.	197,349,947	26,658,780	(10,175,897)	959,072	1,908,856	216,700,758
Ampcera Inc	-	10,452,798	-	-	(314,400)	10,138,398
Finless Foods Inc.	23,709,999	-	(2,820,788)	-	1,654,928	22,544,139
International Polymers Company	160,182,101	-	46,461,042	4,393,110	(45,270,371)	165,765,882
Lancium Technologies Corporation	117,998,458	-	1,028,127	-	8,207,321	127,233,906
Luxbon Solar S.A.	8,293,116	(8,583,473)	57,835	232,522	-	-
REC Silicon ASA	-	242,302,249	(32,275,319)	2,907,923	(215,155)	212,719,698
Simply Foods Inc.	17,450,790	-	(2,133,918)	(54,315)	(15,262,557)	-
SwitchDin Pty Limited	3,580,449	-	(49,245)	(63,024)	691,521	4,159,701
	₩ 2,591,200,112	272,546,978	52,205,282	126,510,494	(45,303,035)	2,997,159,831
Joint ventures:						
Ulsan Complex City Development Co., Ltd.	₩ 6,638,844	-	11,678	-	-	6,650,522
YEOCHUN NCC Co., Ltd.	607,639,038	-	(151,210,268)	-	5,012,488	461,441,258
Burdur Enerji A.S.	-	-	-	-	-	-
CONIGLIO TAX EQUITY PARTNERSHIP, LLC	120,177,803	-	(48,713)	-	7,626,095	127,755,185
GK Summit Apollo Eleven	-	3,213,531	(901,494)	41,921	-	2,353,958
Gulf Advanced Cables Insulation Company	-	-	-	(218,510)	218,510	-
H Properties TMK	-	16,519,000	(352,183)	(502,433)	-	15,664,384
HSP TW TE, LLC	966,072	-	6,461	(713,501)	409,950	668,982
JV Cooke Solar, LLC	27,734,206	-	(2,005,438)	-	(8,343,107)	17,385,661
Kellam Tax Equity Partnership, LLC	59,842,114	-	(18,556)	-	3,555,871	63,379,429
Lakeshore East Retail LLC	2,346,784	-	492,554	-	(480,819)	2,358,519
Parcel O LLC	21,798,368	-	-	-	1,504,097	23,302,465
Premium Hirafu Properties TMK	-	28,144,526	(71,233)	(1,068,834)	(572,069)	26,432,390
Q&G PV Solutions GmbH	59,672	-	17,488	382	(2,566)	74,976
	847,202,901	47,877,057	(154,079,704)	(2,460,975)	8,928,450	747,467,729
	₩ 3,438,403,013	320,424,035	(101,874,422)	124,049,519	(36,374,585)	3,744,627,560

(*1) Includes gain on bargain purchase, impairment amount, change in foreign currencies and dividends received.

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15. Investments in Associates and Joint Ventures (Non-financial business), Continued

(2) Valuation of investments in associates and joint ventures under the equity method for the years ended December 31, 2022 and 2021 are as follows, continued

In thousand won

Investees	2021					
	Balance at 1 January 2021	Acquisition (Disposal)	Gain or loss on equity method investments	Other Comprehensive income (loss)	Other(*)	Balance at 31 December 2021
Associates:						
Smile Ventures Co., Ltd.	₩ 2,064,565	-	(1,428,528)	129,307	2,183,783	2,949,127
H2 Co., Ltd	5,440,725	-	(861,014)	-	1,138,822	5,718,533
Hanwha Savings Bank Co., Ltd.	80,184,456	(86,688,214)	5,984,274	519,484	-	-
Hanwha Station Development Co., Ltd.	79,636,109	-	(786,471)	(13,614)	-	78,836,024
HANWHA Eagles Professional Baseball Club	103,962	-	7,157	-	(37,958)	73,161
Envisioning Climate Solutions Fund	-	2,250,000	(70,566)	-	-	2,179,434
HANWHA FUND INVESTMENT 1 HO	-	5,335,468	-	-	-	5,335,468
Hanwha Impact Corporation(formerly, Hanwha General Chemical Co., Ltd.)	1,264,929,026	485,963,518	123,533,162	138,315,532	(48,493,867)	1,964,247,371
HANWHA INVESTMENT AND SECURITIES CO., LTD.	219,740,788	(261,836,236)	13,199,530	28,925,985	(30,067)	-
Hanwha Hotels and Resort Co., Ltd.	191,652,053	25,577,803	(29,504,475)	5,890,756	3,733,810	197,349,947
Finless Foods Inc.	-	23,669,999	-	-	40,000	23,709,999
International Polymers Company	127,940,973	-	55,284,898	12,269,243	(35,313,013)	160,182,101
Lancium Technologies Corporation	-	116,910,000	(567,641)	16,099	1,640,000	117,998,458
Simply Foods Inc.	-	17,521,498	(369,924)	38,216	261,000	17,450,790
SwitchDin Pty Limited	3,945,083	-	(487,776)	27,180	95,962	3,580,449
Others	11,562,830	-	9,332	17,088	-	11,589,250
	₩ 1,987,200,570	328,703,836	163,941,958	186,135,276	(74,781,528)	2,591,200,112
Joint ventures:						
Ulsan Complex City Development Co., Ltd.	₩ -	6,750,000	(111,156)	-	-	6,638,844
YEOCHUN NCC Co., Ltd.	642,503,753	-	132,115,186	-	(166,979,901)	607,639,038
Burdur Enerji A.S.	-	-	-	-	-	-
CONIGLIO TAX EQUITY PARTNERSHIP, LLC	-	145,124,353	(24,075,350)	-	(871,200)	120,177,803
Gulf Advanced Cables Insulation Company	-	9,334,557	-	(1,105)	(9,333,452)	-
HSP TW TE, LLC	4,790,219	-	(6,619,623)	549,995	2,245,481	966,072
JV Cooke Solar, LLC	27,301,379	-	(1,999,529)	-	2,432,356	27,734,206
Kellam Tax Equity Partnership, LLC	4,300,658	55,912,403	(552,001)	-	181,054	59,842,114
Lakeshore East Retail LLC	1,054,625	-	203,905	-	1,088,254	2,346,784
Parcel O LLC	18,012,344	-	-	-	3,786,024	21,798,368
Q&G PV Solutions GmbH	-	68,685	(7,505)	(1,508)	-	59,672
	697,962,978	217,189,998	98,953,927	547,382	(167,451,384)	847,202,901
	₩ 2,685,163,548	545,893,834	262,895,885	186,682,658	(242,232,912)	3,438,403,013

(*) Includes gain on bargain purchase, impairment amount, change in foreign currencies and dividends received.

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15. Investments in Associates and Joint Ventures (Non-financial business), Continued

(3) Summary of financial information of key associates and joint ventures as of December 31, 2022 and 2021 are as follows:

Investees		December 31, 2022					
		Assets	Liabilities	Equity	Revenue	Net income (loss)	Total comprehensive income
<i>In thousand won</i>							
Associates:							
Hanwha Connect Co., Ltd.(formerly, Hanwha Station Development Co., Ltd.)	₩	474,902,075	331,536,813	143,365,262	152,272,589	5,440,588	5,866,518
Hanwha Impact Corporation		6,230,718,245	1,832,255,953	4,398,462,292	2,533,514,474	112,612,552	120,805,209
Hanwha Hotels and Resort Co., Ltd.		2,141,399,385	1,668,823,744	472,575,641	742,854,167	30,093,169	33,274,793
International Polymers Company		990,165,991	334,941,959	655,224,032	647,681,172	218,565,543	234,953,981
REC Silicon ASA		405,355,774	328,826,064	76,529,710	146,212,687	(100,955,231)	(84,903,840)
Joint ventures:							
Ulsan Complex City Development Co., Ltd.	₩	14,794,475	15,538	14,778,937	-	25,950	25,950
YEOCHUN NCC Co., Ltd.		3,163,612,042	2,230,639,007	932,973,035	6,856,875,862	(328,111,530)	(318,086,553)
Gulf Advanced Cables Insulation Company		19,702,375	42,789,883	(23,087,508)	-	(2,130,979)	(3,416,525)
Lakeshore East Retail LLC		60,024,223	42,718,956	17,305,267	8,623,438	1,165,410	1,165,410
Parcel O LLC		54,972,645	7,370,151	47,602,494	-	-	-
		December 31, 2021					
		<i>In thousand won</i>					
Investees		Assets	Liabilities	Equity	Revenue	Net income (loss)	Total comprehensive income
Associates:							
Hanwha Station Development Co., Ltd.	₩	502,639,235	364,201,803	138,437,432	98,778,125	1,384,752	1,356,575
Hanwha Impact Corporation(formerly, Hanwha General Chemical Co., Ltd.)		5,145,008,383	1,118,339,599	4,026,668,784	1,530,751,569	322,846,625	685,101,962
Hanwha Hotels and Resort Co., Ltd.		2,429,645,168	1,985,320,421	444,324,747	567,479,001	(65,107,634)	(42,725,029)
International Polymers Company		983,841,018	349,720,394	634,120,624	513,240,998	233,878,707	282,356,560
Joint ventures:							
Ulsan Complex City Development Co., Ltd.	₩	14,792,125	39,139	14,752,986	-	(247,013)	(247,013)
YEOCHUN NCC Co., Ltd.		3,513,700,342	2,262,640,754	1,251,059,588	6,471,965,147	270,023,447	276,506,283
Gulf Advanced Cables Insulation Company		20,819,531	40,490,515	(19,670,984)	22,991,308	(30,541,088)	(31,370,415)
Lakeshore East Retail LLC		55,371,500	39,826,081	15,545,419	6,647,252	412,730	412,730
Parcel O LLC		49,978,670	5,448,759	44,529,911	-	-	-

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15. Investments in Associates and Joint Ventures (Non-financial business), Continued

(4) Details of financial information of key associates and joint ventures as of December 31, 2022 and 2021 are as follows:

In thousand won

	YEOCHUN NCC Co., Ltd.		Hanwha Impact Corporation	
	December 31, 2022	December 31, 2021	December 31, 2022	December 31, 2021
Cash and cash equivalents	₩ 76,610,045	87,710	606,007,497	414,285,332
Current financial liabilities	742,731,130	400,791,523	202,660,964	76,064,909
Non-current financial liabilities	1,130,857,481	1,155,199,969	493,721,530	341,723,096
Depreciation(*)	184,633,095	181,053,922	33,638,743	31,096,769
Depreciation on right-of-use assets(*)	1,830,752	1,762,755	7,348,021	3,407,583
Amortization of Intangible assets(*)	1,198,438	1,121,739	4,399,339	1,267,273
Interest income	2,788,527	450,027	18,267,346	10,330,124
Interest expense	42,967,296	25,551,977	15,049,981	6,840,342
Income tax expense	(101,169,308)	86,469,876	(12,811,682)	25,478,949

(*) Includes expenses classified as cost of sales and selling expenses.

(5) Dividends received from associates and joint ventures for the years ended December 31, 2022 and 2021 are as follows:

In thousand won

		2022	2021
Associates:			
HANWHA FUND INVESTMENT 1 HO	₩	60,000	-
Hanwha Connect Co., Ltd.(formerly, Hanwha Station Development Co., Ltd.)		949,408	-
International Polymers Company		49,379,195	35,667,505
Joint ventures:			
YEOCHUN NCC Co., Ltd.	₩	-	170,000,000
HSP TW TE, LLC		248,262	286,064
Lakeshore East Retail LLC		645,574	1,144,099
Kellam Tax Equity Partnership, LLC		602,545	-
CONIGLIO TAX EQUITY PARTNERSHIP, LLC		627,981	-

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15. Investments in Associates and Joint Ventures (Non-financial business), Continued

(6) Adjustments from financial information of key associates and joint ventures to book value of investments in associates and joint ventures as of December 31, 2022 and 2021 are as follows:

In thousand won

Investees	December 31, 2022					
	Net assets at year-end (a) (*1)	Group ownership (b)	Interest in net assets(a x b)	Goodwill	Dereconized unrealized gains(losses)	Year-end book value
Associates:						
Hanwha Connect Co., Ltd.(formerly, Hanwha Station Development Co., Ltd.)	₩ 143,365,262	48.32%	69,274,095	464,326	10,255,397	79,993,818
Hanwha Impact Corporation(*1)	4,397,408,393	47.93%	2,107,677,843	18,744,444	13,220,084	2,139,642,371
Hanwha Hotels and Resort Co., Ltd.(*1)	469,507,013	49.65%	233,102,164	19,304,060	(35,705,466)	216,700,758
International Polymers Company	655,224,032	25.00%	163,806,008	1,795,924	163,950	165,765,882
REC Silicon ASA	76,529,710	21.33%	16,326,338	48,635,474	147,757,886	212,719,698
Joint ventures:						
Ulsan Complex City Development Co., Ltd.	₩ 14,778,937	45.00%	6,650,522	-	-	6,650,522
YEOCHUN NCC Co., Ltd.	932,973,035	50.00%	466,486,518	-	(5,045,260)	461,441,258
Gulf Advanced Cables Insulation Company	(23,087,508)	50.00%	(11,543,754)	-	11,543,754	-
Lakeshore East Retail LLC	17,305,267	50.00%	8,652,634	-	(6,294,115)	2,358,519
Parcel O LLC	47,602,494	50.00%	23,801,247	-	(498,782)	23,302,465

(*1) Associates prepare their consolidated financial statements, in which their stated net assets refer to equity attributable to owners of the Group.

In thousand won

Investees	December 31, 2021					
	Net assets at year-end (a) (*1)	Group ownership (b)	Interest in net assets(a x b)	Goodwill	Dereconized unrealized gains(losses)	Year-end book value
Associates:						
Hanwha Station Development Co., Ltd.	₩ 138,437,432	48.32%	66,886,610	464,326	11,485,088	78,836,024
Hanwha Impact Corporation(formerly, Hanwha General Chemical Co., Ltd.)(*1)	4,026,184,568	47.93%	1,929,825,622	18,744,444	15,677,305	1,964,247,371
Hanwha Hotels and Resort Co., Ltd.(*1)	437,849,411	47.98%	210,064,110	353,401	(13,067,564)	197,349,947
International Polymers Company	634,120,624	25.00%	158,530,156	1,795,924	(143,979)	160,182,101
Joint ventures:						
Ulsan Complex City Development Co., Ltd.	₩ 14,752,986	45.00%	6,638,844	-	-	6,638,844
YEOCHUN NCC Co., Ltd.	1,251,059,588	50.00%	625,529,794	-	(17,890,756)	607,639,038
Gulf Advanced Cables Insulation Company	(19,670,984)	50.00%	(9,835,492)	-	9,835,492	-
Lakeshore East Retail LLC	15,545,419	50.00%	7,772,709	-	(5,425,925)	2,346,784
Parcel O LLC	44,529,911	50.00%	22,264,956	-	(466,588)	21,798,368

(*1) Associates prepare their consolidated financial statements, in which their stated net assets refer to equity attributable to owners of the Group.

(7) Changes in unrecognized accumulated equity amounts due to the termination of applying equity method on December 31, 2022 are as follows:

In thousand won

Investees	Uncorrected loss	
	Accrued amount	Accumulated amount
HANWHA Eagles Professional Baseball Club	₩ (35,520)	(35,520)
Burdur Enerji A.S.	(329,550)	(3,997,657)
Gulf Advanced Cables Insulation Company	(1,708,262)	(13,011,751)

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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16. Investment property (Non-financial business)

(1) Investment properties as of December 31, 2022 and 2021 are as follows:

In thousands won

	December 31, 2022			December 31, 2021		
	Acquisition cost	Accumulated depreciation (*1)	Book value	Acquisition cost	Accumulated depreciation (*1)	Book value
Land	₩ 139,510,227	-	139,510,227	151,400,197	-	151,400,197
Buildings	81,135,360	(21,667,553)	59,467,807	79,695,636	(19,509,737)	60,185,899
Structures	1,531,000	(746,203)	784,797	1,472,741	(631,199)	841,542
	<u>₩ 222,176,587</u>	<u>(22,413,756)</u>	<u>199,762,831</u>	<u>232,568,574</u>	<u>(20,140,936)</u>	<u>212,427,638</u>

(*1) Includes accumulated impairment losses.

(2) Changes in investment property for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

		2022			
		Land	Buildings	Structures	Total
Balance at 1 January 2022	₩	151,400,197	60,185,899	841,542	212,427,638
Changes in scope of consolidation		37,125	112,347	-	149,472
Transfer		(12,447,593)	-	-	(12,447,593)
Depreciation		-	(1,892,710)	(97,814)	(1,990,524)
Changes in exchange rates		520,498	1,062,271	41,069	1,623,838
Balance at 31 December 2022	₩	<u>139,510,227</u>	<u>59,467,807</u>	<u>784,797</u>	<u>199,762,831</u>

In thousands of won

		2021			
		Land	Buildings	Structures	Total
Balance at 1 January 2021	₩	85,286,851	56,018,841	881,128	142,186,820
Acquisition		-	11,476,572	-	11,476,572
Transfer		73,224,448	(6,049,689)	-	67,174,759
disposal		(353,749)	-	-	(353,749)
Depreciation		-	(2,060,441)	(90,008)	(2,150,449)
Classified as held-for-sale current assets		(7,377,750)	-	-	(7,377,750)
Changes in exchange rates		620,397	800,616	50,422	1,471,435
Balance at 31 December 2021	₩	<u>151,400,197</u>	<u>60,185,899</u>	<u>841,542</u>	<u>212,427,638</u>

(3) The Group assessed the difference between fair value and carrying amounts of investment property as ₩339,000 million as of December 31, 2022.

(4) The rental income and rental cost from investment properties for the years ended December 31, 2022 are ₩6,109 million and ₩4,897 million (December 31, 2021: ₩5,882 million and ₩5,179 million), respectively.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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17. Property, Plant and Equipment (Non-financial business)

(1) Property, Plant and Equipment as of December 31, 2022 and 2021 are as follows:

In thousands won

	December 31, 2022			December 31, 2021		
	Acquisition cost	Accumulated depreciation(*1)	Book value	Acquisition cost	Accumulated depreciation(*1)	Book value
Land	₩ 1,746,014,933	(392,276)	1,745,622,657	1,589,979,838	(389,704)	1,589,590,134
Buildings	2,117,643,969	(827,981,700)	1,289,662,269	1,983,054,650	(726,043,090)	1,257,011,560
Structures	554,391,718	(260,026,642)	294,365,076	505,306,564	(214,646,612)	290,659,952
Machineries	6,910,953,945	(4,074,671,095)	2,836,282,850	6,763,698,044	(3,989,353,931)	2,774,344,113
Vehicles	49,068,583	(44,897,277)	4,171,306	47,211,457	(41,704,012)	5,507,445
Tools and equipment	518,850,572	(370,921,191)	147,929,381	440,825,009	(325,601,063)	115,223,946
Others	15,843,501	(3,859,259)	11,984,242	931,820	(484,371)	447,449
Construction in progress	546,155,723	(321,453)	545,834,270	419,173,468	(661,057)	418,512,411
Machinery in transit	3,599,466	-	3,599,466	302,062	-	302,062
	₩ <u>12,462,522,410</u>	<u>(5,583,070,893)</u>	<u>6,879,451,517</u>	<u>11,750,482,912</u>	<u>(5,298,883,840)</u>	<u>6,451,599,072</u>

(*1) Includes accumulated impairment losses and government grants.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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For the years ended December, 2022 and 2021

17. Property, Plant and Equipment (Non-financial business), Continued

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

In thousands of won

	2022									
	Land	Buildings	Structures	Machineries	Vehicles	Tools and equipment	Other property, plant and equipment	Construction in progress	Machinery in transit	Total
Balance at 1 January 2022	₩ 1,589,590,134	1,257,011,560	290,659,952	2,774,344,113	5,507,445	115,223,946	447,449	418,512,411	302,062	6,451,599,072
Acquisition	35,425,951	58,102,281	9,339,155	95,663,558	954,380	11,599,174	11,832,023	684,583,122	10,248,077	917,747,721
Changes in scope of consolidation	154,026,380	19,554,363	6,773,555	4,896,750	362,239	2,436,504	606,354	18,092,136	-	206,748,281
Transfers	276,285	39,088,442	10,169,874	391,988,863	697,285	67,737,472	401,151	(562,484,884)	(6,950,021)	(59,075,533)
Disposal	(1,088,409)	(2,075,543)	(196,759)	(14,443,348)	(64,958)	(5,805,194)	-	(3,285,151)	-	(26,959,362)
Depreciation	-	(85,822,221)	(22,125,605)	(412,797,377)	(3,304,316)	(45,760,728)	(672,679)	-	-	(570,482,926)
Impairment loss(*1)	-	(333,732)	(238,933)	(20,350,048)	-	(673,288)	-	(14,929,121)	-	(36,525,122)
Classified as held-for-sale current assets	(33,303,886)	(3,950,121)	-	-	-	-	-	-	-	(37,254,007)
Changes in exchange rates	384,756	8,045,550	(16,163)	8,153,901	19,231	1,584,548	(630,056)	5,345,757	(652)	22,886,872
Effect of restatement in accordance with K-IFRS No. 1029 (*2)	311,446	41,690	-	8,826,438	-	1,586,947	-	-	-	10,766,521
Balance at 31 December 2022	₩ 1,745,622,657	1,289,662,269	294,365,076	2,836,282,850	4,171,306	147,929,381	11,984,242	545,834,270	3,599,466	6,879,451,517

(*1) The Group recognized the unrecoverable amount as an impairment loss with regard to the photovoltaic and other operating units.

