



Doosan Infracore Co., Ltd. and Subsidiaries

**Consolidated Financial Statements
December 31, 2020 and 2019**

Doosan Infracore Co., Ltd. and Subsidiaries
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December 31, 2020 and 2019

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Independent Auditor's Report

(English Translation of a Report Originally Issued in Korean)

To the Board of Directors and Shareholders of
Doosan Infracore Co., Ltd.

Opinion

We have audited the accompanying consolidated financial statements of Doosan Infracore Co., Ltd. and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as at December 31, 2020 and 2019, and the consolidated statements of profit or loss, and the consolidated statements of comprehensive income, and 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 at December 31, 2020 and 2019, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS).

Basis for Opinion

We conducted our audits in accordance with Korean Standards on Auditing. 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 of the Republic of Korea that are relevant to our audit of the consolidated financial statements and we have fulfilled our other ethical responsibilities in accordance with the ethical requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Emphasis of Matter

Without modifying our opinion, we draw attention to Note 3 to the consolidated financial statements of the Group. Note 3 to the consolidated financial statements describes management's plans and action taken to resolve uncertainty relating to the impact of Coronavirus disease 2019 (COVID-19) on the Group, and to solve these events or circumstances.

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.

(1) Revenue recognition – Estimation of liabilities related to revenue deductions

Why it is determined to be a key audit matter

As at December 31, 2020, the Group has recorded ₩ 75,457 million of liabilities related to revenue deductions, including incentives, promotions and rebates. The Group offers customers a variety of incentive and promotion programs. Costs incurred in connection with these programs are recognized as deductions from revenue, and any unsettled amounts are recognized on an accrual basis. Incentive and rebate arrangements are complex, and judgement of management is required in estimating unsettled amounts. Given the extent of complexity and judgement involved, we consider

estimation of revenue deductions related to incentives, promotions and rebates recognized as at December 31, 2020 to be a key audit matter (Note 3).

How our audit addressed the key audit matter

We have, utilizing the work of component auditors, performed related audit procedures including the followings. We:

- Obtained an understanding on Group's accounting policies for the incentive and promotion programs, and tested design and operating effectiveness of related internal control.
- Performed lookback analysis by comparing the estimation of prior year to actual results
- Evaluated appropriateness of methods used by management and whether they have been consistently used
- Tested completeness of sales quantity information subject to revenue deductions programs
- For selected samples, tested accuracy of the inputs and variables used for the management estimates, including sales quantity information, costs incurred, and associated contractual rate

(2) Impairment assessment of goodwill

Why it is determined to be a key audit matter

As at December 31, 2020, the carrying amount of goodwill is ₩ 2,960,633 million, which accounts for 24.6% of the total assets of the Group. The Group performed an impairment assessment on goodwill by using estimated recoverable amount of goodwill allocated to the cash-generating units group (CGU group) and did not recognize goodwill impairment as the recoverable amount of CGU group exceeds its carrying amount. Given the magnitude of goodwill balance in the consolidated financial statements, and the extent of judgement of management estimating in the recoverable amount, we consider impairment assessment of goodwill to be a key audit matter (Note 13).

How our audit addressed the key audit matter

Key audit procedures we have performed in relation to the goodwill impairment assessment are as follows. We:

- Obtained an understanding and evaluated how management assessed goodwill impairment
- Obtained an understanding on Group's accounting policies for impairment of goodwill, and tested design and operating effectiveness of related internal control.
- Evaluated reasonableness of identifying CGU by management for its assessment of goodwill impairment
- Evaluated appropriateness of valuation model used by management to estimate value-in-use
- Evaluated the competence and independence of external experts.

(3) Impairment assessment of capitalized development costs

Why it is determined to be a key audit matter

As at December 31, 2020, the carrying amount of development costs capitalized as intangible asset is ₩ 285,341 million. The Group operates several R&D centers in Korea, the United States, Europe and other regions, and invests significant amounts to develop new products and technologies. Given the extent of judgement of management required, we consider impairment assessment of capitalized development costs to be a key audit matter (Note 13).

How our audit addressed the key audit matter

Key audit procedures we have performed in relation to impairment assessment of capitalized development costs are as follows.

