

GS Engineering & Construction Corporation
and its subsidiaries

Consolidated financial statements
for the years ended December 31, 2019 and 2018
with the independent auditor's report

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Independent auditor's report

The Shareholders and Board of Directors GS Engineering & Construction Corporation

Opinion

We have audited the consolidated financial statements of GS Engineering & Construction Corporation (the "Company") and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as of December 31, 2019 and 2018, and the consolidated statements of profit or loss, consolidated statements of comprehensive income, consolidated statements of changes in equity and consolidated statements of cash flows for the years then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2019 and 2018, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with Korean International Financial Reporting Standards ("KIFRS").

Basis for opinion

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

Key audit matters

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

A. Uncertainty in estimating total contract costs

A majority of the Group's construction contracts are performed over a long period of time, and total contract costs are estimated based on the future estimates of the components thereof.

Therefore, there may be additional costs incurred that were not estimable until before the prior period due to the following reasons:

- Changes in macroeconomic and microeconomic variables that are the basis of the total contract cost estimation during the construction period
- Various changes in circumstances in the domestic and overseas regions in which constructions are ongoing; and
- Extensions in construction period of some construction projects

For these reasons, there is an uncertainty in estimating total contract costs, and a change in the total contract cost estimation will affect profit or loss of the current or future period. Accordingly, we identified the uncertainty in estimating the total contract costs as a key audit matter.

The major audit procedures we performed are as follows:

- Inquired and checked the related documents for projects with significant differences in total input costs and the estimated total contract costs of the construction contracts that were terminated during the current period
- Inquired the reasons for significant changes in total contract costs during the current period for major contracts and checked the supporting documents concerning such reasons for the changes
- Inquired and reviewed the related documents to verify whether the estimated total contract costs are properly reflected with respect to construction contracts for which there was a change in terms of the contract during the current period
- Reviewed the documents on whether the estimated total contract costs have been recognized with appropriate approval procedures as set by the Group
- Inquired of major contracts with possible changes in the estimated total contract costs due to delays and extensions in construction periods
- Inquired of the validity of total contract costs estimation on significant contracts in which there are no changes in total contract costs for a long period of time

B. Calculation of the percentage-of-completion of a construction

In the case of a construction contract where revenue is recognized based on the input method, the percentage-of-completion of a construction is a factor that directly affect the calculation of the contract revenue. In addition, the calculation of the percentage-of-completion of the construction is affected by the appropriateness of the estimated total contract costs and cumulative contract costs incurred, and accordingly, the effect of uncertainty in the estimated total contract costs, timeliness to reflect the estimated total contract costs, and reliability of the cumulative contract costs incurred are factors that may materially affect the current profit or loss. Therefore, we identified the calculation of the percentage-of-completion of a construction as a key audit matter.

The major audit procedures we performed are as follows:

- Inquired of how contract costs incurred are accumulated and whether there were any changes in the systems and controls in relation to accumulating the actual costs of individual construction contract and tested the related internal controls thereof
- Tested the approval list of the occurrence, amounts and accurate assignment on construction sites for contract costs incurred that are accumulated by major sites
- Inquired of construction contracts for which percentage-of-completion of the construction has significantly changed during the current period and reasons for such changes
- Inquired of occurrence of any costs excluded from the calculation of percentage-of-completion due to failure to reflect the progress of the contract and the related accounting treatment thereof
- Recalculated independently the percentage-of-completion on each construction contract in order to identify the appropriateness of the calculation process
- Compared the difference between the percentage-of-completion under accounting purpose and the percentage of completion by observing the information available to the auditors at the construction sites and reviewed the validity thereof

C. Recoverability of unbilled construction contracts

As described in Note 8 to the accompanying consolidated financial statements, unbilled construction contracts recorded in the consolidated statement of financial position amounts to ₩1,089,296 million as of December 31, 2019, which have been decreased by ₩638,010 million compared to the prior period and accounted for 31% of the total trade and other receivables. Generally, unbilled construction contracts can be claimed based on the conditions to claim as set forth in the contract, such as the completion of construction on a related process and the result of a project inspection conducted by the customer. Accordingly, considering these circumstances, we identified the recoverability of unbilled construction contracts as a key audit matter.

The major audit procedures we performed are as follows:

- Checked the payment terms of a construction contract with significant unbilled construction amounts and reviewed if there is any construction site with abnormally significant unbilled construction amounts based on conditions to claim as set forth in the contract
- Identified construction sites of which there exists significant difference between the percentage-of-completion and construction billing rate and inquired of the reasons therefrom
- Identified significant construction contracts with unbilled contracts, inquired of the possibility of financial risk over a customer, and checked other related information
- If there are significant construction sites in which unbilled construction has not changed for a long period of time, inquired as to the specific reasons such as lawsuits, etc.

D. Accounting treatment for modifications in construction contracts

A modification in a construction contract refers to an alteration to the scope of works in a construction contract by the request of a customer. As described in Note 8 to the consolidated financial statements, the changes in the estimated total construction revenue amounted to ₩2,872,006 million for the year ended December 31, 2019. As majority of the Group's construction contracts are performed over a long period of time, the possibility that modifications are likely to occur exists in such construction contracts, which could result in increase or decrease in contract revenue in accordance with modifications in the scope of works. Accounting treatment for modifications requires an estimate of possibility of changes in total revenue and management's judgment on a reliable measurement of the changes. In addition, the changes in the total construction revenue and costs due to modifications will affect profit or loss of the current or future period. Accordingly, we identified the accounting treatment for variations in construction contract as a key audit matter.

The major audit procedures we performed are as follows:

- Inquired of the reasons for the changes in construction contracts with significant changes in contract revenue
- Inquired regarding the possibility of occurrence of compensations on delayed projects for which are overdue or soon to be completed on the due date as set forth in the contract
- Inquired as to whether the estimation of additional contract costs is reflected in the calculation of estimated total contract costs and percentage-of-completion

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

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

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

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

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

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

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

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

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

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

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

The engagement partner on the audit resulting in this independent auditor's report is *Tae Gon Lee*.



March 19, 2020

This audit report is effective as of March 19, 2020, the independent auditor's report date. Accordingly, certain material subsequent events or circumstances may have occurred during the period from the independent auditor's report date to the time this report is used. Such events and circumstances could significantly affect the accompanying consolidated financial statements and may result in modifications to this report.

GS Engineering & Construction Corporation and its subsidiaries

Consolidated financial statements
for the years ended December 31, 2019 and 2018

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

Byeong Yong Lim
Chief Executive Officer
GS Engineering & Construction Corporation

GS Engineering & Construction Corporation and its subsidiaries
Consolidated statements of financial position
as of December 31, 2019 and 2018

(Korean won in millions)

	Notes	2019	2018
Assets			
Current assets:			
Cash and cash equivalents	10,32,33	₩ 1,792,956	₩ 1,592,619
Trade and other receivables, net	7,8,10,30,32,33	3,505,180	4,297,385
Inventories, net	9	875,114	1,034,194
Short-term financial assets	6,10,12,32,33,35	284,372	295,205
Other current assets	9	871,235	608,762
Total current assets		7,328,857	7,828,165
Non-current assets:			
Property, plant and equipment, net	14	1,176,032	841,048
Intangible assets, net	15	489,994	215,664
Investment properties	16	918,272	915,828
Right-of-use assets	35	519,044	-
Investments in associates and joint ventures	13	52,395	73,491
Long-term trade and other receivables, net	7,10,30,32,33	1,157,030	946,330
Long-term financial assets	6,10,32,33,35	438,709	194,151
Deferred tax assets	28	846,852	788,390
Financial assets at fair value through profit or loss	10,11,33	244,021	230,208
Total non-current assets		5,842,349	4,205,110
Total assets		₩ 13,171,206	₩ 12,033,275
Liabilities			
Current liabilities:			
Trade and other payables	10,17,30,32,33	₩ 1,629,980	₩ 2,023,490
Short-term financial liabilities	10,12,18,32,33,35	991,731	1,118,162
Income tax payable	28	133,844	181,500
Current provisions	8,20	135,707	118,471
Other current liabilities	8,10,17,33	2,909,628	2,918,104
Total current liabilities		5,800,890	6,359,727
Non-current liabilities:			
Long-term financial liabilities	10,16,18,32,33,35	2,344,607	1,147,180
Net defined benefit liabilities	19	49,810	72,788
Non-current provisions	10,20,32,33	411,092	533,924
Deferred tax liabilities	28	130,340	5,858
Other non-current liabilities	10,14,17,33	291,439	289,112
Total non-current liabilities		3,227,288	2,048,862
Total liabilities		9,028,178	8,408,589
Equity			
Equity attributable to owners of the parent:			
Issued capital	1,22	400,489	397,179
Share premium	22	802,294	811,768
Other equity components	22	(9,428)	(77,044)
Accumulated other comprehensive loss	12,22	(46,036)	(70,463)
Retained earnings	23	2,827,363	2,487,073
		3,974,682	3,548,513
Non-controlling interests		168,346	76,173
Total equity		4,143,028	3,624,686
Total liabilities and equity		₩ 13,171,206	₩ 12,033,275

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

GS Engineering & Construction Corporation and its subsidiaries
Consolidated statements of profit or loss
for the years ended December 31, 2019 and 2018
(Korean won in millions, except per share amounts)

	Notes	2019	2018
Sales	5,8,30		
Construction operations		₩ 9,672,557	₩ 12,274,523
Housing construction and sales operations		398,192	570,833
Other operations		345,840	294,017
		<u>10,416,589</u>	<u>13,139,373</u>
Cost of sales	8,29,30		
Cost of construction operations		8,397,455	10,775,213
Cost of housing construction and sales operations		302,090	444,309
Cost of other operations		319,177	292,286
		<u>9,018,722</u>	<u>11,511,808</u>
Gross profit		<u>1,397,867</u>	<u>1,627,565</u>
Selling and administrative expenses	25,29	<u>630,601</u>	<u>563,076</u>
Operating profit	5	767,266	1,064,489
Other income	10,12,26	264,178	259,119
Other expenses	10,12,26	389,312	318,459
Share of profit (loss) of associates	13	(2,904)	6,502
Finance income	10,12,27,30	260,442	106,444
Finance costs	10,12,27,32	<u>225,936</u>	<u>283,046</u>
Profit before income tax	5	673,734	835,049
Income tax expenses	28	<u>226,255</u>	<u>247,615</u>
Profit for the year		<u>₩ 447,479</u>	<u>₩ 587,434</u>
Profit for the year attributable to:			
Equity holders of the parent		443,360	582,099
Non-controlling interests		4,119	5,335
Earnings per share attributable to the equity holders of the parent (Korean won)	24		
Basic earnings per share		₩ 5,590	₩ 7,788
Diluted earnings per share		5,046	7,136

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

GS Engineering & Construction Corporation and its subsidiaries
Consolidated statements of comprehensive income
for the years ended December 31, 2019 and 2018
(Korean won in millions)

	Notes	2019	2018
Profit for the year		₩ 447,479	₩ 587,434
Other comprehensive income (loss)			
Other comprehensive income (loss) to be reclassified to profit or loss in subsequent periods (net of tax):			
Gain on exchange differences on translations of foreign operations	22,28	22,606	(4,831)
Loss on exchange differences on translations of foreign operations	22,28	(5,388)	5,224
Gain on valuation of derivative instruments	12,22,28	3,208	(7,035)
Loss on valuation of derivative instruments	12,22,28	2,342	(3,319)
Other comprehensive income (loss) not to be reclassified to profit or loss in subsequent periods (net of tax):			
Re-measurements on net defined benefit liabilities	19,23,28	(14,495)	(11,818)
Other comprehensive income (loss) for the year		8,273	(21,779)
Total comprehensive income for the year		₩ 455,752	₩ 565,655
Attributable to:			
Equity holders of the parent		453,516	565,092
Non-controlling interests		2,236	563

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

GS Engineering & Construction Corporation and its subsidiaries
Consolidated statements of changes in equity
for the years ended December 31, 2019 and 2018
(Korean won in millions)

	Attributable to equity holders of the parent					Non-controlling Interests	Total equity
	Issued capital	Share premium	Other equity components	Accumulated other comprehensive loss	Retained earnings		
As of January 1, 2018	₩ 358,376	₩ 627,156	₩ (87,207)	₩ (65,365)	₩ 2,334,346	₩ 72,409	₩ 3,239,715
Cumulative effect of changes in accounting policy	-	-	-	91	(395,787)	-	(395,696)
As of January 1, 2018 (restated)	₩ 358,376	₩ 627,156	₩ (87,207)	₩ (65,274)	₩ 1,938,559	₩ 72,409	₩ 2,844,019
Total comprehensive income (loss)							
Profit for the year	-	-	-	-	582,099	5,335	587,434
Gain on exchange differences on translations of foreign operations	-	-	-	(3,634)	-	(1,197)	(4,831)
Loss on exchange differences on translations of foreign operations	-	-	-	8,818	-	(3,594)	5,224
Gain on valuation of derivative instruments	-	-	-	(7,035)	-	-	(7,035)
Loss on valuation of derivative instruments	-	-	-	(3,338)	-	19	(3,319)
Re-measurements on net defined benefit liabilities	-	-	-	-	(11,818)	-	(11,818)
Total comprehensive income for the year	-	-	-	(5,189)	570,281	563	565,655
Transactions with equity holders of the parent							
Interests paid on hybrid securities	-	-	-	-	(1,268)	-	(1,268)
Exchange of hybrid securities	-	(7,369)	10,163	-	-	2,794	2,794
Dividends to equity holders of the parent	-	-	-	-	(21,071)	-	(21,071)
Changes in non-controlling interests	-	-	-	-	-	1,444	1,444
Changes in the scope of consolidation	-	-	-	-	-	1,683	1,683
Conversion of convertible bonds	38,803	191,981	-	-	-	-	230,784
Others	-	-	-	-	572	74	646
Total transactions with equity holders of the parent	38,803	184,612	10,163	-	(21,767)	3,201	215,012
As of December 31, 2018	₩ 397,179	₩ 811,768	₩ (77,044)	₩ (70,463)	₩ 2,487,073	₩ 76,173	₩ 3,624,686
As of January 1, 2019	₩ 397,179	₩ 811,768	₩ (77,044)	₩ (70,463)	₩ 2,487,073	₩ 76,173	₩ 3,624,686
Cumulative effect of changes in accounting policy	-	-	-	-	(6,232)	-	(6,232)
As of January 1, 2019 (restated)	₩ 397,179	₩ 811,768	₩ (77,044)	₩ (70,463)	₩ 2,480,841	₩ 76,173	₩ 3,618,454
Total comprehensive income (loss)							
Profit for the year	-	-	-	-	443,360	4,118	447,479
Gain on exchange differences on translations of foreign operations	-	-	-	19,519	-	3,086	22,606
Loss on exchange differences on translations of foreign operations	-	-	-	(702)	-	(4,685)	(5,388)
Gain on valuation of derivative instruments	-	-	-	3,208	-	-	3,208
Loss on valuation of derivative instruments	-	-	-	2,402	-	(60)	2,342
Re-measurements on net defined benefit liabilities	-	-	-	-	(14,271)	(224)	(14,495)
Total comprehensive income for the year	-	-	-	24,427	429,089	2,235	455,752
Transactions with equity holders of the parent							
Interests paid on hybrid securities	-	-	-	-	(795)	-	(795)
Dividends to equity holders of the parent	-	-	-	-	(78,743)	(4,250)	(82,993)
Changes in non-controlling interests	-	-	-	-	-	2,367	2,367
Changes in the scope of consolidation	-	-	-	-	-	91,403	91,403
Changes in interests in subsidiaries	-	(25,235)	67,616	-	510	1,056	43,947
Conversion of convertible bonds	3,310	15,761	-	-	-	-	19,071
Others	-	-	-	-	(3,539)	(638)	(4,177)
Total transactions with equity holders of the parent	3,310	(9,474)	67,616	-	(82,567)	89,938	68,823
As of December 31, 2019	₩ 400,489	₩ 802,294	₩ (9,428)	₩ (46,036)	₩ 2,827,363	₩ 168,346	₩ 4,143,028

The accompanying notes are an integral part of these consolidated financial statements

GS Engineering & Construction Corporation and its subsidiaries
Consolidated statements of cash flows
for the years ended December 31, 2019 and 2018
(Korean won in millions)

	Notes	2019	2018
Cash flows from operating activities			
Cash generated from operations	31	₩ 1,161,512	₩ 1,282,519
Interest received		69,065	41,802
Interest paid		(137,342)	(150,212)
Dividends received		750	898
Income tax paid		(334,716)	(142,060)
Net cash flows provided by operating activities		759,269	1,032,947
Cash flows from investing activities			
Decrease in other receivables		349,180	369,230
Decrease in short-term financial assets		520,789	413,909
Decrease in long-term other receivables		194,881	284,788
Decrease in long-term financial assets		16,801	10,920
Disposal of financial asstes at fair value through profit or loss		24,785	19,359
Disposal of investments in associates and joint ventures		291	-
Disposal of property, plant and equipment		7,045	28,400
Disposal of intangible assets		1,308	514
Disposal of investment properties		859	1,070
Changes in the scope of consolidation		9,787	-
Increase in other receivables		(178,980)	(382,262)
Increase in short-term financial assets		(480,109)	(475,111)
Increase in long-term other receivables		(630,081)	(372,700)
Increase in long-term financial assets		(27,651)	(9,022)
Acquisition of financial asstes at fair value through profit or loss		(13,281)	(22,505)
Acquisition of investments in associates		(24,680)	(23,062)
Acquisition of property, plant and equipment		(142,819)	(13,696)
Acquisition of intangible assets		(17,234)	(19,685)
Acquisition of investment properties		(69,598)	(44,852)
Acquisition of investments in subsidiaries		(288,904)	-
Changes in the scope of consolidation		(7)	(57)
Net cash flows used in investing activities		(747,618)	(234,762)
Cash flows from financing activities			
Increase in short-term financial liabilities		2,155,082	995,667
Increase in long-term financial liabilities		1,003,335	446,712
Increase in other non-current liabilities		25,682	30,002
Increase in the non-controlling interests		45,953	3,125
Decrease in short-term financial liabilities		(2,672,926)	(2,975,642)
Decrease in other current liabilities		(5,439)	(11,886)
Decrease in long-term financial liabilities		(68,763)	(67,583)
Decrease in other non-current liabilities		(43,968)	(53,364)
Acquisition of investments in subsidiaries		(67,616)	-
Dividends paid		(83,017)	(21,071)
Interest payment in relation to the hybrid securities		(795)	(1,268)
Payment of stock issuance costs		(39)	(314)
Payment of principal portion of lease liabilities		(103,963)	-
Net cash flows provided by (used in) financing activities		183,526	(1,655,622)
Net foreign exchange difference		5,160	7,758
Net increase (decrease) in cash and cash equivalents		200,337	(849,679)
Cash and cash equivalents at the beginning of the year		1,592,619	2,442,298
Cash and cash equivalents at the end of the year		₩ 1,792,956	₩ 1,592,619

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

GS Engineering & Construction Corporation and its subsidiaries
Notes to the consolidated financial statements
December 31, 2019 and 2018

1. General information

General information of GS Engineering & Construction Corporation (the "Company") and its subsidiaries including Xi S&D Inc. (collectively referred to as the "Group") in accordance with KIFRS 1110 *Consolidated Financial Statement* are as follows.

1.1 Corporate information

The Company was incorporated on December 19, 1969, under the laws of the Republic of Korea to engage in the civil works and architectural construction, construction and sales of new houses, repairs and maintenance, overseas general construction and technology consultation. The Company acquired Lucky Foreign Construction Co., Ltd., LG Engineering Co., Ltd. and Baekyang Development Co., Ltd. on January 4, 1979, August 1, 1999 and October 1, 2000, respectively.

The Company has listed its shares on the Korea Exchange since August 3, 1981, and changed its name from LG Engineering & Construction Co., Ltd. to GS Engineering & Construction Corporation on March 18, 2005. Also, in accordance with the *Monopoly Regulation and Fair Trade Act*, the Korea Fair Trade Commission has designated the Group as the related entities to GS Group and placed restrictions on mutual investments between the Group and the entities within GS Group.

As of December 31, 2019, the Company operates overseas branches and construction sites in several foreign countries, including the United Arab Emirates, Kuwait, Canada, China and Singapore.

The Company's issued capital as of December 31, 2019 amounts to ₩400,489 million.

1.2 Summary of consolidated subsidiaries

Consolidated subsidiaries as of December 31, 2019, are as follows:

Subsidiary	Equity ownership (%)		Location	Year end	Principal business activity
	2019	2018			
Xi S&D Inc.	61.17	85.61	Korea	12.31	Construction management
Xi -Estec Co., Ltd.	100.00	100.00	Korea	12.31	Construction service
GCS	99.85	99.70	Korea	12.31	Service
BSM	100.00	100.00	Korea	12.31	Processing
Zeit O&M Co., Ltd. (*1)	100.00	100.00	Korea	12.31	Service
GVESCO Corporation (*2)	100.00	-	Korea	12.31	Service
Pohang Yeongliman Ocean Cable car Co., Ltd. (*2)	60.00	-	Korea	12.31	Service
GS E&C Nanjing Co., Ltd.	100.00	100.00	China	12.31	Construction
Vietnam GS Industry One-Member LLC. (*3)	100.00	100.00	Vietnam	12.31	Real estate
Vietnam GS Enterprise One Member LLC. (*4)	100.00	100.00	Vietnam	12.31	Real estate
GS E&C Delhi Pvt. Ltd.	100.00	100.00	India	3.31	Construction service
GS Engineering & Construction Mumbai Pvt. Ltd.	100.00	100.00	India	3.31	Construction service
GS E&C Thai Co., Ltd. (*5)	49.00	49.00	Thailand	8.31	Real estate
GS E&C Malaysia SDN.BHD. (*7)	-	100.00	Malaysia	12.31	Construction
PT. GSENC Development Indonesia	100.00	100.00	Indonesia	12.31	Construction service
GS Construction Arabia Co., Ltd. (*6)	100.00	100.00	Saudi Arabia	12.31	Construction
GS Saudi Co., Ltd. (*7)	-	75.00	Saudi Arabia	12.31	Construction
GS Construction Middle East L.L.C. (*5)	49.00	49.00	UAE	12.31	Construction
GS Real Estate Development Company (*2)	100.00	-	Saudi Arabia	12.31	Construction
GS E&C Poland SP.ZO.O	100.00	100.00	Poland	12.31	Construction

GS Engineering & Construction Corporation and its subsidiaries
Notes to the consolidated financial statements
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1. General information (cont'd)

1.2 Summary of consolidated subsidiaries (cont'd)

Subsidiary	Equity ownership (%)		Location	Year end	Principal business activity
	2019	2018			
GS Engineering & Construction Spain, S.L.	100.00	100.00	Spain	12.31	Construction
GS Inima Environment S.A. (*8)	100.00	80.42	Spain	12.31	Construction
Chervona Gora EKO (*2)	100.00	-	Ukraine	12.31	Construction
GS E&C Ukraine, LLC (*2)	100.00	-	Ukraine	12.31	Electric
GS E&C Construction Canada Ltd.	100.00	100.00	Canada	12.31	Construction
GS E&C Panama S.A.	100.00	100.00	Panama	12.31	Lease
GS Village Lake LLC	100.00	100.00	USA	12.31	Real estate
GS Property Mountain View LLC.	100.00	100.00	USA	12.31	Real estate
GS MIRAMAR 700 EC, LLC	90.00	90.00	USA	12.31	Real estate
700 EC PROPERTY, LLC	90.00	90.00	USA	12.31	Real estate
PALA-POWER GENERAL CONSTRUCTION SERVICE (PROPRIETARY) LIMITED	100.00	100.00	Botswana	12.31	Construction
GS Engineering & Construction Australia Pty Ltd	100.00	100.00	Australia	12.31	Construction

(*1) The name was changed from Xi O&M to Zeit O&M Co., Ltd. in 2019.

(*2) Newly incorporated in 2019.

(*3) The name was changed from GS Nha Be Development One-member LLC, to Vietnam GS Industry One-Member LLC. in 2019.

(*4) The name was changed from GS Saigon Development One-member LLC, to Vietnam GS Enterprise One Member LLC. in 2019.

(*5) In accordance with a contractual arrangement with other shareholders, the Group is able to exercise control over the entity, and the investee has been included in the consolidation.

(*6) Includes securities held by subsidiaries.

(*7) Liquidated and excluded from the consolidation in 2019.