(*2) This is the effect of applying an accounting policy of hyperinflation in Turkey.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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For the years ended December, 2022 and 2021

17. Property, Plant and Equipment (Non-financial business), Continued

(2) Changes in property, plant and equipment for the years ended December 31, 2022 and 2021 are as follows, continued

In thousands of won

	2021									
	Land	Buildings	Structures	Machineries	Vehicles	Tools and equipment	Other property, plant and equipment	Construction in progress	Machinery in transit	Total
Balance at 1 January 2021	₩ 1,691,586,372	1,197,957,940	240,179,560	2,692,911,799	7,961,285	92,639,846	248,880	492,410,874	588,862	6,416,485,418
Acquisition	1,065,008	29,401,344	52,100	96,927,309	347,495	8,678,582	-	688,862,048	5,063,859	830,397,745
Changes in scope of consolidation	2,599,034	1,871,918	405,608	3,120,363	24,003	1,398,247	-	6,060,691	-	15,479,864
Transfers	(104,464,543)	118,848,252	67,221,145	486,661,253	1,087,907	48,082,956	286,707	(766,628,643)	(5,350,985)	(154,255,951)
Disposal	(1,508,885)	(8,418,926)	(285,777)	(12,274,750)	(35,657)	(1,559,814)	(11,849)	-	-	(24,095,658)
Depreciation	-	(76,985,333)	(19,113,226)	(424,447,032)	(3,963,805)	(35,863,592)	(95,848)	-	-	(560,468,836)
Impairment loss(*1)	-	(1,231,485)	(19,793)	(148,058,705)	(4,964)	(383,150)	-	-	-	(149,698,097)
Classified as held-for-sale current assets	-	(28,986,571)	-	-	-	-	-	(13,995,142)	-	(42,981,713)
Changes in exchange rates	313,148	24,554,421	2,220,335	79,503,876	91,181	2,230,871	19,559	11,802,583	326	120,736,300
Balance at 31 December 2021	₩ 1,589,590,134	1,257,011,560	290,659,952	2,774,344,113	5,507,445	115,223,946	447,449	418,512,411	302,062	6,451,599,072

(*1) The Group recognized the unrecoverable amount as an impairment loss with regard to the photovoltaic and other operating units.

(3) Capital borrowing costs are ₩8,632 million and ₩5,153 million for the years ended December 31, 2022 and 2021, respectively, and the weighted-average capitalization rates of interest for the years ended December 31, 2022 and 2021, are 2.45% to 3.05% and 1.86% to 1.89%, respectively.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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For the years ended December, 2022 and 2021

17. Property, Plant and Equipment (Non-financial business), Continued

(4) Property, Line items which include depreciation expenses of property, plant and equipment for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousand won</i>	<u>2022</u>	<u>2021</u>
Manufacturing cost and others	₩ 479,459,589	482,948,253
Selling and administrative expenses(*1)	<u>91,023,337</u>	<u>77,520,583</u>
	<u>₩ 570,482,926</u>	<u>560,468,836</u>

(*1) Includes amounts allocated to ordinary research and development expense.

(5) Property, plant and equipment are provided as collateral for borrowings as of December 31, 2022 (see Note 55).

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

18. Intangible Assets (Non-financial business)

(1) Intangible Assets as of December 31, 2022 and 2021 are as follows:

In thousands won

	December 31, 2022			December 31, 2021		
	Acquisition cost	Accumulated depreciation(*1)	Book value	Acquisition cost	Accumulated depreciation(*1)	Book value
Goodwill	₩ 1,262,216,454	(53,830,514)	1,208,385,940	1,213,691,509	(50,268,994)	1,163,422,515
Industrial property rights	67,657,626	(19,169,457)	48,488,169	40,146,873	(27,862,482)	12,284,391
Development costs	94,325,421	(82,392,609)	11,932,812	97,516,020	(71,260,145)	26,255,875
Membership	18,547,007	(1,604,467)	16,942,540	38,716,798	(1,446,808)	37,269,990
Prospecting rights/Development rights	145,592	-	145,592	104,031	-	104,031
Emission rights	-	-	-	76,764	-	76,764
Other intangible assets	474,146,800	(115,604,230)	358,542,570	416,414,089	(75,260,794)	341,153,295
	₩ 1,917,038,900	(272,601,277)	1,644,437,623	1,806,666,084	(226,099,223)	1,580,566,861

(*1) Includes accumulated impairment losses.

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Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

18. Intangible Asset (Non-financial business), Continued

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

In thousands of won

		2022							Total
		Goodwill	Industrial property rights	Development costs	Membership	Prospecting rights/ Development rights	Emission rights	Other intangible assets	
Balance at 1 January 2022	₩	1,163,422,515	12,284,391	26,255,875	37,269,990	104,031	76,764	341,153,295	1,580,566,861
Changes in scope of consolidation		67,678,968	19,177,259	(2,268,346)	(22,055,365)	(189,384)	-	2,731,388	65,074,520
Acquisition		-	10,524,388	1,599,499	2,105,600	233,633	71,989	(3,220,859)	11,314,250
Transfers		(627,711)	9,407,880	-	(220,750)	-	(122,290)	40,503,337	48,940,466
Disposal		(5,096,022)	(11,806)	(1,047,542)	(358)	-	(26,463)	(357,947)	(6,540,138)
Amortization		-	(2,090,650)	(13,630,585)	(156,603)	-	-	(21,879,091)	(37,756,929)
Impairment loss(*1)		(25,475,405)	-	-	-	-	-	(970,478)	(26,445,883)
Changes in exchange rates		8,483,595	(803,293)	1,023,911	26	(2,688)	-	575,282	9,276,833
Effect of restatement in accordance with K-IFRS No. 1029 (*2)		-	-	-	-	-	-	7,643	7,643
Balance at 30 December 2022	₩	<u>1,208,385,940</u>	<u>48,488,169</u>	<u>11,932,812</u>	<u>16,942,540</u>	<u>145,592</u>	<u>-</u>	<u>358,542,570</u>	<u>1,644,437,623</u>

(*1) Impairment losses were recognized for the year ended December 31, 2022 in the cash-generating units of the FM division and the Hydrogen tank business division.

(*2) This is the effect of applying an accounting policy of hyperinflation in Turkey .

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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18. Intangible Asset (Non-financial business), Continued

(2) Changes in intangible assets for the years ended December 31, 2022 and 2021 are as follows, continued

In thousands of won

		2021							Total
		Goodwill	Industrial property rights	Development costs	Membership	Prospecting rights/ Development rights	Emission rights	Other intangible assets	
Balance at 1 January 2021	₩	293,079,750	13,065,614	33,191,948	36,409,915	-	-	38,103,642	413,850,869
Changes in scope of consolidation		876,923,716	4,601	6,287,281	-	-	-	299,199,861	1,182,415,459
Acquisition		-	1,649,549	-	4,053,276	104,877	224,293	3,849,546	9,881,541
Transfers		-	817,577	-	975,895	-	-	16,573,875	18,367,347
Disposal		-	(1,400,597)	-	(3,998,573)	-	(147,529)	(2,691)	(5,549,390)
Amortization		-	(1,961,411)	(13,366,904)	(180,637)	-	-	(15,581,749)	(31,090,701)
Impairment loss		(9,802,246)	-	-	-	-	-	(27,057)	(9,829,303)
Changes in exchange rates		8,383,455	109,058	143,550	10,114	(846)	-	(962,132)	7,683,199
other(*1)		(5,162,160)	-	-	-	-	-	-	(5,162,160)
Balance at 30 December 2021	₩	<u>1,163,422,515</u>	<u>12,284,391</u>	<u>26,255,875</u>	<u>37,269,990</u>	<u>104,031</u>	<u>76,764</u>	<u>341,153,295</u>	<u>1,580,566,861</u>

(*1) The goodwill was adjusted for the year ended December 31, 2021 through the subsequent measurement of net assets in subsidiaries acquired for the year ended December 31, 2020.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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18. Intangible Assets (Non-financial business), Continued

(3) Emission rights

1) The quantity of free allocation emission rights for the 3rd planned period (2021-2025) is as follows:

<i>In quantity in tCO2-eq</i>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>Total</u>
Free Allocation Emission Rights	2,584,299	2,584,299	2,584,299	2,560,095	2,560,095	12,873,087

2) Changes in emission rights and emission liabilities for the years ended December 31, 2022 and 2021 are as follows:

i) Emission rights

<i>In thousands of won, quantity in tCO2-eq</i>	<u>2022</u>		<u>2021</u>	
	<u>Quantity</u>	<u>Amount(*1)</u>	<u>Quantity</u>	<u>Amount(*2)</u>
Balance at 1 January	122,674	₩ 4,305,860	198,329	₩ 4,441,305
Increase	131,098	1,888,940	571	7,802
Decrease	<u>(26,080)</u>	<u>(3,200,762)</u>	<u>(76,226)</u>	<u>(143,247)</u>
Balance at 31 December	<u>227,692</u>	<u>₩ 2,994,038</u>	<u>122,674</u>	<u>₩ 4,305,860</u>

(*1) All amounts are classified as other current assets.

(*2) The amount includes ₩4,229,097 thousand in emission rights classified as current assets.

ii) Emission liabilities

<i>In thousands of won, quantity in tCO2-eq</i>	<u>2022</u>		<u>2021</u>	
	<u>Quantity</u>	<u>Amount</u>	<u>Quantity</u>	<u>Amount</u>
Balance at 1 January	-	₩ -	-	₩ -
Increase	127,637	442,704	154,677	2,444,139
Decrease	<u>(127,637)</u>	<u>(442,704)</u>	<u>(154,677)</u>	<u>(2,444,139)</u>
Balance at 31 December	<u>-</u>	<u>₩ -</u>	<u>-</u>	<u>₩ -</u>

(4) Capital borrowing costs are ₩175 million and ₩75 million for the years ended December 31, 2022 and 2021, respectively, and the weighted-average capitalization rates of interest for the years ended December 31, 2022 and 2021, are 2.45% and 1.89%, respectively.

(5) Intangible assets are provided as collateral for borrowings as of December 31, 2022 (see Note 55).

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18. Intangible Assets (Non-financial business), Continued

(6) Goodwill Impairment

1) Goodwill is monitored by the management at the operating segment level (cash-generating units or group of cash-generating units). The following is a summary of goodwill allocation of each operating segment:

<i>In thousand won</i>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Hanwha Q CELLS Co., Ltd.	₩	213,843,297	246,142,018
Hanwha Q CELLS Americas Holdings. Corp.		93,051,810	787,357
Hanwha AZDEL, Inc.		27,151,811	25,399,252
FM business division		-	8,967,569
WOS Inc.		44,357,205	44,357,205
Q Energy Mediterranee		800,855,637	794,489,076
Others		29,126,180	43,280,038
	₩	<u>1,208,385,940</u>	<u>1,163,422,515</u>

2) The recoverable amounts of all cash generating units (groups) have been determined based on value-in-use calculations which are estimated on financial budgets approved by management covering a five-year period or net fair value which is the price in an active market less disposal cost. All assumptions related to the calculations are as follows:

	<u>FM business division</u>	<u>Hydrogen tank business division</u>	<u>Hanwha Q CELLS Co., Ltd.</u>	<u>Q Energy Mediterranee</u>	<u>WOS Inc.</u>
Profit to turnover ratio(*1)	3.30%	-	5.60%	15.10%	51.63%
Growth of sales ratio(*2)	0.50%	-	0.00%	1.00%	0.00%
Discount ratio(*3)	11.40%	-	12.30%	7.30%	16.77%

(*1) The average profit to turnover ratio in order to predict the cash flow in the future

(*2) The average growth of annual sales in order to predict the cash flow in the future

(*3) The discount rate reflecting specific risks associated with the CGU and country

3) It has been determined that the entire impairment loss should be recognized for the cash-generating units (CGUs) of the hydrogen tank business division and the FM business division in the chemical sector, as the book values of these CGUs exceed their recoverable amounts in the impairment test related to the business unit. As of the end of the current period, it is believed that the book values of the cash-generating units (CGUs) excluding the hydrogen tank business division and the FM business division will not exceed their recoverable amounts.

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19. Lease (Non-financial business)

(1) Changes in right-of-use assets for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

		2022							
		Land	Buildings	Structures	Machineries	Vehicles	Tools and equipment	Others	Total
Balance at 1 January 2022	₩	29,409,630	313,906,149	6,515,360	18,644,520	7,287,137	116,263	5,216,470	381,095,529
Changes in scope of consolidation		742,927	36,394,427	-	-	227,499	1	(476,519)	36,888,335
Increase		1,070,005	52,531,565	1,757,802	66,417	6,956,973	32,729	3,575,899	65,991,390
Decrease		(812,336)	(13,550,013)	(505,569)	-	(852,770)	-	(1,047,906)	(16,768,594)
Depreciation		(1,731,276)	(47,773,638)	(2,684,208)	(3,878,855)	(4,998,546)	(64,416)	(2,965,328)	(64,096,267)
Changes in exchange rates		(500,694)	1,363,375	(138)	1,355,712	149,633	8,606	433,657	2,810,151
Balance at 31 December 2022	₩	<u>28,178,256</u>	<u>342,871,865</u>	<u>5,083,247</u>	<u>16,187,794</u>	<u>8,769,926</u>	<u>93,183</u>	<u>4,736,273</u>	<u>405,920,544</u>

In thousands of won

		2021							
		Land	Buildings	Structures	Machineries	Vehicles	Tools and equipment	Others	Total
Balance at 1 January 2021	₩	39,580,726	231,155,649	8,768,990	20,367,304	5,729,931	105,456	4,006,322	309,714,378
Changes in scope of consolidation		8,953	(1,729,346)	-	-	594,519	13,035	-	(1,112,839)
Increase		411,093	198,235,902	530,323	286,170	6,450,029	41,815	8,920,147	214,875,479
Decrease		(16,449)	(85,577,328)	(15,189)	(286,171)	(782,082)	(878)	(4,060,275)	(90,738,372)
Depreciation		(1,574,021)	(38,401,430)	(2,772,548)	(3,424,073)	(4,810,457)	(52,663)	(3,679,261)	(54,714,453)
Amortization		(1,403,395)	9,313,123	-	-	-	-	-	7,909,728
Classified as held-for-sale current assets		(10,990,233)	-	-	-	-	-	-	(10,990,233)
Changes in exchange rates		3,392,956	909,579	3,784	1,701,290	105,197	9,498	29,537	6,151,841
Balance at 31 December 2021	₩	<u>29,409,630</u>	<u>313,906,149</u>	<u>6,515,360</u>	<u>18,644,520</u>	<u>7,287,137</u>	<u>116,263</u>	<u>5,216,470</u>	<u>381,095,529</u>

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19. Lease (Non-financial business), Continued

(2) Profit and expenses recognized for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Depreciation of right-of-use asset	₩ 64,096,267	54,714,453
Interest expense of lease liabilities	27,412,614	24,334,805
Expenses of short term lease	3,308,293	1,977,845
Expenses of leases of low value asset	2,651,806	2,045,811
Expenses of variable lease payments not included in lease liabilities measures	13,136,700	11,049,376
Profit from sub-lease contract	5,480,198	1,914,338

Total cash outflows for lease contract for the year ended December 31, 2022 are ₩116,252 million (2021: ₩97,702 million).

(3) Lease liabilities as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Less than 1 year	₩ 84,465,460	87,452,539
Over 1 year and less than 5 year	248,232,885	270,806,196
Over 5 year	346,135,162	346,064,199
	<u>678,833,507</u>	<u>704,322,934</u>
Less: present value discount	<u>(163,625,523)</u>	<u>(185,325,057)</u>
Present value of lease liabilities	<u>₩ 515,207,984</u>	<u>518,997,877</u>

(4) The classification of liquidity of lease liabilities as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Current liabilities	₩ 81,156,299	83,754,576
Non-Current liabilities	434,051,685	435,243,301
	<u>₩ 515,207,984</u>	<u>518,997,877</u>

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20. Assets classified as held for sale (Non-financial business)

Assets classified as held for sale as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	December 31, 2022(*1)	December 31, 2021(*2,3)
Investment property	₩ -	7,377,750
Property, plant and equipment		
land	33,303,886	-
Buildings	3,950,121	30,440,302
Construction in progress	-	14,697,025
Right-of-use assets	-	11,541,413
Others	-	1,828,897
	<u>₩ 37,254,007</u>	<u>65,885,387</u>

(*1) During the current year, the Group has classified land and certain assets in 6 blocks of the Yeosu National Industrial Complex expansion site as non-current assets held for sale based on a decision made by the board of directors to sell the assets to HANWHA CORP.

(*2) In the prior year, as part of the land disposal plan to Anseong Techno Valley, some of the land being held by Hanwha Solutions Corporation were classified as non-current assets held for sale according to a board resolution on May 11, 2021. However, due to delays in the planned sale, the land disposal plan to Anseong Techno Valley was cancelled, and the ownership of the land was transferred to Anseong Techno Logistics Co., Ltd. through a contribution in kind during the current year.

(*3) During the prior year, the management has approved a plan to sell property, plant and equipment and intangible assets held by Hanwha Q CELLS (Nantong) Co., Ltd. to the local government, and during the current year, the Group has received ₩59,570,606 thousands as proceeds from the sale.