- Obtained an understanding on Group's accounting policies for impairment assessment of development costs, and tested design and operating effectiveness of related internal

- controls
- Obtained the details of capitalized development costs and reconciled the total amount to the amount recorded in the general ledger
- Tested development costs capitalized by examining management's assessment documentation and assessing whether the criteria set out in the relevant accounting standards have been met on a sampling basis
- Obtained an understanding and evaluated the development progress and prospect of the projects selected as a sample by interviewing with appropriate project manager and performing other procedures, and assessed appropriateness of management's conclusion on impairment analysis
- Examined whether the actual sales have been generated from the projects selected and evaluated reasonableness of sales and profitability forecasts to assess future economic benefits of the projects capitalized

(4) Evaluation of provision for warranty

Why it is determined to be a key audit matter

As at December 31, 2020, the carrying amount of provision for warranty amounts to ₩ 278,315 million. The Group provides product warranties for certain periods after sales of products and recognizes provision for warranty by estimating expected repair expenses. The performance obligation of warranty is determined based on diverse assumptions such as warranty periods, expected warranty expenses and the nature and extent of the Group provides. We drew attention to the adequacy of the warranty evaluation considering the fact that the management's estimation is intervened in measuring the provision for warranty (Note 19).

How the matter was addressed in the audit

We performed the following audit procedures in relation to the evaluation of provision for warranty of the Group. We:

- Obtained an understanding of Group's accounting policies for valuation of provision for warranty, and tested design and operating effectiveness of related internal controls
- Verified the accuracy of basic information for accounting estimation used by the management
- Compared reasons for the major assumptions, that management used for estimating the relevant liabilities, with the past performance
- Independently recalculated the balance of liabilities as at December 31, 2020

Other Matter

Auditing standards and their application in practice vary among countries. The procedures and practices used in the Republic of Korea to audit such consolidated financial statements may differ from those generally accepted and applied in other countries.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with Korean IFRS, 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.

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 Korean Standards on Auditing 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 Korean Standards on Auditing, 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 entity'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 Yun-Gyung Chang, Certified Public Accountant.

Seoul, Korea
March 17, 2021

This report is effective as of March 17, 2021, the audit report date. Certain subsequent events or circumstances, which may occur between the audit report date and the time of reading this report, could have a material impact on the accompanying consolidated financial statements and notes thereto. Accordingly, the readers of the audit report should understand that there is a possibility that the above audit report may have to be revised to reflect the impact of such subsequent events or circumstances, if any.

Doosan Infracore Co., Ltd. and Subsidiaries
Consolidated Statements of Financial Position
December 31, 2020 and 2019