(*8) Summarized information of its subsidiaries are as follows:

Subsidiary	Domicile	Principal business activity	Year end	Equity ownership (%)
Aguas de Ensenada, S.A. de C.V.	Mexico	Construction	12.31	100.00
Ambient Servicos Ambientais de Ribeirao Preto, S.A.	Brazil	Construction	12.31	100.00
Aquaria Water LLC	USA	Construction	12.31	87.50
Araucaria Saneamento, S.A.	Brazil	Construction	12.31	51.00
GS Inima Chile S.A.	Chile	Construction	12.31	100.00
GS Inima Mexico, S.A. de C.V.	Mexico	Construction	12.31	100.00
GS Inima USA Construction Corporation	USA	Construction	12.31	100.00
GS Inima USA Corporation	USA	Construction	12.31	100.00
GS Inima Brasil Ltda.	Brazil	Construction	12.31	100.00
Promoagua Desalacion de los Cabos, S.A. de C.V.	Mexico	Construction	12.31	100.00
Saneamento do Vale do Paraiba, S.A.	Brazil	Construction	12.31	50.10
Servicos de Saneamento de Mogi Mirim, S.A.	Brazil	Construction	12.31	64.00
Tecnicas y Gestion Medioambiental, S.A.	Spain	Construction	12.31	100.00
Tractament Metropolitana de Fangs, S.L.	Spain	Construction	12.31	50.40
CASINIMA - Empreitada Ponte da Baia, A.C.E.	Portugal	Construction	12.31	50.00
GS Inima Servicios Corporativos, S.A. de C.V.	Mexico	Construction	12.31	100.00
SOCIEDAD DE ECONOMIA MIXTA AGUAS DE SORIA S.L.	Spain	Construction	12.31	59.20
VALORINIMA S.L.	Spain	Construction	12.31	80.00
Sanama Saneamento Alta Maceio S.A.	Brazil	Construction	12.31	60.00
INIMA-CVV S.A.	Chile	Construction	12.31	65.00
CAEPA COMPANHIA DE AGUA E EGOSTO DE PARIBUNA S.A.	Brazil	Construction	12.31	95.00
COMASA COMPANHIA AGUAS DE SANTA RITA S.A.	Brazil	Construction	12.31	75.00
SAMAR SOLUCOES AMBIENTAIS DE ARACATUBA S.A.	Brazil	Construction	12.31	100.00
Inima Water Services, S.L.	Spain	Construction	12.31	100.00
GS Inima Water Management S.L.	Spain	Construction	12.31	100.00

(*8) Summarized information of its subsidiaries are as follows: (cont'd)

Subsidiary	Domicile	Principal business activity	Year end	Equity ownership (%)
GS Inima Inversiones S.L.U.	Spain	Construction	12.31	100.00
GS Inima Gestion S.L.U.	Spain	Construction	12.31	100.00
Shariket Miyeh Ras Djinet, Spa (*1)	Algeria	Construction	12.31	25.49
GS Inima Environment Colombia S.A.S (*2)	Colombia	Construction	12.31	100.00
GS Inima Industrial S.A. (*2)	Brazil	Construction	12.31	100.00
Aquapolo Ambiental S.A. (*2)	Brazil	Construction	12.31	51.00
Jeceaba Ambiental S.A. (*2)	Brazil	Construction	12.31	84.50
Distribuidora de Aguas Triunfo S.A. (*2)	Brazil	Construction	12.31	100.00
GS Inima Servicios de Saneamento Eirli (*2)	Brazil	Construction	12.31	100.00
Ouro Preto Servicios de Saneamento S.A. – Saneouro (*2)	Brazil	Construction	12.31	60.00

(*1) In accordance with a contractual arrangement with other shareholders, the Group has control over the entity, and the investee has been included in the consolidation.

(*2) Newly incorporated in 2019.

GS Engineering & Construction Corporation and its subsidiaries
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1. General information (cont'd)

1.3 Summarized financial information

Summarized financial information of subsidiaries as of December 31, 2019 and 2018 are as follows (Korean won in millions):

Subsidiary	2019				
	Assets	Liabilities	Equity	Sales	Profit (loss) for the year
Xi S&D Inc.	₩ 278,481	₩ 133,345	₩ 145,136	₩ 277,945	₩ 12,433
Xi -Estec Co., Ltd.	894	473	421	4,613	20
GCS	24,479	7,338	17,141	64,257	2,444
BSM	4,084	2,022	2,062	18,161	1,858
Zeit O&M Co., Ltd.	18,925	9,371	9,554	67,089	496
GVESCO Corporation	5,031	376	4,655	-	(345)
Pohang Yeongliman Ocean Cable car Co., Ltd.	6,696	2,091	4,605	-	(395)
GS E&C Nanjing Co., Ltd.	181,176	139,385	41,791	362,893	28,055
Vietnam GS Industry One-Member LLC.	224,008	199,912	24,096	-	(1,814)
Vietnam GS Enterprise One Member LLC.	378,836	435,528	(56,692)	14,773	(21,439)
GS E&C Delhi Pvt. Ltd.	14,274	15,641	(1,367)	8,231	(7,305)
GS Engineering & Construction Mumbai Pvt. Ltd.	14,766	10,268	4,498	7,268	(10,097)
GS E&C Thai Co., Ltd.	36	-	36	-	-
GS E&C Malaysia SDN.BHD.	-	-	-	-	(21)
PT. GSENC Development Indonesia	24,248	1,106	23,142	-	(1,045)
GS Construction Arabia Co., Ltd.	53,434	750,801	(697,367)	11,807	(27,486)
GS Saudi Co., Ltd.	-	-	-	-	-
GS Construction Middle East L.L.C.	2,580	10,998	(8,418)	253	(7,253)
GS Real Estate Development Company	155	29	126	-	(28)
GS E&C Poland SP.ZO.O.	365	302	63	-	2
GS Engineering & Construction Spain, S.L.	134,141	43,827	90,314	4,525	(3,556)
GS Inima Environment S.A. (*)	1,453,639	927,948	525,691	287,856	23,467
Chervona Gora EKO	24,980	15,894	9,086	-	365
GS E&C Ukraine, LLC	-	-	-	-	-
GS E&C Construction Canada Ltd.	129	1,405	(1,276)	-	9
GS E&C Panama S.A.	1,172	22	1,150	-	-
GS Village Lake LLC	17,222	2,246	14,976	-	(113)
GS Property Mountain View LLC.	28,556	11,641	16,915	-	737
GS MIRAMAR 700 EC, LLC (*)	47,812	31,126	16,686	4,523	829
PALA-POWER GENERAL CONSTRUCTION SERVICE (PROPRIETARY) LIMITED	30	65	(35)	-	(7)
GS Engineering & Construction Australia Pty Ltd	12,282	14,279	(1,997)	-	(1,364)

(*) Includes financial information of subsidiaries.

GS Engineering & Construction Corporation and its subsidiaries
Notes to the consolidated financial statements
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1. General information (cont'd)

1.3 Summarized financial information (cont'd)

Subsidiary	2018				
	Assets	Liabilities	Equity	Sales	Profit (loss) for the year
Xi S&D Inc.	₩ 137,744	₩ 99,528	₩ 38,216	₩ 212,696	₩ 10,716
Xi -Estec Co., Ltd.	878	477	401	4,961	35
GCS	21,534	6,837	14,697	68,747	3,704
BSM	3,687	1,983	1,704	15,581	1,386
Zeit O&M Co., Ltd.	17,671	8,613	9,058	59,205	646
GS E&C Nanjing Co., Ltd.	225,354	171,860	53,494	771,146	32,896
Vietnam GS Industry One-Member LLC	152,238	141,770	10,468	-	(3,137)
Vietnam GS Enterprise One Member LLC	358,135	392,139	(34,004)	329	(29,150)
GS E&C Delhi Pvt. Ltd.	13,651	10,701	2,950	6,284	(8,318)
GS Engineering & Construction Mumbai Pvt. Ltd.	12,677	7,500	5,177	4,960	(10,537)
GS E&C Thai Co., Ltd.	32	-	32	-	(2)
GS EAST ASIA MANILA Inc.	-	-	-	-	(168)
GS E&C Malaysia SDN.BHD.	723	-	723	-	(56)
PT. GSENC Development Indonesia	15,010	329	14,681	-	(685)
GS Construction Arabia Co., Ltd.	47,167	693,302	(646,135)	146,312	113,273
GS Saudi Co., Ltd.	7	4,413	(4,406)	-	-
GS Construction Middle East L.L.C.	28,461	29,632	(1,171)	-	(1,243)
GS E&C Poland SP.ZO.O	366	307	59	-	2
GS Engineering & Construction Spain, S.L.	96,574	60,087	36,487	(13,586)	(38,370)
GS Inima Environment S.A. (*)	635,099	394,225	240,874	231,246	20,563
GS E&C Construction Canada Ltd.	172	1,361	(1,189)	-	(205)
GS E&C Panama S.A.	1,132	21	1,111	-	119
GS Village Lake LLC	15,304	2,075	13,229	-	(58)
GS Property Mountain View LLC	15,628	-	15,628	-	(25)
GS MIRAMAR 700 EC, LLC (*)	46,953	30,530	16,423	1,191	91
Pala-power General Construction Service (Proprietary) Limited	33	60	(27)	-	(11)
GS Engineering & Construction Australia Pty Ltd	5,808	6,425	(617)	-	(649)

(*) Includes financial information of subsidiaries.

The summarized financial information of the subsidiaries is based on amounts before inter-company eliminations. If the significant accounting treatments of the subsidiaries are different from those of the Company, such differences are adjusted.

2. Basis of preparation and a summary of significant accounting policies

2.1 Basis of preparation

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

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

2.2 Basis of consolidation

The consolidated financial statements comprise the financial statements of the Company and its subsidiaries as of December 31, 2019. Control is achieved when the Group is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee. Specifically, the Group controls an investee if, and only if, the Group has:

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

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

- The contractual arrangement with the other vote holders of the investee
- Rights arising from other contractual arrangements
- The Group's voting rights and potential voting rights

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

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

A change in the ownership interest of a subsidiary, without a loss of control, is accounted for as an equity transaction.

If the Group loses control over a subsidiary, it derecognizes the related assets (including goodwill), liabilities, non-controlling interest and other components of equity, while any resultant gain or loss is recognized in profit or loss. Any investment retained is recognized at fair value.

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

2.3 Summary of significant accounting policies

2.3.1 Business combinations and goodwill

Business combinations are accounted for using the acquisition method. The cost of an acquisition is measured as the aggregate of the consideration transferred, which is measured at acquisition date fair value, and the amount of any non-controlling interests in the acquiree. For each business combination, the Group elects whether to measure the non-controlling interests in the acquiree at fair value or at the proportionate share of the acquiree's identifiable net assets. Acquisition-related costs are expensed as incurred.

When the Group acquires a business, it assesses the financial assets and liabilities assumed for appropriate classification and designation in accordance with the contractual terms, economic circumstances and pertinent conditions as of the acquisition date. This includes the separation of embedded derivatives in host contracts by the acquiree. If the business combination is achieved in stages, any previously held equity interest is re-measured at its acquisition date fair value and any resulting gain or loss is recognized in profit or loss. It is then considered in the determination of goodwill.

Any contingent consideration to be transferred by the acquirer will be recognized at fair value at the acquisition date. Contingent consideration classified as equity is not remeasured and its subsequent settlement is accounted for within equity. Contingent consideration classified as an asset or liability that is a financial instrument and within the scope of KIFRS 1109 *Financial Instruments*, is measured at fair value with the changes in fair value recognized in the statement of income in accordance with KIFRS 1109. Other contingent consideration that is not within the scope of KIFRS 1109 is measured at fair value at each reporting date with changes in fair value recognized in profit or loss.

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

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

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

2.3.2 Investment in associates and joint ventures

An associate is an entity over which the Group has significant influence. Significant influence is the power to participate in the financial and operating policy decisions of the investee, but is not control or joint control over those policies. A joint venture is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint venture. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control. The considerations made in determining significant influence or joint control are similar to those necessary to determine control over subsidiaries.

The Group's investments in its associate and joint venture are accounted for using the equity method. Under the equity method, the investment in an associate or a joint venture is initially recognized at cost. The carrying amount of the investment is adjusted to recognize changes in the Group's share of net assets of the associate or joint venture since the acquisition date. Goodwill relating to the associate or joint venture is included in the carrying amount of the investment and is neither amortized nor individually tested for impairment.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.2 Investment in associates and joint ventures (cont'd)

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

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

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

After application of the equity method, the Group determines whether it is necessary to recognize an impairment loss on its investment in its associate or joint venture. At each reporting date, the Group determines whether there is objective evidence that the investment in the associate or joint venture is impaired.

Group calculates the amount of impairment as the difference between the recoverable amount of the associate or joint venture and its carrying value, then recognizes the loss as 'Share of profit of an associate and a joint venture' in the statement of profit or loss.

Upon loss of significant influence over the associate or joint control over the joint venture, the Group measures and recognizes any retained investment at its fair value. Any difference between the carrying amount of the associate or joint venture upon loss of significant influence or joint control and the fair value of the retained investment and proceeds from disposal is recognized in profit or loss.

2.3.3 Segment reporting

Operating segments are reported in a manner consistent with the internal reporting provided to the chief operating decision-maker (Note 5). The chief operating decision-maker, who is responsible for allocating resources and assessing performance of the operating segments, has been identified as the board of directors who is responsible for the Group's strategic decisions.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.4 Current versus non-current classification

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

An asset is current when it is:

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

All other assets are classified as non-current.

A liability is current when:

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

The Group classifies all other liabilities as non-current.

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

2.3.5 Fair value measurement

The Group measures financial instruments such as derivatives at fair value at each balance sheet date. Fair values of financial instruments and fair value hierarchy are disclosed in Note 33.

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The fair value measurement is based on the presumption that the transaction to sell the asset or transfer the liability takes place either:

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

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

The fair value of an asset or a liability is measured using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest.

The Group uses valuation techniques that are appropriate in the circumstances and for which sufficient data are available to measure fair value, maximizing the use of relevant observable inputs and minimizing the use of unobservable inputs.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.5 Fair value measurement (cont'd)

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

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

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

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

2.3.6 Foreign currencies

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

1) Transactions and balances

Transactions in foreign currencies are initially recorded by the Group's entities at their respective functional currency spot rates at the date the transaction first qualifies for recognition. Monetary assets and liabilities denominated in foreign currencies are retranslated at the functional currency spot rates of exchange at the reporting date. Differences arising on settlement or translation of monetary items are recognized in profit or loss.

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

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

2) Translation in foreign operations

The assets and liabilities of foreign operations are translated into Korean won at the rate of exchange prevailing at the reporting date and the statement of profit or loss is translated at exchange rates prevailing at the dates of the transactions. The exchange differences arising on translation of foreign operations are recognized in OCI. On disposal of a foreign operation, the component of OCI relating to that particular foreign operation is recognized in profit or loss.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.7 Financial products: Initial recognition and subsequent measurement

(1) Financial assets

1) Initial recognition and measurement

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

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

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

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

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

2) Subsequent measurement

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

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

① Financial assets at amortized cost (debt instruments)

This category is the most relevant to the Group. The Group measures financial assets at amortized cost if both of the following conditions are met:

- The financial asset is held within a business model with the objective to hold financial assets in order to collect contractual cash flows, and
- The contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding

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

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

2.3 Summary of significant accounting policies (cont'd)

2.3.7 Financial products: Initial recognition and subsequent measurement (cont'd)

② Financial assets at fair value through OCI (debt instruments)

The Group measures debt instruments at fair value through OCI if both of the following conditions are met:

- The financial asset is held within a business model with the objective of both holding to collect contractual cash flows and selling, and
- The contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding

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

The Group's debt instruments at fair value through OCI includes investments in quoted debt instruments included under other non-current financial assets.

③ Financial assets designated at fair value through OCI (equity instruments)

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

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

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

④ Financial assets at fair value through profit or loss

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

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

This category includes derivatives and equity instruments which the Group had not irrevocably elected to treat changes in fair value as other comprehensive income. Dividends on equity instruments are recognized in profit or loss when the right is determined.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.7 Financial products: Initial recognition and subsequent measurement (cont'd)

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

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

3) Derecognition

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

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

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

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

4) Impairment of financial assets

The Group has applied the new expected credit loss (ECL) model of KIFRS 1109 in three types. The expected credit loss model applied to each type of financial asset is as follows.

① Trade receivables

For the purpose of measuring the expected credit losses of trade receivables under KIFRS 1109, the Group applies the practical expedient and uses the expected credit loss model for the life-time for trade receivables subject to the expected credit loss model.

② Debt instruments other than trade receivables

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

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

2.3 Summary of significant accounting policies (cont'd)

2.3.7 Financial products: Initial recognition and subsequent measurement (cont'd)

(2) Financial liabilities

1) Initial recognition and measurement

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

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

The Group's financial liabilities include trade and other payables, loans and borrowings including bank overdrafts, financial guarantee contracts and derivative financial instruments.

2) Subsequent measurement

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

- Loans and borrowings

After initial recognition, interest bearing loans and borrowings are subsequently measured at amortized cost using the EIR method. Gains and losses are recognized in the statement of profit or loss when the liabilities are derecognized as well as through EIR amortization process. Amortized cost is calculated by taking into account any discount or premium on acquisition and fee or costs that are an integral part of the EIR. The EIR amortization is included in finance cost in the statement of profit or loss.

- Financial guarantee contracts

Financial guarantee contracts issued by the Group are those contracts that require a payment to be made to reimburse the holder for a loss it incurs because the specified debtor fails to make a payment when due in accordance with the terms of a debt instrument. Financial guarantee contracts are recognized initially as a liability at fair value, adjusted for transaction costs that are directly attributable to the issuance of the guarantee. Subsequently, the liability is measured at the higher of the best estimate of the expenditure required to settle the present obligation at the reporting date and the amount recognized less cumulative amortization.

- Financial liabilities at fair value through profit or loss

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

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

Gains and losses arising from short-term financial liabilities are recognized in profit or loss.

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

3) Derecognition

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

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

2.3 Summary of significant accounting policies (cont'd)

2.3.7 Financial products: Initial recognition and subsequent measurement (cont'd)

4) Offsetting of financial instruments

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

2.3.8 Derivative financial instruments and hedge accounting

In accordance with the transition rules, the consolidated financial statements have been prepared by applying the requirements of KIFRS 1039 to hedge accounting without applying the requirements of KIFRS 1109.

Derivatives are initially recognized at fair value on the date when a derivative contract is entered into and are subsequently re-measured at their fair value. Changes in the fair value of the derivatives that are not qualified for hedge accounting are recognized in the statements of profit or loss within 'other income (expenses)' or 'finance income (costs)' according to the nature of transactions.

The Group designates certain derivatives as either:

- Fair value hedges when hedging the exposure to changes in the fair value of a recognized asset or liability or a firm commitment
- Cash flow hedges when hedging the exposure to variability in cash flows that is either attributable to a particular risk associated with a recognized asset or liability or a highly probable forecast transaction

At the inception of a hedge relationship, the Group formally designates and documents the hedge relationship to which the Group wishes to apply hedge accounting and the risk management objective and strategy for undertaking the hedge. The documentation includes identification of the hedging instrument, the hedged item or transaction, the nature of the risk being hedged. The Group also documents its assessment, both at hedge inception and on an ongoing basis, of whether the derivatives that are used in hedging transactions are highly effective in offsetting changes in fair values or cash flows of hedged items.

The fair values of various derivative instruments used for hedging purposes are disclosed in Note 12. Movements on the hedging reserve in other comprehensive income are shown in Note 12. The full fair value of a hedging derivative is classified as a non-current asset or liability when the remaining maturity of the hedged item is longer than the Group's normal business cycle and as a current asset or liability when the remaining maturity of the hedged item is shorter than the Group's normal business cycle. Trading derivatives are classified as a non-current asset or liability when the remaining maturity of the hedged item is more than 12 months and as a current asset or liability when the remaining maturity of the hedged item is less than 12 months.

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

(1) Fair value hedge

Changes in the fair value of derivatives that are designated and qualify as fair value hedges are recorded in the statements of profit or loss, together with any changes in the fair value of the hedged asset or liability that are attributable to the hedged risk.

(2) Cash flow hedge

The effective portion of changes in the fair value of derivatives that is designated and qualified as cash flow hedges is recognized in other comprehensive income. The gain or loss relating to the ineffective portion is recognized immediately in the statements of profit or loss within other income (expenses). Amounts accumulated in equity are reclassified to income in the periods when the hedged item affects profit or loss (for example, when the forecast purchase that is hedged takes place).

When a hedging instrument expires or is sold, or when a hedge no longer meets the criteria for hedge accounting, any cumulative gain or loss existing in equity at that time remains in equity and is recognized when the forecast transaction is ultimately recognized in the statements of profit or loss. When a forecast transaction is no longer expected to occur, the cumulative gain or loss that was reported in equity is immediately transferred to the statements of profit or loss within other income (expenses).

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

2.3 Summary of significant accounting policies (cont'd)

2.3.9 Inventories

Inventories are stated at the lower of cost and net realizable value. Raw materials, goods and products, and supplies are determined using the gross average method. Other inventories are determined using the specific identification method.

2.3.10 Property, plant and equipment

All property, plant and equipment is stated at cost, net of accumulated depreciation and accumulated impairment losses, if any. Such cost includes the cost of replacing part of the property, plant and equipment and borrowing costs for long-term construction projects if the recognition criteria are met. Likewise, when a major inspection is performed, its cost is recognized in the carrying amount of the plant and equipment as a replacement if the recognition criteria are satisfied. All other repair and maintenance costs are recognized in profit or loss as incurred.

Land is not depreciated but depreciation on other assets is calculated using the straight-line method to allocate the difference between their cost and their residual values over their estimated useful lives, as follows:

➤ Buildings	6 to 40 years
➤ Structures	4 to 40 years
➤ Machinery	6 to 16 years
➤ Construction equipment	4 to 12 years
➤ Vehicles	4 to 10 years
➤ Tools	4 to 10 years
➤ Equipment	4 to 10 years

The assets' residual values, useful lives and methods of depreciation are reviewed at each fiscal year end, and adjusted prospectively, if appropriate.

2.3.11 Leases

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

(1) The Group as a lessee

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

1) Right-of-use assets

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

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

The right-of-use assets are also subject to impairment. Refer to the accounting policies in section 2.3.15 Impairment of non-financial assets.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.11 Leases (cont'd)

2) Lease liabilities

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

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

3) Short-term leases and leases of low-value assets

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

(2) The Group as a lessor

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

2.3.12 Borrowing costs

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

2.3.13 Intangible assets

Amortization of intangible assets is calculated using the straight-line method over their estimated useful lives. Membership rights are regarded as intangible assets with indefinite useful life and not amortized because there is no foreseeable limit to the period over which the asset is expected to be utilized.

➤ Rental rights	20 years
➤ Technical rights	10 years
➤ Concession assets	30 years
➤ Software	4 to 5 years
➤ Others	5 ~ 15 years

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

2.3 Summary of significant accounting policies (cont'd)

2.3.14 Investment properties

Investment property is held to earn rentals or for capital appreciation or both. Investment property is measured initially at its cost, including transaction costs incurred in acquiring the asset. After recognition as an asset, investment property is carried at cost less accumulated depreciation and impairment losses. Investment property, except for land, is depreciated using the straight-line method over the useful lives of 40 years.

2.3.15 Impairment of non-financial assets

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

When the carrying amount of an asset or CGU exceeds its recoverable amount, the asset is considered impaired and is written down to its recoverable amount. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. In determining fair value less costs of disposal, recent market transactions are taken into account. If no such transactions can be identified, an appropriate valuation model is used. These calculations are corroborated by valuation multiples, quoted share prices for publicly traded companies or other available fair value indicators. Impairment losses of continuing operations are recognized in the statement of income in expense categories consistent with the function of the impaired asset.

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

Intangible assets with indefinite useful lives are tested for impairment annually as of December 31, either individually or at the CGU level.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.16 Pension benefits

The Group operates a defined benefit pension plan. Generally, the amount calculated by periodic actuarial calculations is raised through payments to funds managed by insurance companies or trustees.

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

- The date of the plan amendment or curtailment, and
- The date that the Group recognizes restructuring-related costs

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

2.3.17 Provisions

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

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

(1) Warranty provision

The Group provides warranties for general repairs of defects that existed at the time of sale, as required by law. Provisions related to these assurance-type warranties are recognized when the product is sold or the service is provided to the customer. Initial recognition is based on historical experience. The initial estimate of warranty-related costs is revised annually.

(2) Onerous contracts

If the Group has a contract that is onerous, the present obligation under the contract is recognized and measured as a provision. However, before a separate provision for an onerous contract is established, the Group recognizes any impairment loss that has occurred on assets dedicated to that contract

An onerous contract is a contract under which the unavoidable costs (i.e., the costs that the Group cannot avoid because it has the contract) of meeting the obligations under the contract exceed the economic benefits expected to be received under it. The unavoidable costs under a contract reflect the least net cost of exiting from the contract, which is the lower of the cost of fulfilling it and any compensation or penalties arising from failure to fulfil it.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.18 Current and deferred income tax

(1) Current income tax

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

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

(2) Deferred tax

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

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

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

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

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

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

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply in the year when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted at the reporting date. Deferred tax relating to items recognized outside profit or loss is recognized outside profit or loss. Deferred tax items are recognized in correlation to the underlying transaction either in OCI or directly in equity. Deferred tax assets and deferred tax liabilities are offset, if a legally enforceable right exists to set off current tax assets against current income tax liabilities and the deferred taxes relate to the same taxable entity and the same taxation authority.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.19 Revenue recognition

(1) Identifying performance obligations

The Group's major businesses are civil engineering, construction, housing and overseas construction. Majority of construction contracts with customers meet the requirements of a single contract and are identified as a single obligation to carry out.

(2) Performance obligation satisfied over time

Construction contracts for the Group include condominiums, commercial facilities, factories, roads and bridges those are ordered by customers, and usually require about three to four years of construction.

In accordance with KIFRS 1115, the timing of revenue recognition may vary depending on whether each performance obligation is satisfied at a point in time or over a period of time.

Performance obligations satisfied over time shall meet any of the following criteria:

- The customer simultaneously receives and consumes the benefits provided by the entity's performance as the entity performs.
- The Group's performance creates or enhances an asset that the customer controls as the asset is created or enhanced.
- The Group's performance does not create an asset with an alternative use to the entity and the entity has an enforceable right to payment for performance completed to date.

The Group is obliged to provide construction and maintenance services to the customer during the contract period for a majority of its construction contract. Also, it is determined that the customer controls the asset as the Group creates or enhances its value. Therefore, the Group recognizes the transaction price allocated to the performance obligation by revenue over a contract period.

Meanwhile, the Group recognized revenue as performance obligation satisfied at a point in time(delivery basis) for contracts that do not meet the requirements to recognize revenue over the period of time.

(3) Percentage-of-completion measurement using input method

In accordance with KIFRS 1115, revenue is recognized when the goods or services promised to the customer are transferred and the performance obligation is fulfilled or when the performance obligation is fulfilled over a period of time. The obligation to perform during the period is to measure the percentage-of-completion until the obligation is fulfilled and the revenue is recognized over the period. The method of measuring the percentage-of-completion includes the output method and the input method, and they are applied if the percentage-of-completion of the performance obligation can be reasonably measured. In most construction contracts, the Group applies percentage-of-completion measurement.

In accordance with KIFRS 1115, if the Group expects that the goods are not distinct at contract inception and the entity is expected to significantly control the goods or services before transferring to the customer, and that the costs of the goods transferred are significant in comparison to the total costs expected to be fully satisfied, and that the entity receives the goods from a third party and does not significantly engage in the design and production of those goods, then recognizing the cost of the goods used to fulfill the performance obligation as revenue demonstrates the entity's performance well.