21. Trade payables and other payables (Non-financial business)

Trade payables and other payables as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	December 31, 2022		December 31, 2021	
	<u>Current</u>	<u>Non-current</u>	<u>Current</u>	<u>Non-current</u>
Trade payables	₩ 1,831,922,117	-	1,808,982,601	-
Other payables	<u>556,292,305</u>	<u>39,968,986</u>	<u>632,750,149</u>	<u>173,506,004</u>
	<u>₩ 2,388,214,422</u>	<u>39,968,986</u>	<u>2,441,732,750</u>	<u>173,506,004</u>

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22. Borrowings (Non-financial business)

(1) Borrowings as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	December 31, 2022		December 31, 2021	
	Current	Non-current	Current	Non-current
Borrowings from financial institutions	₩ 2,443,017,668	2,158,055,158	2,003,958,181	1,615,033,333
Debentures	559,792,873	2,047,307,448	607,175,996	1,648,659,183
	₩ <u>3,002,810,541</u>	<u>4,205,362,606</u>	<u>2,611,134,177</u>	<u>3,263,692,516</u>

(2) Borrowings from financial institutions as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	Financial Institutions	December 31, 2022	December 31, 2021
Borrowings in local currency	KDB and others	₩ 2,852,901,219	2,428,742,893
Borrowings in foreign currency	Korea Exim Bank and others	1,737,063,585	1,175,046,618
Loans on trade receivables collateral(*1)	Woori Bank and others	11,108,022	15,202,003
		<u>4,601,072,826</u>	<u>3,618,991,514</u>
Less: Reclassification of current portion		<u>(2,443,017,668)</u>	<u>(2,003,958,181)</u>
		₩ <u>2,158,055,158</u>	<u>1,615,033,333</u>

(*1) The Group discounted trade receivables through factoring agreements with banks, which were accounted for as secured borrowings. Under the terms of the agreements, the Group is contractually obligated to make payments in the event of default by customers (see Note 8).

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22. Borrowings (Non-financial business), Continued

(3) Debentures as of December 31, 2022 and 2021 are as follows:

In thousands of won

Issuing Company	Classification	Maturity date	Interest rate (%)	December 31, 2022	December 31, 2021
Hanwha Solutions Corporation	254-2 th public bonds	2023.11.29	2.50 ₩	90,000,000	90,000,000
Hanwha Solutions Corporation	255 th public bonds	2024.01.31	2.31	150,000,000	150,000,000
Hanwha Solutions Corporation	256 th FRN	-	-	-	237,100,000
Hanwha Solutions Corporation	257 th FRN	-	-	-	59,275,000
Hanwha Solutions Corporation	258 th FRN	-	-	-	59,275,000
Hanwha Solutions Corporation	259 th FRN	-	-	-	59,275,000
Hanwha Solutions Corporation	260-1 th public bonds	-	-	-	110,000,000
Hanwha Solutions Corporation	260-2 th public bonds	2024.10.24	1.98	80,000,000	80,000,000
Hanwha Solutions Corporation	260-3 th public bonds	2026.10.24	2.28	60,000,000	60,000,000
Hanwha Solutions Corporation	269-1 th public bonds	2023.01.20	1.83	140,000,000	140,000,000
Hanwha Solutions Corporation	269-2 th public bonds	2025.01.22	2.04	140,000,000	140,000,000
Hanwha Solutions Corporation	270 th public bonds	2023.04.21	2.38	210,000,000	210,000,000
Hanwha Solutions Corporation	271 th privately placed bonds	2023.06.30	2.63	40,000,000	40,000,000
Hanwha Solutions Corporation	273 th FRN	-	-	-	35,565,000
Hanwha Solutions Corporation	274 th public bonds	2024.04.19	3.00	181,440,000	186,260,000
Hanwha Solutions Corporation	275-1 th public bonds	2024.06.17	1.70	70,000,000	70,000,000
Hanwha Solutions Corporation	275-2 th public bonds	2026.06.17	2.06	30,000,000	30,000,000
Hanwha Solutions Corporation	276 th FRN	2026.10.07	3M EL+1.20	135,120,000	134,234,000
Hanwha Solutions Corporation	277 th FRN	2024.11.23	3ML+1.04	126,730,000	118,550,000
Hanwha Solutions Corporation	278 th FRN	2024.12.30	3ML+0.81	88,711,000	82,985,000
Hanwha Solutions Corporation	279-1 th public bonds	2025.01.24	2.77	275,000,000	-
Hanwha Solutions Corporation	279-2 th public bonds	2027.01.22	3.03	105,000,000	-
Hanwha Solutions Corporation	280 th FRN	2025.03.31	3M Term SOFR+1.50	63,365,000	-
Hanwha Solutions Corporation	281 st FRN	2025.05.07	3M Term SOFR+1.42	101,384,000	-
Hanwha Solutions Corporation	282 nd FRN	2025.05.13	3M Term SOFR+1.50	63,365,000	-
Hanwha Solutions Corporation	283 th privately placed bonds	2025.10.14	3M Term SOFR+1.13	126,730,000	-
Hanwha Solutions Corporation	284 th privately placed bonds	2025.10.17	3M Term SOFR+1.18	63,365,000	-
Hanwha Solutions Corporation	285-1 th public	2024.10.25	6.04	100,000,000	-
Hanwha Solutions Corporation	285-2 th public	2025.10.27	6.18	50,000,000	-
Hanwha Q CELLS Co., Ltd.	FRN	-	-	-	47,420,000
HHR Development B GK	Privately placed bonds	2026.12.31	3.70	2,039,805	-
Hanwha Q CELLS Investment Co., Ltd.	1st privately placed bonds	2023.06.16	1.70	80,003,872	79,993,420
Hanwha Q CELLS Malaysia Sdn. Bhd.	1st public bonds	2024.08.30	3.05	42,735,091	42,199,484
				<u>2,614,988,768</u>	<u>2,262,131,904</u>
Less: Discount on debentures				(7,888,447)	(6,296,725)
Less: Current portion of debentures				(559,792,873)	(607,175,996)
				<u>₩ 2,047,307,448</u>	<u>1,648,659,183</u>

(4) Some of the Group's borrowings and debentures include acceleration clause in the event of reasons such as a drop in credit ratings.

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23. Other financial liabilities (Non-financial business)

Other financial liabilities as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	December 31, 2022		December 31, 2021	
	Current	Non-current	Current	Non-current
Derivatives liabilities	₩ 7,618,900	121,155,338	4,916,756	365,478
Lease liabilities	81,156,299	434,051,685	83,754,576	435,243,301
Deposits	107,284,472	19,068,683	10,676,090	2,040,688
Accrued expense	341,877,179	52,967,534	192,853,652	24,634,161
Financial guarantee liabilities(*1)	-	-	8,294	-
Non-controlling interests	-	6,402,268	-	7,078,867
	₩ <u>537,936,850</u>	<u>633,645,508</u>	<u>292,209,368</u>	<u>469,362,495</u>

(*1) The Group provides payment guarantees to related parties as of December 31, 2022 (see Note 56).

24. Other liabilities (Non-financial business)

(1) Other liabilities as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	December 31, 2022		December 31, 2021	
	Current	Non-current	Current	Non-current
Advances from customers	₩ 14,410,271	964,156	3,295,099	3,216,769
Withholdings	15,326,081	-	11,995,089	-
Value-added tax payables	35,161,356	-	40,305,228	-
Unearned revenues	61,900,338	2,826,734	2,880,450	2,663,194
Refund liabilities	1,352,275	-	1,457,361	-
Contract liabilities	317,912,313	18,621,457	236,644,449	-
	₩ <u>446,062,634</u>	<u>22,412,347</u>	<u>296,577,676</u>	<u>5,879,963</u>

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24. Other liabilities (Non-financial business), Continued

(2) Contract asset and contract liability as of December 31, 2022 and 2021 are as follows:

(i) Contract assets and liabilities regarding from contracts with customers as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Refund asset		
Right to retrieve refunded inventories	₩ 72,445	90,064
Refund liability		
Refund liability	₩ 1,352,275	1,457,361
Contract asset		
Amount due from customers for contract work	₩ 62,643,122	35,456,239
Prepaid construction costs		
Prepaid construction costs	₩ 797,539	6,046,697
Contract liability		
Customer loyalty	₩ 39,541,070	32,599,312
Amount due to customers for contract work	39,967,677	29,314,971
Advances from customers	255,581,767	173,324,865
Unearned revenue	1,443,256	1,405,301
	₩ <u>336,533,770</u>	<u>236,644,449</u>

(ii) Details of effects on current and future profit or loss and changes in contract assets and liabilities of changes in estimated gross contract revenue and costs of in-progress solar power plant construction contracts as of December 31, 2022, are as follows:

<i>In thousands of won</i>	Changes in estimated gross contract revenue	Changes in estimated gross contract costs	Effects on current profit or loss	Effects on future profit or loss	Changes in contract assets	Changes in contract liabilities
Domestic construction	₩ 4,631,646	3,926,707	485,537	219,402	1,065,712	(580,175)
Overseas construction	3,685,918	(63,797)	3,652,802	96,913	3,632,172	20,630
	₩ <u>8,317,564</u>	<u>3,862,910</u>	<u>4,138,339</u>	<u>316,315</u>	<u>4,697,884</u>	<u>(559,545)</u>

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25. Net defined benefit liabilities (Non-financial business)

(1) Net defined benefit liabilities as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Present value of defined benefit obligation	₩	581,162,368	606,683,560
Fair value of plan assets		<u>(183,982,054)</u>	<u>(151,460,551)</u>
Net defined benefit liabilities	₩	<u>397,180,314</u>	<u>455,223,009</u>

(2) Changes in the present value of defined benefit obligation for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		<u>2022</u>	<u>2021</u>
Balance at 1 January	₩	606,683,560	583,397,134
Current service cost		73,090,635	73,163,227
Interest expense		21,567,833	17,728,171
Remeasurements(*)		(73,087,831)	(27,653,071)
Benefits paid		(51,992,187)	(40,084,102)
Changes in scope of consolidation		4,747,900	544,080
Changes in exchange rates		<u>152,458</u>	<u>(411,879)</u>
Balance at 31 December	₩	<u>581,162,368</u>	<u>606,683,560</u>

(*) Remeasurement of defined benefit obligation is as follows:

<i>In thousand won</i>		<u>2022</u>	<u>2021</u>
Actuarial losses (gains) due to empirical adjustments	₩	22,802,311	(26,170,223)
Actuarial (gains) losses arising from demographic assumptions		15,221,652	(1,197,616)
Actuarial losses (gains) due to changes in financial assumptions		<u>(111,111,794)</u>	<u>(285,232)</u>
	₩	<u>(73,087,831)</u>	<u>(27,653,071)</u>

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

<i>In thousand won</i>		<u>2022</u>	<u>2021</u>
Balance at 1 January	₩	151,460,551	136,831,995
Interest income		2,337,428	4,035,174
Remeasurements		(2,055,840)	(1,714,280)
Contributions by the employer		43,429,866	21,372,635
Benefits paid		(11,930,416)	(9,917,076)
Changes in scope of consolidation		-	(121,945)
Changes in exchange rates		<u>740,465</u>	<u>974,048</u>
Balance at 31 December	₩	<u>183,982,054</u>	<u>151,460,551</u>

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25. Net defined benefit liabilities (Non-financial business), Continued

(4) Plan assets as of December 31, 2022 and 2021 are as follows:

<i>In thousand won</i>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Equity instruments	₩	4,648,259	1,462,299
Debt instruments		7,230,625	12,396,643
Principal guaranteed financial instruments		168,138,985	136,077,870
Others		3,964,185	1,523,739
	₩	<u>183,982,054</u>	<u>151,460,551</u>

(5) Expenses recognized in the consolidated statements of comprehensive income for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousand won</i>		<u>2022</u>	<u>2021</u>
Current service cost	₩	73,090,635	73,163,227
Net interest cost		19,230,405	13,692,997
Others		(558,353)	-
	₩	<u>91,762,687</u>	<u>86,856,224</u>

Retirement benefits of ₩685 million and ₩952 million were transferred to construction in progress under property, plant and equipment for the years ended December 31, 2022 and 2021.

(6) Key actuarial assumptions as of December 31, 2022 and 2021 are as follows:

	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Discount rate	2.75 ~ 6.71%	2.48 ~ 3.91%
Expected salary growth rate	2.98 ~ 4.76%	2.85 ~ 4.92%

(7) Key actuarial assumptions for the years ended December 31, 2022 are as follows:

	<u>Change in assumption</u>	<u>Increase in assumption</u>	<u>Decrease in assumption</u>
Discount rate	1.00%	5.29% Decrease	6.12% Increase
Expected salary growth rate	1.00%	6.46% Increase	5.41% Decrease

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26. Provisions (Non-financial business)

(1) Provisions as of December 31, 2022 and 2021 are as follows:

In thousand won

	December 31, 2022		December 31, 2021	
	Current	Non-current	Current	Non-current
Construction warranties	₩ 13,321	3,067,396	-	1,688,409
Provision for restoration	-	3,211,755	-	2,563,434
Provision for litigation	-	-	2,444,000	-
Product warranties	43,213,108	117,092,912	49,507,449	101,789,702
Others	4,608,125	4,136,643	2,506,660	6,151,153
	₩ 47,834,554	127,508,706	54,458,109	112,192,698

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

In thousands of won

		2022					
		Construction warranties	Provision for restoration	Provision for litigation	Product warranties	Others	Total
Balance at 1 January 2022	₩	1,688,409	2,563,434	2,444,000	151,297,151	8,657,813	166,650,807
Established		1,699,120	79,321	6,022	33,469,122	3,017,723	38,271,308
Used		(43,000)	-	-	(25,121,617)	(1,334,294)	(26,498,911)
Reversal		(257,128)	-	(2,450,022)	(49,467)	(955,187)	(3,711,804)
Changes in exchange rates and others		(6,684)	569,000	-	710,831	(641,287)	631,860
Balance at 31 December 2022	₩	3,080,717	3,211,755	-	160,306,020	8,744,768	175,343,260
Current	₩	13,321	-	-	43,213,108	4,608,125	47,834,554
Non-current		3,067,396	3,211,755	-	117,092,912	4,136,643	127,508,706

In thousands of won

		2021					
		Construction warranties	Provision for restoration	Provision for litigation	Product warranties	Others	Total
Balance at 1 January 2021	₩	1,523,610	2,108,400	2,444,000	136,229,845	15,611,046	157,916,901
Established		655,447	455,034	-	16,283,361	5,081,012	22,474,854
Used		(39,507)	-	-	(7,553,502)	(9,500,000)	(17,093,009)
Reversal		(465,989)	-	-	(346,734)	(2,250,304)	(3,063,027)
Changes in exchange rates and others		14,848	-	-	6,684,181	(283,941)	6,415,088
Balance at 31 December 2021	₩	1,688,409	2,563,434	2,444,000	151,297,151	8,657,813	166,650,807
Current	₩	-	-	2,444,000	49,507,449	2,506,660	54,458,109
Non-current		1,688,409	2,563,434	-	101,789,702	6,151,153	112,192,698

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27. Financial instruments by category (Financial business)

(1) Details of financial assets held by the Group as of December 31, 2022 and 2021 are as follows:

In thousand won

		December 31, 2022		
	Financial assets at amortized cost	Financial assets at FVTPL	Financial assets at FVTOCI	Total
Cash and cash equivalents	₩ 67,788,637	-	-	67,788,637
Securities	-	170,808,507	1,492,153	172,300,660
Loan receivables and others	1,225,921,497	-	-	1,225,921,497
Other financial assets	134,640,830	-	-	134,640,830
Deposit	128,495,091	-	-	128,495,091
Others	6,145,739	-	-	6,145,739
	<u>₩ 1,428,350,964</u>	<u>170,808,507</u>	<u>1,492,153</u>	<u>1,600,651,624</u>

In thousand won

		December 31, 2021		
	Financial assets at amortized cost	Financial assets at FVTPL	Financial assets at FVTOCI	Total
Cash and cash equivalents	₩ 84,367,727	-	-	84,367,727
Securities	-	96,183,772	1,492,153	97,675,925
Loan receivables and others	1,099,170,123	-	-	1,099,170,123
Other financial assets	117,153,454	-	-	117,153,454
Deposit	114,422,945	-	-	114,422,945
Others	2,730,509	-	-	2,730,509
	<u>₩ 1,300,691,304</u>	<u>96,183,772</u>	<u>1,492,153</u>	<u>1,398,367,229</u>

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27. Financial instruments by category (Financial business), Continued

(2) Details of financial liabilities held by the Group as of December 31, 2022 and 2021 are as follows:

In thousand won

		December 31, 2022			
		Financial liabilities at FVTPL	Derivatives for hedge	Financial liabilities at amortized cost	Total
Deposit liabilities	₩	-	-	1,409,686,760	1,409,686,760
Other financial liabilities		-	-	23,948,102	23,948,102
accrued expenses		-	-	21,300,934	21,300,934
amount payable		-	-	2,466,764	2,466,764
lease liabilities		-	-	180,404	180,404
	₩	-	-	1,433,634,862	1,433,634,862

In thousand won

		December 31, 2021			
		Financial liabilities at FVTPL	Derivatives for hedge	Financial liabilities at amortized cost	Total
Deposit liabilities	₩	-	-	1,224,148,714	1,224,148,714
Other financial liabilities		-	-	15,818,977	15,818,977
accrued expenses		-	-	13,986,697	13,986,697
amount payable		-	-	1,218,907	1,218,907
lease liabilities		-	-	613,373	613,373
	₩	-	-	1,239,967,691	1,239,967,691

28. Cash and cash equivalents and deposit (Financial business)

(1) Details of cash and cash equivalents and deposit as of December 31, 2022 and 2021 are as follows:

In thousands of won

		December 31, 2022	December 31, 2021
Cash and cash equivalents			
Cash and demand deposit	₩	67,788,637	84,367,727
Deposit			
Deposit		128,495,091	114,422,945
	₩	196,283,728	198,790,672

(2) Deposit, which are restricted in use, as of December 31, 2022 and 2021 are as follows:

In thousands of won	Financial institution	December 31, 2022	December 31, 2021	Reason
Deposit	Korea Federation of Savings Banks and others	₩ 53,495,091	49,422,945	Reserve assets and financial business collateral

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29. Fair Value Financial Assets (Financial business)

Fair value financial assets as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Financial assets at FVTPL		
Equity securities		
Securities	₩ 37,043,819	32,108,799
Beneficiary securities	99,346,854	46,697,492
Debt securities	17,376,960	-
Other securities	15,697,207	9,639,465
financial derivatives	1,343,667	7,738,016
	<u>170,808,507</u>	<u>96,183,772</u>
Financial assets at FVTOCI		
Debt securities		
Debentures	1,492,154	1,492,154
	<u>1,492,154</u>	<u>1,492,154</u>
	₩ <u>172,300,661</u>	<u>97,675,926</u>

30. Loan receivables and other receivables (Financial business)

(1) Details of loan receivables and other receivables as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Deposit-backed loan	₩ 190,400	132,050
Securities-secured loan	132,464,155	175,654,966
Real estate mortgage	461,830,080	432,723,917
Credit loan	649,731,646	508,078,857
Others	1,351,093	1,212,249
	<u>1,245,567,374</u>	<u>1,117,802,039</u>
Income from deferred loan	(2,022,426)	(1,566,253)
Present value discount	154,926	(136,087)
Allowances for doubtful accounts	₩ (17,778,377)	(16,929,576)
	<u>1,225,921,497</u>	<u>1,099,170,123</u>

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30. Loan receivables and other receivables (Financial business), Continued

(2) The details of loan receivables that are impaired or overdue as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Loan receivables not past due:	₩ 1,198,794,949	1,092,170,988
Past due but not impaired:		
Less than 1 months	7,397,364	462,113
Less than 2 months	10,141,336	-
Less than 3 months	1,142,227	-
Over 3 months	-	-
	<u>18,680,927</u>	<u>462,113</u>
Impaired	<u>28,091,498</u>	<u>25,168,938</u>
	₩ <u>1,245,567,374</u>	<u>1,117,802,039</u>

(*) Classified based on the principal of loan receivables.