(in Korean won)	Notes	December 31, 2020		December 31, 2019	
Assets					
Current assets					
Cash and cash equivalents	4,10,36	₩	1,663,459,039,827	₩	756,173,371,116
Short-term financial instruments	4,5,10		139,940,131,859		144,970,645,937
Short-term investment securities	4,6,10		111,160,898,007		9,318,795,000
Trade and other receivables	4,7,10		1,358,281,427,677		1,369,116,857,182
Derivative assets	4,9,10		415,822,604		18,988,676,082
Inventories	8		1,589,908,086,009		1,786,289,860,152
Other current assets			186,449,615,091		220,054,157,373
			<u>5,049,615,021,074</u>		<u>4,304,912,362,842</u>
Non-current assets					
Long-term financial instruments	4,5,10		582,864,908		880,896,511
Long-term investment securities	4,6,10		40,447,591,006		14,272,106,397
Long-term trade and other receivables	4,7,10		4,969,070,586		3,801,609,182
Investments in associates and joint ventures	11		143,219,994,410		102,979,090,904
Property, plant and equipment	12		1,851,511,569,146		1,871,456,154,884
Intangible assets	13		4,480,673,780,764		4,562,367,986,165
Investment properties	14		135,527,255,910		138,829,679,310
Deferred tax assets	30		156,818,059,667		174,235,049,341
Right-of-use assets	15		88,408,864,815		95,677,455,743
Other non-current assets	4,10		75,112,121,557		69,180,589,842
			<u>6,977,271,172,769</u>		<u>7,033,680,618,279</u>
Total assets		₩	<u>12,026,886,193,843</u>	₩	<u>11,338,592,981,121</u>
Liabilities					
Current liabilities					
Trade and other payables	4,10,16	₩	1,600,710,190,244	₩	1,599,449,470,221
Short-term borrowings	4,10,17,36		930,840,259,045		591,083,320,796
Current portion of bonds	4,10,17,36		612,592,894,338		1,037,594,646,618
Current portion of long-term borrowings	4,10,17,36		80,918,529,449		621,375,844,987
Current tax liabilities	30		32,897,125,091		30,414,605,601
Current derivative liabilities	9,10		220,775,235		492,095,603
Provisions	19		240,699,675,799		236,982,347,908
Current lease liabilities	4,10,15		25,214,690,922		28,225,777,667
Other current liabilities	10		358,548,574,067		338,801,722,238
			<u>3,882,642,714,190</u>		<u>4,484,419,831,639</u>
Non-current liabilities					
Other non-current payables	10,16		5,658,287		1,370,355,771
Bonds	4,10,17,36		1,795,800,115,056		902,476,286,676
Long-term borrowings	4,10,17,36		868,988,012,974		751,008,617,154
Net defined benefit liabilities	18		438,980,831,440		429,338,000,825
Non-current derivative liabilities	9,10		43,774,149,009		1,974,340,123
Deferred tax liabilities	30		272,264,977,225		260,072,401,549
Non-current provisions	19		62,526,535,945		52,254,778,188
Non-current lease liabilities	4,10,15		52,184,669,864		51,179,799,272
Other non-current liabilities			120,719,925,261		136,946,531,665
			<u>3,655,244,875,061</u>		<u>2,586,621,111,223</u>
Total liabilities			<u>7,537,887,589,251</u>		<u>7,071,040,942,862</u>
Equity					
Share capital	1,20		1,079,658,125,000		1,040,806,395,000
Capital surplus	20		166,597,929,630		154,356,219,760
Other components of equity	21		(71,162,757,356)		(70,649,474,593)
Accumulated other comprehensive income	22		(205,475,268,112)		(159,818,151,453)
Retained earnings	23		1,408,125,824,003		1,257,868,188,737
Equity attributable to owners of the Parent Company			<u>2,377,743,853,165</u>		<u>2,222,563,177,451</u>
Non-controlling interest			<u>2,111,254,751,427</u>		<u>2,044,988,860,808</u>
Total equity			<u>4,488,998,604,592</u>		<u>4,267,552,038,259</u>
Total liabilities and equity		₩	<u>12,026,886,193,843</u>	₩	<u>11,338,592,981,121</u>

The above consolidated statements of financial position should be read in conjunction with the accompanying notes.

Doosan Infracore Co., Ltd. and Subsidiaries
Consolidated Statements of Profit or Loss
Years Ended December 31, 2020 and 2019

<i>(in Korean won)</i>	Notes	2020		2019	
Revenue	24,25	₩	7,934,104,967,691	₩	8,185,839,945,377
Cost of sales	26		<u>(6,205,896,086,155)</u>		<u>(6,273,218,676,924)</u>
Gross profit			1,728,208,881,536		1,912,621,268,453
Selling and administrative expenses	26,27		<u>(1,069,610,266,857)</u>		<u>(1,072,224,207,963)</u>
Operating profit			658,598,614,679		840,397,060,490
Finance income	28		199,535,878,876		150,590,559,071
Finance costs	28		(385,268,802,984)		(330,376,100,312)
Other non-operating income	29		26,126,824,534		13,936,345,577
Other non-operating expenses	29		(47,579,182,011)		(63,836,570,629)
Loss on equity method	11		<u>(3,158,331,477)</u>		<u>(7,702,168,374)</u>
Profit before income tax			448,255,001,617		603,009,125,823
Income tax expense	30		<u>(163,181,318,468)</u>		<u>(207,310,954,827)</u>
Profit for the year		₩	<u>285,073,683,149</u>	₩	<u>395,698,170,996</u>
Profit is attributable to:					
Owners of the Parent Company		₩	148,834,138,692	₩	239,913,446,929
Non-controlling interest			136,239,544,457		155,784,724,067
Earnings per share					
attributable to the equity holders of the Parent Company	31				
Basic earnings per share		₩	707	₩	1,153
Diluted earnings per share			703		1,139

The above consolidated statements of profit or loss should be read in conjunction with the accompanying notes.