The construction contracts in plant sector are contracts including the purchase and installation of special equipment, and most of the projects are carried out over a long period of time of 3 years or more. The Group carries out the accounting by considering total planning costs versus special equipment costs, whether the customer has significant control over the special equipment under separate contracts, and whether the Group is deeply involved in design and production of the special equipment.

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

2.3 Summary of significant accounting policies (cont'd)

2.3.19 Revenue recognition (cont'd)

(4) Incremental cost of obtaining a contract and cost to fulfil a contract

The Group capitalizes incremental costs of obtaining a contract or contract costs incurred directly related to contract and created resources used to fulfill a contract and expected to be recovered. If capitalization requirements are not met, it is accounted for as current expenses.

2.4 New and amended standards and interpretations

2.4.1 KIFRS 1116 Leases

KIFRS 1116 supersedes KIFRS 1017 *Leases*, KIFRS 2104 *Determining whether an Arrangement contains a Lease*, KIFRS 2015 *Operating Leases-Incentives* and KIFRS 2027 *Evaluating the Substance of Transactions Involving the Legal Form of a Lease*. The standard sets out the principles for the recognition, measurement, presentation and disclosure of leases and requires lessees to recognize most leases on the balance sheet.

Lessor accounting under KIFRS 1116 is substantially unchanged from KIFRS 1017. Lessors will continue to classify leases as either operating or finance leases using similar principles as in KIFRS 1017. Therefore, KIFRS 1116 does not have an impact for leases where the Group is the lessor.

The Group adopted KIFRS 1116 using the full retrospective method of adoption, with the date of initial application of January 1, 2019. The Group elected to use the transition practical expedient to not reassess whether a contract is, or contains, a lease at January 1, 2019. Instead, the Group applied the standard only to contracts that were previously identified as leases applying KIFRS 1017 and KIFRS 2104 at the date of initial application. Also, upon adoption of KIFRS 1116, the Group applied a single recognition and measurement approach for all leases except for short-term leases and leases of low-value assets.

Major impact of the standard on the consolidated financial statements are disclosed in Note 35.

2.4.2 KIFRS 2123 *Uncertainty over Income Tax Treatment*

The Interpretation addresses the accounting for income taxes when tax treatments involve uncertainty that affects the application of KIFRS 1012 *Income Taxes*. It does not apply to taxes or levies outside the scope of KIFRS 1012, nor does it specifically include requirements relating to interest and penalties associated with uncertain tax treatments. The Interpretation specifically addresses the following:

- Whether an entity considers uncertain tax treatments separately
- The assumptions an entity makes about the examination of tax treatments by taxation authorities
- How an entity determines taxable profit (tax loss), tax bases, unused tax losses, unused tax credits and tax rates
- How an entity considers changes in facts and circumstances

The Group determines whether to consider each uncertain tax treatment separately or together with one or more other uncertain tax treatments and uses the approach that better predicts the resolution of the uncertainty. The Interpretation did not have an impact on the consolidated financial statements of the Group.

2.4.3 Amendments to KIFRS 1109: *Prepayment Features with Negative Compensation*

Under KIFRS 1109, a debt instrument can be measured at amortized cost or at fair value through other comprehensive income, provided that the contractual cash flows are 'solely payments of principal and interest on the principal amount outstanding' (the SPPI criterion) and the instrument is held within the appropriate business model for that classification. The amendments to KIFRS 1109 clarify that a financial asset passes the SPPI criterion regardless of an event or circumstance that causes the early termination of the contract and irrespective of which party pays or receives reasonable compensation for the early termination of the contract. These amendments had no impact on the consolidated financial statements of the Group.

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

2.4 New and amended standards and interpretations (cont'd)

2.4.4 Amendments to KIFRS 1019: *Plan Amendment, Curtailment or Settlement*

The amendments to KIFRS 1019 address the accounting when a plan amendment, curtailment or settlement occurs during a reporting period. The amendments specify that when a plan amendment, curtailment or settlement occurs during the annual reporting period, an entity is required to determine the current service cost for the remainder of the period after the plan amendment, curtailment or settlement, using the actuarial assumptions used to remeasure the net defined benefit liability (asset) reflecting the benefits offered under the plan and the plan assets after that event. An entity is also required to determine the net interest for the remainder of the period after the plan amendment, curtailment or settlement using the net defined benefit liability (asset) reflecting the benefits offered under the plan and the plan assets after that event, and the discount rate used to remeasure that net defined benefit liability (asset). The amendments had no impact on the consolidated financial statements of the Group as it did not have any plan amendments, curtailments, or settlements during the period.

2.4.5 Amendments to KIFRS 1028: *Long-term interests in associates and joint ventures*

The amendments clarify that an entity applies KIFRS 1109 to long-term interests in an associate or joint venture to which the equity method is not applied but that, in substance, form part of the net investment in the associate or joint venture (long-term interests). This clarification is relevant because it implies that the expected credit loss model in KIFRS 1109 applies to such long-term interests.

The amendments also clarified that, in applying KIFRS 1109, an entity does not take account of any losses of the associate or joint venture, or any impairment losses on the net investment, recognized as adjustments to the net investment in the associate or joint venture that arise from applying KIFRS 1028 *Investments in Associates and Joint Ventures*. These amendments had no impact on the consolidated financial statements as the Group does not have long-term interests in its associate and joint venture.

2.4.6 Annual Improvements 2015-2017 Cycle

➤ KIFRS 1103 *Business Combinations*

The amendments clarify that, when an entity obtains control of a business that is a joint operation, it applies the requirements for a business combination achieved in stages, including remeasuring previously held interests in the assets and liabilities of the joint operation at fair value. In doing so, the acquirer remeasures its entire previously held interest in the joint operation.

An entity applies those amendments to business combinations for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after January 1, 2019, with early application permitted.

These amendments had no impact on the consolidated financial statements of the Group as there is no transaction where joint control is obtained.

➤ KIFRS 1111 *Joint Arrangements*

An entity that participates in, but does not have joint control of, a joint operation might obtain joint control of the joint operation in which the activity of the joint operation constitutes a business as defined in KIFRS 1103. The amendments clarify that the previously held interests in that joint operation are not remeasured.

An entity applies those amendments to transactions in which it obtains joint control on or after the beginning of the first annual reporting period beginning on or after January 1, 2019, with early application permitted.

These amendments had no impact on the consolidated financial statements of the Group as there is no transaction where a joint control is obtained.

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

2.4 New and amended standards and interpretations (cont'd)

2.4.6 Annual Improvements 2015-2017 Cycle (cont'd)

➤ KIFRS 1012 *Income Taxes*

The amendments clarify that the income tax consequences of dividends are linked more directly to past transactions or events that generated distributable profits than to distributions to owners. Therefore, an entity recognizes the income tax consequences of dividends in profit or loss, other comprehensive income or equity according to where it originally recognized those past transactions or events.

An entity applies the amendments for annual reporting periods beginning on or after January 1, 2019, with early application permitted. When the entity first applies those amendments, it applies them to the income tax consequences of dividends recognized on or after the beginning of the earliest comparative period.

Since the Group's current practice is in line with these amendments, they had no impact on the consolidated financial statements of the Group.

➤ KIFRS 1023 *Borrowing Costs*

The amendments clarify that an entity treats as part of general borrowings any borrowing originally made to develop a qualifying asset when substantially all of the activities necessary to prepare that asset for its intended use or sale are complete.

The entity applies the amendments to borrowing costs incurred on or after the beginning of the annual reporting period in which the entity first applies those amendments. An entity applies those amendments for annual reporting periods beginning on or after January 1, 2019, with early application permitted.

Since the Group's current practice is in line with these amendments, they had no impact on the consolidated financial statements of the Group.

3. Significant accounting judgments, estimates and assumptions

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

Other disclosures relating to the Group's exposure to risks and uncertainties are provided in Note 32.

3.1 Accounting estimates and assumptions

The key assumptions concerning the future and other key sources of estimation uncertainty at the reporting date, that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year, are discussed below. The Group based its assumptions and estimates on parameters available when the consolidated financial statements were prepared. Existing circumstances and assumptions about future developments, however, may change due to market changes or circumstances arising beyond the control of the Group. Such changes are reflected in the assumptions when they occur.

1) Impairment of non-financial assets

The Group assesses, at each reporting date, whether there is an indication that an asset may be impaired. Goodwill and intangible assets with indefinite useful lives are tested for impairment annually as of December 31 either individually or at the CGU level, as appropriate or when circumstances indicate that the carrying value may be impaired. Other non-financial assets are assessed for impairment when circumstances indicate that its asset may be impaired.

To calculate the value in use, the Group estimates the expected future cash inflows derived from CGU and applies the appropriate discount rate to those future cash inflows.

2) Deferred tax assets

Deferred tax assets are recognized for unused tax losses to the extent that it is probable that taxable profit will be available against which the losses can be utilized. Significant management judgment is required to determine the amount of deferred tax assets that can be recognized, based upon the likely timing and the level of future taxable profits together with future tax planning strategies. As of December 31, 2019 the Group has no tax losses carried forward to offset taxable income. Further details on taxes are disclosed in Note 28.

3) Defined benefit plans

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

In determining the appropriate discount rate, management considers the interest rates of corporate bonds in currencies consistent with the currencies of the post-employment benefit obligation with at least an 'AA+' rating or above, as set by an internationally acknowledged rating agency. The mortality rate is based on publicly available mortality tables for the specific countries. Future salary increases and pension increases are based on expected future inflation rates for the respective countries.

Further details about pension obligations are disclosed in Note 19.

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

3.1 Estimates and assumptions (cont'd)

4) Revenue recognition

Revenue for construction contracts is recognized on the basis of the percentage-of-completion method, under which revenue is recognized as work progress in the ratio of actual cost incurred to estimated total cost. A variation is an instruction by the customer for a change in the scope of the work to be performed under the contract. A variation may lead to an increase or a decrease in contract revenue. Examples of variations are changes in the specifications or design of the asset and changes in the duration of the contract.

Contract revenue is measured at the fair value of the initial amount of revenue agreed in the contract. The measurement of contract revenue is affected by a variety of uncertainties that depend on the outcome of future events such as delays caused by the contractor, claim, and incentive. The estimates often need to be revised as events occur and uncertainties are resolved. Therefore, the amount of contract revenue may increase or decrease from one period to the next. A variation is recognized in contract revenue when the following four circumstances are satisfied. It is probable that the customer will approve the variation and the amount of revenue arising from the variation. Negotiations have reached an advanced stage such that it is probable that the customer will accept the claim. The contract is sufficiently advanced that it is probable that the specified performance standards will be met or exceeded. The amount of revenue can be reliably measured.

The total contract cost is measured at the end of each reporting period. However, the measurement of contract revenue is affected by various uncertainties that depend on the outcome of future events including project, geographic and economic characteristics. When the uncertainties that prevented the cost of the contract being estimated reliably no longer exist, expenses associated with the construction contract shall be recognized.

4. Standards issued but not yet effective

The standards and interpretations that are issued, but not yet effective, up to the date of issuance of the Group's consolidated financial statements are disclosed below. The Group intends to adopt these standards, if applicable, when they become effective.

4.1 Amendments to KIFRS 1103: *Definition of a Business*

In October 2018, the IASB issued amendments to the definition of a business in KIFRS 1103 *Business Combinations* to help entities determine whether an acquired set of activities and assets is a business or not. They clarify the minimum requirements for a business, remove the assessment of whether market participants are capable of replacing any missing elements, add guidance to help entities assess whether an acquired process is substantive, narrow the definitions of a business and of outputs, and introduce an optional fair value concentration test. New illustrative examples were provided along with the amendments.

Since the amendments apply prospectively to transactions or other events that occur on or after the date of first application, the Group will not be affected by these amendments on the date of transition.

4.2 Amendments to KIFRS 1001 and KIFRS 1008: *Definition of Material*

In October 2018, the IASB issued amendments to KIFRS 1001 *Presentation of Financial Statements* and KIFRS 1008 *Accounting Policies, Changes in Accounting Estimates and Errors* to align the definition of 'material' across the standards and to clarify certain aspects of the definition. The new definition states that, 'Information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions that the primary users of general purpose financial statements make on the basis of those financial statements, which provide financial information about a specific reporting entity.'

The amendments to the definition of material is not expected to have a significant impact on the Group's consolidated financial statements.

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5. Segment information and revenue from contracts with customers

(1) Details of the Group's reportable segments are as follows:

Operating segments	Principal business activity
Infra works	Road, railroad and others
Architectural & housing construction	Office building, factory, apartment and others
Plant construction(*)	Petroleum refining facility, waste water treatment plant, power plant, power control facility and others
Others	Resort, lease and others

(*) The power segment was integrated into the plant segment for the year ended December 31, 2018. The comparative period information has been restated to reflect these changes.

(2) Sales and operating profit (loss) for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

2019							
	Infra works	Architectural & housing construction	Plant construction	Others	Total	Consolidation adjustments	Consolidated total
Sales	₩ 880,749	₩ 6,147,656	₩ 3,494,852	₩ 135,130	₩ 10,658,387	₩ (241,798)	₩ 10,416,589
Inter-company sales	(10,090)	(118,293)	(58,270)	(55,145)	(241,798)	241,798	-
Net sales	870,659	6,029,363	3,436,582	79,985	10,416,589	-	10,416,589
Operating profit (loss)(*)	(8,014)	689,952	85,269	60	767,267	-	767,267
Profit (loss) before income tax(*)	(58,632)	881,603	(139,528)	(9,709)	673,734	-	673,734

(*) Operating profit (loss) and profit (loss) before income tax are net of eliminating intercompany transactions.

2018							
	Infra works	Architectural & housing construction	Plant construction	Others	Total	Consolidation adjustments	Consolidated total
Sales	₩ 1,117,459	₩ 7,242,179	₩ 4,855,304	₩ 136,835	₩ 13,351,777	₩ (212,404)	₩ 13,139,373
Inter-company sales	(1,167)	(104,556)	(50,871)	(55,810)	(212,404)	212,404	-
Net sales	1,116,292	7,137,623	4,804,433	81,025	13,139,373	-	13,139,373
Operating profit (loss)(*)	23,927	802,664	243,384	(5,486)	1,064,489	-	1,064,489
Profit (loss) before income tax(*)	(33,908)	986,675	(103,653)	(14,065)	835,049	-	835,049

(*) Operating profit (loss) and profit (loss) before income tax are net of eliminating intercompany transactions.

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5. Segment information and revenue from contracts with customers (cont'd)

(3) Assets and liabilities as of December 31, 2019 and 2018 are as follows (Korean won in millions):

		Infra works	Architectural & housing construction	Plant construction	Others	Total	Consolidation adjustment	Consolidated total
2019								
Assets	₩	1,579,605	₩ 6,347,117	₩ 4,398,871	₩ 2,185,667	₩ 14,511,260	₩ (1,340,054)	₩ 13,171,206
Liabilities		1,106,545	772,933	6,106,189	2,176,801	10,162,468	(1,134,290)	9,028,178
2018								
Assets	₩	1,377,035	₩ 5,810,385	₩ 4,070,958	₩ 1,745,916	₩ 13,004,294	₩ (971,019)	₩ 12,033,275
Liabilities		908,036	820,549	6,028,778	1,730,939	9,488,302	(1,079,713)	8,408,589

(4) Revenue of segments for the year ended December 31, 2019 and 2018 are as follows (Korean won in millions):

		2019				
		Infra works	Architectural & housing construction	Plant construction	Others	Total
Major product & service						
Construction contract as a constructor	₩	850,193	₩ 5,463,476	₩ 3,094,561	₩ -	₩ 9,408,230
Construction contract as a developer & constructor		-	398,192	-	-	398,192
Engineering service and others		16,238	124,287	339,251	-	479,776
Lease and others		4,228	43,408	2,770	32,275	82,681
Resort		-	-	-	47,710	47,710
	₩	870,659	₩ 6,029,363	₩ 3,436,582	₩ 79,985	₩10,416,589
Timing of revenue recognition						
Recognition over time		849,475	5,761,008	3,117,877	-	9,728,360
Recognition at a point in time		21,184	268,355	318,705	79,985	688,229
	₩	870,659	₩ 6,029,363	₩ 3,436,582	₩ 79,985	₩10,416,589
		2018				
		Infra works	Architectural & housing construction	Plant construction	Others	Total
Major product & service						
Construction contract as a constructor	₩	1,098,595	₩ 6,417,040	₩ 4,517,098	₩ -	₩12,032,733
Construction contract as a developer & constructor		-	570,833	-	-	570,833
Engineering service and others		13,351	98,324	280,228	-	391,903
Lease and others		4,347	51,425	7,107	33,823	96,702
Resort		-	-	-	47,202	47,202
	₩	1,116,293	₩ 7,137,622	₩ 4,804,433	₩ 81,025	₩13,139,373
Timing of revenue recognition						
Recognition over time		1,097,867	6,952,970	4,551,673	-	12,602,510
Recognition at a point in time		18,426	184,652	252,760	81,025	536,863
	₩	1,116,293	₩ 7,137,622	₩ 4,804,433	₩ 81,025	₩13,139,373

5. Segment information and revenue from contracts with customers (cont'd)

(5) Major customer constituting more than 10% of sales is as follows (Korean won in millions):

There are no major customers that account for more than 10% of sales for the year ended December 31, 2019.

	2018		
	Sales	Ratio	Segment
Major customer 1	₩ 1,641,089	12.49%	Plant construction

(6) Geographic information for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

					China and					
	Korea		Middle East		South-East Asia		Others		Total	
2019										
Sales	₩	7,520,143	₩	1,447,788	₩	993,008	₩	697,448	₩	10,658,387
Inter-company sales		(187,635)		(19,739)		(33,202)		(1,222)		(241,798)
Net sales	₩	7,332,508	₩	1,428,049	₩	959,806	₩	696,226	₩	10,416,589
2018										
Sales	₩	7,818,860	₩	3,514,873	₩	1,434,447	₩	583,597	₩	13,351,777
Inter-company sales		(177,665)		(13,936)		(19,053)		(1,750)		(212,404)
Net sales	₩	7,641,195	₩	3,500,937	₩	1,415,394	₩	581,847	₩	13,139,373

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6. Restricted financial instruments

Details of restricted financial instruments as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	Bank	2019	2018	Remarks
Short-term financial assets	Suhyup	₩ -	₩ 555	Pledge of apartment sales income
	NH and others	-	49,360	Pledge of construction billing
	Shinhan	7,930	-	- Subcontractor account
	Shinhan and others	3,376	-	- Loan repayment accumulation
	Shinhan	4,616	4,889	Leasehold deposits
	Shinhan	6,050	6,050	Loans for employees' housing
	Shinhan and others	30,000	30,000	Supports interest for cooperative firm
	NH and others	698	-	Special provisions for construction warranty account
	SC	35,892	34,661	L/C issued for overseas sites
	Shinhan and others	1,600	1,600	Provisional attachment related to subcontractor's lawsuit
	KEB Hana	-	20,000	Pledge of time deposits
	Woori	4,343	4,147	Credit card receivables of Elysian
	Banobras and others	1,536	2,064	Other deposits and others
		96,041	153,326	
Long-term financial assets	Shinhan	₩ 1,669	₩ 1,669	Pledge of Collateral for HUG
	Shinhan	487	214	Leasehold deposits
	Shinhan and others	20	20	Deposit for overdraft
		2,176	1,903	
		₩ 98,217	₩ 155,229	

7. Trade and other receivables

(1) Trade and other receivables as of December 31, 2019 and 2018 are as follows (Korean won in millions):

		2019		
		Receivables	Allowance for doubtful accounts	Receivables, net
Current assets				
Trade receivables	Receivables from construction contracts	₩ 1,967,019	₩ (180,400)	₩ 1,786,619
	Receivables from apartment sales	24,798	(1,741)	23,057
	Unbilled amount related to construction	1,204,373	(115,077)	1,089,296
	Notes receivable	96,694	-	96,694
	Other trade receivable	14,641	(462)	14,179
		3,307,525	(297,680)	3,009,845
Other receivables	Other receivables	₩ 596,433	₩ (248,452)	₩ 347,981
	Accrued revenue	60,187	(26,078)	34,109
	Short-term loans	195,221	(81,976)	113,245
		851,841	(356,506)	495,335
		₩ 4,159,366	₩ (654,186)	₩ 3,505,180
Non-current assets				
Long-term trade and other receivables	Long-term trade receivables	₩ 45,884	₩ -	₩ 45,884
	Long-term loans	892,204	(297,443)	594,761
	Leasehold deposits	237,658	(3,186)	234,472
	Deposits provided for business	290,397	(8,484)	281,913
		₩ 1,466,143	₩ (309,113)	₩ 1,157,030

7. Trade and other receivables (cont'd)

		2018		
		Receivables	Allowance for doubtful accounts	Receivables, net
Current assets				
Trade receivables	Receivables from construction contracts	₩ 1,938,507	₩ (166,021)	₩ 1,772,486
	Receivables from apartment sales	196,979	(885)	196,094
	Unbilled amount related to construction	1,841,687	(114,381)	1,727,306
	Notes receivable	12,587	-	12,587
	Other trade receivable	12,643	(254)	12,389
		4,002,403	(281,541)	3,720,862
Other receivables	Other receivables	₩ 624,853	₩ (215,802)	₩ 409,051
	Accrued revenue	44,159	(22,767)	21,392
	Short-term loans	227,684	(81,605)	146,079
		896,696	(320,174)	576,522
		₩ 4,899,100	₩ (601,715)	₩ 4,297,384
Non-current assets				
Long-term trade and other receivables	Long-term trade receivables	₩ 76,053	₩ -	₩ 76,053
	Long-term loans	748,510	(269,215)	479,295
	Leasehold deposits	205,512	(2,562)	202,950
	Deposits provided for business	195,377	(7,346)	188,031
		₩ 1,225,452	₩ (279,123)	₩ 946,329

(2) Aging schedule on trade and other receivables are as follows (Korean won in millions):

	2019		2018	
	Trade receivables	Other receivables	Trade receivables	Other Receivables
Receivables not impaired				
Up to 1 year	₩ 2,508,512	₩ 317,566	₩ 3,375,046	₩ 400,355
1 to 2 years	162,696	75,133	110,292	75,988
Over 2 years	326,837	121,575	331,525	125,310
	2,998,045	514,274	3,816,863	601,653
Individually impaired	309,480	337,567	185,540	295,043
	₩ 3,307,525	₩ 851,841	₩ 4,002,404	₩ 896,696
Allowance for doubtful accounts	₩ (297,680)	₩ (356,506)	₩ (281,541)	₩ (320,174)

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7. Trade and other receivables (cont'd)

(3) Changes in allowance for doubtful accounts as of December 31, 2019 and 2018 are as follows (Korean won in millions):

		2019			
		Beginning	Bad debt expenses	Reversal / write-off	Ending
Trade and other receivables	Receivables from construction contracts	₩ 166,021	₩ 22,876	₩ (8,497)	₩ 180,400
	Receivables from apartment sales	885	1,621	(765)	1,741
	Unbilled amount related to construction	114,381	696	-	115,077
	Other receivables	215,802	50,684	(18,034)	248,452
	Accrued revenue	22,767	4,219	(908)	26,078
	Short-term loans	81,605	1,410	(1,039)	81,976
	Other trade receivables	254	2,034	(1,826)	462
		601,715	83,540	(31,069)	654,186
Long-term trade and other receivables	Long-term loans	₩ 269,215	₩ 62,840	₩ (34,612)	₩ 297,443
	Leasehold deposits	2,562	1,144	(520)	3,186
	Deposits provided for business	7,346	1,749	(611)	8,484
		279,123	65,733	(35,743)	309,113
		₩ 880,838	₩ 149,273	₩ (66,812)	₩ 963,299

		2018									
		Beginning		Effect of changes in accounting policies(*)		Bad debt expenses		Reversal / write-off		Ending	
Trade and other receivables	Receivables from construction contracts	₩	111,833	₩	23,749	₩	53,741	₩	(23,302)	₩	166,021
	Receivables from apartment sales		-		750		146		(11)		885
	Unbilled amount related to construction		44,155		-		70,226		-		114,381
	Other receivables		173,635		21,917		27,310		(7,060)		215,802
	Accrued revenue		14,402		483		9,133		(1,251)		22,767
	Short-term loans		90,357		12,448		2,068		(23,268)		81,605
	Other trade receivables		834		-		1,135		(1,715)		254
			435,216		59,347		163,759		(56,607)		601,715
Long-term trade and other receivables	Long-term loans	₩	243,216	₩	26,778	₩	8,938	₩	(9,717)	₩	269,215
	Leasehold deposits		150		2,177		1,282		(1,047)		2,562
	Deposits provided for business		392		6,087		921		(54)		7,346
			243,758		35,042		11,141		(10,818)		279,123
		₩	678,974	₩	94,389	₩	174,900	₩	(67,425)	₩	880,838

(*) There is the effect of adopting KIFRS 1109 'Financial Instruments'

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8. Construction contracts

(1) Changes in the outstanding balances of construction contracts for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

2019					
	Beginning	Increase	Sales recognized	Ending	
Infra works	₩ 2,729,107	₩ 872,988	₩ 849,475	₩ 2,752,620	
Architectural construction	8,362,139	6,263,523	5,436,188	9,189,474	
Plant construction	3,918,140	2,446,735	3,117,878	3,246,997	
	15,009,386	9,583,246	9,403,541	15,189,091	
Housing construction and sales operations	₩ 1,268,215	₩ 69,319	₩ 398,192	₩ 939,342	
	₩ 16,277,601	₩ 9,652,565	₩ 9,801,733	₩ 16,128,433	

2018					
	Beginning	Effect of changes in accounting policies(*)	Increase	Sales recognized	Ending
Infra works	₩ 3,089,020	₩ 17,137	₩ 720,817	₩ 1,097,867	₩ 2,729,107
Architectural construction	9,729,459	23,553	5,005,604	6,396,477	8,362,139
Plant construction	6,060,656	27,433	2,381,724	4,551,673	3,918,140
	18,879,135	68,123	8,108,145	12,046,017	15,009,386
Housing construction and sales operations	₩ 818,558	₩ 58,351	₩ 962,139	₩ 570,833	₩ 1,268,215
	₩ 19,697,693	₩ 126,474	₩ 9,070,284	₩ 12,616,850	₩ 16,277,601

(*) The effect of adopting KIFRS 1115 'Revenue from contracts with customers'

(2) Details of construction contracts in progress as of December 31, 2019 and 2018 are as follows (Korean won in millions):

2019				
	Accumulated sales	Accumulated cost	Accumulated Profit (loss)	Reserve for receivables (*)
Infra works	₩ 10,021,513	₩ 9,610,567	₩ 410,946	₩ 126,278
Architectural construction	30,132,918	26,050,021	4,082,897	12,468
Plant construction	39,130,005	39,145,702	(15,697)	248,704
	79,284,436	74,806,290	4,478,146	387,450
Housing construction and sales operations	₩ 2,630,603	₩ 2,029,301	₩ 601,302	₩ -
	₩ 81,915,039	₩ 76,835,591	₩ 5,079,448	₩ 387,450

(*) Included in trade receivables.