31. Other financial assets (Financial business)

(1) Other financial assets as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Deposit	₩ 128,495,091	114,422,945
Other receivables	4,933	9,292
Accrued revenue	6,270,031	2,773,564
Allowances for doubtful accounts	<u>(129,225)</u>	<u>(52,347)</u>
	₩ <u>134,640,830</u>	<u>117,153,454</u>

(2) Changes in other financial assets for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Balance at 1 January	₩ 52,347	-
Changes in scope of consolidation	-	55,096
Net transfer	<u>76,878</u>	<u>(2,749)</u>
Balance at 31 December	₩ <u>129,225</u>	<u>52,347</u>

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32. Derivative financial instruments (Financial business)

Derivative financial instruments as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	December 31, 2022		December 31, 2021	
	Asset	Liability	Asset	Liability
Currency swaps	₩ 1,343,667	-	-	-
Other derivative assets	-	-	7,738,016	-
	₩ 1,343,667	-	7,738,016	-

33. Other Assets (Financial business)

Other assets as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	December 31, 2022	December 31, 2021
Prepaid expenses	₩ 71,963	45,742
Advance payments	122,126	65,574
Domestic exchange	9,871,180	1,950,608
Deposits	2,216,840	1,968,040
Others	608,792	14,844
	₩ 12,890,901	4,044,808

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34. Property, Plant and Equipment (Financial business)

(1) Property, Plant and Equipment as of December 31, 2022 and 2021 are as follows:

		December 31, 2022			December 31, 2021		
		Acquisition cost	Accumulated depreciation	Book value	Acquisition cost	Accumulated depreciation	Book value
<i>In thousands won</i>							
Land	₩	1,177,413	-	1,177,413	1,177,413	-	1,177,413
Buildings		3,107,096	(1,446,220)	1,660,876	3,107,097	(1,363,590)	1,743,507
Tools and equipment		1,224,740	(626,059)	598,681	636,852	(458,381)	178,471
Others		1,142,367	(881,679)	260,688	1,010,281	(745,942)	264,339
	₩	<u>6,651,616</u>	<u>(2,953,958)</u>	<u>3,697,658</u>	<u>5,931,643</u>	<u>(2,567,913)</u>	<u>3,363,730</u>

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

		2022				
		Land	Buildings	Tools and equipment	Others	Total
<i>In thousands of won</i>						
Balance at 1 January, 2022	₩	1,177,413	1,743,507	178,471	264,339	3,363,730
Acquisition		-	-	587,888	132,085	719,973
Depreciation		-	(82,631)	(167,678)	(135,736)	(386,045)
Balance at 31 December, 2022	₩	<u>1,177,413</u>	<u>1,660,876</u>	<u>598,681</u>	<u>260,688</u>	<u>3,697,658</u>

		2021				
		Land	Buildings	Tools and equipment	Others	Total
<i>In thousands of won</i>						
Balance at 1 January, 2021	₩	-	-	-	-	-
Acquisition		-	-	63,800	294	64,094
Changes in scope of consolidation		1,182,981	2,082,353	146,738	318,300	3,730,372
Disposal		(5,568)	(316,212)	(136)	(1)	(321,917)
Depreciation		-	(22,634)	(31,931)	(54,254)	(108,819)
Balance at 31 December, 2021	₩	<u>1,177,413</u>	<u>1,743,507</u>	<u>178,471</u>	<u>264,339</u>	<u>3,363,730</u>

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35. Intangible Assets (Financial business)

(1) Intangible assets as of December 31, 2022 and 2021 are as follows:

		December 31, 2022			December 31, 2021		
		Acquisition cost	Accumulated depreciation	Book value	Acquisition cost	Accumulated depreciation	Book value
Membership	₩	772,159	-	772,159	772,159	-	772,159
Other intangible assets		6,488,633	(1,728,882)	4,759,751	2,301,662	(1,172,286)	1,129,376
	₩	<u>7,260,792</u>	<u>(1,728,882)</u>	<u>5,531,910</u>	<u>3,073,821</u>	<u>(1,172,286)</u>	<u>1,901,535</u>

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

		2022		
		Membership	Other intangible assets	Total
Balance at 1 January, 2022	₩	772,159	1,129,376	1,901,535
Acquisition		-	4,186,971	4,186,971
Depreciation		-	(556,596)	(556,596)
Balance at 31 December, 2022	₩	<u>772,159</u>	<u>4,759,751</u>	<u>5,531,910</u>

		2021		
		Membership	Other intangible assets	Total
Balance at 1 January, 2021	₩	-	-	-
Changes in scope of consolidation		312,159	1,224,173	1,536,332
Acquisition		460,000	20,147	480,147
Depreciation		-	(114,944)	(114,944)
Balance at 31 December, 2021	₩	<u>772,159</u>	<u>1,129,376</u>	<u>1,901,535</u>

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36. Lease (Financial business)

(1) Changes in right-of-use assets for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousand won</i>		2022	
		Rental store facilities	Total
Balance at 1 January, 2022	₩	613,373	613,373
Increase		216,485	216,485
Depreciation		(216,485)	(216,485)
Others		(432,969)	(432,969)
Balance at 31 December, 2022	₩	180,404	180,404

<i>In thousand won</i>		2021	
		Rental store facilities	Total
Balance at 1 January, 2021	₩	-	-
Changes in scope of consolidation		667,494	667,494
Depreciation		(54,121)	(54,121)
Balance at 31 December, 2021	₩	613,373	613,373

(2) Profit and expenses recognized for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		2022	2021
Depreciation of right-of-use asset	₩	216,485	54,121

(3) Lease liabilities as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		December 31, 2022	December 31, 2021
Less than 1 year	₩	180,404	36,081
Over 1 year and less than 5 year		-	180,404
Over 5 year		-	396,888
		180,404	613,373
Less: present value discount		-	-
Present value of lease liabilities	₩	180,404	613,373

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37. Deposit liabilities (Financial business)

Deposit liabilities as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>Interest rate(%)</u>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Ordinary deposit	0~0.1	₩	1,214,803	3,053,865
Term deposit	1.2~6.3		1,404,457,846	1,194,258,382
Fixed deposit	1.3~7.0		3,640,438	25,843,734
Others	1.9~4.9		<u>373,673</u>	<u>992,733</u>
		₩	<u>1,409,686,760</u>	<u>1,224,148,714</u>

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38. Net defined benefit liabilities (Financial business)

(1) Net defined benefit liabilities as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Present value of defined benefit obligation	₩	3,943,762	3,921,067
Fair value of plan assets		<u>(4,130,783)</u>	<u>(3,976,989)</u>
Net defined benefit liabilities(assets)	₩	<u>(187,021)</u>	<u>(55,922)</u>

(2) Changes in the present value of defined benefit obligation for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		<u>2022</u>	<u>2021</u>
Balance at 1 January	₩	3,921,067	-
Current service cost		499,057	147,689
Interest expense		135,864	27,683
Remeasurements(*)		(309,666)	(124,879)
Benefits paid		(574,529)	(567,520)
Changes in scope of consolidation		271,969	4,438,094
Balance at 31 December	₩	<u>3,943,762</u>	<u>3,921,067</u>

(*) Remeasurement of defined benefit obligation is as follows:

<i>In thousands of won</i>		<u>2022</u>	<u>2021</u>
Actuarial (gains) losses due to empirical adjustments	₩	143,384	121,146
Actuarial losses (gains) due to changes in financial assumptions		<u>(453,050)</u>	<u>(246,025)</u>
	₩	<u>(309,666)</u>	<u>(124,879)</u>

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

<i>In thousands of won</i>		<u>2022</u>	<u>2021</u>
Balance at 1 January	₩	3,976,989	-
Interest income		138,113	23,362
Remeasurements		(56,837)	(3,229)
Contributions by the employer		-	841,119
Benefits paid		72,518	(369,548)
Changes in scope of consolidation		-	3,485,285
Balance at 31 December	₩	<u>4,130,783</u>	<u>3,976,989</u>

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38. Net defined benefit liabilities (Financial business), Continued

(4) Plan assets as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Debt instruments	₩ 4,129,312	3,975,518
Others	1,471	1,471
	<u>₩ 4,130,783</u>	<u>3,976,989</u>

(5) Expenses recognized in the consolidated statements of comprehensive income for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Current service cost	₩ 499,057	147,689
Net interest cost	(2,249)	4,321
	<u>₩ 496,808</u>	<u>152,010</u>

(6) Key actuarial assumptions for the years ended December 31, 2022 and 2021 are as follows:

	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Discount rate	3.57%	3.57%
Expected salary growth rate	3.20%	3.20%

(7) Key actuarial assumptions for the years ended December 31, 2022 are as follows:

	<u>Change in assumption</u>	<u>Increase in assumption</u>	<u>Decrease in assumption</u>
Discount rate	1.00%	5.60% Decrease	6.31% Increase
Expected salary growth rate	1.00%	6.39% Increase	5.76% Decrease

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39. Provisions (Financial business)

Changes in provisions for the year ended December 31, 2022 and 2021 are as follows:

In thousand won

		2022		
		Provision for restoration	Unused Limit Liabilities	Total
Balance at 1 January, 2022	₩	40,917	69,141	110,058
Reversal		-	(33,338)	(33,338)
Others		556	-	556
Balance at 31 December, 2022	₩	<u>41,473</u>	<u>35,803</u>	<u>77,276</u>

In thousand won

		2021		
		Provision for restoration	Unused Limit Liabilities	Total
Balance at 1 January, 2021	₩	-	-	-
Changes in scope of consolidation		40,778	65,717	106,495
Reversal		-	3,424	3,424
Others		139	-	139
Balance at 31 December, 2021	₩	<u>40,917</u>	<u>69,141</u>	<u>110,058</u>

40. Other Financial Liabilities (Financial business)

Other financial liabilities as of December 31, 2022 and 2021 are as follows:

In thousands of won

		December 31, 2022	December 31, 2021
Other payables	₩	2,466,764	1,218,907
Accrued expense		21,300,934	13,986,697
Lease liabilities		180,404	613,373
	₩	<u>23,948,102</u>	<u>15,818,977</u>

41. Other Liabilities (Financial business)

Other liabilities as of December 31, 2022 and 2021 are as follows:

In thousands of won

		December 31, 2022	December 31, 2021
Unearned revenues	₩	301,581	2,954
Other borrowings		4,342,690	-
Domestic exchange		-	2,446,501
Others		786,261	128,205
	₩	<u>5,430,532</u>	<u>2,577,660</u>

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42. Capital Stock and Surplus

(1) Capital stock as of December 31, 2022 and 2021 are as follows:

In thousands of won, except for share data

	December 31, 2022		December 31, 2021	
	Common shares	Preferred shares(*)	Common shares	Preferred shares(*)
Number of authorized shares	200,000,000	200,000,000	200,000,000	200,000,000
Par value per share (in won)	₩ 5,000	5,000	5,000	5,000
Number of issued shares	191,278,497	1,123,737	191,278,497	1,123,737
Capital	₩ 972,621,970	5,618,685	972,621,970	5,618,685

(*) Non-cumulative preferred shares are eligible to receive cash dividends equal to cash dividends for common shares plus an additional 1%.

As the Company has retired 3,245,897 shares until December 31, 2022, there is a difference of ₩16,229 million between the common shares capital and the total face value of issued shares.

(2) Changes in the number of outstanding shares for the years ended December 31, 2022 and 2021 are as follows:

	December 31, 2022		December 31, 2021	
	Common shares	Preferred shares	Common shares	Preferred shares
Balance at 1 January	190,580,380	1,123,737	159,464,937	1,123,737
Acquisition of treasury stock	(1,962,800)	(10,500)	(300,000)	-
Disposal of treasury stock	8,927	-	1,443	-
Paid-in capital increase	-	-	31,414,000	-
Balance at 31 December	188,626,507	1,113,237	190,580,380	1,123,737

(3) Capital surplus as of December 31, 2022 and December 31, 2021 are as follows:

In thousands of won

	December 31, 2022	December 31, 2021
Paid-in capital in excess of par value	₩ 1,668,350,654	1,668,350,654
Revaluation reserve	218,556,235	218,556,235
Gain from merger	75,670,859	75,670,859
Other capital surplus	357,473,384	40,671,711
	₩ 2,320,051,132	2,003,249,459

43. Capital Adjustments

Capital Adjustments as of December 31, 2022 and 2021 are as follows:

In thousands of won

	December 31, 2022	December 31, 2021
Losses on sale of treasury stock	₩ (90,429)	-
Treasury stock	(111,763,552)	(21,154,754)
Other adjustment to stockholder's equity	(42,299,959)	(3,020,878)
	₩ (154,153,940)	(24,175,632)

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44. Accumulated Other Comprehensive Income

Accumulated other comprehensive income as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Gain (Loss) on valuation of FVTOCI - financial assets(debt instrument) ₩	(1,699,786)	(96,173)
Gain (Loss) on valuation of FVTOCI - financial assets(equity instrument)	(54,799,955)	(49,173,729)
Share of other comprehensive income of associates and joint ventures	238,264,105	198,390,588
Gain(Loss) on valuation of derivatives	2,786,579	(201,951)
Currency translation adjustments	30,443,051	1,739,387
Revaluation surplus (OCI)	<u>33,708</u>	<u>34,763</u>
	₩ <u>215,027,702</u>	<u>150,692,885</u>

45. Retained Earnings

Retained earnings as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Legal reserves ₩	68,399,058	107,999,058
Voluntary reserves	4,124,080,942	3,742,431,385
Retained earnings from equity method investees	697,333,822	697,333,822
Unappropriated retained earnings	<u>671,591,622</u>	<u>503,649,433</u>
	₩ <u>5,561,405,444</u>	<u>5,051,413,698</u>

46. Dividends

(1) No dividends on common shares and preferred shares for the year ended December 31, 2021.

(2) No dividends on common shares and preferred shares for the year ended December 31, 2022 are to be proposed at the regular general shareholders' meeting scheduled for March 23, 2023.

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47. Revenue

(1) Revenue of non-financial business for the year ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Sales - finished goods	₩	9,980,046,559	7,567,161,107
Sales - merchandise		2,608,919,470	2,581,298,690
Sales - construction		409,710,138	143,358,595
Others		564,816,412	414,307,688
	₩	<u>13,563,492,579</u>	<u>10,706,126,080</u>

(2) Revenue of financial business for the year ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Commission income	₩	5,459,208	401,354
Investment operating income		84,996,318	18,664,951
	₩	<u>90,455,526</u>	<u>19,066,305</u>

48. Cost of Sale

(1) Cost of sale of non-financial business for the year ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Cost of goods sold - finished goods	₩	8,783,308,763	7,257,639,588
Cost of goods sold - merchandise		1,186,661,610	856,887,881
Cost of goods sold - construction		381,300,848	132,496,690
Others		431,770,183	268,633,218
	₩	<u>10,783,041,404</u>	<u>8,515,657,377</u>

(2) Cost of sale of financial business for the year ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Commission expense	₩	1,236,174	566,430
Investment operating expense		49,781,009	7,179,387
Others		18,514,273	5,609,152
	₩	<u>69,531,456</u>	<u>13,354,969</u>

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49. Selling and Administrative Expenses

Selling and administrative expenses for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Salaries	₩ 491,734,206	344,248,661
Retirement benefits	36,736,308	39,166,827
Other long-term employee benefits	2,937,832	319,233
Voluntary resignation benefits	722,790	141,486
Welfare expenses	76,713,821	58,092,400
Rental expenses	17,731,414	16,094,140
Lease expenses	9,115,490	7,795,368
Reception expenses	10,111,402	8,811,942
Depreciation on investment property	1,257,487	1,475,023
Depreciation on property, plant and equipment	91,023,337	77,629,402
Amortization of intangible assets	20,551,428	10,670,311
Depreciation on right-of-use assets	53,527,149	43,781,149
Taxes and dues	38,138,576	44,785,168
Advertising expenses	52,691,874	45,004,976
Bad debt expenses	5,236,417	12,160,799
Travel expenses	22,757,964	9,330,791
Travel expenses for overseas branch	1,006,059	158,018
Conference expenses	2,460,832	1,796,284
Communication charges	6,797,835	5,364,470
Supplies expenses	13,065,574	5,928,491
Publication expenses	1,526,503	1,586,374
Outsourcing expenses	125,045,723	84,775,965
Freight expenses	178,719,314	194,528,053
Warehousing charges	62,728,706	44,922,012
Sample and packing expenses	5,557,263	6,614,671
Utility expenses	22,235,782	17,264,805
Sales commissions	21,875,081	19,351,130
Export selling expenses	75,078,093	65,181,963
Repair expenses	12,573,462	10,124,650
Insurance expenses	19,259,714	16,449,368
Commissions	153,197,946	134,912,989
Research expenses	78,870,866	54,042,350
Ordinary development expenses	62,248,490	40,291,196
Market development expenses	4,033,340	3,204,712
Product warranties expenses	31,259,263	20,466,737
Training expenses	8,848,186	4,949,405
Product handling commission	1,380,259	998,258
Others	16,372,079	5,412,807
	<u>₩ 1,835,127,865</u>	<u>1,457,832,384</u>

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50. Expenses by Nature

Details of expenses by nature for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	2022	2021
Changes in finished goods, semi finished goods, work in process ₩	(687,546,145)	(213,771,921)
Sales merchandise	1,186,661,610	856,887,881
Use of raw materials and supplies	7,436,771,533	5,794,379,057
Employee benefits(*1)	1,234,187,948	1,055,934,296
Welfare expenses	183,140,472	162,747,417
Rental expenses	29,850,620	24,303,550
Lease expenses	19,096,799	15,073,032
Depreciation of investment property	1,990,524	2,150,449
Depreciation on property, plant and equipment	570,868,972	560,577,655
Amortization of intangible assets	38,313,526	31,205,645
Depreciation of right-of-use assets	64,312,751	54,768,575
Freight and warehousing expenses	254,650,912	269,477,875
Utility expenses	171,506,488	161,058,326
Outsourcing expenses	580,129,193	668,500,307
Export selling expenses	75,461,486	65,233,304
Taxes and dues	62,530,558	63,736,401
Others	1,465,773,478	414,582,881
Total(*2)	₩ 12,687,700,725	9,986,844,730

(*1) Includes salaries and wages, and retirement benefits.

(*2) The total amount is the sum of cost of sales and selling and administrative expenses in the consolidated financial statements of comprehensive income.