Doosan Infracore Co., Ltd. and Subsidiaries
Consolidated Statements of Comprehensive Income
Years Ended December 31, 2020 and 2019

<i>(in Korean won)</i>	Notes	2020	2019
Profit for the year		₩ 285,073,683,149	₩ 395,698,170,996
Other comprehensive income			
<i>Items that will not be reclassified to profit or loss :</i>			
Remeasurements of net defined benefit liability	18	(11,017,849,266)	(41,849,401,252)
Revaluation reserves of property, plant and equipment	12	-	33,791,953,262
Loss on valuation of equity instruments at fair value through other comprehensive income		-	(2,369,093,630)
Share of other comprehensive income of associates	11	-	1,737,603,778
Share of retained earnings of associates	11	43,762,664	(183,785,886)
<i>Items that may be subsequently reclassified to profit or loss :</i>			
Exchange differences		(76,846,084,349)	112,466,225,181
Cash flow hedges	9	3,056,646,628	1,406,355,621
Other comprehensive income for the year, net of tax		<u>(84,763,524,323)</u>	<u>104,999,857,074</u>
Total comprehensive income for the year		<u>₩ 200,310,158,826</u>	<u>₩ 500,698,028,070</u>
Total comprehensive income for the year is attributable to:			
Owners of the Parent Company		₩ 104,600,518,607	₩ 305,666,065,211
Non-controlling interest		95,709,640,219	195,031,962,859
		<u>₩ 200,310,158,826</u>	<u>₩ 500,698,028,070</u>

The above consolidated statements of comprehensive income should be read in conjunction with the accompanying notes.

Doosan Infracore Co., Ltd. and Subsidiaries
Consolidated Statements of Changes in Equity
Years Ended December 31, 2020 and 2019

(in Korean won)

(in Korean won)

	Attributable to owners of the Parent Company															
	Share capital		Capital surplus		Other components of equity		Accumulated other comprehensive income		Retained Earnings		Subtotal		Non-controlling Interest		Total	
Balance at January 1, 2019	₩	1,040,790,385,000	₩	213,014,383,085	₩	(129,310,962,134)	₩	(256,805,144,728)	₩	1,049,189,116,801	₩	1,916,877,778,024	₩	1,903,937,105,549	₩	3,820,814,883,573
Total comprehensive income:																
Profit for the year		-		-		-		-		239,913,446,929		239,913,446,929		155,784,724,067		395,698,170,996
Remeasurement of net defined benefit liabilities		-		-		-		-		(31,295,789,705)		(31,295,789,705)		(10,553,611,547)		(41,849,401,252)
Revaluation reserves of property, plant and equipment		-		-		-		31,876,521,385		60,968,141		31,937,489,526		1,854,463,736		33,791,953,262
Loss(Gain) on valuation of financial assets at fair value through		-		-		-		(2,540,552,371)		171,458,741		(2,369,093,630)		-		(2,369,093,630)
Share of other comprehensive income of associates		-		-		-		1,614,767,527		-		1,614,767,527		122,836,251		1,737,603,778
Share of retained earnings of associates		-		-		-		-		(171,012,170)		(171,012,170)		(12,773,716)		(183,785,886)
Exchange differences		-		-		-		61,553,072,511		-		61,553,072,511		50,913,152,670		112,466,225,181
Cash flow hedges		-		-		-		4,483,184,223		-		4,483,184,223		(3,076,828,602)		1,406,355,621
Total comprehensive income for the period		-		-		-		96,986,993,275		208,679,071,936		305,666,065,211		195,031,962,859		500,698,028,070
Transactions with owners:																
Cancellation and redemption of share options		-		243,505,810		(243,505,810)		-		-		-		-		-
Exercise of stock warrants		16,010,000		3,324,216		-		-		-		19,334,216		-		19,334,216
Dividend of subsidiary		-		-		-		-		-		-		(53,980,207,600)		(53,980,207,600)
Reclassification of other components of equity		-		(58,904,993,351)		58,904,993,351		-		-		-		-		-
Total transactions with owners		16,010,000		(58,658,163,325)		58,661,487,541		-		-		19,334,216		(53,980,207,600)		(53,960,873,384)
Balance at December 31, 2019	₩	1,040,806,395,000	₩	154,356,219,760	₩	(70,649,474,593)	₩	(159,818,151,453)	₩	1,257,868,188,737	₩	2,222,563,177,451	₩	2,044,988,860,808	₩	4,267,552,038,259
Balance at January 1, 2020	₩	1,040,806,395,000	₩	154,356,219,760	₩	(70,649,474,593)	₩	(159,818,151,453)	₩	1,257,868,188,737	₩	2,222,563,177,451	₩	2,044,988,860,808	₩	4,267,552,038,259
Total comprehensive income:																
Profit for the year		-		-		-		-		148,834,138,692		148,834,138,692		136,239,544,457		285,073,683,149
Remeasurement of net defined benefit liabilities		-		-		-		-		(417,257,631)		(417,257,631)		(10,600,591,635)		(11,017,849,266)
Revaluation reserves of property, plant and equipment		-		-		-		(1,799,768,503)		1,799,768,503		-		-		-
Share of retained earnings of associates		-		-		-		-		40,985,702		40,985,702		2,776,962		43,762,664
Exchange differences		-		-		-		(46,801,841,183)		-		(46,801,841,183)		(30,044,243,166)		(76,846,084,349)
Cash flow hedges		-		-		-		2,944,493,027		-		2,944,493,027		112,153,601		3,056,646,628
Total comprehensive income for the period		-		-		-		(45,657,116,659)		150,257,635,266		104,600,518,607		95,709,640,219		200,310,158,826
Transactions with owners:																
Cancellation and redemption of share options		-		513,282,763		(513,282,763)		-		-		-		-		-
Exercise of stock warrants		38,851,730,000		10,892,620,131		-		-		-		49,744,350,131		-		49,744,350,131
Issuance of convertible bonds		-		835,806,976		-		-		-		835,806,976		-		835,806,976
Dividend of subsidiary		-		-		-		-		-		-		(29,443,749,600)		(29,443,749,600)
Total transactions with owners		38,851,730,000		12,241,709,870		(513,282,763)		-		-		50,580,157,107		(29,443,749,600)		21,136,407,507
Balance at December 31, 2020	₩	1,079,658,125,000	₩	166,597,929,630	₩	(71,162,757,356)	₩	(205,475,268,112)	₩	1,408,125,824,003	₩	2,377,743,853,165	₩	2,111,254,751,427	₩	4,488,998,604,592