2018				
	Accumulated sales	Accumulated cost	Accumulated Profit (loss)	Reserve for receivables (*)
Infra works	₩ 9,569,014	₩ 9,161,986	₩ 407,028	₩ 115,731
Architectural construction	24,921,275	21,710,815	3,210,460	12,055
Plant construction	36,456,639	36,707,328	(250,689)	244,393
	70,946,928	67,580,129	3,366,799	372,179
Housing construction and sales operations	₩ 2,233,601	₩ 1,720,866	₩ 512,735	₩ -
	₩ 73,180,529	₩ 69,300,995	₩ 3,879,534	₩ 372,179

(*) Included in trade receivables.

8. Construction contracts (cont'd)

(3) Details of contract assets and liabilities (unbilled and overbilled amount) related to construction as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019		2018	
	Contract assets	Contract liabilities	Contract assets	Contract liabilities
Infra works	₩ 424,286	₩ 182,521	₩ 369,510	₩ 137,871
Architectural & housing construction	269,760	1,393,967	309,658	1,382,571
Plant construction	395,250	326,076	1,048,138	665,553
	₩ 1,089,296	₩ 1,902,564	₩ 1,727,306	₩ 2,185,995

As of December 31, 2019, the unbilled amount from housing construction and sales operations is ₩8,140 million (₩192,736 million in 2018), and overbilled amount from housing construction and sales operations is ₩255,990 million (₩164,038 million in 2018).

(4) As of December 31, 2019, the cost of fulfilling a contract which the Group has recognized as an asset is ₩84,234 million (₩115,776 million in 2018). In connection with construction contracts, the Group recognized cost directly related to the contract (or expected contract) and that creates or increases the value of the entity's resources to be used in fulfilling its future performance obligations and recoverable, as cost to fulfill a contract.

(5) Details of major joint construction contracts as of December 31, 2019 are as follows (Korean won in millions):

	Total contract amount	Amounts attributable to the Group	Equity interest attributable to the Group	Principal contractee
Karbala Refinery Project	₩ 6,785,185	₩ 2,544,444	37.50%	Hyundai E&C
Clean Fuels Project(MAA)	4,937,811	1,645,937	33.33%	JGC
P10-Project	1,878,080	957,821	51.00%	The Group
STAR Project	2,384,040	794,680	33.33%	The Group
PP-12 Combined Thermal Power Plant	1,378,989	689,495	50.00%	Arabian Bemco Contracting Co. Ltd.
Qatar Doha Metro	2,260,641	565,160	25.00%	QDVC
Boryeong LNG Terminal Project	908,842	499,863	55.00%	The Group
New Hanul Nuclear Power Plant #1,2 main facility construction	1,751,389	437,847	25.00%	Hyundai E&C
Kintex Onecity	1,245,731	415,244	33.33%	The Group
Gaepo 8 complex	2,539,860	846,620	33.33%	Hyundai E&C

8. Construction contracts (cont'd)

(6) Provision for construction losses under the stage-of-completion method, changes in contract revenues and costs arising from accounting estimates changes and unbilled amount related to construction for the year ended December 31, 2019 and 2018 are as follows (Korean won in millions):

2019								
	Provision for construction losses	Changes in contract revenues	Changes in estimated contract costs	Profit (loss) for current year due to changes in estimates	Expected profit due to changes in estimate	TOTAL	Changes in unbilled amount related to construction	
Infra works	₩ 2,831	₩ 87,661	₩ 105,537	₩ (26,276)	₩ 8,400	₩ (17,876)	₩ (26,276)	
Architectural construction	7,912	910,604	80,875	457,029	372,700	829,729	457,029	
Plant construction	47,652	1,873,741	1,726,516	6,723	140,502	147,225	6,723	
	₩ 58,395	₩ 2,872,006	₩ 1,912,928	₩ 437,476	₩ 521,602	₩ 959,078	₩ 437,476	

2018								
	Provision for construction losses	Changes in contract revenues	Changes in estimated contract costs	Profit (loss) for current year due to changes in estimates	Expected profit due to changes in estimate	TOTAL	Changes in unbilled amount related to construction	
Infra works	₩ 3,790	₩ 142,046	₩ 122,815	₩ (17,391)	₩ 36,622	₩ 19,231	₩ (17,391)	
Architectural construction	11,660	1,054,855	352,046	283,770	419,039	702,809	283,770	
Plant construction	71,333	1,422,820	1,165,291	108,018	149,511	257,529	108,018	
	₩ 86,783	₩ 2,619,721	₩ 1,640,152	₩ 374,397	₩ 605,172	₩ 979,569	₩ 374,397	

8. Construction contracts (cont'd)

(7) Under the stage-of-completion method, the construction contracts of which the contract revenue exceeds 5% of the preceding year's total revenue for the year ended December 31, 2019 and 2018 are as follows (Korean won in millions):

						2019			
						Unbilled amount related to construction	Receivables from construction contracts		
		Contract date	Contract due	Progress Rate (%)	Amount	Accumulated impairment	Amount	Allowance for doubtful accounts	
Infra works	Thomson-East Coast line								
	Contract T301	2016-03-18	2024-02-28	51.36	₩ 174,499	₩ -	₩ 46,775	₩ -	-
Architectural- construction	Doha Link project	2014-12-30	2019-06-20	98.80	-	-	53,589	-	-
	P10-Project	2015-10-20	2020-06-30	96.76	-	-	31,360	207	-
	Gran City Xi	2016-10-01	2020-02-18	92.41	-	-	227,648	6,931	-
	Gran City Xi 2 nd	2017-05-01	2020-10-31	66.85	-	-	5	-	-
	Gaepo presidents Xi	2019-11-04	2023-02-28	3.75	34,045	-	-	-	-
	Gaepo 8 complex	2018-03-14	2021-07-31	11.89	-	-	-	-	-
	GP3 (Architectural-construction)	2017-07-07	2020-04-30	87.33	-	-	21,880	-	-
Plant	Karbala Refinery Project	2014-04-22	2022-02-16	80.49	-	-	149,351	-	-
	ERC Refinery Project	2007-08-29	2020-02-29	99.65	114,677	-	64,752	-	-
	RRW Unit Restoration	2017-06-29	2019-06-30	98.92	-	-	-	-	-
	Clean Fuels Project(MAA) (*)	2014-04-13	2020-06-30	96.78	9,811	-	5,232	-	-
	MFC Project	2018-08-07	2021-04-30	32.69	-	-	-	-	-
	Yeosu No.2 Complex Project	2018-12-04	2021-06-30	44.20	57,190	-	44,167	292	-
	LPIC Project PKG 3	2015-12-17	2020-03-27	91.86	-	-	9,084	-	-
	KOC Wara Pressure								
	Maintenance Project (*)	2011-09-15	2020-06-30	98.74	69,913	69,913	1,564	-	-
	Bahrain LNGIT Project (*)	2015-12-02	2020-03-31	97.82	17,614	-	-	-	-
	Star ProjectC	2013-05-20	2019-12-19	99.54	-	-	54,106	-	-
	PP-12 Combined								
	Thermal Power Plant (*)	2012-05-16	2020-06-30	98.10	89,972	-	-	-	-
	Anyang Cogeneration								
	Power Plant No.2 Construction	2015-09-22	2021-12-31	75.18	-	-	-	-	-

(*) Expected construction period.

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8. Construction contracts (cont'd)

						2018			
						Unbilled amount related to construction	Receivables from construction contracts		
		Contract date	Contract due	Progress Rate (%)	Amount	Accumulated impairment	Amount	Allowance for doubtful accounts	
Infra works	Thomson-East Coast line								
	Contract T301	2016-03-18	2024-02-28	34.71	₩ 105,174	₩ -	₩ 29,500	₩ -	
Architectural- construction	Doha Link project (*)	2014-12-30	2019-03-31	93.72	23,564	-	68,095	-	
	P10-Project	2015-10-20	2020-06-30	88.79	8,789	-	2,805	16	
	Gran City Xi	2016-10-01	2020-02-29	60.95	1,212	-	81,710	831	
	Gran City Xi 2 nd	2017-05-01	2020-10-31	29.65	-	-	12	-	
	Marina South Parcel	2013-08-01	2018-05-30	88.79	11,874	-	12,504	-	
	Gaepo 8 complex	2018-03-14	2021-07-31	3.65	-	-	-	-	
Plant	GP3 (Architectural-construction)	2017-07-07	2019-12-31	81.23	31,357	-	72,882	-	
	Karbala Refinery Project (*)	2014-04-22	2019-12-31	58.8	-	-	100,166	-	
	ERC Refinery Project (*)	2007-08-29	2019-06-30	95.89	192,848	-	5,836	-	
	RRW Unit Restoration	2017-06-29	2019-01-10	87.83	552,894	-	24,277	-	
	Clean Fuels Project(MAA) (*)	2014-04-13	2019-06-30	86.62	-	-	10,039	-	
	NSRP Project	2013-07-22	2018-11-14	98.17	-	-	-	-	
	Rumaitha/Shanayel								
	Facilities Phase III	2014-04-14	2018-06-28	96.85	-	-	5,042	-	
	LPIC Project PKG 3	2015-12-17	2019-12-03	69.17	-	-	23,374	-	
	KOC Wara Pressure								
	Maintenance Project (*)	2011-09-15	2019-06-30	99.19	69,499	69,499	1,509	-	
	Bahrain LNGIT Project	2015-12-02	2019-02-15	92.59	12,963	-	-	-	
	Star ProjectC (*)	2013-05-20	2019-06-30	96.51	36,915	-	4,774	-	
	PP-12 Combined								
	Thermal Power Plant (*)	2012-05-16	2019-06-30	97.52	84,507	-	-	-	
	Anyang Cogeneration								
	Power Plant No.2								
	Construction	2014-09-22	2021-10-31	62.45	-	-	-	-	

(*) Expected construction period.

Of the construction contracts whose total contract revenue amounts to 5% or more of the previous fiscal year's sales, construction contracts before commencement which did not generate profits are excluded. On the other hand, there are no construction contracts that are excluded from the disclosure due to related laws or contracts with the client.

9. Inventories and other current assets

(1) Inventories as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Land for construction (*)	₩ 305,909	₩ 324,177
Finished housing	822	50,079
Goods and products	1,173	835
Raw materials	55,542	71,999
Unfinished housing construction	511,040	586,754
Supplies	514	351
Incomplete construction	114	-
	₩ 875,114	₩ 1,034,195

(*) Land for construction of ₩243,374 million has been pledged as collateral.

(2) Other current assets as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Prepaid construction costs	₩ 84,234	₩ 115,776
Advance payments	596,348	341,107
Prepaid expenses	103,933	68,826
Prepaid value added tax	58,732	65,938
Prepaid income taxes	27,988	17,115
	₩ 871,235	₩ 608,762

10. Categories of financial assets and liabilities

(1) Categories of financial assets as of December 31, 2019 and 2018 are as follows (Korean won in millions):

2019				
	Financial assets at fair value through profit or loss	Derivative financial instruments	Financial assets at amortized costs	Total
Cash and cash equivalents	₩ -	₩ -	₩ 1,792,956	₩ 1,792,956
Trade and other receivables (*1)	-	-	2,415,884	2,415,884
Short-term financial assets (*2) (*3)	-	14,869	230,031	244,900
Long-term trade and other receivables	-	-	1,157,030	1,157,030
Long-term financial assets (*3)	-	-	438,708	438,708
Financial assets at fair value through profit or loss	244,021	-	-	244,021
	₩ 244,021	₩ 14,869	₩ 6,034,609	₩ 6,293,499

(*1) Excludes unbilled amount related to construction.

(*2) Excludes firm commitments assets.

(*3) Includes lease receivables that were recognized in accordance with the application of KIFRS1116 *Leases* (Note 35).

2018				
	Financial assets at fair value through profit or loss	Derivative financial instruments	Financial assets at amortized costs	Total
Cash and cash equivalents	₩ -	₩ -	₩ 1,592,619	₩ 1,592,619
Trade and other receivables (*1)	-	-	2,570,079	2,570,079
Short-term financial assets (*2)	-	6,922	241,452	248,374
Long-term trade and other receivables	-	-	946,330	946,330
Long-term financial assets	-	-	194,151	194,151
Financial assets at fair value through profit or loss	230,208	-	-	230,208
	₩ 230,208	₩ 6,922	₩ 5,544,631	₩ 5,781,761

(*1) Excludes unbilled amount related to construction.

(*2) Excludes firm commitments assets.

10. Categories of financial assets and liabilities (cont'd)

(2) Categories of financial liabilities as of December 31, 2019 and 2018 are as follows (Korean won in millions):

2019					
	Financial liabilities at fair value through profit or loss	Derivative financial instruments	Other financial liabilities at amortized costs	Total	
Trade and other payables	₩ -	₩ -	₩ 1,629,980	₩	1,629,980
Short-term financial liabilities					
(*1) (*2)	14,268	3,734	956,615		974,617
Other current liabilities (*3)	-	-	218,190		218,190
Long-term financial liabilities (*2)	-	2,016	2,342,591		2,344,607
Non-current provision liabilities (*4)	-	-	125,237		125,237
Other non-current liabilities (*5)	-	-	241,968		241,968
	₩ 14,268	₩ 5,750	₩ 5,514,581	₩	5,534,599

(*1) Excludes firm commitments liabilities.

(*2) Includes lease liabilities that were recognized in accordance with the application of KIFRS 1116 *Leases* (see Note 35).

(*3) Consists of accrued expenses, accrued dividends and current membership guarantee deposits, except for short-term employee benefits.

(*4) Represents provisions for financial guarantees.

(*5) Consists of security deposits and non-current membership guarantee deposits.

2018					
	Financial liabilities at fair value through profit or loss	Derivative financial instruments	Other financial liabilities at amortized costs	Total	
Trade and other payables	₩ -	₩ -	₩ 2,023,490	₩	2,023,490
Short-term financial liabilities (*1)	42,267	3,142	1,044,364		1,089,773
Other current liabilities (*2)	-	-	224,368		224,368
Long-term financial liabilities	-	1,805	1,145,375		1,147,180
Non-current provision liabilities (*3)	-	-	232,245		232,245
Other non-current liabilities (*4)	-	-	266,485		266,485
	₩ 42,267	₩ 4,947	₩ 4,936,327	₩	4,983,541

(*1) Excludes firm commitments liabilities.

(*2) Consists of accrued expenses, accrued dividends and current membership guarantee deposits.

(*3) Represents provisions for financial guarantees.

(*4) Consists of security deposits and non-current membership guarantee deposits.

10. Categories of financial assets and liabilities (cont'd)

(3) Net gains and losses on financial instruments by category for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

2019					
	Financial instruments at fair value through profit or loss	Derivative financial instruments	Financial assets (liabilities) at amortized costs	Total	
Interest income	₩ 47	₩ -	₩ 49,714	₩	49,761
Interest expense	-	-	(147,136)		(147,136)
Gain (loss) on foreign currency translation	-	-	31,090		31,090
Gain (loss) on foreign currency transaction	-	-	(3,479)		(3,479)
Gain (loss) on derivatives valuation (*)	27,896	6,917	-		34,813
Gain (loss) on derivatives transaction	(18,221)	(59,002)	-		(77,223)
Dividend income	750	-	-		750
Other finance income (loss)	(27,454)	-	(3,357)		(30,811)
	<u>₩ (16,982)</u>	<u>₩ (52,085)</u>	<u>₩ (73,168)</u>	<u>₩</u>	<u>(142,235)</u>

(*) Excludes gain (loss) on valuation of firm commitments.

2018					
	Financial instruments at fair value through profit or loss	Derivative financial instruments	Financial assets (liabilities) at amortized costs	Total	
Interest income	₩ 96	₩ -	₩ 50,964	₩	51,060
Interest expense	-	-	(135,042)		(135,042)
Gain (loss) on foreign currency translation	-	-	26,304		26,304
Gain (loss) on foreign currency transaction	-	-	(27,033)		(27,033)
Gain (loss) on derivatives valuation (*)	(30,946)	3,476	-		(27,470)
Gain (loss) on derivatives transaction	3,431	(68,893)	-		(65,462)
Dividend income	898	-	-		898
Other finance income (loss)	(35,971)	-	(162,680)		(198,651)
	<u>₩ (62,492)</u>	<u>₩ (65,417)</u>	<u>₩ (247,487)</u>	<u>₩</u>	<u>(375,396)</u>

(*) Excludes gain (loss) on valuation of firm commitments.

11. Financial assets at fair value through profit or loss

(1) Details of financial assets at fair value through profit or loss as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Government bonds	₩ 4,154	₩ 1,373
Debt securities	5,210	5,210
Non-marketable equity securities, etc	234,658	223,625
	₩ 244,022	₩ 230,208

(2) Changes in Financial assets at fair value through profit or loss for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Beginning	₩ 230,208	₩ 251,727
Acquisition	12,181	24,660
Disposal	(12,272)	(19,503)
Valuation	(36,783)	(27,242)
Transfer (*1) (*2)	43,292	-
Changes in exchange rate	477	566
Changes in the scope of consolidation	6,919	-
Ending	₩ 244,022	₩ 230,208

(*1) Due to changes in equity ownership during the year ended December 31, 2019, the investments in Sejong Industrial Complex Co., Ltd. were reclassified from investments in associates to financial assets at fair value through profit or loss.

(*2) Due to the loss of significant influence in accordance with the shareholder's agreement, the investments in Shariket Tahlya Miyah Mostaganem, Spa were reclassified from investments in associates to financial assets at fair value through profit or loss.

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11. Financial assets at fair value through profit or loss (cont'd)

(3) Details of non-marketable equity securities as of December 31, 2019, and 2018 are as follows (Korean won in millions):

Investee	Number Of shares	Equity Interest (%)	Acquisition cost		Book value (*1)	
			2019	2018	2019	2018
Dong Yang Engineering and Construction Corp.	545	0.02	₩ 3	₩ 3	₩ 3	₩ 3
IoT Gwangmyeong co.,Ltd	-	-	-	191	-	191
Central Yongin Corp.	80,000	8.89	400	400	400	400
International Convention Center Jeju	100,000	0.26	500	500	500	500
The Korea Economic Daily	646	0.00	14	14	14	14
KIAMCO Gyeonggi Railway Investment Private Investment Trust	8,104,011,384	10.31	8,107	8,107	-	1,192
Tropical Bintan Pte., Ltd.	625,000	12.50	2,444	2,444	-	-
Gaya Railway Co., Ltd.	305,490	2.30	1,527	1,527	158	230
Kangreung Sewage Pipe Co., Ltd.	50,682	3.30	253	253	253	253
Kyunggi Railroad Cd.,Ltd.	495,000	2.45	2,475	2,475	-	364
Keangnam Enterprise Ltd.	292	0.00	1	1	1	1
Gyeongbuk Green Energy	286,552	8.40	1,433	1,433	1,433	1,433
Gumi Green Water Co., Ltd.	335,412	18.90	1,677	1,677	1,348	1,677
Gumimakeunmul	116,721	40.50	584	584	584	584
Gunsan Green Energy Center Co., Ltd.	246,962	10.05	1,235	1,235	1,235	1,235
Green Energy Development Co., Ltd.	81,000	27.00	405	405	405	405
Nonsan Drain Co., Ltd.	91,868	11.90	459	459	459	459
Evergreen Goyang Co., Ltd.	24,267	1.76	121	121	121	121
Dangyul Co., Ltd.	128,228	11.29	641	641	641	641
Daegu Green Energy Center CO., Ltd.	474,400	10.20	2,372	2,372	-	-
Daejeon Green Energy Centre Ltd.	396,792	10.20	1,984	1,984	-	-
Daejeon Sewage Pipe Co., Ltd.	108,456	4.00	830	830	830	830
Dream Hub Project Financial Investment	4,000,000	2.00	20,000	20,000	-	-
Masan Drain Co., Ltd.	220,890	8.14	1,104	1,104	503	390
Midan City Development Co., Ltd	2,391,480	13.40	13,240	13,240	-	-
Mileseum Co., Ltd.	86,645	1.63	433	433	433	433
Pumyang Asset Management	725	0.12	4	4	4	4
Pusan New Road co., Ltd.	2,201,310	45.00	11,007	4,010	11,007	4,010
North Han-River Barraks	8,847	0.33	44	28	44	28
Blue Core PFV Co., Ltd.	1,000,000	10.00	5,000	5,000	5,000	5,000
Bichaenoori Co., Ltd.	11,500	11.50	58	58	-	-
Bichaenoori Development Co., Ltd.	657,800	11.50	3,289	3,289	-	-
S-Y highway Co., Ltd.	4,737,712	7.00	23,689	23,689	11,896	12,048
Seo-seoul City Expressway Co., Ltd.	600,087	3.53	3,000	3,000	3,000	3,000
Seoul-Munsan Highway Co., Ltd.	9,667,840	36.40	48,339	48,339	48,339	48,339
Seoul Northern Highway Co., Ltd.	2,730,560	5.60	13,653	13,653	2,624	12,861
Seoul Tunnel Co., Ltd.	1,147,200	6.00	5,736	5,736	5,736	5,736
Siheung Ecopia Co., Ltd.	30,530	3.51	153	153	153	153
Ssangyong E&C Co., Ltd.	1,726	0.00	9	7	9	7
Asiad Country Club Co., Ltd.						
(Formerly, Busan Travel & Development Co., Ltd.)	80,000	2.67	400	400	-	-
Ansan 4dong 90 block PFV Co., Ltd.	320,000	16.00	3,200	3,200	2,809	2,701
Alpha Dome City Co., Ltd.	13,175	0.98	66	66	-	-
Alpharos Mixed-use Development Co., Ltd.	9,580	9.58	48	48	-	-
Alpharos PFV Co., Ltd.	2,299,200	9.58	11,496	11,496	-	-
Youngduk & Bio Co., Ltd.	34,870	4.22	174	174	174	174
Oksan Ochang Highway Corporation	5,988,000	60.00	29,940	29,940	6,371	24,844
Ulsan green Co., Ltd.	701,368	19.74	3,507	3,507	4,034	3,662
Wonju Green Co., Ltd.	226,376	11.03	1,132	1,132	395	349
Eun Pyung New Road Corp.	435,200	55.06	2,176	2,176	2,176	2,176
Eumseong Sewage Pipe Co., Ltd.	67,210	6.30	336	336	336	336
Uiyeongbu LRT Inc.	8,663,394	47.54	45,226	45,226	-	-
Jeonju Sewage Pipe Co., Ltd.	207,060	7.90	1,035	1,035	-	-
The 2 nd YoungDong Highway Co., Ltd.	1,437,483	2.69	7,272	7,272	507	6,687
The 2 nd Outer Circular Highway Co., Ltd.	2,894,436	13.32	14,472	14,472	14,472	14,472
Jinsung Construction Co., Ltd.	10,095	1.39	101	101	101	101
Paju-Yangju Powerful Army Co., Ltd.	89,289	8.00	447	447	-	-
Public Development Co., Ltd.	394,655	17.09	3,947	3,947	3,773	4,265
Pyeongtaek EOS	328,200	6.00	1,641	1,641	1,641	1,641

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11. Financial assets at fair value through profit or loss (cont'd)

Investee	Number Of shares	Equity Interest (%)	Acquisition cost		Book value (*1)	
			2019	2018	2019	2018
Clean Gimpo Co., Ltd.	-	-	-	1,949	-	2,036
Pureun seobu environment	13,488	1.30	68	68	68	68
Poonglim Industrial Co., Ltd.	-	-	-	1	-	1
Korea Investment Trust Management	-	-	-	9,960	-	9,960
Hwasung Ecotec Co., Ltd.	8,689	0.90	43	43	43	43
Construction Guarantee Cooperative (*2)	16,363	0.41	17,095	17,095	24,449	24,244
Fire Guarantee Cooperative (*2)	40	0.01	20	20	20	20
Engineering Construction Financial Cooperative (*2)	13,700	1.08	6,612	6,612	8,855	8,409
Electric Construction Financial Cooperative (*2)	600	0.01	98	98	98	98
Information & Communication Financial Cooperative (*2)	440	0.04	61	61	61	61
Donghae International Resources Terminal Co., Ltd.	38,000	10.00	190	-	190	-
Sambu Construction Co., Ltd.	13,615	0.01	14	-	14	-
Sejong Industry Complex Corp.	20,000	1.01	10	-	10	-
Others (*3)	-	-	68,419	16,023	66,928	14,735
			<u>₩ 395,469</u>	<u>₩ 347,945</u>	<u>₩ 234,658</u>	<u>₩ 223,625</u>

(*1) The book value is the amount of net asset value or after fair value evaluation.

(*2) The financial assets have been pledged as collateral in relation to its construction performance guarantee, etc.

(*3) Non-marketable equity securities held by a subsidiary.

Equity securities held by the Group with 20% or more of the voting power of the investee over which it does not have significant influence are classified as financial assets at fair-value through profit or loss.

12. Derivative instruments

The Group entered into currency forward contracts with financial institutions to hedge the foreign currency risk of long-term construction contracts which satisfy the criteria for firm commitments, and these instruments are designated as a fair value hedge.

Also, the Group entered into currency forward contracts with financial institutions to hedge the foreign currency risk of sub-contracts and these instruments are designated as a cash flow hedge.