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51. Other Non-Operating Income and Expenses

(1) Other non-operating income for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Gain on foreign currency transactions	₩ 368,834,617	118,717,689
Gain on foreign currency translations	250,857,950	131,925,469
Gain on valuation of derivatives	146,450,457	98,517,657
Gain on disposal of investment in associates	14,352,526	10,804,435
Gain on transactions of derivatives	70,120,621	26,960,678
Gain on valuation of FVTPL – financial assets	1,568,532	1,900,613
Gain on disposal of investment property	6,593,058	3,987
Reversal of impairment losses on investment property	-	12,818
Gain on disposal of property, plant and equipment	7,513,016	23,364,859
Gain on disposal of intangible assets	252	-
Reversal of impairment losses on right-of-use assets	-	9,313,123
Gain on disposal of non-current assets held for sale	-	206,211,666
Reversal of bad debt expense	20,256	16,445
Reversal of other bad debt expense	2,456,723	-
Rental income	579,717	460,366
Others	45,664,862	31,577,281
	<u>₩ 915,012,587</u>	<u>659,787,086</u>

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51. Other Non-Operating Income and Expenses, Continued

(2) Other non-operating expenses for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Loss on foreign currency transactions	₩ 312,766,963	117,968,477
Loss on foreign currency translations	359,461,750	220,886,382
Loss on valuation of derivatives	133,797,835	4,166,071
Loss on disposal of investment in associates	11,783,065	57,924,531
Impairment loss on investment in associates	16,678,710	9,333,452
Loss on transactions of derivatives	23,316,582	49,791,172
Loss on valuation of FVTPL—financial asset	3,123,668	15,225
Loss on transactions of FVTPL—financial asset	153,049	123,756
Loss on disposal of trade receivables	2,870,106	559,649
Loss on disposal of property, plant and equipment	11,563,666	14,824,347
Loss on disposal of intangible assets	18,567,010	1,508,915
Impairment loss on property, plant and equipment	36,278,863	149,698,097
Impairment loss on intangible assets	26,445,881	9,829,303
Impairment loss on right-of-use assets	-	8,262,892
Other bad debt expenses	1,337,838	1,014,830
Loss on inventory abandoned	480,370	1,052,006
Commissions (non-operating)	6,361,462	9,558,414
Donations	7,897,618	5,370,236
Others	46,807,368	18,157,712
	<u>₩ 1,019,691,804</u>	<u>680,045,467</u>

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52. Financial Income and Expenses

(1) Financial income for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Financial income		
Interest income	₩ 33,047,245	18,506,377
Dividends income	1,896,140	1,795,245
Gain on valuation of non-controlling interest liability	<u>777,427</u>	<u>1,599,328</u>
	<u>₩ 35,720,812</u>	<u>21,900,950</u>

(2) Financial expenses for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Financial expense		
Interest expense	₩ 226,175,690	147,547,828

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53. Income Tax Expense

(1) Income tax expense for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Current income tax:		
Current income taxes(*)	₩ 543,316,811	262,885,177
Adjustments for prior years	<u>9,158,983</u>	<u>(2,095,616)</u>
	<u>552,475,794</u>	<u>260,789,561</u>
Deferred income tax:		
Changes of temporary differences	<u>(117,474,854)</u>	<u>(1,929,326)</u>
Income tax charged directly to equity	<u>(232,177,368)</u>	<u>(19,850,173)</u>
Income tax expense	<u>₩ 202,823,572</u>	<u>239,010,062</u>

(*) The Group adjusts income tax expense due to Corporate Income Refund Tax to current income tax.

(2) The actual income tax expense on the Group's profit before income tax, which differs from the amount that is computed using the tax calculated at the weighted average of annual corporate income tax rates rate applied to profits of consolidated entities, for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Profit (loss) before income tax	₩ 569,238,864	855,338,283
Income tax based on statutory tax rate	<u>156,540,688</u>	<u>235,218,028</u>
Adjustments:		
Permanent differences	85,595,442	(15,736,385)
Adjustments for prior years	9,158,983	(2,095,616)
Tax credit	(16,245,830)	(48,665,587)
Effects of unrecognized deferred tax	(28,142,078)	60,735,669
Others	<u>(4,083,633)</u>	<u>9,553,953</u>
	<u>46,282,884</u>	<u>3,792,034</u>
	<u>₩ 202,823,572</u>	<u>239,010,062</u>

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53. Income Tax Expense, Continued

(3) Income tax credited (charged) directly to equity for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Current income tax:		
Remeasurement of net defined benefit liabilities	₩ 515,751	494,398
Deferred income tax:		
Gain (loss) on valuation of fair value of financial assets	(4,492,169)	2,869,048
Share of other comprehensive loss (income) of associates and joint ventures	16,528,969	(17,735,438)
Gain (loss) on valuation of derivatives	(1,291,849)	(336,971)
Currency translation adjustments	(5,214,764)	(242,817)
Remeasurement of net retirement benefit liabilities	(18,011,085)	(6,895,400)
Share of remeasurements of net defined benefit liabilities of associates and joint ventures	(1,015,109)	(350,890)
Other capital surplus	(219,301,953)	2,245,955
Other capital adjustments	104,841	101,942
	<u>(232,693,119)</u>	<u>(20,344,571)</u>
	₩ <u>(232,177,368)</u>	<u>(19,850,173)</u>

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53. Income Tax Expense, Continued

(4) Changes in deferred income tax for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

	2022					
	Balance at January 1, 2022	Profit or loss	Other comprehensive income	Equity	Changes in scope of consolidation	Balance at December 31, 2022
Allowance for doubtful accounts	₩ 9,031,475	571,997	-	-	-	9,603,472
Loss on valuation of inventories	15,881,816	(6,052,923)	-	-	-	9,828,893
Gain (loss) on valuation of derivatives	2,013,959	(6,075,994)	(1,291,849)	-	-	(5,353,884)
Gain (loss) on valuation of financial assets	26,125,778	(27,328,319)	(4,492,169)	-	-	(5,694,710)
Bonuses	34,775,981	(34,282,157)	-	-	-	493,824
Depreciation	(45,837,498)	197,608	-	-	-	(45,639,890)
Defined benefit obligation	126,271,904	5,766,872	(18,011,085)	-	-	114,027,691
Plan assets	(37,423,914)	(7,322,952)	-	-	-	(44,746,866)
Revaluation reserve	(28,481,460)	819,636	-	-	-	(27,661,824)
Revaluation surplus	(227,744,731)	24,109,333	-	-	-	(203,635,398)
Share of remeasurements of net defined benefit liabilities of associates and joint ventures	(38,975,509)	386,956,820	10,299,096	(219,197,112)	(2,242,956)	136,840,339
Others	19,535,582	15,051,008	-	-	-	34,586,590
Balance at December 31, 2022	₩ (144,826,617)	352,410,929	(13,496,007)	(219,197,112)	(2,242,956)	(27,351,763)

In thousands of won

	2021					
	Balance at January 1, 2021	Profit or loss	Other comprehensive income	Equity	Changes in scope of consolidation	Balance at December 31, 2021
Allowance for doubtful accounts	₩ 7,932,196	1,099,279	-	-	-	9,031,475
Loss on valuation of inventories	4,488,812	11,393,004	-	-	-	15,881,816
Gain (loss) on valuation of derivatives	(158,792)	2,509,722	(336,971)	-	-	2,013,959
Gain (loss) on valuation of financial assets	24,043,732	(787,002)	2,869,048	-	-	26,125,778
Bonuses	16,971,249	17,804,732	-	-	-	34,775,981
Depreciation	(47,756,024)	1,918,526	-	-	-	(45,837,498)
Defined benefit obligation	115,279,363	17,887,941	(6,895,400)	-	-	126,271,904
Plan assets	(33,391,166)	(4,032,748)	-	-	-	(37,423,914)
Revaluation reserve	(28,940,779)	459,319	-	-	-	(28,481,460)
Revaluation surplus	(201,519,686)	(26,225,045)	-	-	-	(227,744,731)
Share of remeasurements of net defined benefit liabilities of associates and joint ventures	(32,172,343)	699,937	(18,329,145)	2,347,897	8,478,145	(38,975,509)
Others	19,989,350	(453,768)	-	-	-	19,535,582
Balance at December 31, 2021	₩ (155,234,088)	22,273,897	(22,692,468)	2,347,897	8,478,145	(144,826,617)

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53. Income Tax Expense, Continued

(5) Deductible (taxable) temporary differences not recognized as deferred income tax as of December 31, 2022 and 2021 are as follows:

<i>In thousands of won</i>	<u>Balance at 31, December 2022</u>	<u>Balance at 31, December 2021</u>
Investments in associates and joint ventures (*1)	₩ 1,208,731,966	831,202,589

(*1) Temporary differences on investments in associates and joint ventures which are not likely to be reversed.

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54. Earnings Per Share

(1) Basic earnings per common shares from continuing operations for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won, except for share data and eps</i>	<u>2022</u>	<u>2021</u>
Profit from continuing operations	₩ 366,023,151	616,328,220
Profit from continuing operations attributable to owners of the Group	359,146,279	619,050,615
Profit from continuing operations available to common shares	356,989,495	615,263,638
Weighted average number of common shares outstanding (In shares)	<u>190,565,942</u>	<u>185,321,202</u>
Basic earnings per common share (In won)	₩ <u>1,873</u>	<u>3,320</u>

(2) Basic earnings per preferred shares from continuing operations for the years ended December 31, 2022 and 2021 are as follows:

<i>In thousands of won, except for share data and eps</i>	<u>2022(*1)</u>	<u>2021(*1)</u>
Profit from continuing operations	₩ 366,023,151	616,328,220
Profit from continuing operations attributable to owners of the Group	359,146,279	619,050,615
Profit from continuing operations available to preferred shares	2,156,784	3,786,977
Weighted average number of preferred shares outstanding (In shares)	<u>1,121,608</u>	<u>1,123,737</u>
Basic earnings per preferred shares from continuing operations (In won)	₩ <u>1,923</u>	<u>3,370</u>

(*1) Preferred shares were issued under former commercial law prior to amendments in 1997. These preferred shares hold the same priority as common shares in terms of dividends pay out and distribution of residual properties. Thus, earning per share was calculated accordingly.

(3) Potential ordinary shares as of December 31, 2022 and 2021 are as follows:

<i>in shares</i>	<u>Balance at 31 December 2022</u>	<u>Balance at 31 December 2021</u>
RSU (*1)	1,050,529	561,820

(*1) Basic and diluted earnings per for the years ended December 31, 2022 and 2021 are identical due to the antidilutive effect of RSU shares.

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55. Commitments and Contingencies

(1) Credit limits provided by financial institutions as of December 31, 2022 are as follows:

<i>In thousands of won, In USD, EUR, CNY, CZK, THB, MYR</i>	<u>Currency</u>	<u>Limit</u>
Overdraft	KRW	15,500,000
	CZK	119,085,873
Usance	USD	472,500,000
	EUR	50,000,000
	THB	30,000,000
D/A, D/P, Local and foreign trade	USD	65,000,000
	THB	40,000,000
Others	KRW	2,572,553,000
	USD	1,980,460,330
	EUR	941,023,780
	CNY	2,230,000,000
	MYR	812,730,100
	THB	70,000,000
	CZK	459,674,127
Total	KRW	2,588,053,000
	USD	2,517,960,330
	EUR	991,023,780
	CNY	2,230,000,000
	MYR	812,730,100
	THB	140,000,000
	CZK	578,760,000

(2) Details of assets provided as a collateral for borrowing as of December 31, 2022 are as follows:

<i>In thousands of won</i>	<u>Guaranteed amount</u>	<u>Collateral right holder</u>
Cash and cash equivalents	₩ 110,992,805	Kookmin Bank and others
Trade receivables and other receivables	11,108,022	Shinhan Bank and others
Other financial assets	139,847,701	Bank of Hope and others
Inventories	148,798,339	Industrial Bank of Korea and others
Property, plant and equipment	1,419,659,685	KDB and others
Intangible assets	21,090,345	MG and others
Investments in subsidiaries	81,419,000	Industrial Bank of Korea and others

(3) Details of Guarantees provided to others as of December 31, 2022 are as follows:

As of the end of the current year, the Group is obligated to provide construction completion guarantees and defect repairs for solar power plants to companies such as Taeon Anmyeon Clean Energy Co., Ltd. The Group specifies responsibility for incomplete construction and damages due to failure to meet the guaranteed power output for five project implementers, including Taeon Anmyeon Clean Energy Co., Ltd.

As of the end of current year, the Group providing payment guarantees (loan guarantee amount: ₩ 26,201 million) for its employees who have borrowed funds from financial institutions.

As of the end of the current year, the Group is providing payment guarantee for the Win-win loan as follows:

<i>In thousands of won</i>	<u>Details of payment guarantee</u>	<u>Currency</u>	<u>Limit</u>
Buyer	Win-win loan	KRW	9,000,000

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55. Commitments and Contingencies, Continued

(4) Details of Guarantees provided by others are as of December 31, 2022 are as follows:

In thousands of won, USD, EUR, CNY

Guarantee details	Guaranteed by	Currency	Amount	Credit limit
Contract performance guarantee	SC Bank and others	KRW	48,973,500	55,545,000
	KEB Hana Bank	USD	4,512,600	5,000,000
FRN Payment guarantee	Shinhan Bank	USD	220,000,000	220,000,000
		EUR	100,000,000	100,000,000
Foreign currency payment guarantee	CGIF	CNY	1,000,000,000	1,000,000,000
Payment guarantee	KEB Hana Bank	KRW	55,034,785	55,034,785
Total		KRW	104,008,285	110,579,785
		USD	224,512,600	225,000,000
		EUR	100,000,000	100,000,000
		CNY	1,000,000,000	1,000,000,000

In addition, as of December 31, 2022, the Group is provided with guarantees of ₩ 76,244 million from Seoul Guarantee Insurance Co., Ltd. for solar power plant construction performance guarantee and defect repair.

(5) As of the end of current year, there are 28 pending lawsuits against the Group as a plaintiff, with a total litigation cost of W 95,970 million. There are 43 pending lawsuits against the Group as a defendant, with a total litigation cost of W 102,290 million. As of the end of current year, the results for the lawsuits are unpredictable.

(6) Commitments in sale and purchase agreement of the shares

On July 30, 2021, the Group has acquired shares in Hanwha Impact Corporation from Samsung C&T Corporation and Samsung SDI Co., Ltd. Of the consideration paid for share acquisition and interest of about ₩479,319 million, ₩335,523 million was paid in installment (first and second payment), and third payments of ₩143,796 million will be paid by July 2023. It has pledged some of the shares acquired to secure the third payments.

- Tag-along Right
- Right of First Refusal
- Co-sale Right
- Call option for the largest shareholder based on certain conditions
- Penalty put option for the investor based on certain conditions

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For the years ended December, 2022 and 2021

55. Commitments and Contingencies, Continued

(6) Commitments in sale and purchase agreement of the shares, continued

	Exercise conditions	Exercise details
Tag-along Right	When selling the shares held by the controlling shareholder to a third party	The right to participate in a tag-along sale at the same price and conditions as the controlling shareholder's sale of shares
Co-sale Right	In the event of a failed IPO within a predetermined period or when all shares cannot be sold to a third party	Able to sell all of shares held and shares held by the largest shareholder together, and priorities expected rate of return of the investment to the investors
Put Option	Intentional non-compliance with specific contractual obligations agreed upon with investors	The ability to exercise a put option to purchase some or all of the held shares at a price that includes a 10% IRR premium on the invested capital

The Group sold its holdings (39.7%) in Hanwha Advanced Materials Co., Ltd. and HAM Holdings Co., Ltd., both of which are subsidiaries, to Mandarin Holdings Co., Ltd. and BCC Mandarin Investments, L.P. (hereinafter referred to as the "Investor") on December 29, 2022. The share purchase agreement includes granting the Investor new share acquisition rights, resulting in the Investor's final investment shares of 47.24%. The shareholder agreement between the controlling company, which is the majority shareholder at the time of the sale of the shares of Hanwha Advanced Materials Co., Ltd. and HAM Holdings Co., Ltd., and the Investor includes the following key terms:

- Tag-along Right
- Right of First Refusal
- Co-sale Right
- Call option for the largest shareholder based on certain conditions
- Penalty put option for the investor based on certain conditions

	Exercise conditions	Exercise details
Tag-along Right	When selling the shares held by the controlling shareholder to a third party	The right to participate in a tag-along sale at the same price and conditions as the controlling shareholder's sale of shares
Co-sale Right	In the event of a failed IPO within a predetermined period or when all shares cannot be sold to a third party	Able to sell all of shares held and shares held by the largest shareholder together, and priorities expected rate of return of the investment to the investors
Put Option	Intentional non-compliance with specific contractual obligations agreed upon with investors	The ability to exercise a put option to purchase some or all of the held shares at a price that includes a 10% IRR premium on the invested capital

(7) Contingent consideration

On August 19, 2021, the Group acquired 100% of the shares of WOS Inc. from Wave Electronics Co., Ltd., thereby has obtained control. In relation to the consideration transferred, an additional ₩40 billion contingent consideration (earn-out) clause is included, and up to ₩40 billion will be paid in installments from 2024 to 2026 when the order and sales targets are achieved.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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55. Commitments and Contingencies, Continued

(8) Mid/Long-term discount promissory note agreement

The Group has issued commercial papers with a maturity of three months through financial institutions and has entered into a mid/long-term discount promissory note agreement that will be rolled over for three years. However, if the credit rating is downgraded, the roll-over may be suspended and the promissory notes may be repaid temporarily. As the year ended December 31, 2022, the Group has issued commercial paper amounting to ₩270 billion, which are recognized as short-term borrowings.

(9) As of the end of current year, total credit limit for committed loan is ₩827,931 million. Of this, the loan balance of ₩615,807 million was taken out, and committed amount of ₩212,124 million was unused.

(10) The Group has sold land and buildings to a structured company and is currently leasing and using them.

In 2021, the Group sold the land and building of the Galleria Department Store in Gwanggyo to KORAMCO VALUE-INVEST REAL ESTATE NO.3-2 JA-REIT at a price of ₩653.4 billion, and are currently being leased to be used. The Group has the right to purchase the land and building of the Store at a fair value when the lease term expires.

In addition, the Group has acquired ₩20 billion worth of shares in KORAMCO VALUE-INVEST REAL ESTATE NO.3-2 JA-REIT, and in the event of a loss arising from the sale taken place by the real estate to the third party, the Group has an obligation to compensate up to ₩20 billion, which is the investment amount.

(11) The followings are breakdown by industry for loans as of the end of prior and current year.

Real estate PF loan applies either classification based on the assessment of feasibility or classification based on the soundness of assets such as overdue, or possibility of bankruptcy, etc., whichever is more conservative. The asset soundness based on the assessment of feasibility for the real estate PF loan is classified by each unit of the real estate PF loan facility.

In thousands of won

	December 31, 2022		December 31, 2021	
	Amount	Ratio(%)	Amount	Ratio(%)
PF loans	₩ 163,556,026	13.1	190,051,430	17.0
Finance and insurance business	384,601,672	30.9	308,253,703	27.6
Manufacturing business	42,048,168	3.4	28,635,833	2.6
Construction business	56,285,509	4.5	44,533,356	4.0
Wholesale and retail business	32,914,803	2.6	35,401,628	3.2
Real estate and Rent business	342,195,764	27.5	298,750,401	26.7
Accommodation and restaurant business	36,022,838	2.9	50,591,188	4.5
Arts, sports and leisure services	-	-	265,116	-
Others	54,953,059	4.5	63,557,607	5.7
Household loan	132,537,258	10.6	97,336,703	8.7
	₩ 1,245,115,097	100.0	1,117,376,965	100.0

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56. Related Parties

(1) Details of related parties as of December 31, 2022 are as follows:

Description		Company name
Parent company		Hanwha Corporation
Associates/Joint ventures	Domestic	Smile ventures Co., Ltd. H2 Co., Ltd Ulsan Complex City Development Co., Ltd. HANWHA Eagles Professional Baseball Club YEOCHUN NCC Co., Ltd. Eagles Energy Co.,Ltd DaNAgreen Co.,Ltd. HANWHA FUND INVESTMENT 1 HO Hanwha Connect Co., Ltd.(formerly, Hanwha Station Development Co., Ltd.) Hanwha Impact Corporation Hanwha Hotels and Resort Co., Ltd.
	Overseas	Burdur Enerji A.S. CONIGLIO TAX EQUITY PARTNERSHIP, LLC Crystal Solar Inc. Finless Foods Inc. GRANSOLAR ATOTONILCO, S.A. DE C.V. GRANSOLAR OCOTLAN, S.A. DE C.V. Gulf Advanced Cables Insulation Company H Properties TMK HSP TW TE, LLC International Polymers Company JV Cooke Solar, LLC Kellam Tax Equity Partnership, LLC Lakeshore East Retail LLC Lancium Technologies Corporation Parcel O LLC Premium Hirafu Properties TMK Q&G PV Solutions GmbH REC Silicon ASA Simply Foods Inc. GK Summit Apollo Eleven SwitchDin Pty Limited Ampcera Inc
Conglomerate(*1)	Domestic	Data Analytics Lab Seoulyeokbukbuyeoksegwon Development Co. SIT Tech CO.,LTD HPND Co., Ltd. Yeosu sea world corporation Ilsan sea world corporation Kyongju Aerospace Electrical Systems Co., Ltd HANWHA 63 CITY CORPORATION

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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56. Related Parties, Continued

(1) Details of related parties as of December 31, 2022 are as follows, continued:

Description	Company name	
Conglomerate(*1)	Domestic	Hanwha Estate Service Co., Ltd. The Tastable Co., Ltd Hanwha aqua planet Eco E&O corporation Jeju Ocean Science Museum Corporation Carrot Co., Ltd Tg Solar Co., Ltd. HANWHA LIFE LAB Co., Ltd. Hanwha Life Financial Service Co, Ltd. HANWHA LIFE INSURANCE CO., LTD. Hanwha General Insurance Co., Ltd. HANWHA I&A Co., Ltd. HANWHA SYSTEMS Co., Ltd. Hanwha Energy Corporation HANWHA AEROSPACE CO., LTD. Hanwha Asset Management Co., Ltd. Hanwha Precision Machinery Co., Ltd. HANWHA TECHWIN CO., LTD. HANWHA TOTAL ENERGIES PETROCHEMICALS Co., Ltd.(formerly, HANWHA TOTAL PETROCHEMICAL Co., Ltd.) HANWHA INVESTMENT AND SECURITIES CO., LTD. Hanwha Power System Co. Ltd. Haenara Solar Co., Ltd. and others Hanwha Next Co, Ltd. Hanwha Intelligence Co., LTD. DEOKYANG ENERGEN Hanwha Munitions Corportion Hanwha REIT Co., Ltd. Hanwha Convergence Co., Ltd.(formerly, SIT CO.,LTD)
	Overseas	174 PG Torreon, S. de R.L. de C.V. Alfabeta En. San. ve Tic. A.S. Altinorda Enerji IC ve Dis Ticaret Sanayi ve Ticaret Ltd. Sti. Bahcesaray Enerji IC ve Dis Ticaret Sanayi ve Ticaret Ltd. Sti. BT1 Enerji IC ve Dis Ticaret Sanayi ve Ticaret Ltd. Sti. Cento En. San. ve Tic. Ltd. Sti. Gunesim En. San. ve Tic. Ltd. Sti. HANWHA AERO ENGINES.,LTD Hanwha Aerospace USA Hanwha Asset Management (USA) Ltd. HANWHA DEFENSE USA,INC. Hanwha Energy Australia Pty. Ltd. Hanwha Energy Corporation Europe S.L. Hanwha Energy Corporation Japan Hanwha Energy Corporation Singapore Pte. Ltd.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
For the years ended December, 2022 and 2021

56. Related Parties, Continued

(1) Details of related parties as of December 31, 2022 are as follows, continued:

Description	Company name
Conglomerate(*1) Overseas	Hanwha Energy USA Holdings Corporation Hanwha Europe GmbH Hanwha General Chemical AU Pty Ltd Hanwha Impact Partners INC HANWHA MINING SERVICE USA INC. Hanwha Power Systems Americas, Inc. Hanwha Power Systems (Shanghai) Co.,LTD Hanwha Q CELLS Japan Co.,Ltd. Hanwha Solar Power USA Corp. Hanwha Systems USA Corporation HANWHA TECHWIN AMERICA, INC. Hanwha Techwin Automation Americas, Inc. HQC Tatanka Wi Solar Power Generation Station, LLC Jindera Solar Farm Pty. Ltd. Lamda En. San. ve Tic. A.S. Meca Enerji IC ve Dis Ticaret Sanayi ve Ticaret Ltd. Sti. NHS Agri-Service Pty Ltd NHS Holdings Pty Ltd Oberon Solar IA, LLC Oberon Solar IB, LLC Raggio En. San. ve Tic. Ltd. Sti. Razin GES Elektrik Sanayi ve Ticaret A.S. Razin Gunes Enerjisi Sanayi ve Ticaret A.S. Razin Elektrik Uretim Sanayi ve Ticaret A.S. Razin En. San. ve Tic. A.S. Tessa En. San. ve Tic. Ltd. Sti. Vizi En. San. ve Tic. Ltd. Sti. Hanwha BCGE O&M Limited Liability Company Hanwha Energy Retail Investment Spain S.L.U Power Systems Mfg., LLC and others

(*1) Although these companies are not applicable to related parties defined in K-IFRS 1024 Paragraph 9, a group of large-size affiliates designated by the Korea Fair Trade Commission are classified as related parties according to the resolution by the Securities & Futures Commission in accordance with substantial relationship defined in K-IFRS 1024 Paragraph 10.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
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56. Related Parties, Continued

(2) Transactions with related parties for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

Company name	2022			
	Sales	Disposal of fixed assets	Purchase	Acquisition of fixed assets
Parent company:				
Hanwha Corporation	₩ 121,341,462	-	51,944,691	45,135,026
Joint ventures:				
YEOCHUN NCC Co., Ltd.	29,649,994	-	1,806,382,467	-
GK Summit Apollo Eleven	223,432	-	-	-
H Properties TMK	834,245	-	-	-
Associates:				
REC Silicon ASA	149,638	-	-	-
Hanwha Impact Corporation	8,985,707	-	35,288,802	-
Hanwha Hotels and Resort Co., Ltd.	2,198,407	680,874	24,138,810	1,959,720
Hanwha Connect Co., Ltd. (formerly, Hanwha Station Development Co., Ltd.)(*1)	29,850	-	957,644	-
Eagles Energy Co.,Ltd	65,071	-	-	-
HANWHA Eagles Professional Baseball Club	1,463,542	-	1,494,361	-
International Polymers Company(*2)	-	-	238,385,533	-
Q&G PV Solutions GmbH	877,696	-	-	-
Conglomerate:				
The Tastable Co., Ltd	338,886	-	43,295	-
Hanwha aqua planet	250,663	-	436	-
DreamPlus Asia Limited Partnership	8,580	-	-	-
Eco E&O corporation	26,491	-	225,436	-
Jeju Ocean Science Museum Corporation	252	-	-	-
DEOKYANG ENERGEN	25,152,317	-	2,094,837	-
Enterprise Blockchain Co., Ltd.	13,853	-	-	-
Hanwha Munitions Corpotion	8,204,031	-	545	-
HPND Co., Ltd.	3,613	-	1,872	-
Carrot Co., Ltd	81,059	-	836,010	-
Hanwha Next Co, Ltd.	10,698	-	480,000	-
HANWHA LIFE LAB Co., Ltd.	104,585	-	-	-
Hanwha REIT Co., Ltd.	-	-	42,714	-
Hanwha Intelligence Co., LTD.	9,949	-	-	-
HANWHA SYSTEMS Co., Ltd.	2,963,214	-	70,164,550	34,738,949
Hanwha Asset Management Co., Ltd.	124,528	-	-	-
Hanwha Engineering & Construction Corporation(*3)	2,007,314	-	210,376	14,272,131
Hanwha General Insurance Co., Ltd.	3,378,091	-	11,993,871	-
HANWHA AEROSPACE CO., LTD.	3,135,164	-	-	-
Hanwha Defense	1,340,932	-	-	-
HANWHA LIFE INSURANCE CO., LTD.	6,666,351	-	27,118,875	64,966

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56. Related Parties, Continued

(2) Transactions with related parties for the years ended December 31, 2022 and 2021 are as follows, continued:

In thousands of won

Company name	2022			
	Sales	Disposal of fixed assets	Purchase	Acquisition of fixed assets
Hanwha Energy Corporation	₩ 925,169	-	188,029,522	-
Hanwha Life Financial Service Co., Ltd.	960,872	-	7,431	-
Hanwha Precision Machinery Co., Ltd.	552,290	-	18,401,678	736,794
HANWHA INVESTMENT AND SECURITIES CO., LTD. (*4)	968,080	-	362,258	-
Ilsan sea world corporation	122	-	-	-
SIT Tech CO.,LTD	18,475	-	-	-
Yeosu sea world corporation	134	-	-	-
Seoulyeokbukbuyeoksegwon Development Co.	253,764	-	-	-
HANWHA 63 CITY CORPORATION	290,724	-	4,596	-
Hanwha Power System Co. Ltd.	467,888	-	257,194	582,410
HANWHA TECHWIN CO., LTD.	590,179	-	184	22,650
Hanwha Estate Service Co., Ltd.	11,302	-	-	-
Hanwha Convergence Co., Ltd.(formerly, SIT CO.,LTD)	111,904	-	54,400	-
HANWHA I&A Co., Ltd.	191,497	-	-	-
HANWHA TOTAL ENERGIES PETROCHEMICALS Co., Ltd.(formerly, HANWHA TOTAL PETROCHEMICAL Co., Ltd.)	12,486,818	-	173,367,692	-
Hanwha Aerospace USA	530,537	-	-	-
Hanwha Asset Management (USA) Ltd.	12,638	-	-	-
Hanwha BCGE O&M Limited Liability Company	-	-	24,953	-
HANWHA DEFENSE USA,INC.	402,009	-	-	-
Hanwha Energy Retail Investment Spain S.L.U	400,262	-	-	-
Hanwha Energy USA Holdings Corporation	444,480	-	191,706	-
Hanwha Europe GmbH	208,594,197	-	1,090,894	-
Hanwha Impact Partners INC.	638,159	-	267,888	-
Hanwha Power Systems (Shanghai) Co.,LTD	-	-	327,363	-
Hanwha Power Systems Americas, Inc.	126,477	-	-	-
Hanwha Q CELLS Japan Co., Ltd.	161,277,230	-	174,818,905	-
Hanwha Systems USA Corporation	73,239	-	-	-
HANWHA TECHWIN AMERICA, INC.	435,666	-	-	-
Hanwha Techwin Automation Americas, Inc.	108,182	-	-	-
Power Systems Mfg., LLC	198,414	-	440,199	-
Hanwha General Chemical AU Pty Ltd	3,517	-	-	-
	₩ 610,713,840	680,874	2,829,451,988	97,512,646

(*1) The Group received dividends of ₩949 million from Hanwha Connect Co., Ltd. for the year ended December 31, 2022.

(*2) The Group received dividends of ₩49,379 million from International Polymers Company for the year ended December 31, 2022.

(*3) Hanwha Engineering & Construction Corporation was merged into Hanwha Corporation on November 1st, 2022. The transaction details mentioned refer to the transactions made before the merger date.

(*4) The Group received dividends of ₩59 million from HANWHA INVESTMENT AND SECURITIES CO., LTD. for the year ended December 31, 2022. In addition to the above dividend receipts, the Group received dividends of ₩628 million from Coniglio Tax Equity Partnership, LLC, received dividends of ₩603 million from Kellam Tax Equity Partnership, LLC, received dividends of ₩646 million from Lakeshore East Retail LLC, received dividends of ₩248 million from HSP TW TE LLC and received dividends of ₩60 million from HANWHA FUND INVESTMENT 1 HO, for the year ended December 31, 2022.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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56. Related Parties, Continued

(2) Transactions with related parties for the years ended December 31, 2022 and 2021 are as follows, continued:

In thousands of won

Company name	2021			
	Sales	Disposal of fixed assets	Purchase	Acquisition of fixed assets
Parent company:				
Hanwha Corporation	₩ 146,508,273	-	43,447,235	91,975,265
Associates:				
Hanwha Savings Bank Co., Ltd.	4,690	-	-	-
Eagles Energy Co.,Ltd	83,917	-	-	-
Hanwha Station Development Co., Ltd.	52,480	-	602,501	-
HANWHA Eagles Professional Baseball Club	42,094	-	1,156,175	-
Hanwha Impact Corporation(formerly, Hanwha General Chemical Co., Ltd.)	7,245,881	-	33,153,493	-
Hanwha Hotels and Resort Co., Ltd.	2,218,231	2,959,473	16,721,300	147,000
International Polymers Company(*1)	23,552	-	234,221,453	-
Joint ventures:				
Ulsan Complex City Development Co., Ltd.	1,721,735	-	-	-
YEOCHUN NCC Co., Ltd.(*2)	28,491,973	-	1,652,065,606	-
Gulf Advanced Cables Insulation Company	157,619	-	-	-
Conglomerate:				
174 Power Global O&M, LLC	-	-	904,099	-
Data Analytics Lab	630	-	-	-
Seoulyeokbukbuyeoksegwon Development Co.	2,371	-	-	-
SIT CO.,LTD	61,088	-	-	-
SIT Tech CO.,LTD	11,238	-	-	-
HPND Co., Ltd.	7,250	-	-	-
Yeosu sea world corporation	114	-	-	-
Ilsan sea world corporation	77	-	-	-
HANWHA 63 CITY CORPORATION	226,061	-	56,024	-
Hanwha Engineering & Construction Corporation	2,110,012	-	38,510	62,559,477
Hanwha Estate Co., Ltd.	139,804	-	13,885,404	55,300
Hanwha Estate Service Co., Ltd.	5,880	-	607	-

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56. Related Parties, Continued

(2) Transactions with related parties for the years ended December 31, 2022 and 2021 are as follows, continued:

In thousands of won

Company name	2021			
	Sales	Disposal of fixed assets	Purchase	Acquisition of fixed assets
Conglomerate:				
The Tastable Co., Ltd	₩ 274,088	-	134,901	-
Hanwha aqua planet	188,240	-	-	-
H-Solution Corporation(*3)	210	-	-	-
Eco E&O corporation	133,140	-	399,619	-
Jeju Ocean Science Museum Corporation	32	-	-	-
Carrot Co., Ltd	49,541	-	751,486	-
Foodist Food Culture(Shanghai) Co., Ltd.	-	-	764,169	-
DNC Plaza	27	-	-	-
Hanwha Defense	2,571,808	-	-	-
HANWHA LIFE LAB Co., Ltd. (formerly, Hanwha Life Asset Co., Ltd.)	46,880	-	-	-
Hanwha Life Financial Service Co, Ltd.	914,003	-	-	-
Hanwha LIFE INSURANCE CO., LTD.(*4)	7,167,780	-	23,304,427	-
Hanwha General Insurance Co., Ltd.	2,893,258	-	12,761,528	263
HANWHA I&A Co., Ltd.	119,426	-	-	-
HANWHA SYSTEMS Co., Ltd.	4,867,420	-	51,088,329	24,543,066
Hanwha Energy Corporation	850,176	-	159,446,246	-
HANWHA AEROSPACE CO., LTD	2,641,154	-	-	-
Hanwha Asset Management Co., Ltd.	89,106	-	-	-
Hanwha Precision Machinery Co., Ltd.	582,236	-	6,978,297	545,985
HANWHA TECHWIN CO., LTD.	605,002	-	40,500	80,200
HANWHA TOTAL PETROCHEMICAL Co., Ltd.	10,884,517	-	131,230,110	-
HANWHA INVESTMENT AND SECURITIES CO., LTD.	887,581	-	264,357	-
Hanwha Power System Co. Ltd.	257,855	-	279,094	138,390
Alfabeta En. San. ve Tic. A.S.	11,572	-	-	-
Altinorda Enerji IC ve Dis Ticaret Sanayi ve Ticaret Ltd. Sti.	11,177	-	-	-
Bahcesaray Enerji IC ve Dis Ticaret Sanayi ve Ticaret Ltd. Sti.	11,177	-	-	-
BT1 Enerji IC ve Dis Ticaret Sanayi ve Ticaret Ltd. Sti.	45,416	-	-	-
Cento En. San. ve Tic. Ltd. Sti.	23,145	-	-	-
Gunesim En. San. ve Tic. Ltd. Sti.	11,572	-	-	-
Hanwha Aerospace USA	30,431	-	-	-
Hanwha Asset Management (USA) Ltd.	32,394	-	-	-
Hanwha Energy USA Holdings Corporation	745,153	-	-	-
Hanwha Europe GmbH	132,917,786	-	-	-
Hanwha General Chemical AU Pty Ltd	10,313	-	-	-
Hanwha Impact Partners INC (formerly, Hanwha General Chemical USA Corp.)	1,961,939	-	-	-
Hanwha Power Systems Americas, Inc.	30,261	-	307,104	-
Hanwha Q CELLS Japan Co.,Ltd.	191,219,992	-	-	-
Hanwha Solar Power USA Corp.	16,472	-	450,916	-
Hanwha Systems USA Corporation	26,227	-	-	-
HANWHA TECHWIN AMERICA, INC.	133,615	-	-	-
Hanwha Techwin Automation Americas, Inc.	48,955	-	179,648,076	-
Lamda En. San. ve Tic. A.S.	11,211	-	-	-

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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56. Related Parties, Continued

(2) Transactions with related parties for the years ended December 31, 2022 and 2021 are as follows, continued:

In thousands of won

Company name	2021			
	Sales	Disposal of fixed assets	Purchase	Acquisition of fixed assets
Conglomerate:				
Meca Enerji IC ve Dis Ticaret Sanayi ve Ticaret Ltd. Sti.	₩ 11,354	-	-	-
NHS Agri-Service Pty Ltd	6,871	-	-	-
NHS Holdings Pty Ltd	1,718	-	112,160	-
Raggio En. San. ve Tic. Ltd. Sti.	11,572	-	-	-
Razin GES Elektrik Sanayi ve Ticaret A.S.	14,321	-	-	-
Razin Gunes Enerjisi Sanayi ve Ticaret A.S.	21,517	-	-	-
Razin Elektrik Uretim Sanayi ve Ticaret A.S.	56,978	-	-	-
Razin En. San. ve Tic. A.S.	22,964	-	-	-
Tessa En. San. ve Tic. Ltd. Sti.	23,145	-	-	-
Vizi En. San. ve Tic. Ltd. Sti.	11,572	-	-	-
	<u>₩ 552,619,270</u>	<u>2,959,473</u>	<u>2,564,213,726</u>	<u>180,044,946</u>

(*1) The Group received dividends of ₩35,668 million from International Polymers Company for the year ended December 31, 2021.

(*2) The Group received dividends of ₩170,000 million from YEOCHUN NCC Co., Ltd. for the year ended December 31, 2021.

(*3) This is the transaction details before the merger with Hanwha Energy Corporation.