Details of derivative instruments as of December 31, 2019 and 2018 are as follows (Korean won in millions):

		2019								
		Valuation			Gain or loss			Accumulated other comprehensive loss (*1)		
		Assets	Liabilities		Gain	Loss	Net	Gain	Loss	Net
Derivatives that are not designated as hedging instruments	For sale	₩	₩	5,277	₩	₩	5,277	₩	₩	₩
	Put option (*2)	-	8,991	33,173	-	33,173	-	-	-	-
		₩	₩	14,268	₩	₩	27,896	₩	₩	₩
Derivatives that are designated as hedging instruments	Cash flow hedge	₩	₩	4,629	₩	₩	(409)	₩	₩	₩
	Fair value hedge	8,418	1,121	8,447	1,121	7,326	-	-	-	-
		₩	₩	14,869	₩	₩	6,917	₩	₩	₩
Firm commitments assets or liabilities		₩	₩	17,115	₩	₩	39,479	₩	₩	₩
		₩	₩	37,133	₩	₩	74,292	₩	₩	₩

(*1) Gain (loss) on valuation of derivatives are presented before income tax effects.

(*2) The conversion right in relation to foreign convertible bond was provided to the bond holder, and the fair value of the conversion right assessed by the external institution was accounted for as derivative liabilities.

		2018								
		Valuation			Gain or loss			Accumulated other comprehensive loss (*1)		
		Assets	Liabilities		Gain	Loss	Net	Gain	Loss	Net
Derivatives that are not designated as hedging instruments	For sale	₩	₩	1,425	₩	₩	(1,425)	₩	₩	₩
	Put option (*2)	-	40,842	-	29,521	(29,521)	-	-	-	-
		-	42,267	-	30,946	(30,946)	-	-	-	-
Derivatives that are designated as hedging instruments	Cash flow hedge	₩	₩	4,394	₩	₩	(802)	₩	₩	₩
	Fair value hedge	5,602	553	5,376	1,098	4,278	-	-	-	-
		₩	₩	6,922	₩	₩	3,476	₩	₩	₩
Firm commitments assets or liabilities		₩	₩	28,388	₩	₩	46,257	₩	₩	₩
		₩	₩	75,602	₩	₩	18,787	₩	₩	₩

(*1) Gain (loss) on valuation of derivatives are presented before income tax effects.

(*2) The conversion right in relation to foreign convertible bond was provided to the bond holder, and the fair value of the conversion right assessed by the external institution was accounted for as derivative liabilities.

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13. Investments in associates and joint ventures

(1) Changes in investments in associates for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

2019						
	Equity Ownership (%)	Beginning	Increase	Gain (loss) on equity method	Changes in equity	Ending
Major Development Co., Ltd.	45.00	₩ -	₩ -	₩ -	₩ -	-
GS KOCREF New Stay REIT Co., Ltd.	25.24	-	-	-	-	-
Sejong Industry Complex Corp. (*1)	1.01	-	-	-	-	-
Hakun 7 Industry Complex Co., Ltd.	20.00	122	-	(107)	-	15
Beopwon Industry Urban Development Corp.	20.00	-	-	-	-	-
HyangSan 2 Urban Development Corp.	50.00	4	-	(3)	-	1
Tongjin Industry Complex Co., Ltd.	20.00	10	-	-	-	10
SoBaek Co., Ltd.	29.99	-	-	-	-	-
Yeouido MBC Site MXD PFV. Inc. (*2)	10.00	6,448	-	(5,817)	-	631
Gwancheon Sangsang PFV (*2)	19.00	2,016	-	(217)	-	1,799
FGS East Asia Technical Resource Management, Inc.	25.00	11	16	1	2	30
Cadiz San Fernando, A.I.E.	21.95	1,536	-	340	(295)	1,581
Participes de Biorreciclaje S.A.	33.33	6,455	-	746	87	7,288
Gestion de Participes de Biorreciclaje	33.33	-	-	-	-	-
Shariket Miyeh Ras Djinet, Spa (*3)	25.49	10,792	(10,792)	-	-	-
Shariket Tahlya Miyah Mostaganem, Spa (*4)	25.50	31,076	(35,271)	4,195	-	-
Cheongju Hi Tech Valley (*5)	20.00	-	160	(100)	-	60
BKT Co., Ltd. (*5)	29.00	-	18,000	(1,325)	-	16,675
PT. CORE RESOURCE (*5)	49.00	-	1,124	(502)	33	655
Zero Tech Co., Ltd. (*2) (*5)	19.00	-	1	(1)	-	-
Cheonan Techno Park Inc. (*5)	20.00	-	600	(235)	-	365
Camp Stanton Co., Ltd. (*5)	29.00	-	2	-	-	2
		₩ 58,470	₩ (26,160)	₩ (3,025)	₩ (173)	₩ 29,112

(*1) Due to changes in equity ownership during the year ended December 31, 2019, the investments in Sejong Industrial Complex Co., Ltd. were reclassified from investments in associates to financial assets at fair value through profit or loss.

(*2) The investee is classified as associate as the Group has significant influence over the retention of directors' rights.

(*3) The investee is included in the scope of consolidation as the Group obtained a control over the investee in accordance with the shareholder's agreement.

(*4) Due to the loss of significant influence in accordance with the shareholder's agreement, the investments were left off investments in associates.

(*5) Newly acquired for the year ended December 31, 2019.

2018						
	Equity Ownership (%)	Beginning	Increase	Gain (loss) on equity method	Changes in equity	Ending
Major Development Co., Ltd.	40.00	₩ -	₩ -	₩ -	₩ -	-
GS KOCREF New Stay REIT Co., Ltd.	25.24	1,291	-	(1,291)	-	-
Sejong Industry Complex Corp.	20.00	-	-	-	-	-
Hakun 7 Industry Complex Co., Ltd.	20.00	9	190	(77)	-	122
Beopwon Industry Urban Development Corp.	20.00	34	-	(34)	-	-
HyangSan 2 Urban Development Corp.	50.00	5	-	(1)	-	4
Tongjin Industry Complex CO., Ltd (*1)	20.00	-	10	-	-	10
SoBaek Co., Ltd. (*1)	29.97	-	90	(90)	-	-
Yeouido MBC Site MXD PFV. Inc. (*1)(*2)	10.00	-	6,500	(52)	-	6,448
Gwancheon Sangsang PFV (*1)(*2)	19.00	-	2,030	(14)	-	2,016
FGS East Asia Technical Resource Management, Inc.	25.00	-	-	11	-	11
PT. Daria Mulia Properti (*1)	44.13	-	14,131	(94)	1	14,038
Cadiz San Fernando, A.I.E.	21.95	1,525	-	332	(321)	1,536
Participes de Biorreciclaje S.A.	33.33	5,745	-	719	(9)	6,455
Gestion de Participes de Biorreciclaje	33.33	-	-	-	-	-
Shariket Miyeh Ras Djinet, Spa	25.49	9,104	-	1,562	126	10,792
Shariket Tahlya Miyah Mostaganem, Spa	25.50	25,456	-	5,268	352	31,076
		₩ 43,169	₩ 22,951	₩ 6,239	₩ 149	₩ 72,508

(*1) Newly acquired in 2018.

(*2) The investee is classified as associate as the Group has significant influence over the retention of directors' rights.

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13. Investments in associates and joint ventures (cont'd)

(2) Changes in investments in joint ventures for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	Equity ownership (%)	2019				
		Beginning	Increase and Decrease	Gain (loss) on equity method	Changes in equity	Ending
G&M Estate Co., Ltd.	50.00	₩ 508	₩ -	₩ (19)	₩ -	₩ 489
GS Korea for Project Management Company	49.00	20	-	-	1	21
Hialeah Water, LLP	50.00	454	-	(22)	14	446
PT. Daria Mulia Properti (*)	50.00	14,038	6,974	162	1,153	22,327
		₩ 15,020	₩ 6,974	₩ 121	₩ 1,168	₩ 23,283

(*) The investee was reclassified to a joint venture from an associate as the Group holds joint control over the investee for the year ended December 31, 2019.

	2018				
	Equity ownership (%)	Beginning	Gain (loss) on equity method	Changes in equity	Ending
G&M Estate Co., Ltd.	50.00	₩ 522	₩ (14)	₩ -	₩ 508
GS Korea for Project Management Company	49.00	19	1	-	20
Hialeah Water, LLP	50.00	679	275	(500)	454
		₩ 1,220	₩ 262	₩ (500)	₩ 982

(3) Equity method of accounting has been suspended due to accumulated losses, and unrecognized losses in equity for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019		
	Beginning	Increase (decrease)	Ending
Major Development Co., Ltd.	₩ 9,074	₩ (1,361)	₩ 7,713
GS KOCREF New Stay REIT Co., Ltd.	11,320	10,262	21,582
Beopwon Industry Urban Development Corp.	660	323	983
SoBaek Co., Ltd.	1,112	4,334	5,446
Gestion de Participes de Biorreciclaje	11	-	11
Zero Tech Co., Ltd	-	48	48
	₩ 22,177	₩ 13,606	₩ 35,783

	2018		
	Beginning	Increase (decrease)	Ending
Major Development Co., Ltd.	₩ 6,486	₩ 2,588	₩ 9,074
FGS East Asia Technical Resource Management, Inc.	338	(338)	-
GS KOCREF New Stay REIT Co., Ltd.	-	11,320	11,320
Beopwon Industry Urban Development Corp.	-	660	660
Sejong Industry Complex Corp.	-	23	23
SoBaek Co., Ltd.	-	1,112	1,112
Gestion de Participes de Biorreciclaje	11	-	11
	₩ 6,835	₩ 15,365	₩ 22,200

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13. Investments in associates and joint ventures (cont'd)

(4) A summary of financial information on associates and joint ventures is as follows (Korean won in millions):

		2019					Profit or loss for the year	
		Assets	Liabilities	Net assets	Sales			
Associates	Major Development Co., Ltd.	₩ 22,566	₩ 43,723	₩ (21,157)	₩ -	₩ -	₩ 111	
	GS KOCREF New Stay REIT Co., Ltd.	322,402	273,016	49,386	1,241	-	(10,328)	
	Hakun 7 Industry Complex Co., Ltd.	2,503	2,422	81	-	-	(547)	
	Beopwon Industry Urban Development Corp.	64,167	69,170	(5,003)	-	-	(1,616)	
	HyangSan 2 Urban Development Corp.	393	393	-	-	-	(7)	
	Tongjin Industry Complex CO., Ltd.	50	1	49	-	-	-	
	SoBaek Co., Ltd.	202,994	221,154	(18,160)	-	-	(11,731)	
	Yeouido MBC Site MXD PFV. Inc.	637,679	599,268	38,411	17,757	-	(26,073)	
	Gwancheon Sangsang PFV	6,269	482	5,787	-	-	(1,151)	
	FGS East Asia	1,014	892	122	375	-	(16)	
	Technical Resource Management, Inc.							
	Cadiz San Fernando, A.I.E.	10,758	3,556	7,202	5,783	-	1,552	
	Participes de Biorreciclaje S.A.	96,535	74,301	22,234	24,223	-	2,283	
	Gestion de Participes de Biorreciclaje	-	-	-	-	-	-	
	Cheongju Hi Tech Valley	14	257	(243)	-	-	(1,043)	
	BKT Co., Ltd.	39,666	14,855	24,811	23,811	-	(5,028)	
	PT. CORE RESOURCE	6,840	5,754	1,086	9,634	-	(995)	
	Zero Tech Co., Ltd.	1,299	1,550	(251)	-	-	(256)	
	Cheonan Techno Park Inc.	1,441	57	1,384	-	-	(1,572)	
	Camp Stanton Co., Ltd.	10	-	10	-	-	-	
Joint venture	G&M Estate Co., Ltd.	1,088	111	977	815	-	(39)	
	GS Korea for Project Management Company	111	70	41	349	-	(1)	
	Hialeah Water, LLP	1,220	326	894	-	-	(43)	
	PT. Daria Mulia Properti	31,243	16	31,227	-	-	324	

		2018					Profit or loss for the year	
		Assets	Liabilities	Net assets	Sales			
Associates	Major Development Co., Ltd.	₩ 51,387	₩ 74,073	₩ (22,686)	₩ -	₩ -	₩ (1,900)	
	GS KOCREF New Stay REIT Co., Ltd.	319,352	259,639	59,713	453	-	(8,469)	
	Sejong Industry Complex Corp.	99	213	(114)	-	-	(109)	
	Hakun 7 Industry Complex Co., Ltd.	1,306	696	610	-	-	(386)	
	Beopwon Industry Urban Development Corp.	53,578	56,967	(3,389)	-	-	(3,467)	
	HyangSan 2 Urban Development Corp.	97	90	7	-	-	(3)	
	Tongjin Industry Complex CO., Ltd.	50	-	49	-	-	(1)	
	SoBaek Co., Ltd.	180,861	184,567	(3,706)	-	-	(4,006)	
	Yeouido MBC Site MXD PFV. Inc..	70,741	6,257	64,484	-	-	(516)	
	Gwancheon Sangsang PFV.	6,929	-	6,929	-	-	(71)	
	FGS East Asia	1,238	1,192	46	1,191	-	(67)	
	Technical Resource Management, Inc.							
	PT. Daria Mulia Properti	22,127	14	22,113	-	-	(212)	
	Cadiz San Fernando, A.I.E.	10,804	3,808	6,996	5,726	-	1,514	
	Participes de Biorreciclaje S.A.	86,249	66,566	19,682	23,386	-	2,201	
	Gestion de Participes de Biorreciclaje	90	122	(32)	-	-	-	
	Shariket Miyeh Ras Djinet Spa	98,510	56,164	42,345	21,881	-	6,131	
	Shariket Tahlya Miyah Mostaganem, Spa	208,614	86,753	121,860	40,223	-	20,653	
	G&M Estate Co., Ltd.	1,121	104	1,017	997	-	(27)	
	GS Korea for Project Management Company	79	39	40	132	-	1	
	Hialeah Water, LLP	1,314	407	907	-	-	549	

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14. Property, plant and equipment

(1) Details of property, plant and equipment as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019			2018		
	Acquisition cost	Accumulated depreciation	Net book value	Acquisition cost	Accumulated depreciation	Net book value
Land	₩ 533,615	₩ -	₩ 533,615	₩ 456,855	₩ -	₩ 456,855
Buildings	638,515	(163,751)	474,764	396,502	(148,553)	247,949
Structures	113,333	(46,238)	67,095	112,795	(43,476)	69,319
Machinery	52,308	(37,543)	14,765	42,512	(35,136)	7,376
Construction equipment	45,894	(28,767)	17,127	66,260	(42,025)	24,235
Vehicles	24,394	(19,592)	4,802	24,281	(18,871)	5,410
Tools	27,682	(18,481)	9,201	22,746	(16,886)	5,860
Equipment	133,109	(113,419)	19,690	130,551	(109,847)	20,704
Construction-in progress	34,973	-	34,973	3,340	-	3,340
	₩ 1,603,823	₩ (427,791)	₩ 1,176,032	₩ 1,255,842	₩ (414,794)	₩ 841,048

(2) Changes in property, plant and equipment for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019						
	Beginning	Acquisition	Disposal	Depreciation	Transfer (*)	Exchange differences	Change in consolidation
Land	₩ 456,855	₩ 62,792	₩ -	₩ -	₩ 14,017	₩ (92)	₩ 43
Buildings	247,949	27,682	(100)	(13,056)	32,471	(343)	180,161
Structures	69,319	524	-	(2,760)	-	12	-
Machinery	7,376	4,184	(275)	(2,794)	-	94	6,180
Construction equipment	24,235	1,010	(4,508)	(5,729)	-	367	1,752
Vehicles	5,410	1,272	(299)	(1,636)	-	55	-
Tools	5,860	4,705	(494)	(2,492)	-	76	1,546
Equipment	20,704	5,832	(343)	(6,708)	-	183	22
Construction-in progress	3,340	33,099	-	-	(3,478)	117	1,895
	₩ 841,048	₩ 141,100	₩ (6,019)	₩ (35,175)	₩ 43,010	₩ 469	₩ 191,599
							₩ 1,176,032

(*) Land and buildings were transferred from investment properties, and construction in progress was transferred to cost of sales.

	2018						
	Beginning	Acquisition	Disposal	Depreciation	Exchange differences	Ending	
Land	₩ 456,856	₩ -	₩ -	₩ -	₩ (1)	₩ 456,855	
Buildings	252,639	1,697	-	(9,726)	3,339	247,949	
Structures	71,445	598	-	(2,735)	11	69,319	
Machinery	23,054	756	(12,855)	(3,747)	168	7,376	
Construction equipment	53,896	2,437	(26,331)	(7,584)	1,817	24,235	
Vehicles	5,008	2,500	(935)	(1,235)	72	5,410	
Tools	6,227	2,104	(468)	(1,904)	(99)	5,860	
Equipment	25,192	3,559	(239)	(7,717)	(91)	20,704	
Construction-in progress	3,202	1	-	-	137	3,340	
	₩ 897,519	₩ 13,652	₩ (40,828)	₩ (34,648)	₩ 5,353	₩ 841,048	

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

(3) Collateral pledged to financial institutions for borrowings as of December 31, 2019 and 2018 is as follows (Korean won in millions):

		2019				
		Carrying amount	Secured amount	Related account	Related amount	Secured party
-	₩	-	₩	-	₩	-
		2018				
		Carrying amount	Secured amount	Related account	Related amount	Secured party
Land	₩	30,277	₩	52 Deposit	₩	52 AIG

15. Intangible assets

(1) Changes in intangible assets for the years ended as of December 31, 2019 and 2018 are as follows (Korean won in millions):

2019												
	Beginning	Acquisition	Disposal	Amortization	Changes in the scope of consolidation	Exchange differences	Ending					
Goodwill	₩ 56,286	₩ -	₩ -	₩ -	₩ 51,652	₩ 364	₩ 108,302					
Memberships	40,573	50	(164)	-	-	26	40,485					
Computer software	4,505	6,202	(806)	(1,816)	237	(3)	8,319					
Concession assets	100,182	10,016	-	(10,056)	221,044	(41)	321,145					
Technical rights	12,375	-	-	(3,787)	-	198	8,786					
Others	1,743	1,227	-	(375)	365	(3)	2,957					
	₩ 215,664	₩ 17,495	₩ (970)	₩ (16,034)	₩ 273,298	₩ 541	₩ 489,994					

2018												
	Beginning	Acquisition	Disposal	Amortization	Exchange differences	Ending						
Goodwill	₩ 54,988	₩ 1,302	₩ -	₩ -	₩ (4)	₩ 56,286						
Lease rights	218	-	-	(218)	-	-						
Memberships	41,145	-	(586)	-	14	40,573						
Computer software	3,867	2,134	(7)	(1,380)	(109)	4,505						
Concession assets	93,140	17,490	-	(6,149)	(4,299)	100,182						
Technical rights	16,088	-	-	(3,769)	56	12,375						
Others	36	1,895	-	(188)	-	1,743						
	₩ 209,482	₩ 22,821	₩ (593)	₩ (11,704)	₩ (4,343)	₩ 215,664						

15. Intangible assets (cont'd)

(2) Impairment tests for goodwill

Goodwill is monitored by the management at the operating segment level (CGU or group of CGU). The following is a summary of goodwill allocation for each operating segment (Korean won in millions):

Operating segments	Allocated goodwill
Plant	₩ 107,039
Others	₩ 1,263

Goodwill impairment reviews are undertaken annually. The impairment review performed in 2019 suggests that the carrying value of CGU does not exceed the recoverable amount. The recoverable amounts of all CGUs have been determined based on value-in-use calculations. The key assumptions used for value-in-use calculations in 2019 are as follows:

	Operation profit margin (*1)	Perpetual growth rate (*2)	Post-tax discount rate (*3)
Main assumption	12.9% ~ 19.1%	1.0%	6.60%

(*1) Operation profit margin rate is used to extrapolate cash flows for the next five years.

(*2) Perpetual growth rate is consistent with the projected growth rate after five years in industry reports.

(*3) Post-tax discount rate is applied to cash flow projections.

Possible variations in the amount or timing of the estimated future cash flow may lead to changes in the recoverable amount. Accordingly, management continues to monitor revenue and industrial trend.

16. Investment properties

(1) Changes in investment properties for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Beginning	₩ 915,828	₩ 879,889
Acquisition	69,597	44,852
Disposal	(836)	(939)
Depreciation	(6,919)	(7,209)
Impairment	(14,807)	-
Transfer (*)	(46,487)	(1,475)
Exchange differences	1,896	710
Ending	₩ 918,272	₩ 915,828
Acquisition cost	₩ 981,779	₩ 957,917
Accumulated depreciation	(25,765)	(19,155)
Accumulated impairment losses	(37,742)	(22,934)

(*) Investment properties are transferred to property, plant and equipment for the year ended December 31, 2019, and investment properties were transferred to inventories for the year ended December 31, 2018.

Fair values of investment properties approximate their book values as of December 31, 2019 and 2018.

(2) Gain and loss on investment properties recognized in profit or loss for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Lease income	₩ 6,407	₩ 7,668
Operating expenses	16,739	11,428
	₩ (10,332)	₩ (3,760)

16. Investment properties (cont'd)

(3) Collateral pledged to financial institutions for borrowings as of December 31, 2019 and 2018 are as follows (Korean won in millions):

		2019				
	Carrying amount	Secured amount	Related account	Related amount	Secured party	
Land	₩ 149,189	₩ 156,718	Long-term borrowings and others	₩ 130,893	Woori and others	
Buildings	207,863					
		2018				
	Carrying amount	Secured amount	Related account	Related amount	Secured party	
Land	₩ 585,130	₩ 313,708	Long-term borrowings and others	₩ 252,723	Woori and others	
Buildings	217,839					

17. Trade and other payables, other liabilities

(1) Trade and other payables as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Trade payables	₩ 1,394,222	₩ 1,756,861
Other payables	235,758	266,629
	₩ 1,629,980	₩ 2,023,490

(2) Details of other current liabilities as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Advance from construction contracts	₩ 154,801	₩ 254,585
Advance from apartment sales	274,180	215,654
Overbilled amounts related to construction	1,747,763	1,931,410
Advance from customers	130,013	102,629
Withholdings	236,351	171,451
Deposits received	1,166	1,233
Accrued expenses	164,883	59,358
Dividends payable	6	1
Unearned revenue	397	1,518
Value added tax withheld	22,922	15,256
Membership guarantee deposits	177,146	165,009
	₩ 2,909,628	₩ 2,918,104

(3) Details of other non-current liabilities as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Long-term deposits received	₩ 49,471	₩ 22,627
Leasehold deposits received	215,190	222,280
Membership guarantee deposits	26,778	44,205
	₩ 291,439	₩ 289,112

18. Financial liabilities

(1) Details of short-term financial liabilities as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019		2018
Short-term financial liabilities			
Short-term borrowings	₩ 450,893	₩	594,992
Current portion of long-term debts	410,553		450,501
Present value discount	-		(1,015)
Discount on debentures	-		(63)
Conversion right adjustments	-		(51)
Current lease liabilities (*1)	95,169		-
Derivative liabilities (*2)	35,117		73,797
	₩ 991,732	₩	1,118,161

(*1) The current lease liabilities have been recognized due to the application of KIFRS 1116 *Leases* (see Note 35).

(*2) The fair value of conversion rights that are granted to creditors in relation to the issuance of foreign convertible bonds are included in derivative liabilities.

(2) Details of long-term financial liabilities as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019		2018
Long-term financial liabilities			
Long-term borrowings	₩ 1,187,750	₩	958,839
Debentures	667,565		112,986
Discount on debentures	(1,772)		(804)
Conversion right adjustments	(8,242)		(12,368)
Non-current lease liabilities (*1)	497,290		-
Derivative liabilities	2,016		1,805
Others (*2)	-		86,723
	₩ 2,344,607	₩	1,147,181

(*1) The non-current lease liabilities have been recognized due to the application of KIFRS 1116 *Leases* (see Note 35).

(*2) The present value of the exercise price of put option contracts that were granted to the financial investors who participated in the acquisition of equity interests in the subsidiaries is included in others. In addition, the put options were exercised for the year ended December 31, 2019.

18. Financial liabilities (cont'd)

(3) Details of short-term borrowings as of December 31, 2019 and 2018 are as follows (Korean won in millions):

Type	Creditor	Maturity	Annual interest rate (%)	2019	2018
Usance	KEB Hana	2020-04-06	0.35	₩ 451	₩ 38,306
	Kookmin	2020-05-19	0.30~2.38	2,966	25,613
	NH	-	-	-	5,004
	Suhyup	2020-04-06	0.35	5,574	4,802
	Woori	2020-05-13	0.30~2.50	3,105	31,983
	KDB	2020-05-11	2.27~2.36	843	8,899
	UOB	-	-	-	1,017
	Shinhan	2020-04-28	0.35~2.26	1,016	-
	Bank of China	2020-05-11	2.82~3.12	6,595	20,710
	HSBC	-	-	-	55,905
General borrowings in Foreign currency	HSBC	2020-11-20	1M Libor + 1.83	57,890	-
	Qatar National Bank Consortium	2020-06-30	5.00	6,321	9,211
	United Overseas Bank	2020-05-15	6M Sibor + 2.00	31,080	-
	UOB	-	-	-	33,782
	UOB	-	-	-	13,023
	Industrial & Commercial Bank of China	2020-05-11	3M Libor + 1.90	34,734	55,905
	Industrial & Commercial Bank of China	2020-01-10	3M Libor + 2.20	23,156	-
	China Everbright Bank	2020-07-24	3M Libor + 1.90	23,156	22,362
	Bank of China	2020-02-17	6M Libor + 2.00	34,734	-
	Korea Exim	-	-	-	178,896
Subsidiaries	DB Madrid	2020-05-24	12M Libor + 1.50	57,048	54,729
	Smilegate	2020-04-07	6M Libor	92,880	-
	Helios and others	2020-06-30	-	11	-
	JSC Credit Agricole Bank	2020-07-15	6M EURLibor + 3.00	15,880	-
	Caixa and others (*)	2020-12-04	TR + 8.70	53,453	34,845
				₩ 450,893	₩ 594,992

(*) Future cash flows from the service concession arrangements have been pledged as collateral (see Note 34).

18. Financial liabilities (cont'd)

(4) Details of long-term borrowings as of December 31, 2019 and 2018 are as follows (Korean won in millions):

Type	Creditor	Maturity	Annual interest rate (%)		2019	2018
Long-term borrowings in Korean won	IBK Capital (*1)	2021-02-19	3.82~4.05	₩	30,000	₩ 52,070
	Kookmin	-	-		-	7,000
	NongHyup Life Insurance Co., Ltd. (*1)	2021-02-19	3.82~4.05		20,000	20,000
	Double K 3 rd Co., Ltd.	-	-		-	8,000
	Tongyang Life Insurance Co., Ltd.	-	-		-	3,105
	Dream Arena Co., Ltd. (*1)	2021-02-19	3.82~4.15		75,000	75,000
	DGB CAPITAL Co., Ltd.	-	-		-	10,000
	KDB Capital (*1)	2020-09-17	3.82		5,000	15,000
	Suhyup	-	-		-	2,070
	Aju Capital	-	-		-	25,518
	Elysia the 1 st Co., Ltd. (*1)	2020-09-15	4.50~5.00		16,500	36,450
	FN siksa 1 st Co., Ltd.	2021-06-14	3.64~3.95		12,981	18,965
	NH Capital Co., Ltd.	-	-		-	15,000
	Woori (*2)	2045-06-12	2.30~2.80		127,435	127,435
	DB Savings Bank Co. Ltd.	-	-		-	10,000
	Utopia The Eighteenth Co., Ltd.	-	-		-	40,000
	China Construction Bank	-	-		-	43,000
	Industrial & Commercial Bank of China (*1)	2020-04-20	3.54		20,000	20,000
	IBK	-	-		-	26,300
	GRE L.L.C	-	-		-	45,900
	KB Capital	-	-		-	22,000
	KTB Securities	-	-		-	100,000
	Fairy Ilsan Co., Ltd.	2022-11-16	4.74		24,049	-
	HSBC	2021-05-10	2.95		100,000	-
	YKGAEPO.Co.,Ltd. (*1)	2021-10-08	2.85		100,000	-
	Korea Exim	2024-09-19	2.15		37,500	25,000
Long-term borrowings in foreign currency	Korea Exim	2021-04-12	3M Libor + 2.48		13,755	13,283
	Korea Exim	-	-		-	10,233
	Korea Exim	2021-01-04	6M Libor + 2.19		118,096	83,858
	Korea Exim	2024-09-19	6MEURibor + 1.53		31,137	-
	Korea Exim	2026-09-23	6MEURibor + 1.68		119,364	-
	Arab Bank, S'pore	2020-01-20	6M Libor + 2.40		57,890	55,905
	Mashreq	-	-		-	38,015
	Qatar National Bank Consortium	-	-		-	9,211
Subsidiaries	Caixa and others (*3) (*4)	2041-08-15	TR + 8.70 and others		458,433	362,475
					1,367,140	1,320,793
Less: current portion					(179,390)	(361,954)
					1,187,750	958,839
Less: discount on long-term borrowings					-	-
				₩	1,187,750	₩ 958,839

(*1) Future cash flows from the business are pledged as collateral

(*2) Part of the land held by the Company are pledged as collateral (see Note 16).

(*3) Future cash flows from the service concession arrangements have been pledged as collateral (see Note 34).

(*4) Part of the land held by the subsidiaries are pledged as collateral (see Note 9).

18. Financial liabilities (cont'd)

(5) Details of debentures as of December 31, 2019 and 2018 are as follows (Korean won in millions):

Type	Series	Maturity	Annual interest rate (%)	2019	2018
Bonds in Korean won with fixed interest rate	The 135th unsecured bond (private)	2021-05-10	2.50	20,000	-
	The 136th unsecured bond (public)	2022-07-12	2.00	300,000	-
	Convertible bonds (*1)	2021-04-12	2.90	62,000	81,085
Bonds in foreign currency	The 133th secured bond (variable rate)	2022-04-26	3M Libor + 0.95	57,890	-
	The 134th secured bond (variable rate)	2023-05-04	3M Libor + 1.85	57,890	-
	Convertible bonds (*2)	2021-07-21	4.50	87,067	84,081
Bonds of subsidiaries in foreign currency	Bond (*3)	2021-03-03	CDI + 4.35	3,938	6,517
	Bond (*3)	2030-03-01	TR + 9.00	28,242	29,851
	Bond (*3)	2020-09-25	CDI + 1.30	148,833	-
	Bond (*3)	2027-05-15	CDI + 2.67	52,192	-
	Bond (*3)	2021-03-30	IGP-M + 12.5	1,345	-
	Bond (*3)	2029-08-01	TR + 8.75	79,331	-
				898,728	201,534
Less: current portion				(231,163)	(88,548)
				667,565	112,986
Less: discount on debentures				(1,772)	(804)
Less: conversion right adjustments				(8,242)	(12,368)
				₩ 657,551	₩ 99,814

(*1) Convertible bonds

The Group issued unsecured convertible bonds on April 08, 2016 in accordance with the resolution made at the Board of Directors' meeting. Details of the bonds are as follows:

	Description
Aggregate principal amount of the bonds	₩250,000,000,000
Par interest rate	2.90%
Yield to maturity	2.90%
Conversion period	From April 12, 2017 to March 12, 2021
Type of shares to be issued in accordance with the conversion	Fully paid ordinary shares
Details of conversion rights	<ol style="list-style-type: none"> 1. Conversion price: ₩28,829 per share 2. Payments: paid at once on maturity, redemption at the option of the bondholders 3. Issued: private offering 4. Adjustments to conversion price: adjustments described under "Terms and Conditions of the Bonds" (consolidation, subdivision, reclassification or capital reduction, share dividends, capitalization of profits or reserves, distributions, rights issues of shares or options over shares: issues at less than current market price and others)

During the year ended December 31, 2019, the Group issued 662,007 shares of its ordinary share for the exercise of conversion rights to face par value of ₩ 19,085 million.

On the other hand, the convertible bonds are classified as current liabilities due to the early repayment rights of the bondholders.

18. Financial liabilities (cont'd)

(*2) Convertible bonds

The Group issued unsecured foreign convertible bonds on July 07, 2016 in accordance with the resolution made at the Board of Directors' meeting. Details of the bonds are as follows:

	Description
Aggregate principal amount of the bonds	USD 150,000,000
Par interest rate	4.50%
Yield to maturity	4.50%
Conversion period	From July 21, 2017 to July 14, 2021
Type of shares to be issued in accordance with the conversion	Fully paid ordinary shares
Details of conversion rights	<ol style="list-style-type: none"> 1. Conversion price: ₩32,664 per share 2. Payments: paid at once on maturity, redemption at the option of the bondholders, redemption at the option of the issuer 3. Issued: private offering (Korea) and public offering (Foreign) 4. Adjustments to conversion price: adjustments described under "Terms and Conditions of the Bonds" (consolidation, subdivision, reclassification or capital reduction, share dividends, capitalization of profits or reserves, distributions, rights issues of shares or options over shares, issues at less than current market price and others)

The convertible bonds have been classified as non-current liabilities due to the expiration of the early repayment right of the bondholders as of December 31, 2019

(*3) Future cash flows from the service concession arrangements have been pledged as collateral (see Note 34).

19. Net defined benefit liability

(1) Defined contribution retirement pension

The Group operates a defined contribution pension plan under which the amount contributed by the Group is expensed. The amount recognized in the consolidated statement of profit or loss for the year ended December 31, 2019 is ₩2,714 million.

(2) Defined benefit retirement pension

The Group operates a defined benefit pension plan for its employees, which is recorded at the present value of benefits paid using the projected unit credit method based on actuarial assumptions and on a discount basis.

1) The amounts recognized in the consolidated statements of financial position are as follows (Korean won in millions):

	2019	2018
Present value of the defined benefit obligation (*)	₩ 497,487	₩ 460,767
Fair value of plan assets	(447,678)	(387,979)
Defined benefit liability in the consolidated statements of financial position	₩ 49,809	₩ 72,788

(*) The present value of the defined benefit obligation is calculated by deducting contributions to the National Pension Fund of ₩598 million as of December 31, 2019 (2018: ₩612 million).

19. Net defined benefit liability (cont'd)

(2) Defined benefit retirement pension (cont'd)

2) Changes in the carrying amount of defined benefit obligation for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Beginning balance	₩ 460,767	₩ 421,701
Current service cost	55,359	55,317
Interest expenses	9,758	10,856
Remeasurements:	18,484	12,772
Actuarial gain and loss arising from changes in demographic assumptions	(810)	(565)
Actuarial gain and loss arising from changes in financial assumptions	12,437	12,856
Experience adjustments	6,807	481
Exchange differences	(40)	(75)
Payments from plans:	(46,950)	(40,022)
Benefit payments	(46,950)	(40,022)
Liabilities transferred from (to) a related party	159	(51)
Changes in consolidation	-	269
Ending balance	₩ 497,487	₩ 460,767

3) Changes in the fair value of plan assets for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Beginning balance	₩ 387,979	₩ 366,295
Interest income	8,383	9,515
Remeasurements:	(1,010)	(3,928)
Return on plan assets (excluding amounts included in interest income)	(1,010)	(3,928)
Contributions:	92,364	49,711
Employers	92,364	49,711
Payments from plans:	(40,360)	(34,001)
Benefit payments	(39,650)	(33,242)
Service costs	(711)	(759)
Assets transferred to a related party	322	118
Changes in consolidation	-	269
Ending balance	₩ 447,678	₩ 387,979

4) The amounts recognized in the consolidated statements of profit or loss for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Current service cost	₩ 55,359	₩ 55,317
Net interest	2,087	2,100
Ending balance (*)	₩ 57,446	₩ 57,417

(*) Represents total expenses for pension benefits:

	2019	2018
Cost of sales	₩ 38,167	₩ 32,570
Selling and general administrative expenses	19,279	24,847
	₩ 57,446	₩ 57,417

19. Net defined benefit liability (cont'd)

(2) Defined benefit retirement pension (cont'd)

5) The principal actuarial assumptions as of December 31, 2019 and 2018 are as follows:

	2019	2018
Discount rate	1.88%	2.35%
Future salary increase (including inflation)	3.00%	3.00%

Mortality rates used as actuarial assumptions are based on post-2018 figures announced by the Insurance Development Institute.

6) A quantitative sensitivity analysis for significant assumptions as of December 31, 2019 is as follows (Korean won in millions):

Assumptions	Sensitivity level (%)	Impact on defined benefit obligation	
		1% increase	1% decrease
Discount rate	1.00	₩ (24,999)	₩ 27,943
Future salary increases	1.00	27,464	(25,073)

20. Provisions

Details of provisions as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Current provisions		
Provisions for construction loss	₩ 58,395	₩ 86,783
Provisions for construction warranty	33,379	-
Provisions for others	43,933	31,688
	135,707	118,471
Non-current provisions		
Provisions for financial guarantee	₩ 125,237	₩ 232,245
Provisions for construction warranty	256,405	280,476
Provisions for others	29,451	21,203
	411,093	533,924
	₩ 546,800	₩ 652,395

21. Commitments and contingencies

(1) As of December 31, 2019, the Group has been provided with guarantees of ₩13,999,036 million (2018: ₩12,740,712 million) from the Construction Guarantee and other business partners in relation to its construction performance, sales of housing lots and construction warranties. As of December 31, 2019, the Group has been provided with guarantees of ₩44,859 million (2018: ₩112,015 million) from the Korea Development Bank and others in relation to letters of credit and ₩3,079,097 million (2018: ₩3,155,200 million) from the Korea Development Bank and others in relation to the performance of its overseas construction projects.

(2) As of December 31, 2019, the Group has provided construction performance guarantees and payment guarantees of ₩104,666 million (2018: ₩34,661 million) in relation to its overseas construction projects and the Group has provided guarantees of ₩7,476,310 million (2018: ₩9,468,099 million) to its business partners.

(3) As of December 31, 2019, in relation to housing loans and temporary relocation costs of future tenants during the construction period, the Group has provided guarantees of ₩1,966,368 million (2018: ₩2,935,095 million) within the limit of ₩4,184,916 million (2018: ₩5,230,810 million) through agreements with financial institutions. Also, in relation to redevelopment projects, the Group has provided payment guarantees of ₩538,286 million (2018: ₩705,015 million) within the limit of ₩688,400 million (2018: ₩907,666 million) through agreements with reconstruction project cooperatives as of December 31, 2019.

(4) As of December 31, 2019, for the Group's investees incorporated under the Act on Private Investment in Social Overhead Capital, the Group has provided payment guarantees of ₩527,839 million (2018: ₩426,420 million), its portion of total payment guarantee amount of ₩2,383,340 million (2018: ₩1,988,730 million) provided together with its partners, and pledged investments with a carrying value of ₩222,862 million (2018: ₩224,918 million) as collateral as of December 31, 2019. Also, the Group and its partners have provided put options and other commitments of ₩63,250 million (2018: ₩90,144 million) to the financial investors of Ulsan Green Co., Ltd. and others.

(5) As of December 31, 2019, the Group has not provided payment guarantee in relation to asset securitizations (2018: ₩102,400 million) to LNBK Yeongjong Limited and other parties.

(6) As of December 31, 2019, the Group has provided construction completion commitments of ₩2,018,401 million (2018: ₩1,290,142 million) for construction owners up to ₩2,418,601 million (2018: ₩1,353,042 million).

(7) As of December 31, 2019, the group has provided 22 checks (22 blank checks), 42 notes amounting to ₩443,031 million (2018: 22 checks (22 blank checks), and 32 notes amounting to ₩365,485 million) in face value as collaterals to guarantee its construction contracts.

(8) The Group has contingent liabilities in respect of legal claims arising in the ordinary course of business. The Group is involved in 85 lawsuits with aggregated claims sought by the Group amounting to ₩849,360 million (2018: 76 litigations amounting to ₩649,450 million), and 115 lawsuits with aggregated claims against the Group amounting to ₩1,089,880 million (2018: 103 litigations amounting to ₩781,621 million) as the defendant. As of December 31, 2019, the outcome of these cases cannot be reasonably determined. The lawsuits which the Group is involved in as the defendant include a class action.

21. Commitments and contingencies (cont'd)

(9) As of December 31, 2019, the group provided payment guarantees of ₩1,472,208 million (2018: ₩1,665,700 million) within the limit of ₩1,494,708 million (2018: ₩1,665,700 million) through agreements with financial institutions for the borrowings of the developers of the construction projects. Details of guaranteed borrowings are ABCP and ABSTB amounting to ₩1,194,108 million (2018: ₩1,447,400 million) and other PF loans amounting to ₩278,100 million (2018: ₩218,300 million), respectively (excluding borrowings for intermediate payments, relocation expenses, completion guarantee, SOC and others).

Major guarantees for the developers' debts that the group provided as of December 31, 2019, are as follows (Korean won in millions):

Location	Creditor	Loan balance	Guaranteed amount	Details	Loan period	Type
Daegu	Securities	₩ 210,000	₩ 210,000	Debt guarantee	2019.03~2020.03	ABCP(ABSTB)
Gyeonggi province	Securities	202,100	202,100	Debt guarantee	2019.03~2020.06	ABCP(ABSTB)
	and others					and other loans
Busan	Securities	170,400	170,400	Debt guarantee	2019.05~2020.08	ABCP(ABSTB)
	and others					and other loans
Gyeonggi province	Securities	161,400	161,400	Debt guarantee	2019.12~2020.01	ABCP(ABSTB)
Gyeonggi province	Securities	135,000	112,500	Debt guarantee	2019.10~2020.10	ABCP(ABSTB)
Gyeongbuk province	Securities	94,000	94,000	Debt guarantee	2019.11~2020.06	ABCP(ABSTB)
Gyeongbuk province	Securities	60,000	60,000	Debt guarantee	2019.09~2020.05	ABCP(ABSTB)
Gyeonggi province	Insurance	60,000	60,000	Debt guarantee	2017.08~2020.08	Other loans
Gyeonggi province	Securities	60,000	60,000	Debt guarantee	2019.11~2020.05	ABCP(ABSTB)
Chungcheong province	Securities	57,000	57,000	Debt guarantee	2019.03~2020.03	ABCP(ABSTB)

(10) As of December 31, 2019, the group has provided payment guarantees to the Korea Securities Finance Corporation by June 2, 2020 for the employee's stock ownership acquisition fund personal loan.

(11) The Group has entered into an operating lease contract for 20 years for renting Gran Seoul with Kocref Chungjin No.18 Entrust Management Real Estate Investment Company in 2014. The Group does not hold any purchase option to purchase the leased building upon maturity of the lease period in relation to the contracts above.

(12) In relation to the commitments and contingencies above, the Group may be required to make accelerated repayments or provide additional guarantees for the borrowings, payment guarantees, and major lease agreements under the contract if the credit rating of unsecured bonds issued by the group falls below a certain level. As of December 31, 2019, the credit rating of unsecured bonds is unlikely to be downgraded.

(13) GS Inima Environment S.A., a subsidiary, has provided as collateral future cash flows from the service concession arrangements and has pledged payment guarantees related to borrowings from financial institutes.

22. Issued capital and share premium

(1) Details of issued capital as of December 31, 2019 and 2018 are as follows:

	2019	2018
Authorized shares	200,000,000 shares	200,000,000 shares
Par value per share	₩5,000	₩5,000
Outstanding shares	80,097,804 shares	79,435,797 shares
Issued capital	₩400,489 million	₩397,179 million

(2) Details of share premium as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Gain on disposal of treasury stock	₩ 2,384	₩ 2,384
Additional paid-in capital	783,111	767,250
Gain on business combination	15,002	15,002
Other share premium	1,797	27,133
	₩ 802,294	₩ 811,769

(3) Details of other equity components as of December 31, 2019 and 2018, are as follows (Korean won in millions):

	2019	2018
Treasury stock (*1)	₩ (36,443)	₩ (36,443)
Other equity components (*2)	-	(67,617)
Hybrid securities (*3) (*4)	27,015	27,015
	₩ (9,428)	₩ (77,045)

(*1) To stabilize the Group's share price, the Group purchased 692,595 shares of own stock and recognized the acquisition in other components of equity as of December 31, 2019.

(*2) The Group granted a put option contracts to financial investors who participated in the acquisition of equity interests in the subsidiaries in accordance with a shareholder agreement. The present value of the exercise price is recorded as deduction from other equity components.

(*3) This is the amount after deducting the issuing cost.

(*4) The details of hybrid securities are as follows:

	Description
Amounts	₩56,995,527,600
Maturity date	April 14, 2045 (The Group has an option to extend its maturity period.)
Interest rate	Annual interest rate of 2.9% (under step-up provisions, after 5 years of issuance, an additional interest rate will be added on the average yield of 5-year unsecured bonds and redetermined every year.)
Interest payment term	Interest is payable every 3 months, and the Group has an option to extend payments.
Dividend policy	If the interest of the hybrid bonds is not paid, It is not allowed to pay dividend or interest for the same priority ranking debt, preferred stock, or common stock.
Exchange policy	Hybrid securities are exchangeable with treasury stock for, ₩39,600 the hybrid securities face value of.
Exercise period	From May 14, 2015 to March 14, 2045
Others	After 5 years of issuance, call option is exercisable for the entire unexchanged securities with at the Group's discretion on interest payment dates thereafter. According to the amendments to IFRS, call option is exercisable for the entire unexchanged securities when these securities are not qualified to be recorded as equity.

(*5) Up until the year ended December 31, 2019, hybrid bond of ₩29,127 million was exchanged for 746,686 shares of treasury stock held by the parent.

22. Issued capital and share premium (cont'd)

(4) Details of other comprehensive loss as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Gain on valuation of derivative instruments	₩ 4,377	₩ 1,169
Loss on valuation of derivative instruments	(16,178)	(18,580)
Gain on exchange differences on translations of foreign operations	110,724	91,203
Loss on exchange differences on translations of foreign operations	(146,054)	(145,352)
Share of other comprehensive income of associates	1,095	1,095
	₩ (46,036)	₩ (70,463)

23. Retained earnings

Retained earnings as of December 31, 2019 and 2018 consist of the following (Korean won in millions):

	2019	2018
Legal reserves	₩ 91,494	₩ 83,448
Appropriated retained earnings for business stabilization	884,653	844,653
Discretionary reserves	1,669,391	1,594,422
Remeasurements of net defined benefit liability	(68,819)	(54,548)
Other consolidated retained earnings	64,616	56,718
Unappropriated accumulated deficit (*)	186,028	(37,620)
	₩ 2,827,363	₩ 2,487,073

(*) The opening balance has been adjusted in accordance with the application of KIFRS 1116 *Leases* (see Note 35).

24. Earnings per share

Basic and diluted earnings per share of equity holders of the group for the years ended December 31, 2019 and 2018 are as follows (Korean won except for shares):

	2019	2018
Profit for the year attributable to equity holders of the parent (*1)	₩ 442,565,074,982	₩ 580,830,662,246
Diluted effect:		
Profit related to convertible bonds (*2)	1,497,942,855	3,684,381,579
Profit related to hybrid securities (*2)	592,538,730	944,662,719
Profit (loss) related to foreign currency convertible bonds (*2)	(15,286,893,373)	20,017,251,137
Diluted profit for the year	429,368,663,194	605,476,957,681
Weighted average number of ordinary shares in issue (*3)	79,170,815	74,577,577
Diluted effect:		
Convertible bonds	2,558,449	5,385,655
Hybrid securities	692,595	1,027,092
Foreign currency convertible bonds	2,664,967	3,863,681
	85,086,826	84,854,005
Basic earnings (loss) per share	₩ 5,590	₩ 7,788
Diluted earnings (loss) per share	5,046	7,136

(*1) Excludes interest payment of the hybrid securities.

(*2) The amount is after deducting the income tax effect.

(*3) Details of calculation of weighted average number of ordinary shares outstanding for the years ended December 31, 2019 and 2018 are as follows (Korean won except for shares):

	2019	2018
	Number of shares	Number of shares
Beginning	79,435,797	71,675,237
Conversion of convertible bonds	662,007	7,760,560
Treasury stock	(692,595)	(692,595)
	28,897,347,493	27,220,815,456
Weighted average number of ordinary shares outstanding	79,170,815	74,577,577

25. Selling and general administrative expenses

Selling and general administrative expenses for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Salaries	₩ 293,776	₩ 162,616
Pension benefits	19,279	24,841
Employee welfare benefits	31,903	28,837
Taxes and dues	19,451	12,328
Commissions	121,102	109,112
Rents	5,499	30,885
Depreciation	6,355	5,668
Amortization	4,834	4,570
Depreciation of investment properties	15	302
Depreciation of right-of-use assets	21,669	-
Advertising	27,104	21,789
Bad debt expenses	17,227	98,831
Development	32,973	34,353
Warranty	4,427	6,601
Insurance premium	8,888	7,648
Travel	8,141	6,605
Reversal of financial guarantee liability	(897)	(247)
Others	8,855	8,337
	₩ 630,601	₩ 563,076

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26. Other operating income and expenses

(1) Other operating income for the years ended December 31, 2019 and 2018 consists of the following (Korean won in millions):

	2019	2018
Gain on disposal of property, plant and equipment	₩ 2,240	₩ 1,658
Gain on disposal of intangible assets	99	-
Gain on disposal of investment properties	41	131
Gain on changes in leases	563	-
Gain on disposal of other assets	1,290	-
Gain on foreign currency transactions	56,464	56,475
Gain on foreign currency translation	47,362	53,298
Reversal of allowance for bad debt	31,497	24,953
Gain on valuation of derivatives	10,721	6,002
Gain on derivatives transactions	9,072	9,184
Gain on valuation of firm commitments	54,791	59,085
Gain on exchange differences on translations of foreign operations	6,838	4,786
Dividend income	750	898
Gain on valuation of financial assets at fair value through profit or loss	1,299	9,044
Gain on disposal of financial assets at fair value through profit or loss	2,642	160
Miscellaneous gain	38,509	33,445
	₩ 264,178	₩ 259,119

(2) Other operating expenses for the years ended December 31, 2019 and 2018 consist of the following (Korean won in millions):

	2019	2018
Loss on disposal of property, plant and equipment	₩ 1,199	₩ 14,086
Loss on disposal of intangible assets	-	79
Loss on disposal of investment property	19	-
Impairment loss on investment property	14,807	-
Loss on changes in leases	31	-
Loss on disposal of other assets	4,363	113
Loss on foreign currency transactions	32,220	61,620
Loss on foreign currency translation	21,629	15,508
Bad debt expense	133,698	54,736
Loss on valuation of derivatives	9,081	3,952
Loss on derivatives transactions	86,295	74,646
Loss on valuation of firm commitments	15,312	12,828
Loss on disposal of trade receivables	1,946	5,162
Loss on exchange differences on translations of foreign operations	10,688	17,488
Loss on valuation of financial assets at fair value through profit or loss	37,405	35,776
Impairment loss on financial assets at fair value through profit or loss	-	7,448
Miscellaneous loss and others	20,619	15,017
	₩ 389,312	₩ 318,459

27. Finance income and costs

(1) Finance income for the years ended December 31, 2019 and 2018 consists of the following (Korean won in millions):

	2019	2018
Interest income	₩ 49,761	₩ 51,060
Gain on foreign currency transactions	30,029	36,910
Gain on foreign currency translation	21,978	17,100
Gain on disposal of financial assets at fair value through profit or loss	8,383	-
Gain on valuation of derivatives	33,173	-
Reversal of financial guarantee liabilities	117,118	-
Gain on disposal of associates investments	-	1,374
	₩ 260,442	₩ 106,444

(2) Finance costs for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Interest expenses	₩ 147,136	₩ 135,042
Loss on foreign currency transactions	57,750	58,798
Loss on foreign currency translation	16,621	28,586
Loss on disposal of financial assets at fair value through profit or loss	1,705	1,440
Loss on valuation of financial assets at fair value through profit or loss	667	510
Loss on valuation of derivatives	-	29,520
Financial guarantee expenses	-	29,149
Loss on disposal of associates investments and joint ventures	1,307	-
Impairment loss on investments in associates and joint ventures	750	-
	₩ 225,936	₩ 283,045

28. Income tax

(1) Income tax expense for the years ended December 31, 2019 and 2018 consists of the following (Korean won in millions):

	2019	2018
Current tax on profits for the year	₩ 206,836	₩ 253,136
Origination and reversal of temporary differences (*1)	22,287	(140,170)
Total income tax expense	₩ 229,123	₩ 112,966
Deferred tax charged directly to equity (*2)	₩ 2,868	₩ (134,649)
Income tax expense	226,255	247,615

(*1) Changes in deferred tax for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Beginning balance of deferred tax assets	₩ 782,532	₩ 642,362
Changes in deferred income tax	(66,019)	140,170
Changes in temporary differences	(22,287)	140,170
Changes in the scope of consolidation	(43,732)	-
Ending balance of deferred tax assets	₩ 716,513	₩ 782,532

28. Income tax (cont'd)

(*2) Income tax credited (charged) directly to equity as of December 31, 2019 and 2018 is as follows (Korean won in millions):

	2019			2018		
	Before tax	Tax (charge) credit	After tax	Before tax	Tax (charge) credit	After tax
Gain on valuation of derivatives	4,306	1,098	3,208	(9,443)	(2,408)	(7,035)
Loss on valuation of derivatives	4,334	1,093	3,241	(4,420)	(1,101)	(3,319)
Gain on exchange differences on translations of foreign operations	27,547	8,032	19,515	1,857	5,533	(3,676)
Loss on exchange differences on translations of foreign operations	(943)	(240)	(703)	11,837	3,018	8,819
Remeasurements of net defined benefit pension plans	(19,443)	(4,948)	(14,495)	(15,863)	(4,045)	(11,818)
Consideration for conversion rights	(134)	(34)	(100)	(972)	(248)	(724)
Retained earnings (*)	-	(2,133)	2,133	-	(135,398)	135,398
	<u>₩ 15,667</u>	<u>₩ 2,868</u>	<u>₩ 12,799</u>	<u>₩ (17,004)</u>	<u>₩ (134,649)</u>	<u>₩ 117,645</u>

(*) The opening balance has been adjusted in accordance with the application of KIFRS 1116 *Leases* (see Note 35).