(*4) The Group received dividends of ₩456 million from Hanwha LIFE INSURANCE CO., LTD. for the year ended December 31, 2021. In addition to the above dividend receipts, the Group received dividends of ₩286 million and ₩1,117 million from HSP TW TE, LLC and Lakeshore East Retail LLC, respectively.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
Notes to the Consolidated Financial Statements
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56. Related Parties, Continued

(3) Outstanding receivables and payables from transactions with related parties as of December 31, 2022 and 2021 are as follows:

In thousands of won

	December 31, 2022					
	Receivables			Payables		
	Accounts receivable	Loans	Other receivables	Accounts payable	Borrowings	Other payables
Parent company:						
Hanwha Corporation	₩ 9,575,919	-	2,094,463	17,122,734	-	14,406,736
Joint ventures:						
YEOCHUN NCC Co., Ltd.	3,997,987	-	312,935	213,201,016	-	8,701,805
Gulf Advanced Cables Insulation Company(*1)	-	16,216,125	478,283	-	-	-
Q&G PV Solutions GmbH	189,123	-	-	-	-	-
Associates:						
HANWHA Eagles Professional Baseball Club	-	-	193,020	-	-	-
Hanwha Impact Corporation	2,152,464	-	113,965	1,650,030	-	5,998,663
Hanwha Station Development Co., Ltd.	340,735	-	610,000	-	-	1,288,851
Hanwha Hotels and Resort Co., Ltd.	404,497	-	11,443,660	36,523	2,039,805	2,781,568
Crystal Solar Inc.(*2)	-	1,866,931	329,066	-	-	-
International Polymers Company	-	-	1,970,790	28,196,602	-	-
REC Silicon ASA	139,243	-	-	-	-	-
Conglomerate:						
HANWHA 63 CITY CORPORATION	24,869	-	-	-	-	1,660,143
The Tastable Co., Ltd	6,577	-	-	64	-	2,113
Hanwha aqua planet	6,976	-	1,123	-	-	-
Eco E&O corporation	928	-	-	10,802	-	-
DEOKYANG ENERGEN	4,668,051	-	-	428,798	-	1,810
Hanwha Munitions Corpotion	2,715,089	-	-	-	-	5,623,222
Hanwha Next Co, Ltd.	-	-	1,200,000	-	-	-
HANWHA LIFE LAB Co., Ltd.	4,659	-	-	-	-	-
Hanwha Life Financial Service Co, Ltd.	6,726	-	-	-	-	1,922,989
HANWHA LIFE INSURANCE CO., LTD.	10,551	-	111,158,909	-	-	72,274,018
Hanwha General Insurance Co., Ltd.	26,014	-	238,448	-	-	8,545,677
HANWHA SYSTEMS Co., Ltd.	270,662	-	-	9,681,589	-	23,889,305
Hanwha Energy Corporation	74,403	-	7,189	20,413,261	-	3,848,730
HANWHA AEROSPACE CO., LTD.	374,886	-	84,208	-	-	9,893,352
Hanwha REIT Co., Ltd.	-	-	2,216,840	-	-	-
Hanwha Asset Management Co., Ltd.	1,337	-	-	-	-	-
Hanwha Precision Machinery Co., Ltd.	-	-	-	8,337,843	-	1,824,554
Hanwha Convergence Co., Ltd.(formerly, SIT CO.,LTD)	5,610	-	-	-	-	1,540
HANWHA TECHWIN CO., LTD.	-	-	-	-	-	2,000,000
HANWHA TOTAL ENERGIES PETROCHEMICALS Co., Ltd.(formerly, HANWHA TOTAL PETROCHEMICAL Co., Ltd.)	1,644,891	-	-	12,675,555	-	9,914,454
HANWHA INVESTMENT AND SECURITIES CO., LTD.	6,549	-	-	-	-	21,965,513
Hanwha Power System Co. Ltd.	1,210	-	-	-	-	56,141
HANWHA DEFENSE USA,INC.	-	-	243,562	-	-	-
Hanwha Energy USA Holdings Corporation	758,079	-	142,363	-	-	-
Hanwha Europe GmbH	41,064,800	-	-	2,073	-	41,490
Hanwha Impact Partners INC.	109,408	-	19,668	13,084	-	-
Hanwha Power Systems (Shanghai) Co.,LTD	-	-	-	15,422	-	-
Hanwha Q CELLS Japan Co., Ltd.	6,806,713	-	8,275,480	12,320,788	-	241,043
Hanwha Systems USA Corporation	-	-	-	38,019	-	-
Hanwha Techwin Automation Americas, Inc.	-	2,557,129	-	-	-	-
Power Systems Mfg., LLC	-	-	-	-	-	409,620
	₩ 75,388,956	20,640,185	141,133,972	324,144,203	2,039,805	197,293,337

(*1) The Group recognized allowance for doubtful accounts for loans and others of Gulf Advanced Cables Insulation Company as of December 31, 2022.

(*2) The Group recognized allowance for doubtful accounts for loans and others of Crystal Solar Inc as of December 31, 2022.

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56. Related Parties, Continued

(3) Outstanding receivables and payables from transactions with related parties as of December 31, 2022 and December 2021 are as follows, continued

In thousands of won

	December 31, 2021				
	Receivables			Payables	
	Accounts receivable	Loans	Other receivables	Accounts payable	Other payables
Parent company:					
Hanwha Corporation	₩ 6,740,633	-	2,078,390	11,531,988	21,432,676
Associates:					
HANWHA Eagles Professional Baseball Club	-	-	408,293	-	-
Eagles Energy Co.,Ltd	51,489	-	120,000	-	-
Hanwha Station Development Co., Ltd.	151,881	-	560,000	-	185,831
Hanwha Impact Corporation(formerly, Hanwha General Chemical Co., Ltd.)	1,983,866	-	104,950	6,573,927	150,397
Hanwha Hotels and Resort Co., Ltd.	197,162	-	30,304,832	41,704	2,179,206
Crystal Solar Inc.(*1)	-	1,866,931	347,906	-	-
International Polymers Company	-	-	1,843,582	44,848,219	-
Luxbon Solar S.A.	-	-	3,182,183	-	-
Joint ventures:					
YEOCHUN NCC Co., Ltd.	2,687,322	-	144,712	305,475,308	8,717,266
Gulf Advanced Cables Insulation Company(*2)	-	16,216,125	447,411	-	-
Conglomerate:					
SIT CO.,LTD	2,309	-	-	-	-
Hanwha Engineering & Construction Corporation	37,339	-	1003	9,128,000	-
HANWHA 63 CITY CORPORATION	96	-	-	-	465
The Tastable Co., Ltd	7,279	-	-	2,836	3,023
Hanwha aqua planet	14,885	-	1,012	-	-
Eco E&O corporation	-	-	127,035	-	-
Hanwha Defense	566,522	-	2,340	-	-
HANWHA LIFE LAB Co., Ltd. (formerly, Hanwha Life Asset Co., Ltd.)	1,284	-	-	-	-
Hanwha Life Financial Service Co, Ltd.	9,321	-	-	-	3,269
Hanwha LIFE INSURANCE CO., LTD.	613,015	-	102,844,048	-	137,918,193
Hanwha General Insurance Co., Ltd.	48,690	-	276,022	510	50,850
HANWHA SYSTEMS Co., Ltd.	617,939	-	-	1,295,775	10,299,247
Hanwha Energy Corporation	58,053	-	7,312	16,327,363	21,464
HANWHA AEROSPACE CO., LTD	127,878	-	5,682	-	-
Hanwha Asset Management Co., Ltd.	1,654	-	-	-	-
Hanwha Precision Machinery Co., Ltd.	6,645	-	-	2,974,961	118,293
HANWHA TOTAL PETROCHEMICAL Co., Ltd.	1,441,133	-	1,397,339	14,948,694	-
HANWHA INVESTMENT AND SECURITIES CO., LTD.	16,423	-	-	-	7,837,538
Hanwha Power System Co. Ltd.	-	-	-	-	244,838
Hanwha Aerospace USA	1,227	-	-	-	-
Hanwha Asset Management (USA) Ltd.	7,735	-	-	-	-
Hanwha Energy USA Holdings Corporation	2,540,635	-	-	-	-
Hanwha Europe GmbH	37,140,464	-	-	8,505	344
Hanwha General Chemical AU Pty Ltd	-	-	945	-	-
Hanwha Impact Partners INC (formerly, Hanwha General Chemical USA Corp.)	8,743	-	-	-	-
Hanwha Power Systems (Shanghai) Co.,LTD	94,993	-	-	31,254	-
Hanwha Power Systems Americas, Inc.	16,716	-	-	-	-
Hanwha Q CELLS Japan Co., Ltd.	24,936,161	-	1,009,960	7,157,961	1,880,434
Hanwha Solar Power USA Corp.	2,845	-	-	-	-
Hanwha Systems USA Corporation	26,283	-	-	-	-
Hanwha Techwin Automation Americas, Inc.	-	2,375,075	-	-	-
	₩ 80,158,620	20,458,131	145,214,957	420,347,005	191,043,334

(*1) The Group recognized allowance for doubtful accounts for loans and others of Crystal Solar Inc as of December 31, 2021.

(*2) The Group recognized allowance for doubtful accounts for loans and others of Gulf Advanced Cables Insulation Company as of December 31, 2021.

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56. Related Parties, Continued

(4) Loan transactions with related parties for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

	<u>Company</u>		<u>Balance at 1 January 2022</u>	<u>Increase</u>	<u>Decrease</u>	<u>Others(*1)</u>	<u>Balance at 31 December 2022</u>
Associate:	Crystal Solar Inc.	₩	1,866,931	-	-	-	1,866,931
Joint venture:	Gulf Advanced Cables Insulation Company		16,216,125	-	-	-	16,216,125
Conglomerate:	Hanwha Techwin Automation Americas, Inc.		2,375,075	-	-	182,054	2,557,129
		₩	<u>20,458,131</u>	<u>-</u>	<u>-</u>	<u>182,054</u>	<u>20,640,185</u>

(*1) Includes the accrued interest income on loans.

In thousands of won

	<u>Company</u>		<u>Balance at 1 January 2021</u>	<u>Increase</u>	<u>Decrease</u>	<u>Others(*1)</u>	<u>Balance at 31 December 2021</u>
Associate:	Crystal Solar Inc.	₩	1,866,931	-	-	-	1,866,931
Joint venture:	Gulf Advanced Cables Insulation Company		15,941,122	-	-	275,003	16,216,125
Conglomerate:	Hanwha Techwin Automation Americas, Inc.		2,187,592	-	-	187,483	2,375,075
		₩	<u>19,995,645</u>	<u>-</u>	<u>-</u>	<u>462,486</u>	<u>20,458,131</u>

(*1) Includes the accrued interest income on loans.

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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56. Related Parties, Continued

(5) Equity transactions with the Group's related parties for the years ended December 31, 2022 and 2021, are as follows:

<i>In thousands of won</i>		2022		
		Transaction	Company	Amount
Joint venture:	Capital increase	HANWHA FUND INVESTMENT 1 HO	₩	624,000
	Return of Investment	HANWHA FUND INVESTMENT 1 HO		990,034
Associate:	Capital increase	GK Summit Apollo Eleven		1,035,531
		Premium Hirafu Properties TMK		1,722,433
Conglomerate:	Share sales	Hanwha Asset Management Co., Ltd.		1,644,575
<i>In thousands of won</i>		2021		
		Transaction	Company	Amount
Joint venture:	Capital increase	Gulf Advanced Cables Insulation Company	₩	9,334,557
		Kellam Tax Equity Partnership, LLC		53,294,825
		CONIGLIO TAX EQUITY PARTNERSHIP, LLC		116,781,711
Associate:	Capital increase	Hanwha Hotels and Resort Co., Ltd.		28,778,900
	Share acquisitions	Hanwha Hotels and Resort Co., Ltd.		29,699,570
Conglomerate:	Share sales	Hanwha Asset Management Co., Ltd.		214,617,234
	Share acquisitions	Hanwha Engineering & Construction Corporation HANWHA TechM CO.,LTD		70,082,460 17,734,000

(6) Payment guarantees provided for related parties as of December 31, 2022 are as follows:

<i>In USD, JPY</i>		Payment guarantee			Use of payment guarantee
		Guarantee	Currency	Limit	
Burdur Enerji A.S.	USD	9,301,512	4,198,521	Borrowings from financial institutions	
H Properties TMK	JPY	10,800,000,000	1,800,000,000	Borrowings from financial institutions	
GK Summit Apollo Eleven	JPY	3,240,000,000	540,000,000	Borrowings from financial institutions	
	USD	9,301,512	4,198,521		
	JPY	14,040,000,000	2,340,000,000		

(7) Collaterals provided for related parties as of December 31, 2022, are as follows:

<i>In thousands of won</i>			
Related party	Collaterals	Collateral amount	Borrower
Eagles Energy Co.,Ltd	Investments in associates	₩ 21,300,500	Consus New Energy Private Fund Special Asset Trust No.1

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56. Related Parties, Continued

(8) Fulfillment guarantees provided for related parties as of December 31, 2022 are as follows:

In USD, JPY, thousands of won

<u>Company</u>	<u>Counterparty</u>	<u>Currency</u>	<u>Amount</u>
Hanwha Q CELLS Japan Co., Ltd.	Marubeni Corporation	USD	131,000,000
	NTT Facilities Inc.	JPY	4,610,000,000
	Itochu Corporation	USD	2,526,518
	JGC Corporation	JPY	131,348,708
	GK Rokunohe Solar Park	JPY	296,000,000
	Nippon Renewable Energy K.K.	JPY	2,111,360,000
Hanwha Station Development Co., Ltd.	Korea National Railway	KRW	<u>3,202,968</u>
		USD	133,526,518
		JPY	7,148,708,708
		KRW	<u>3,202,968</u>

(9) Details of compensation for key executives for the years ended December 31, 2022 and 2021, are as follows:

In thousands of won

		<u>2022</u>	<u>2021</u>
Short-term employee benefits (*1)	₩	96,132,401	87,431,086
Retirement benefits		10,507,388	8,873,637
Other long-term employee benefits		<u>24,697</u>	<u>25,605</u>
	₩	<u>106,664,486</u>	<u>96,330,328</u>

(*1) Share-based Payments of ₩42,753 million and ₩22,206 million for the years ended December 31, 2022 and 2021 respectively, are included in short-term employee benefits.

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56. Related Parties, Continued

(10) Changes in lease liabilities about related parties, including conglomerates for years ended December 31, 2022 and 2021 are as follows:

In thousands of won

		2022		
Company		Balance at 1 January 2022	Variation	Balance at 31 December 2022
Parent company:	Hanwha Corporation	₩ 16,424,553	(2,602,509)	13,822,044
Associates/Joint ventures:	Hanwha Station Development Co., Ltd.	212,339	(212,339)	-
	YEOCHUN NCC Co., Ltd.	-	3,917	3,917
Conglomerate:	Hanwha LIFE INSURANCE CO., LTD.	45,254,748	(14,772,865)	30,481,883
	Hanwha General Insurance Co., Ltd.	333,072	(333,072)	-
	Hanwha Energy Corporation	735	(735)	-
		₩ 62,225,447	(17,917,603)	44,307,844

In thousands of won

		2021		
Company		Balance at 1 January 2021	Variation	Balance at 31 December 2021
Parent company:	Hanwha Corporation	₩ 18,443,320	(2,018,767)	16,424,553
Associates/Joint ventures:	Hanwha Station Development Co., Ltd.	207,868	4,471	212,339
Conglomerate:	Hanwha LIFE INSURANCE CO., LTD.	109,420,622	(64,165,874)	45,254,748
	Hanwha General Insurance Co., Ltd.	380,230	(47,158)	333,072
	Hanwha Energy Corporation	38,263	(37,528)	735
		₩ 128,490,303	(66,264,856)	62,225,447

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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57. Cash Flows

(1) Cash flows generated from operating activities for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

	<u>2022</u>	<u>2021</u>
Income before income tax expense	₩ 569,238,864	855,338,283
Adjustments:	1,339,616,978	700,731,723
Retirement benefits(*1)	92,331,028	86,056,174
Other long-term employee benefits	6,342,114	3,376,162
Depreciation of investment property	1,990,524	2,150,449
Depreciation of property, plant and equipment	570,868,972	560,577,655
Amortization of intangible assets	38,313,526	31,205,645
Depreciation of right-of-use assets	64,312,751	54,768,575
Bad debt expenses	5,367,345	13,676,911
Rental expenses	149,304	111,041
Transfer of provisions(reversal)	34,526,167	13,940,655
Gain on valuation of derivatives	(146,450,457)	(98,517,657)
Gain on foreign currency translation	(250,857,950)	(131,925,469)
Gain on disposal of trade receivables	-	(42,500)
Gain on disposal of investment in associates	(14,352,526)	(10,804,435)
Gain on valuation of FVTPL – financial assets	(1,568,532)	(3,705,862)
Gain on disposal of FVTPL – financial assets	-	(587,002)
Gain on disposal of investment property	(6,593,058)	(3,987)
Reversal of impairment losses of investment property	-	(12,818)
Gain on disposal of property, plant and equipment	(7,513,016)	(23,364,859)
Gain on disposal of intangible assets	(252)	-
Gain on disposal of non-current assets held for sale	-	(206,211,666)
Gain on disposal of right-of-use assets	(1,022)	(92)
Reversal of impairment losses of right-of-use assets	-	(9,313,123)
Loss on foreign currency translation	359,461,750	220,886,382
Loss on disposal of trade receivables	2,870,106	559,649
Loss on disposal of FVTOCI—financial asset	158,473	123,756
Loss on disposal of investment in associates and joint ventures	11,783,065	57,924,531
Impairment loss of investment in associates and joint ventures	16,678,710	9,333,452
Loss on valuation of FVTPL – financial assets	17,232,163	90,945
Loss on valuation of derivatives	134,824,982	4,166,071
Loss on disposal of property, plant and equipment	11,563,666	14,824,347
Loss on disposal of intangible assets	18,567,010	1,508,915
Impairment loss of property, plant and equipment	36,278,863	149,698,097
Impairment loss of intangible assets	26,445,881	9,829,303
Impairment loss of right-of-use assets	-	8,262,892
Other bad debt expense(reversal)	1,414,123	1,010,698
Loss on inventory abandoned	480,370	2,992,036
Loss on valuation of inventories	52,183,836	46,141,562
Interest income	(33,047,246)	(18,506,377)
Dividends income	(1,896,140)	(1,795,245)
Interest income (finance business)	(77,132,779)	(16,233,623)
Dividends income (finance)	(5,128,010)	-
Interest expense	226,175,690	147,547,828
Interest expense (finance business)	34,491,876	5,571,110
Gain(loss) on equity method investments	101,874,422	(262,895,885)
Others	30,169,015	39,916,810
Gain on valuation of non-controlling interest's liabilities	(777,427)	(1,599,328)
Transfer of financial guarantee contract liabilities	2,242,132	-
Bargain purchase gain	(14,162,471)	-

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57. Cash Flows, Continued

(1) Cash flows generated from operating activities for the years ended December 31, 2022 and 2021 are as follows, continued

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Changes in operating assets and liabilities:	₩ (1,626,469,383)	(191,216,246)
Trade receivables	(400,171,019)	(21,125,799)
Other receivables	(69,923,062)	(36,366,789)
Inventories	(35,441,471)	(691,583,516)
FVTOCI – financial assets	-	19
Other financial assets	(212,802,018)	(31,944,211)
Other current assets	(13,533,302)	34,216,779
Other non-current assets	(44,474,154)	(13,322,026)
Trade payables	(812,020,343)	506,564,107
Other payables	(223,461,440)	47,652,264
Other financial liabilities	113,614,717	12,980,730
Other current liabilities	53,739,995	(23,275,528)
Other non-current liabilities	(4,453,025)	(24,313,551)
Payment of severance indemnities	(53,315,016)	(42,295,400)
Plan assets	(31,784,915)	(12,509,365)
Payment of other long-term employee benefits	(7,231,202)	(4,080,910)
Provision	(26,498,259)	(17,092,870)
Financial guarantee liabilities	2,914,635	1,314,955
Payment of derivatives	(47,167,552)	22,830,494
Other Deposits	185,538,048	101,134,371
Cash generated from operations	₩ <u>282,386,459</u>	<u>1,364,853,760</u>

(*1) Excludes ₩685 million (2021: ₩952 million) transferred to construction in progress from ₩93,016 million (2021: ₩87,008 million) for the years ended December 31, 2022.

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57. Cash Flows, Continued

(2) Significant transactions not affecting cash flows for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

	<u>2022</u>	<u>2021</u>
Transfer to the related assets from construction in progress	₩ 494,861,157	730,943,494
Transfer to stored goods from machinery in transit	6,950,025	5,350,985
Changes in advance payments due to acquisition of property, plant and equipment	(16,554,704)	17,766,904
Reclassification of current portion of debentures and borrowings	3,002,810,541	2,611,134,177
Transfer to intangible assets from property, plant and equipment	54,051,751	10,918,508

(3) Changes in liabilities from financing activities for the year ended December 31, 2022 and 2021 are as follows:

In thousands of won

	<u>2022</u>		<u>2021</u>	
	<u>Borrowings and Debentures</u>	<u>Dividend payable</u>	<u>Borrowings and Debentures</u>	<u>Dividend payable</u>
Balance at 1 January, 2022	₩ 5,874,826,693	-	5,688,573,526	-
Changes in scope of consolidation	(1,053,695)	-	3,817,560	-
Changes in cashflows from financing activities	1,303,832,128	-	(71,181,277)	-
Decrease in retained earnings	-	-	-	-
Decrease in non-controlling interests	-	-	-	-
Others(*1)	30,568,021	-	253,616,884	-
Balance at 31 December, 2022	<u>₩ 7,208,173,147</u>	<u>-</u>	<u>5,874,826,693</u>	<u>-</u>

(*1) Includes effects due to exchange rate changes.