(2) A reconciliation between profit before income tax at the Korea statutory tax rate to income tax expense at the effective tax rate of the Group as of December 31, 2019 and 2018 is as follows (Korean won in millions):

	2019	2018
Profit before income tax	₩ 673,734	₩ 835,049
Tax calculated at domestic tax rates applicable to profits in the respective countries	171,802	212,937
Tax effects of:		
Expenses not deductible for tax purposes	10,466	5,946
Foreign income tax expense	7,268	8,381
Deferred tax unrecognized	25,610	18,127
Additional income taxes for prior periods and others	11,109	2,224
	<u>54,453</u>	<u>34,678</u>
Income tax expense	<u>₩ 226,255</u>	<u>₩ 247,615</u>

29. Expenses classified by nature

Expenses classified by nature for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Labor cost	₩ 1,188,728	₩ 1,154,641
Materials	2,336,357	3,053,262
Outsourcing	4,182,226	5,549,169
Employee welfare benefits	125,216	128,022
Bad debt expense	17,249	98,831
Rents	63,186	184,545
Depreciation and amortization	51,209	46,352
Taxes and dues	144,257	177,593
Service fees	733,164	837,617
Others	658,492	1,228,439
Changes in inventories	149,239	(383,587)
Total (*)	₩ 9,649,323	₩ 12,074,884

(*) The total amounts include cost of sales, selling and general administrative expenses.

30. Related party transactions

(1) Related parties as of December 31, 2019 are as follows:

Relationship	Related parties
Associates(*1)	GS KOCREF New Stay REIT Co., Ltd., Major Development Co., Ltd., FGS East Asia Technical Resource Management, Inc., SoBaek Co., Ltd., Tongjin Industry Complex CO., Ltd., Hakun 7 Industry, Complex Co., Ltd., HyangSan 2 Urban Development Corp., Beopwon Industry Urban Development Corp., Yeouido MBC Site MXD PFV. Inc., PT. CORE RESOURCE (*2), BKT Co., Ltd. (*2), Cheongju High Tech Valley (*2), GWACHEON SANGSANG PFV, Zero Tech CO., Ltd. (*2), Camp Stanton Co., Ltd. (*2), Cheonan Techno Park Inc. (*2), PT. CORE RESOURCE INDONESIA (*3), Cadiz San Fernando, A.I.E., Gestion de Participes de Bioreciclaje, Participes de Biorreciclaje de Cadiz, S.A.
Joint ventures(*1)	G&M Estate Co., Ltd., PT. Daria Mulia Properti (*4), GS Korea for Project Management Company, Hialeah Water, LLP
Others	GS Holdings, GS Retail Co., Ltd., GS Global Corp., Samyangtongsang Ltd., GS Home Shopping Inc., GS Energy Corporation, GS Power Co., Ltd., Sal de Vida Korea Corporation, Boryeong LNG Terminal Co., Ltd., GS Park 24 Co., Ltd., Incheon Total Energy Co., GS-Caltex Corporation, Inno Polytech Corporation, GS Mbiz Co., Ltd., Sangji Shipping Co., Ltd., GS BIO Co., Ltd., GS EcoMetal Co., Ltd., Fresh Serve CO., Ltd., GS Netvision Co., Ltd., CVS net Co., Ltd., Parnas Hotel Co., Ltd., PNS Co., Ltd., GSNetworks Co., Ltd., GS Teleservices Co., Ltd., APlusB Co., Ltd., TenByTen Inc., GS EPS Co., Ltd., PLS Co., Ltd., GS ENTEC Corp., GS E&R Corp., Donghae green energy Co., Ltd., GS Yeoyang Windpower Co., Ltd., GS Donghae Electric Power Co., Ltd., GS Pocheon Green Energy Corp., Yeongyang Wind Power Corporation-2, YGE. Co., Ltd., Gumi green Energy Co., Ltd., Yeongdeok Windpower Corporation1 Co., Ltd., Samcheok Green Energy Park Co., Ltd.(*5), GS Sports Co., Ltd., Oksan Ochang Highway Corporation, Eun Pyeong New Road Corp., Pusan New road Co., Ltd., GUMIMAKEUNMUL, GS Neotek, Samyang INT'L Co., Ltd., Boheun Development Co., Ltd., Chemtech International Co., Ltd., Oksan Distribution, Seungsan Group Corporation, Gaseung Development Company, Happening People Inc. (*5), Central Motors Corp., Winasset Co., Ltd., Sam Joung Development Co., Ltd., Procure Co., Ltd., Kyung Won Construction Co., Ltd. Donghae International Resources Terminal Co., Ltd. (*5), Epice Co., Ltd. (*5)

(*1) Equity ownership information is disclosed in Note 13.

(*2) Newly acquired in 2019.

(*3) Newly established during the year ended December 31, 2019 as a subsidiary of PT. CORE RESOURCE.

(*4) The investee was classified as a joint venture as the Group holds joint control over the investee for the year ended December 31, 2019.

(*5) Newly included as an other related party of the Group for the year ended December 31, 2019.

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30. Related party transactions (cont'd)

(2) Significant transactions with related parties for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

		2019										
		Sales, others			Purchase, others							
	Related party	Sales	Other income	Total	Purchase	Other expenses	Total	Changes in ownership				
Associates	GS KOCREF	₩	22	₩	-	₩	22	₩	-	₩	-	-
	New Stay REIT Co., Ltd.	₩	11	₩	-	₩	11	₩	-	₩	-	750
	Major Development Co., Ltd.											
	FGS East Asia											
	Technical Resource Management, Inc.		-		49		49		264		-	16
	SoBaek Co., Ltd.		-		621		621		-		-	-
	Beopwon Industry											
	Urban Development Corp.		2,737		-		2,737		20		-	-
	Yeouido MBC Site											
	MXD PFV, Inc.		20,414		221		20,635		743		-	-
	PT.CORE RESOURCE		-		242		242		-		-	1,124
	BKT Co., Ltd.		-		-		-		-		-	18,000
	Cheongju High Tech Valley Co., Ltd.		-		-		-		-		-	160
Zero Tech Co., Ltd.		-		23		23		-		-	1	
Camp Station Co., Ltd.		-		-		-		-		-	3	
Cheonan Techno Park Inc.		-		-		-		-		-	600	
Joint venture	G&M Estate Co., Ltd.		334		-		334		515		-	515
	PT. Daria Mulia Properti		-		-		-		-		-	6,974
Others	GS Holdings		214		-		214		-		18,908	18,908
	GS Retail Co., Ltd.		431		-		431		406		96	502
	GS Global Corp.		17		-		17		13,053		-	13,053
	GS Home Shopping Inc.		664		-		664		2		-	2
	GS Energy Corporation		430		-		430		180		-	180
	GS Power Co., Ltd.		104,974		-		104,974		382		-	382
	Boryeong LNG Terminal Co., Ltd		83,419		-		83,419		-		-	-
	GS Park 24 Co., Ltd.		1,455		-		1,455		-		3	3
	GS-Caltex Corporation		392,083		-		392,083		624		508	1,132
	GS Mbiz Co., Ltd.		3		-		3		98		-	98
	Parnas Hotel Co., Ltd.		7,425		-		7,425		109		-	109
	PNS Co., Ltd.		-		-		-		9		-	9
	GS EPS Co., Ltd.		135,455		-		135,455		15		1	16
	GS ENTEC Corp.		-		-		-		2,107		-	2,107
	GS E&R Corp.		2,783		-		2,783		-		-	-
	GS Donghae Electric Power Co., Ltd.		21,871		-		21,871		38		-	38
	GS Pocheon Green Energy Corp.		14,901		-		14,901		-		-	-
	GS Sports Ltd.		564		-		564		29		4,216	4,245
	Oksan Ochang Highway Corporation		18,047		-		18,047		82		-	82
	Eun Pyeong New Road Corp.		1		11		12		-		-	-
	Pusan New Road Co., Ltd.		5,249		-		5,249		-		-	-

30. Related party transactions (cont'd)

		2019						
		Sales, others			Purchase, others			Changes in ownership
Related party	Sales	Other income	Total	Purchase	Other expenses	Total		
Others	GUMI							
	MAKEUNMUL	3,536	-	3,536	-	-	-	-
	GS Neotek	180	-	180	9,622	826	10,448	-
	Samyang INT'L Co., Ltd.	-	-	-	10,205	-	10,205	-
	Seungsan Group Corporation	-	-	-	-	15	15	-
	Donghae International Resources Terminal Co., Ltd.	-	-	-	-	-	-	190
	GS ITM (*)	-	-	-	167	42	209	-
		₩ 817,220	₩ 1,167	₩ 818,387	₩ 38,670	₩ 24,615	₩ 63,285	₩ 34,815

(*) Excluded from related parties in 2019.

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30. Related party transactions (cont'd)

		2018							
		Sales, others			Purchase, others				
	Related party	Sales	Other income	Total	Purchase	Other expenses	Total	Changes in ownership	
Associates	GS KOCREF New Stay REIT Co., Ltd.	₩ 38,072	₩ -	₩ 38,072	₩ -	₩ -	₩ -	₩ -	-
	Major Development Co., Ltd.	23	-	23	-	-	-	-	-
	FGS East Asia Technical Resource Management, Inc.	-	81	81	1,318	18	1,336	-	-
	SoBaek Co., Ltd.	-	267	267	-	-	-	-	90
	Tongjin Industry Complex CO., Ltd	-	-	-	-	-	-	-	10
	Hakun 7 Industry Complex Co.,Ltd.	-	-	-	-	-	-	-	190
	Yeouido MBC Site MXD PFV. Inc	232	-	232	-	-	-	-	6,500
	Gwancheon Sangsang PFV	-	-	-	-	-	-	-	2,030
	G&M Estate Co., Ltd.	310	-	310	811	-	811	-	-
	Samyang INT'L Co., Ltd.	-	-	-	17,547	9	17,556	-	-
Joint venture Others	Seungsan Group Corporation	-	-	-	-	11	11	-	-
	GS Holdings	218	-	218	-	23,487	23,487	-	-
	GS Global Corp.	13	-	13	16,916	-	16,916	-	-
	GS Donghae Electric Power Co., Ltd.	12,733	-	12,733	40	-	40	-	-
	GS Retail Co., Ltd.	521	-	521	345	94	439	-	-
	GS Sports Ltd.	528	-	528	21	4,751	4,772	-	-
	GS ITM	-	-	-	2,083	278	2,361	-	-
	GS ENTEC Corp.	-	-	-	29,179	-	29,179	-	-
	GS E&R Corp.	2,568	-	2,568	-	-	-	-	-
	GS Teleservice	-	-	-	-	20	20	-	-
	GS Pocheon Green Energy Corp.	68,455	-	68,455	15	-	15	-	-
	GS Home Shopping Inc.	664	-	664	-	-	-	-	-
	Boryeong LNG Terminal Co., Ltd	35,648	-	35,648	59	546	605	-	-
	Pusan New Road Co., Ltd.	6,080	-	6,080	-	-	-	-	1,855
	Seoul Munsan Highway Corporation	50,687	-	50,687	5	-	5	-	-
	Oksan Ochang Highway Corporation	8,485	-	8,485	-	-	-	-	-
	Eun Pyeong New Road Corp.	-	11	11	-	-	-	-	-
	GS Neotek	268	-	268	15,474	31	15,505	-	-
	GS Energy Corporation	1,898	-	1,898	142	-	142	-	-
	GS Mbiz Co., Ltd.	-	-	-	1,574	-	1,574	-	-
	GS EPS Co., Ltd.	36,259	-	36,259	8	-	8	-	-
	GS-Caltex Corporation	76,945	-	76,945	19	-	19	-	-

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30. Related party transactions (cont'd)

		2018						
		Sales, others			Purchase, others			Changes in ownership
Related party	Sales	Other income	Total	Purchase	Other expenses	Total		
Others	GS Power Co., Ltd.	84,600	-	84,600	429	-	429	-
	GS Park 24 Co., Ltd.	1,053	-	1,053	3	3	6	-
	Parnas Hotel Co., Ltd.	4,734	-	4,734	69	43	112	-
	Gunsan Green Energy Center Co., Ltd.	3,333	-	3,333	-	-	-	-
	GUMI MAKEUNMUL	-	-	-	-	-	-	584
	NC TAS	36	-	36	357	145	502	-
	PNS Co., Ltd.	-	-	-	7	-	7	-
	GS Netvision	-	-	-	8	-	8	-
		₩ 434,363	₩ 359	₩ 434,722	₩ 86,429	₩ 29,436	₩ 115,865	₩ 11,259

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30. Related party transactions (cont'd)

(3) Receivables and payables arising from related party transactions

1) Receivables and payables arising from related party transactions as of December 31, 2019 and 2018 are as follows (Korean won in millions):

		2019							
	Related party	Receivables				Payables			
		Trade receivables	Other receivables	Loans	Total	Trade payables	Other payables	Total	
Associates	GS KOCREF New Stay REIT CO., Ltd.	₩ 21	₩ -	₩ -	₩ 21	₩ -	₩ 1,547	₩ 1,547	
	Major Development Co., Ltd.	-	-	-	-	-	5	5	
	FGS East Asia Technical Resource Management, Inc.	-	36	871	907	-	-	-	
	SoBaek Co., Ltd.	-	621	6,856	7,477	-	-	-	
	HyangSan 2 Urban Development Corp	-	-	-	-	-	5	5	
	Beopwon Industry Urban Development corp.	2,738	-	-	2,738	-	-	-	
	Yeouido MBC Site MXD PFV, Inc	5,696	157	-	5,853	-	157	157	
	PT. CORE RESOURCE	-	274	2,940	3,214	-	-	-	
	Zero Tech Co., Ltd.	-	23	1,550	1,573	-	-	-	
	Cadiz San Fernando, A.I.E.	214	-	-	214	199	-	199	
	Gestion de Participes De Biorreciclaje	78	-	-	78	-	-	-	
	Participes de Biorreciclaje S.A	2,137	-	-	2,137	-	-	-	
	G&M Estate Co., Ltd.	-	66	-	66	-	70	70	
	GS Holdings	-	-	-	-	-	2,825	2,825	
	GS Retail Co., Ltd.	-	35	-	35	77	4,143	4,220	
	GS Global Corp.	-	41	-	41	933	1,175	2,108	
	GS Home Shopping Inc.	68	10	-	78	-	2,511	2,511	
	GS Energy Corporation	-	339	-	339	-	4,254	4,254	
	GS Power Co., Ltd.	-	-	-	-	15	14,952	14,967	
	Boryeong LNG Terminal Co., Ltd.	7,138	-	-	7,138	-	30,937	30,937	
Joint venture Others	GS Park 24 Co., Ltd.	-	151	-	151	7	-	7	
	GS-Caltex Corporation	3,158	-	-	3,158	-	42,434	42,434	
	GS Mbiz Co., Ltd	-	-	-	-	94	-	94	
	Parnas Hotel Co., Ltd.	781	90	-	871	15	1,600	1,615	
	PNS Co., Ltd.	-	-	-	-	1	-	1	
	GS Teleservice	-	-	-	-	-	345	345	
	GS EPS Co., Ltd.	-	-	-	-	-	9,132	9,132	
	GS ENTEC Corp.	-	-	-	-	131	-	131	
	GS E&R Corp.	251	-	-	251	-	-	-	
	GS Donghae Electric Power Co., Ltd.	3,653	17	-	3,670	-	-	-	
	GS Pocheon Green Energy Corp.	40,513	-	-	40,513	-	10,037	10,037	
	GS SPORTS Ltd.	28	60	-	88	-	126	126	
	Oksan Ochang Highway Corporation	20,013	559	-	20,572	-	1,224	1,224	
	Eun Pyeong New Road Corp.	1,948	72	163	2,183	-	-	-	
	Pusan New road Co., Ltd.	6,985	-	-	6,985	-	-	-	
	GUMI MAKEUNMUL	3,243	24	-	3,267	-	-	-	
	GS Neotek	14	60	-	74	2,388	1,736	4,124	
	Samyang INT'L Co., Ltd.	-	-	-	-	3,555	147	3,702	
	Seungsan Group Corporation	-	3,149	-	3,149	-	314	314	
	Kyung Won Construction Co., Ltd.	-	-	-	-	-	114	114	
	Donghae International Resources Terminal Co., Ltd.	-	-	-	-	-	1,380	1,380	
		₩ 98,677	₩ 5,784	₩ 12,380	₩ 116,841	₩ 7,415	₩ 131,170	₩ 138,585	

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30. Related party transactions (cont'd)

		2018							
		Receivables				Payables			
	Related party	Trade receivables	Other receivables	Loans	Total	Trade payables	Other payables	Total	
Associates	GS KOCREF New Stay REIT CO., Ltd.	₩ 25	₩ -	₩ -	₩ 25	₩ -	₩ 1,299	₩ 1,299	
	Major Development Co., Ltd.	4,069	-	-	4,069	-	6	6	
	FGS East Asia Technical Resource Management, Inc.	-	158	1,006	1,164	-	-	-	
	SoBaek Co., Ltd.	-	-	6,856	6,856	-	-	-	
	HyangSan 2 Urban Development Corp	-	-	-	-	-	5	5	
	Cadiz San Fernando, A.I.E.	270	-	-	270	200	-	200	
	Gestion de Participes De Biorreciclaje	77	-	-	77	-	-	-	
	Participes de Biorreciclaje S.A	896	-	-	896	-	-	-	
	Shariket Miyeh Ras Djinet, Spa	811	-	-	811	706	-	706	
	Shariket Tahlya Miyah Mostaganem Spa	2,324	-	-	2,324	-	-	-	
	G&M Estate Co., Ltd.	-	64	-	64	-	68	68	
	Samyang INT'L Co., Ltd.	-	-	-	-	4,816	147	4,963	
	Seungsan Group Corporation	-	3,149	-	3,149	-	311	311	
	GS Holdings	-	10	-	10	-	2,825	2,825	
	GS Global Corp.	-	41	-	41	1,503	1,482	2,985	
Joint venture Others	GS Donghae Electric Power Co., Ltd.	7,385	27	-	7,412	-	-	-	
	GS Retail Co., Ltd.	-	23	-	23	-	7,709	7,709	
	GS SPORTS Ltd.	41	-	-	41	-	144	144	
	GS ITM	-	91	-	91	304	75	379	
	GS ENTEC Corp.	-	-	-	-	538	-	538	
	GS E&R Corp.	230	-	-	230	-	708	708	
	GS Teleservice	-	-	-	-	-	347	347	
	GS Pocheon Green Energy Corp.	26,946	-	-	26,946	-	6,889	6,889	
	GS Home Shopping Inc.	74	-	-	74	-	1,511	1,511	
	Boryeong LNG Terminal Co., Ltd.	978	-	-	978	-	32,065	32,065	
	Pusan New road Co., Ltd.	4,382	-	-	4,382	-	-	-	
	Oksan Ochang Highway Corporation	3,686	391	-	4,077	-	65	65	
	Eun Pyeong New Road Corp.	1,947	61	163	2,171	-	-	-	
	GS Neotek	11	-	-	11	1,915	1,622	3,537	
	GS Energy Corporation	-	95	-	95	-	4,536	4,536	
	GS Mbiz Co., Ltd	-	-	-	-	569	-	569	
	GS EPS Co., Ltd.	-	-	-	-	-	28,959	28,959	
	GS-Caltex Corporation	9,418	5	-	9,423	-	6,891	6,891	
	GS Power Co., Ltd.	2,376	-	-	2,376	49	20,161	20,210	
	GS Park 24 Co., Ltd.	-	107	-	107	-	-	-	
	Parnas Hotel Co., Ltd.	611	-	90	701	16	1,600	1,616	
	Kyung Won Construction Co., Ltd.	-	-	-	-	-	114	114	
	PNS Co., Ltd.	-	-	-	-	2	-	2	
		₩ 66,557	₩ 4,222	₩ 8,115	₩ 78,894	₩ 10,618	₩ 119,539	₩ 130,157	

2) The aggregate valuation allowance for the related party receivables is ₩ 617 million as of December 31, 2019.

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30. Related party transactions (cont'd)

(4) Changes in loans to related parties for the years ended December 31, 2019, and 2018 are as follows (Korean won in millions):

	Annual interest rate (%)	Maturity date	2019					Interest income	Equity transaction
			Beginning	Increase	Effects of changes in foreign exchange rates	Transfer	Ending		
Major Development Co., Ltd	-	-	₩ -	₩ -	₩ -	₩ -	₩ -	₩ -	750
FGS East Asia Technical Resource Management, Inc.	4.60	2020.01.17 ~2020.07.11	1,006	-	171	36	871	49	16
SoBaek Co., Ltd.	6.00	-	6,856	-	-	-	6,856	621	-
PT. CORE RESOURCE	8.00~12.00	2020.10.16 ~2020.10.22	2,236	631	-	73	2,940	242	1,124
BKT Co., Ltd.	-	-	-	-	-	-	-	-	18,000
Cheongju High Tech Valley Co., Ltd.	-	-	-	-	-	-	-	-	160
Zero Tech Co., Ltd.	4.60	-	-	1,550	-	-	1,550	23	1
Camp Stanton Co., Ltd.	-	-	-	-	-	-	-	-	3
Cheonan Techno Park Inc.	-	-	-	-	-	-	-	-	600
PT. Daria Mulia Properti	-	-	-	-	-	-	-	-	6,974
Pusan New Road Co., Ltd.	-	-	-	-	-	-	-	-	6,997
Eun Pyeong New Road Corp.	6.90	-	163	-	-	-	163	11	-
Donghae International Resources Terminal Co., Ltd.	-	-	-	-	-	-	-	-	190
			₩ 10,261	₩ 2,181	₩ 171	₩ 109	₩ 12,380	₩ 946	₩ 34,815

	Annual interest rate (%)	Maturity date	2018					Interest income	Equity transaction
			Beginning	Increase	Effects of changes in foreign exchange rates	Transfer	Ending		
FGS East Asia Technical Resource Management, Inc.	4.60	2019.01.17~2020.07.13	₩ 1,714	₩ 983	₩ 1,804	₩ 113	₩ 1,006	₩ 81	-
SoBaek Co., Ltd.	6.00	-	-	6,856	-	-	6,856	-	90
Tongjin Industry Complex CO., Ltd	-	-	-	-	-	-	-	-	10
Hakun 7 Industry Complex Co., Ltd	-	-	-	-	-	-	-	-	190
Yeouido MBC Site	-	-	-	-	-	-	-	-	6,500
MXD PFV. Inc	-	-	-	-	-	-	-	-	2,030
Gwancheon Sangsang PFV	-	-	-	-	-	-	-	-	1,855
Pusan New Road Co., Ltd.	-	-	-	-	-	-	-	-	-
Eun Pyeong New Road Corp.	6.90	-	163	-	-	-	163	11	-
GUMI MAKEUNMUL	-	-	-	-	-	-	-	-	584
			₩ 1,877	₩ 7,839	₩ 1,804	₩ 113	₩ 8,025	₩ 92	₩ 11,259

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30. Related party transactions (cont'd)

(5) Details of payment guarantees the Group provides to the related parties as of December 31, 2019 and 2018 are as follows (Korean won in millions):

		Type	Beneficiary	Period	2019	2018
Associates	Major Development Co., Ltd.	Payment guarantee	Kyobo Securities Co., Ltd.	2019.11~2020.02	₩ 43,700	₩ -
		Payment guarantee	HI INVESTMENT & SECURITIES CO., Ltd.	-	-	70,000
	SoBaek Co., Ltd.	Payment guarantee	SC Bank	2019.05~2020.05	90,000	-
		Payment guarantee	BNK Securities	2019.08~2020.08	80,400	-
		Payment guarantee	Korea asset Securities Co., Ltd.	-	-	80,400
		Payment guarantee	Kyobo Securities Co., Ltd.	-	-	80,600
	Beopwon Industry Urban Development corp.	Conditional debt acquisition	NH Bank and others	2019.07~2021.04	60,000	-
		Conditional debt acquisition	National Agricultural Cooperative Federation and others	2019.07~2024.01	551,031	-
	Yeouido MBC Site MXD PFV. Inc.					
Others	Oksan Ochang Highway Corporation	Payment guarantee	Meritz Fire & Marine Insurance Co., Ltd and others	2015.10~2036.07	10,200	6,000
	Pusan New Road Co., Ltd	Contract fulfillment guarantee	Construction Guarantee Cooperative	2018.01~2023.12	24,757	24,757

(6) Details of the assets pledged as collateral for the related parties as of December 31, 2019 and 2018 are as follows (Korean won in millions):

		Type of collateral	Beneficiary	2019	2018
Others	Oksan Ochang Highway Corporation	Equity securities	Meritz Fire & Marine Insurance Co., Ltd. and others	₩ 29,940	₩ 29,940
		Electronic bill	Meritz Fire & Marine Insurance Co., Ltd. and others	17,000	-
	GUMI MAKEUNMUL	Equity securities	Mirae Asset green infrastructure special asset investment trust 2	584	584

(7) Compensation for key management personnel of the Group as of December 31, 2019 and 2018 consists of the following (Korean won in millions):

	2019	2018
Salaries	₩ 50,064	₩ 27,834
Pension benefits	4,508	4,295
	₩ 54,572	₩ 32,129

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31. Cash flows

(1) Cash flows from operating activities for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
	₩	₩
Profit for the year	447,479	587,434
Adjustments for:		
Income tax expense	226,255	247,615
Interest expenses	147,136	135,042
Interest income	(49,761)	(51,060)
Dividend income	(750)	(898)
Depreciation	35,175	34,648
Amortization	16,034	11,704
Depreciation of investment properties	6,919	7,209
Depreciation of right-of-use assets	76,336	-
Bad debt expenses	159,103	179,984
Reversal of bad debt expense	(39,675)	(51,370)
Provision for severance benefits	60,160	59,248
Loss on disposal of trade receivables	1,946	5,162
Gain or loss on foreign currency translation, net	(31,090)	(26,304)
Gain or loss on disposal of property, plant and equipment, net	(1,041)	12,428
Gain or loss on disposal of intangible assets, net	(99)	79
Gain or loss on disposal of investment properties, net	(22)	(131)
Impairment loss on investment properties	14,807	-
Gain or loss on valuation of derivatives, net	(34,813)	27,470
Gain or loss on derivatives transactions, net	77,223	65,463
Gain or loss on valuation of firm commitments, net	(39,479)	(46,257)
Financial guarantee expenses	-	29,149
Reversal of provision for financial guarantee	(118,016)	(247)
Construction warranty expenses	85,929	117,386
Reversal of provision for construction warranties	(26,128)	(1,223)
Gain or loss on disposal of other assets	3,073	113
Gain or loss on valuation of financial assets at fair value through profit or loss	36,773	27,242
Gain or loss on disposal of financial assets at fair value through profit or loss	(9,320)	1,280
Impairment loss on financial assets	-	7,448
Loss on overseas operations translation	10,688	17,488
Gain on overseas operations translation	(6,838)	(4,786)
Gain or loss on disposal of investments in associates	1,307	(1,374)
Impairment loss on investments in associates	750	-
Valuation gain or loss on investments in associates	2,904	(6,501)
Gain or loss on changes in leases	(532)	-
Others	3,985	2,629
	608,939	798,636
Changes in operating assets and liabilities		
Trade and other receivables	817,373	186,190
Inventories	192,170	139,834
Settlement of derivatives transactions	(36,080)	(20,631)
Other current assets	(235,544)	20,302
Other non-current assets	(4,403)	(2,770)
Trade and other payables	(448,335)	(474,928)
Other current liabilities	(35,718)	100,465
Current provision	(16,746)	27,933
Non-current provision	(54,181)	(26,325)
Other non-current liabilities	22,678	(883)
Payment of severance benefits	(102,834)	(60,901)
Overseas operations translation	6,714	8,163
	105,094	(103,551)
Cash flows from (used in) operations	₩ 1,161,512	₩ 1,282,519

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31. Cash flows (cont'd)

(2) Details of significant non-cash transactions for the years ended December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Reclassification of borrowings	₩ 336,525	₩ 323,002
Write off of trade receivables and long-term loans	74,247	47,817
Reclassification loans	48,721	78,456
Decrease in right-of-use assets	48,690	-
Reclassification to current portion of provisions for construction warranty	33,379	-
Reclassification to current portion of other long-term construction receivables	32,744	-
Reclassification of business security deposit	29,938	21,475
Increase in right-of-use assets	28,288	-
Conversion of convertible bonds	19,210	231,823
Reclassification of membership guarantee deposits	17,576	12,323
Non-cash acquisition of inventories	9,915	49,330
Reclassification to current portion of debentures	-	127,854
Exchange of hybrid securities	-	29,127

(3) Details of changes in liabilities arising from financing activities for the year ended December 31, 2019 are as follows (Korean won in millions):

			Cash flows from financing activities	Impact on non-cash transactions							Ending					
				Additional expenses	Current portion	Transfer	Changes in scope of consolidation	Exchange differences								
Beginning																
Short-term borrowings	₩	594,992	₩	(193,203)	₩	-	₩	46,626	₩	-	₩	8,935	₩	(6,457)	₩	450,893
Current portion of debentures		88,434		149,806		104		-		(19,076)		12,706		(811)		231,163
Current portion of long-term borrowing		360,939		(474,447)		537		289,899		478		-		1,984		179,390
Current lease liabilities		-		-		-		95,169		-		-		-		95,169
Other current liabilities		165,009		(5,439)		-		17,576		-		-		-		177,146
Debentures		99,814		429,090		4,663		-		502		123,371		111		657,551
Long-term borrowings		958,839		505,483		-		(336,525)		-		52,008		7,945		1,187,750
Lease liabilities		693,912		(103,963)		22,940		(95,196)		(20,403)		-		(27)		497,290
Other non-current liabilities		289,112		(18,286)		-		(17,576)		13,378		25,797		(986)		291,439
	₩	3,251,051	₩	289,041	₩	28,244	₩	-	₩	(25,121)	₩	222,817	₩	1,759	₩	3,767,791

32. Financial risk management

The Group's activities are exposed to a variety of financial risks: market risk (including currency risk, fair value interest rate risk, cash flow interest rate risk and price risk), credit risk and liquidity risk. The Group supports to generate stable and continuous business performance and simultaneously focuses on improvement of cost competitiveness by improving financial structure and reducing financial cost.

The Group's overall risk management program focuses to minimize potential adverse effects on the Group's financial risk by monitoring periodical financial risk and rearranging the financial risk management policy.

(1) Financial risk

(a) Market risk

i) Foreign exchange risk

The Group operates internationally and is exposed to foreign exchange risk arising from various currency exposures. The Group's principal monetary assets and liabilities denominated in currencies other than its functional currency as of December 31, 2019 and 2018 are as follows (Korean won in millions / foreign currencies in thousands):

	2019			
	Financial assets		Financial liabilities	
	Foreign currency	Korean won equivalent	Foreign currency	Korean won equivalent
USD	780,034	903,124	825,173	955,386
EUR	272,851	354,005	166,469	215,982
KWD	3,556	13,582	6,399	24,440
JPY	-	-	227,084	2,415
SGD	-	-	1	1

	2018			
	Financial assets		Financial liabilities	
	Foreign currency	Korean won equivalent	Foreign currency	Korean won equivalent
USD	921,086	1,029,866	1,095,105	1,224,437
EUR	157,213	201,102	87,917	112,460
KWD	1,575	5,805	139	511
JPY	-	-	3,304,168	33,477
SGD	-	-	1	-

As of December 31, 2019 and 2018, if the Group's functional currency had fluctuated by 5% against foreign currencies with all other variables held constant, profit before income tax would have been affected as follows (Korean won in millions):

	2019		2018	
	5% increase	5% decrease	5% increase	5% decrease
USD	₩ (2,613)	₩ 2,613	₩ (9,729)	₩ 9,729
EUR	6,901	(6,901)	4,432	(4,432)
KWD	(543)	543	265	(265)
JPY	(121)	121	(1,674)	1,674

32. Financial risk management (cont'd)

ii) Interest rate risk

The Group's interest rate risk arises from variable-rate borrowings, and related interest expense is exposed to interest rate risk. As of December 31, 2019, the financial liabilities that are exposed to interest rate risk are the variable-rate borrowings issued at variable rates amounting to ₩1,557,572 million (2018: ₩873,663 million).

As of December 31, 2019 and 2018, if interest rates had fluctuated by 100bp with all other variables held constant, interest expenses would have been affected as follows (Korean won in millions):

	2019		2018	
	100bp increase	100bp decrease	100bp increase	100bp decrease
Interest expenses	₩ 12,539	₩ (12,539)	₩ 5,881	₩ (5,881)

(b) Credit risk

Credit risk occurs in the ordinary course of business and investment activities of the Group when the customers or counterparties could not comply with the obligations of the contract. To manage the credit risk, the Group evaluates the credit of customers periodically, considering past experience and other factors and sets individual credit limit considering the credit quality of customer.

Credit risk arises from cash equivalents, derivative financial instruments and deposits with banks and financial institutions, as well as credit risk to primary customers, including outstanding receivables and firm committed transactions.

The Group's credit risk is managed in accordance with the Group's credit policy with the purpose of minimizing possible loss through efficient credit risk management, support for rapid decision making and implementation of safety measures on the Group's accounts receivable. The Group appropriately evaluates and reflects the risks to the consolidated statement of financial position when a default is expected, as of December 31, 2019, for receivables with any signs of impairment or those for which recovery date has passed.

The allowance provision for the trade receivable as of December 31, 2019, is as follows (Korean won in millions):

Past due period	Expected credit losses ratio (%)	Book value	Expected credit losses
Receivable not past due	0.66	₩ 365,238	₩ 2,415
Less than 3 months	0.88	242,030	2,119
Between 4 ~ 12 months	2.01 ~ 8.62	248,596	9,425
Between 13 ~ 24 months	10.68 ~ 16.70	6,256	757
Between 25 ~ 36 months	19.23 ~ 41.46	4,729	1,135
Over 36 months	51.04	10,390	5,303
		₩ 877,239	₩ 21,154

In addition, the Group has recognized an allowance for doubtful accounts on trade receivables of ₩276,525 million as of December 31, 2019.

Details of maximum exposure to credit risk as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018
Cash equivalents (excluding cash on hands)	₩ 1,789,799	₩ 1,587,442
Trade and other receivables	3,505,180	4,297,385
Short-term financial assets	284,372	295,205
Long-term financial assets	438,708	194,151
Long-term trade and other receivables	1,157,030	946,330
Non-current provisions (*)	4,650,941	4,707,050

(*) The maximum exposure to credit risk is the principal amount of contractual cash flow from the PF, redevelopment projects, SOC, overseas operations and others that are subject to provision of non-current liabilities.

32. Financial risk management (cont'd)

(c) Liquidity risk

The Group's liquidity risk arises when it lacks sufficient cash to fulfill payment obligations from financial liabilities or to meet operational needs.

The Group manages its liquidity through monitoring forecasts of the Group's liquidity requirements to ensure it has sufficient cash to meet operational needs.

Major commitments related to financing arrangements with domestic financial institutions as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	Financial institutions	2019		2018	
		Limited amount	Used amount	Limited amount	Used amount
Short-term and long-term financial liabilities (*)	Korea Eximbank and others	₩ 4,063,500	₩ 2,726,764	₩ 3,715,434	₩ 2,236,954

(*) Excludes firm commitment liabilities and lease liabilities.

The table below summarizes the maturity profile of the Group's financial assets based on contractual undiscounted payments (Korean won in millions):

	2019					
	Book value	Cash flow on contract	Residual maturity			
			Less than 1 year	Between 1 year and 2 years	Between 2 years and 3 years	Over 3 years
Trade and other payables	₩ 1,629,980	₩ 1,629,980	₩ 1,629,980	₩ -	₩ -	₩ -
Short-term and long-term financial liabilities (*1)	3,319,224	3,715,055	1,222,486	684,774	481,804	1,325,991
Non-current provisions (*2)	125,237	4,650,941	2,414,676	963,619	435,987	836,659
	₩ 5,074,441	₩ 9,995,976	₩ 5,267,142	₩ 1,648,393	₩ 917,791	₩ 2,162,650

(*1) Excludes firm commitment liability and includes interest income.

(*2) The cash flows on contract is the principal amount from the PF, redevelopment projects, SOC, overseas operations and others that are recognized as non-current liabilities.

	2018					
	Book value	Cash flow on contract	Residual maturity			
			Less than 1 year	Between 1 year and 2 years	Between 2 years and 3 years	Over 3 years
Trade and other payables	₩ 2,023,490	₩ 2,023,490	₩ 2,020,490	₩ -	₩ -	₩ -
Short-term and long-term financial liabilities (*1)	2,236,954	2,237,386	1,436,221	343,777	275,212	272,176
Non-current provisions (*2)	232,245	4,707,050	2,368,145	1,268,508	818,465	251,932
	₩ 4,492,689	₩ 9,057,926	₩ 5,827,856	₩ 1,612,285	₩ 1,093,677	₩ 524,108

(*1) Excludes firm commitment liability and includes interest income.

(*2) The cash flows on contract is the principal amount from the PF, redevelopment projects, SOC, overseas operations and others that are recognized as non-current liabilities.

32. Financial risk management (cont'd)

(2) Capital risk management

The Group's capital management objectives are to safeguard the Group's ability to continue as a going concern in order to provide returns to shareholders and benefits to other stakeholders and to maintain an optimal capital structure to reduce the cost of capital.

Gearing ratios as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019		2018
Total liabilities (A)	₩ 9,028,178	₩	8,408,589
Total equity (B)	4,143,027		3,624,686
Deposits (C)	1,789,799		1,587,442
Borrowings (D)	2,706,747		2,103,017
Debt-to-equity ratio (A/B)	218%		232%
Net borrowings ratio ((D-C)/B)	22%		14%

33. Fair value

For the year ended December 31, 2019, there are no significant changes in the business environment and economic environment that affect the fair value of financial assets and financial liabilities of the Group.

(1) Fair value of financial instruments by category

Carrying amount and fair value of financial instruments by category as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019		2018	
	Book value	Fair value	Book value	Fair value
Financial assets				
Cash and cash equivalents	₩ 1,792,956	₩ 1,792,956	₩ 1,592,619	₩ 1,592,619
Trade and other receivables (*1)	2,415,884	2,415,884	2,570,079	2,570,079
Short-term financial assets (*2)	284,372	284,372	295,205	295,205
Long-term trade and other receivables	1,157,030	1,157,030	946,330	946,330
Long-term financial assets (*2)	438,708	438,708	194,151	194,151
Financial assets at fair value through profit or loss	244,021	244,021	230,208	230,208
	₩ 6,332,971	₩ 6,332,971	₩ 5,828,592	₩ 5,828,592
Financial liabilities				
Trade and other payables	₩ 1,629,980	₩ 1,629,980	₩ 2,023,490	₩ 2,023,490
Short-term financial liabilities (*3)	991,732	991,732	1,118,162	1,118,162
Other current liabilities (*4)	218,190	218,190	224,368	224,368
Long-term financial liabilities (*3)	2,344,607	2,344,607	1,147,180	1,147,180
Other non-current liabilities (*5)	241,968	241,968	266,485	266,485
Non-current provisions (*6)	125,237	125,237	232,245	232,245
	₩ 5,551,714	₩ 5,551,714	₩ 5,011,930	₩ 5,011,930

(*1) Unbilled construction is excluded.

(*2) Includes lease receivables that were recognized in accordance with the application of KIFRS 1116 *Leases* (see Note 35).

(*3) Includes lease liabilities that were recognized in accordance with the application of KIFRS 1116 *Leases* (see Note 35).

(*4) Consists of accrued expenses, accrued dividends and current membership guarantee deposits, except for short-term employee benefits.

(*5) Consists of security deposits and non-current membership guarantee deposits.

(*6) Represents financial guarantee provision liabilities.

(2) Financial instruments measured at cost

Certain investments in non-marketable equity securities include entities at their initial phase of business operations and the carrying arrangements have been measured at cost as the variability of estimated cash flows is significant, which the probabilities of the various estimates cannot be reasonably assessed and accordingly the fair value of the underlying assets cannot be reliably assessed are measured at cost.

(3) Fair value hierarchy

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

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

33. Fair value (cont'd)

(3) Fair value hierarchy (cont'd)

Valuation methods used to measure the fair value of financial instruments include the following:

- Disclosed market price of similar product or dealer price
- Fair value of derivatives is measured by discounting to present value using forward exchange rate as of December 31, 2019 and 2018.
- Cash flow discount method is used for others.

(4) Fair value hierarchy classifications of the financial assets and financial liabilities that are measured at fair value

Fair value hierarchy classifications of the financial assets and financial liabilities that are measured at fair value as of December 31, 2019 and 2018 are as follows (Korean won in millions):

2019	Level 1	Level 2 (*)	Level 3	Total	
Financial assets					
Derivatives assets	₩	- ₩	54,341 ₩	- ₩	54,341
Financial assets at fair value through profit or loss			-	244,021	244,021
Financial liabilities					
Derivatives liabilities	₩	- ₩	37,133 ₩	₩	37,133

2018	Level 1	Level 2 (*)	Level 3	Total	
Financial assets					
Derivatives assets	₩	- ₩	53,752 ₩	- ₩	53,752
Financial assets at fair value through profit or loss			-	230,208	230,208
Financial liabilities					
Derivatives liabilities	₩	- ₩	75,602 ₩	₩	75,602

(*) Details of valuation methods and input variables of financial instruments classified as level 2 of the fair value hierarchy as of December 31, 2019 and 2018 are as follows (Korean won in millions):

	2019	2018	Valuation methods	Total
Derivative assets	₩	₩	DCF and others	CDI and others
Derivative liabilities	₩	₩		

Carrying values are deemed the approximation of fair value and thus fair value hierarchy of items disclosed in carrying value is not presented.

(5) Transfers between levels of each fair value hierarchy

There are no transfers between levels of each fair value hierarchy for the year ended December 31, 2019.

34. Service concession arrangements

GS Inima Environment S.A. has constructed, operated and maintained Service Concession Arrangements through its subsidiaries and details of significant business information are as follows (Korean won in millions):

Subsidiaries	Principal business activity	Countries	Start date	Expiry date	Amount	Classification
Ambient Servicos Ambientais de Ribeirao Preto, S.A.	Sewage purifying plant, DBOOT	Brazil	September 1995	September 2033	₩ 75,653	Financial assets
Samar Solucoes Ambientais de Aracatuba S.A.	Water and sewage processing plant, BOT	Brazil	September 2012	October 2042	57,486	Intangible assets
Shariket Miyeh Ras Djinet, Spa	Seawater desalinationing plant, DBOOT	Algeria	February 2012	September 2037	79,840	Financial assets
Jeceaba Ambiental S.A.	Sewage processing plant, DBOT	Brazil	May 2009	April 2026	185,874	Financial assets, Intangible assets
Distribuidora de Aguas Triunfo S.A.	Industrial waterworks in chemical complex, AOO	Brazil	March 2014	February 2054	122,709	Intangible assets

35. Changes in accounting policies

The Group applied KIFRS 1116 Leases with the date of initial application of January 1, 2019, and in accordance with the transition provision set out in the standard, the comparative consolidated financial statements for the prior year have not been restated. The impact of the application of KIFRS 1116 on the consolidated financial statements as of January 1, 2019, the date of initial application, is as follows (Korean won in millions):

	Amount
Assets:	
Right-of-use assets	₩ 615,806
Finance lease receivables	69,741
Deferred tax assets	2,133
Total assets	₩ 687,680
Liabilities:	
Lease liabilities	₩ 693,912
Equity:	
Retained earnings	(6,232)
Total liabilities and capital	₩ 687,680

(1) Effect of first-time adoption of KIFRS 1116

The Group has lease contracts for various items of buildings, construction and other equipment used in its operations. Upon adoption of KIFRS 1116, the Group applied a single recognition and measurement approach for all leases where the Group is the lessee, except for short-term leases and leases of low-value assets. The standard provides specific guidance on transition requirements and practical expedient that the Group has applied.

1) Leases previously classified as operating leases

The Group recognized right-of-use assets and lease liabilities for those leases previously classified as operating leases, except for short-term leases and leases of low-value assets. The right-of-use assets for most leases were recognized based on the carrying amount as if the standard had always been applied, apart from the use of incremental borrowing rate at the date of initial application. In some leases, the right-of-use assets were recognized based on the amount equal to the lease liabilities, adjusted for any related prepaid and accrued lease payments previously recognized. Lease liabilities were recognized based on the present value of the remaining lease payments, discounted using the incremental borrowing rate at the date of initial application.

2) Practical expedients applied by the Group

The Group also applied the available practical expedients wherein it:

- Used a single discount rate to a portfolio of leases with reasonably similar characteristics
- Relied on its assessment of whether leases are onerous immediately before the date of initial application
- Applied the short-term leases exemptions to leases with lease term that ends within 12 months of the date of initial application
- Excluded the initial direct costs from the measurement of the right-of-use asset at the date of initial application
- Used hindsight in determining the lease term where the contract contained options to extend or terminate the lease

35. Changes in accounting policies (cont'd)

(2) Summary of new accounting policies

1) Right-of-use assets

The Group recognizes right-of-use assets at the commencement date of the lease (i.e., the date the underlying asset is available for use). Right-of-use assets are measured at cost, less any accumulated depreciation and impairment losses, and adjusted for any remeasurement of lease liabilities. The cost of right-of-use assets includes the amount of lease liabilities recognized, initial direct costs incurred, and lease payments made at or before the commencement date less any lease incentives received. If ownership of the leased asset transfers to the Group at the end of the lease term or the cost reflects the exercise of a purchase option, depreciation is calculated using the estimated useful life of the asset. The right-of-use assets are also subject to impairment.

2) Lease liabilities

At the commencement date of the lease, the Group recognizes lease liabilities measured at the present value of lease payments to be made over the lease term. The lease payments include fixed payments (including in-substance fixed payments) less any lease incentives receivable, variable lease payments that depend on an index or a rate, and amounts expected to be paid under residual value guarantees. The lease payments also include the exercise price of a purchase option reasonably certain to be exercised by the Group and payments of penalties for terminating the lease, if the lease term reflects the Group exercising the option to terminate. Variable lease payments that do not depend on an index or a rate are recognized as expenses in the period in which the event or condition that triggers the payment occurs. In calculating the present value of lease payments, the Group uses its incremental borrowing rate at the lease commencement date because the interest rate implicit in the lease is not readily determinable. After the commencement date, the amount of lease liabilities is increased to reflect the accretion of interest and reduced for the lease payments made. In addition, the carrying amount of lease liabilities is remeasured if there is a modification, a change in the lease term, a change in the lease payments (e.g., changes to future payments resulting from a change in an index or rate used to determine such lease payments) or a change in the assessment of an option to purchase the underlying asset.

3) Short term leases and leases of low-value assets

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

4) Significant judgment in determining the lease term of contract with renewal options

The Group determines the lease term as the non-cancellable term of the lease, together with any periods covered by an option to extend the lease if it is reasonably certain to be exercised, or any periods covered by an option to terminate the lease, if it is reasonably certain not to be exercised. The Group has several lease contracts that include one-year or temporary period renewal options. The Group applies judgment in evaluating whether it is reasonably certain whether or not to exercise the option to renew the lease. That is, it considers all relevant factors that create an economic incentive for it to exercise either the renewal or termination. After the commencement date, the Group reassesses the lease term if there is a significant event or change in circumstances that is within its control and affects its ability to exercise or not to exercise the option to renew or to terminate (e.g., changes in business strategy).

35. Changes in accounting policies (cont'd)

(3) Amount recognized in the consolidated statement of financial position and consolidated statement of profit or loss

The carrying amount of the Group's right-of-use assets and lease liabilities and changes thereof as of and for the year ended December 31, 2019 are as follows (Korean won in millions):

Detail of account	Right-of-use assets				Lease liabilities
	Buildings	Construction equipment	Other equipment	Total	
Beginning	₩ 595,591	₩ 18,752	₩ 1,463	₩ 615,806	₩ 693,912
Increase	2,694	19,562	6,032	28,288	28,288
Decrease	(47,723)	(967)	-	(48,690)	(49,223)
Depreciation	(55,523)	(18,178)	(2,635)	(76,336)	-
Interest expenses	-	-	-	-	23,472
Payment	-	-	-	-	(103,963)
Exchange difference	(23)	-	-	(23)	(26)
Ending	₩ 495,016	₩ 19,169	₩ 4,860	₩ 519,045	₩ 592,460

For the year ended December 31, 2019, the Group recognized lease payments of ₩96,283 million, ₩12,262 million and ₩9,828 million for short-term leases, leases of low-value assets and variable lease payments, respectively, and an interest income of ₩2,795 million from sub-lease arrangements.

In addition, the difference between the lease liabilities measured at the present value of the remaining lease payments of operating lease arrangements that are outstanding as of December 31, 2019, discounted using the incremental borrowing rate at the date of initial application, and the lease liabilities recognized in the consolidated statement of financial position at the date of initial application is due to the short-term leases and leases of low-value assets.

36. Business combinations

(1) Acquisition of interests

For the year ended December 31, 2019, the Group acquired 100% interests in FIP Operacoes Industriais, an affiliate of BRK Ambiental S.A. that specializes in industrial water treatment. The total consideration transferred was BRL 1,056 million (₩304,294 million at the exchange rate of ₩288.05 / BRL 1 as of December 31, 2019), and the date of the acquisition is September 30, 2019.

(2) Identified assets and liabilities

Details of identifiable assets and liabilities at fair value acquired from the acquisition of FIP Operacoes Industriais at the date of acquisition are as follows (Korean won in millions):

	Amount
Total consideration transferred (*1)	₩
Cash paid	304,294
Total consideration transferred	₩ 304,294
Assets:	₩
Cash and cash equivalents	2,967
Trade and other receivables	33,314
Other current assets	34,129
Other non-current assets	136,096
Property, plant and equipment	202,221
Intangible assets	209,860
Liabilities:	
Trade and other payables	3,162
Short-term borrowings	21,635
Other current liabilities	9,729
Other non-current liabilities	150,111
Long-term borrowings	125,883
Total identifiable net assets	₩ 308,067
Total net assets acquired (based on ownership ratio)	₩ 252,713
Goodwill arising on acquisition	₩ 51,581

(*1) Details of net cash flows on acquisition for the year ended December 31, 2019 are as follows (Korean won in millions):

	Amount
Payment for business combinations	₩ 304,294
Net cash acquired with the subsidiary	2,967
Net cash flows on acquisition	₩ 301,327