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58. Operating Segment Information

The Group has four strategic business units as reportable segments. Each strategic business unit operates to provide distinguished products and services. As required technical capabilities and marketing strategies are different for these business units, they are separately operated. The chief decision maker reviews internal reports for each strategic business unit on at least a quarterly basis.

Details of segment reporting are as follows:

- a. Raw materials: manufacturing and distribution of PE, PVC and CA
- b. Manufacturing: manufacturing and distribution of automotive parts
- c. Retail: department stores, wholesaling and retailing
- d. Photovoltaic: manufacturing and distribution of solar products, such as ingots and modules
- e. Others: manufacturing, distribution and leasing

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58. Operating Segment Information, Continued

(1) Operating income by each reportable segment for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

	2022							Total
	Raw material	Manufacturing	Retail	Photovoltaic	Others	Subtotal	Consolidated adjustment	
Revenue:								
External revenue	₩ 5,909,190,234	1,152,239,178	532,706,430	5,568,474,669	491,337,594	13,653,948,105	-	13,653,948,105
Inter-segment revenue	353,099,636	143,695,918	36,753,039	5,660,955,926	21,901,997	6,216,406,516	(6,216,406,516)	-
	<u>₩ 6,262,289,870</u>	<u>1,295,935,096</u>	<u>569,459,469</u>	<u>11,229,430,595</u>	<u>513,239,591</u>	<u>19,870,354,621</u>	<u>(6,216,406,516)</u>	<u>13,653,948,105</u>
Operating profit (*1)	₩ 582,059,601	41,856,758	35,750,892	649,927,593	(38,313,144)	1,271,281,700	(305,034,320)	966,247,380
Share of profit of associates and joint ventures								(101,874,422)
Other non-operating income and expenses								(104,679,217)
Financial income and expenses								(190,454,878)
Income before income tax expense:								569,238,863
Depreciation and amortization (*2)	238,806,868	54,352,903	76,711,922	285,872,553	19,190,557	674,934,803	550,970	675,485,773
Loss on valuation of inventories	30,477,620	5,636,092	2,954,498	11,957,189	1,346,044	52,371,443	(187,607)	52,183,836
Bad debt expenses	956,235	1,656,935	287,541	2,378,928	(43,222)	5,236,417	-	5,236,417
Capital expenditures (*3)	471,779,502	17,666,446	45,022,998	284,909,456	129,941,137	949,319,539	-	949,319,539

(*1) Total segment operating income is different from operating income in the consolidated statements of comprehensive income due to unrecognized income on inter-segment transactions, which were eliminated upon consolidation.

(*2) Total amount of depreciation of property, plant and equipment, investment property and right-of-use assets and amortization of intangible assets.

(*3) Capital expenditures consist of acquisition of property, plant and equipment, investment property and intangible assets.

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58. Operating Segment Information, Continued

(1) Operating income by each reportable segment for the years ended December 31, 2022 and 2021 are as follows, continued:

In thousands of won

	2021							Consolidated adjustment	Total
	Raw material	Manufacturing	Retail	Photovoltaic	Others	Subtotal			
Revenue:									
External revenue	₩ 5,364,014,673	938,922,614	514,740,700	3,568,492,538	339,021,860	10,725,192,385	-	10,725,192,385	
Inter-segment revenue	398,282,467	83,483,488	33,713,853	3,135,287,735	13,060,967	3,663,828,510	(3,663,828,510)	-	
	<u>₩ 5,762,297,140</u>	<u>1,022,406,102</u>	<u>548,454,553</u>	<u>6,703,780,273</u>	<u>352,082,827</u>	<u>14,389,020,895</u>	<u>(3,663,828,510)</u>	<u>10,725,192,385</u>	
Operating profit(*1)	₩ 1,046,045,481	11,107,461	26,793,156	(426,504,339)	(13,947,799)	643,493,960	94,853,695	738,347,655	
Share of profit of associates and joint ventures								262,895,885	
Other non-operating income and expenses								(20,258,380)	
Financial income and expenses								(125,646,877)	
Income before income tax expense								855,338,283	
Depreciation and amortization(*2)	217,244,632	55,017,228	69,496,043	300,758,113	10,867,784	653,383,800	(4,681,476)	648,702,324	
Loss on valuation of inventories	7,125,082	5,249,432	1,083,135	55,431,838	991,005	69,880,492	(23,738,930)	46,141,562	
Bad debt expenses	(279,881)	(344,698)	326,259	12,613,312	(154,193)	12,160,799	-	12,160,799	
Capital expenditures(*3)	312,092,892	61,059,118	55,392,582	385,659,523	19,956,384	834,160,499	-	834,160,499	

(*1) Total segment operating income is different from operating income in the consolidated statements of comprehensive income due to unrecognized income on inter-segment transactions, which were eliminated upon consolidation.

(*2) Total amount of depreciation of property, plant and equipment, investment property and right-of-use assets and amortization of intangible assets.

(*3) Capital expenditures consist of acquisition of property, plant and equipment, investment property and intangible assets.

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58. Operating Segment Information, Continued

(2) Operating segment information as of December 31, 2022 and December 31, 2021 are as follows:

In thousands of won

	December 31, 2022							
	Raw material	Manufacturing	Retail	Photovoltaic	Others (*1)	Subtotal	Consolidated adjustment	Total
Segment assets:								
Current assets	₩ 1,558,540,758	794,267,535	334,071,526	7,143,559,238	1,699,451,991	11,529,891,048	(2,956,595,613)	8,573,295,435
Investment in associates and joint ventures	1,033,835,726	527,021,828	173,599,186	9,083,814,897	3,622,196,831	14,440,468,468	(10,695,840,908)	3,744,627,560
Other non-current assets	3,137,006,144	543,818,354	1,488,907,067	4,101,245,194	822,915,736	10,093,892,495	(204,145,299)	9,889,747,196
Finance business assets	-	-	-	-	1,624,027,222	1,624,027,222	-	1,624,027,222
	₩ <u>5,729,382,628</u>	<u>1,865,107,717</u>	<u>1,996,577,779</u>	<u>20,328,619,329</u>	<u>7,768,591,780</u>	<u>37,688,279,233</u>	<u>(13,856,581,820)</u>	<u>23,831,697,413</u>
Segment liabilities:								
Current liabilities	₩ 1,258,938,487	408,720,514	537,748,072	4,563,490,387	2,648,756,366	9,417,653,826	(2,609,162,396)	6,808,491,430
Non-current liabilities	510,787,037	112,423,993	483,785,644	1,697,398,891	3,421,412,628	6,225,808,193	(540,376,116)	5,685,432,077
Finance business liabilities	-	-	-	-	1,440,862,347	1,440,862,347	-	1,440,862,347
	₩ <u>1,769,725,524</u>	<u>521,144,507</u>	<u>1,021,533,716</u>	<u>6,260,889,278</u>	<u>7,511,031,341</u>	<u>17,084,324,366</u>	<u>(3,149,538,512)</u>	<u>13,934,785,854</u>

(*1) Cash and borrowings of HANWHA SOLUTIONS CORPORATION are classified as 'Others' as classification by business segment is limited.

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58. Operating Segment Information, Continued

(2) Operating segment information as of December 31, 2022 and December 31, 2021 are as follows, continued:

In thousands of won

	December 31, 2021							
	Raw material	Manufacturing	Retail	Photovoltaic	Others (*1)	Subtotal	Consolidated adjustment	Total
Segment assets:								
Current assets	₩ 1,643,784,745	542,437,343	342,650,246	4,078,224,500	1,128,218,852	7,735,315,686	(1,661,355,755)	6,073,959,931
Investment in associates and joint ventures	513,780,409	1,195,867,939	173,965,220	6,961,938,886	2,691,121,255	11,536,673,709	(8,098,270,696)	3,438,403,013
Other non-current assets	2,915,087,122	643,745,608	1,469,310,244	3,883,144,885	312,498,934	9,223,786,793	(138,619,973)	9,085,166,820
Finance business assets	-	-	-	-	1,410,042,430	1,410,042,430	-	1,410,042,430
	₩ 5,072,652,276	2,382,050,890	1,985,925,710	14,923,308,271	5,541,881,471	29,905,818,618	(9,898,246,424)	20,007,572,194
Segment liabilities:								
Current liabilities	₩ 1,235,927,136	475,884,326	582,977,783	3,506,925,586	1,756,925,807	7,558,640,638	(1,770,750,936)	5,787,889,702
Non-current liabilities	405,021,530	149,358,930	444,592,211	1,084,910,251	2,900,682,266	4,984,565,188	(210,087,241)	4,774,477,947
Finance business liabilities	-	-	-	-	1,243,957,426	1,243,957,426	-	1,243,957,426
	₩ 1,640,948,666	625,243,256	1,027,569,994	4,591,835,837	5,901,565,499	13,787,163,252	(1,980,838,177)	11,806,325,075

(*1) Cash and borrowings of HANWHA SOLUTIONS CORPORATION are classified as 'Others' as classification by business segment is limited.

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58. Operating Segment Information, Continued

(3) Details of the consolidation adjustment for assets and liabilities in each sector as of December 31, 2022 and December 31, 2021 are as follows:

<i>In thousands of won</i>	<u>December 31, 2022</u>	<u>December 31, 2021</u>
Consolidated assets		
Segment assets		
Subtotal of assets	₩ 29,919,687,453	24,363,937,147
Other segment assets	7,768,591,780	5,541,881,471
Consolidated adjustment		
Investment capital offset	(10,203,360,807)	(8,098,270,696)
Internal transaction offset	(2,756,622,425)	(2,071,477,369)
Others	(896,598,588)	271,501,641
	<u>₩ 23,831,697,413</u>	<u>20,007,572,194</u>
Consolidated liabilities		
Segment liabilities		
Subtotal of liabilities	₩ 9,573,293,025	7,885,597,753
Other segment liabilities	7,511,031,341	5,901,565,499
Consolidated adjustment		
Internal transaction offset	(2,756,622,425)	(2,071,881,454)
Deferred tax liabilities	112,851,335	146,158,655
Others	(505,767,422)	(55,115,378)
	<u>₩ 13,934,785,854</u>	<u>11,806,325,075</u>

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58. Operating Segment Information, Continued

(4) Details of the Group's sales revenues by region for the years ended December 31, 2022 and 2021, and non-current assets by region as of December 31, 2022 and December 31, 2021, are as follows:

(i) Sales revenues by region

<i>In thousands of won</i>		<u>2022</u>	<u>2021</u>
Domestic	₩	6,585,176,134	6,048,850,430
Oversea			
China		2,722,308,008	2,291,818,011
Germany		1,203,537,762	952,702,352
Others		3,142,926,201	1,431,821,592
		<u>7,068,771,971</u>	<u>4,676,341,955</u>
	₩	<u>13,653,948,105</u>	<u>10,725,192,385</u>

(ii) Non-current assets by region

<i>In thousands of won</i>		<u>December 31, 2022</u>	<u>December 31, 2021</u>
Domestic	₩	10,324,488,170	9,639,650,078
Oversea			
China		595,474,281	747,763,535
Germany		359,487,287	215,332,884
Others		1,704,805,957	1,497,283,573
		<u>2,659,767,525</u>	<u>2,460,379,992</u>
	₩	<u>12,984,255,695</u>	<u>12,100,030,070</u>

(*) Financial assets and deferred income tax assets are excluded from these amounts.

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59. Revenue

The Group recognized sales revenue of each operating segment by transferring goods and services over time or at a point in time. The classification of revenue for each segment is consistent with operating segment information under K-IFRS 1108 (see Note 58.(1)).

<i>In thousands of won</i>	<u>2022</u>	<u>2021</u>
Revenue recognized at a point in time		
Raw materials	₩ 5,905,722,603	5,360,543,661
Manufacturing	1,151,876,276	933,044,341
Retail	523,989,525	505,870,048
Photovoltaic	5,157,612,058	3,422,456,482
Others	467,113,425	339,021,860
	<u>13,206,313,887</u>	<u>10,560,936,392</u>
Revenue recognized over time		
Raw materials	3,467,631	3,471,012
Manufacturing	362,902	5,878,273
Retail	8,716,905	8,870,652
Renewable energy	410,862,611	146,036,056
Others	24,224,169	-
	<u>447,634,218</u>	<u>164,255,993</u>
	<u>₩ 13,653,948,105</u>	<u>10,725,192,385</u>

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60. Non-controlling interests

(1) Changes in accumulated non-controlling interests

Profit or loss allocated to non-controlling interests, net income attributable to non-controlling interests in equity and accumulated non-controlling interests of subsidiaries that are material to the Group for the years ended December 31, 2022 and 2021 are as follows:

In thousands of won

	Percentage of non-controlling interests	2022				Balance at 31 December 2022
		Balance at 1 January 2022	Net income allocated to noncontrolling interests	Dividends paid to non-controlling	Others	
Hanwha Holdings(USA), Inc.	38.48%	44,870,665	(1,395,934)	-	25,363,363	68,838,094
LYNOTECH GmbH	35.03%	-	(35,026)	-	17,851,543	17,816,517
HAM Holdings Corporation	47.24%	-	-	-	206,544,07	206,544,073
Hanwha Advanced Materials Corporation	47.24%	-	-	-	442,063,25	442,063,258
HCC Holdings Co., Ltd.	49.00%	-	8,307,398	-	216,895,67	225,203,071

In thousands of won

	Percentage of non-controlling interests	2021				Balance at 31 December 2021
		Balance at 1 January 2021	Net income allocated to noncontrolling interests	Dividends paid to non-controlling	Others	
Hanwha Holdings(USA), Inc.	20.00%	41,583,844	(2,646,460)	-	5,933,281	44,870,665

HANWHA SOLUTIONS CORPORATION AND SUBSIDIARIES
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60. Non-controlling interests, Continued

(2) Summarized financial information of subsidiaries

Summarized financial information for each non-controlling interest that is material to the Group prior to the elimination of intercompany transactions is as follows:

(i) Summarized consolidated statement of financial position as of December 31, 2022 and December 31, 2021 are as follows:

In thousands of won	December 31, 2022				
	<u>Hanwha Holdings(USA), Inc.(*1)</u>	<u>LYNQTECH GmbH</u>	<u>HAM Holdings Corporation</u>	<u>Hanwha Advanced Materials Corporation</u>	<u>HCC Holdings Co., Ltd.</u>
Current assets	₩ 184,904,390	27,521,840	52,871,747	343,432,739	58,686,317
Non-current assets	145,567,713	40,801,111	371,347,321	255,973,630	413,578,917
Current liabilities	136,247,063	17,462,497	76,373	101,426,614	5,360,508
Non-current liabilities	11,306,833	-	11,157,158	55,916,496	-
Equity	182,918,207	50,860,454	412,985,537	442,063,259	466,904,726

(*1) Consolidated financial information of intermediate parent company Hanwha Holdings (USA), Inc. and its 14 subsidiaries.

In thousands of won	December 31, 2021
	<u>Hanwha Holdings(USA), Inc.(*1)</u>
Current assets	₩ 347,963,979
Non-current assets	335,147,364
Current liabilities	335,055,188
Non-current liabilities	75,887,599
Equity	272,168,556

(*1) Consolidated financial information of intermediate parent company Hanwha Holdings (USA), Inc. and its 14 subsidiaries.

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60. Non-controlling interests, Continued

(2) Summarized financial information of subsidiaries, continued

(ii) Summarized consolidated statement of comprehensive income for years ended December 31, 2022 and 2021 are as follows:

In thousands of won

		2022				
		Hanwha Holdings(USA), Inc.(*1)	LYNQTECH GmbH	HAM Holdings Corporation	Hanwha Advanced Materials Corporation	HCC Holdings Co., Ltd.
Revenue	₩	371,682,917	3,141,840	-	48,361,352	-
Net income for the year		(10,648,295)	(99,989)	(6,365,759)	(5,752,784)	53,757,809
Other comprehensive income (loss)		21,438,086	(2,354,370)	-	-	-
	₩	<u>10,789,791</u>	<u>(2,454,359)</u>	<u>(6,365,759)</u>	<u>(5,752,784)</u>	<u>53,757,809</u>

(*1) Consolidated financial information of intermediate parent company Hanwha Holdings (USA), Inc. and its 14 subsidiaries.

In thousands of won

		2021
		Hanwha Holdings(USA), Inc.(*1)
Revenue	₩	672,072,907
Net income for the year		(11,600,748)
Other comprehensive income (loss)		29,567,429
	₩	<u>17,966,681</u>

(*1) Consolidated financial information of intermediate parent company Hanwha Holdings (USA), Inc. and its 14 subsidiaries.

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60. Non-controlling interests, Continued

(2) Summarized financial information of subsidiaries, continued

(iii) Summarized consolidated statements of cash flows for years ended December 31, 2022 and 2021 are as follows:

In thousands of won	2022				
	Hanwha Holdings(USA), Inc.(*1)	LYNQTECH GmbH	HAM Holdings Corporation	Hanwha Advanced Materials Corporation	HCC Holdings Co., Ltd.
Cash flows from operating activities	₩ 24,845,456	(25,359,352)	(189,681)	(3,843,363)	(7,317,510)
Cash flows from investing activities	331,906	37,074,208	201	(1,257,256)	66,225,311
Cash flows from financing activities	(32,536,863)	(75,331)	52,969,856	137,275,354	(448,647)
Decrease in cash and cash equivalents	(7,359,501)	11,639,525	52,780,376	132,174,735	58,459,154
Balance at 1 January	65,517,702	-	-	-	-
Effects of foreign exchange rate	4,656,685	(52,246)	-	-	-
Balance at 31 December	₩ 62,814,886	11,587,279	52,780,376	132,174,735	58,459,154

(*1) Consolidated financial information of intermediate parent company Hanwha Holdings (USA), Inc. and its 14 subsidiaries.

In thousands of won	2021	
	Hanwha Holdings(USA), Inc.(*1)	
Cash flows from operating activities	₩	(27,825,217)
Cash flows from investing activities		(2,192,416)
Cash flows from financing activities		(36,318,847)
Increase(decrease) in cash and cash equivalents		(66,336,480)
Balance at 1 January		123,213,049
Effects of foreign exchange rate		8,641,133
Balance at 31 December	₩	65,517,702

(*1) Consolidated financial information of intermediate parent company Hanwha Holdings (USA), Inc. and its 14 subsidiaries.

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61. Share-based payment

The Group granted 489,102 shares of Restrictive Stock Units (the "RSU") to executives and employee, and also granted the cash compensation linked with the share price. The Group recognized the compensation expenses of ₩42,753 million for the year ended December 31, 2022.

Stock option is measured at the fair value at the grant date for the Restrictive Stock Units, while cash compensation linked with the share price is measured at the closing price at the end of every reporting period. The annual share-based payment will be fully vested for executives above Vice President if they provide service for more than six months in the fiscal year in which it includes the grant date, while executives below executive director will be granted the annual share-based payment in the concept of performance-based incentives on December 31 and it will be fully vested at the same time. Share-based payment will be effective after the grant date, from 5 to 10 years.

62. Subsequent Events

(1) Payment for increase in preference share capital

On 11st January 2023, payment of ₩49,387 million for increase in preference share capital, which was decided by the board meeting on 28th October, 2022, has been completed.

(2) Spin-off

On 1st March 2023, the Group has spin-off business division of which it operates business of department store, and retail and wholesale businesses to establish new Company (Hanwha Galleria Co., Ltd.) through a simple and spin-off method as prescribed in Article 530-2 to 11 of Commercial Act.