The above consolidated statements of changes in equity should be read in conjunction with the accompanying notes.

Doosan Infracore Co., Ltd. and Subsidiaries
Consolidated Statements of Cash Flows
Years Ended December 31, 2020 and 2019

<i>(in Korean won)</i>	Note	2020	2019
Cash flows from operating activities			
Cash generated from operations:	36		
Profit for the year	₩	285,073,683,149	₩ 395,698,170,996
Adjustments		713,740,733,193	699,544,598,699
Changes in operating assets and liabilities		287,061,060,297	(279,345,395,612)
Interest received		18,463,373,663	15,548,783,391
Interest paid		(143,306,988,879)	(152,315,252,013)
Dividends received		560,000,000	12,982,337,562
Income tax paid		(110,745,091,807)	(124,694,966,717)
Net cash inflow from operating activities		<u>1,050,846,769,616</u>	<u>567,418,276,306</u>
Cash flows from investing activities			
Decrease in short-term financial instruments		5,030,514,078	116,468,540,790
Decrease in long-term financial instruments		240,578,471	-
Disposal of short-term investment securities		-	4,229,388,547
Disposal of long-term investment securities		3,225,381,820	89,098,064,562
Decrease in loans		260,528,473	214,655,657
Disposal of property, plant and equipment and investment properties		8,574,079,178	40,704,138,031
Disposal of intangible assets		5,076,894,597	2,661,894,631
Others		1,382,892,899	-
Acquisition of short-term financial securities		(100,500,186,033)	-
Acquisition of long-term investment securities		(30,599,233,803)	(5,373,856,271)
Increase in loans		(28,321,200,000)	-
Acquisition of property, plant and equipment		(220,138,150,928)	(266,697,358,416)
Acquisition of intangible assets		(95,719,541,929)	(182,781,856,741)
Acquisition of investment properties		(1,436,320,658)	(89,941,811,010)
Acquisition of investment in associates and joint ventures		(46,184,763,344)	(41,386,826,160)
Others		(4,056,208,823)	(6,569,781,464)
Net cash outflow from investing activities		<u>(503,164,736,002)</u>	<u>(339,374,807,844)</u>
Cash flows from financing activities			
Net increase in short-term borrowings		345,268,747,480	-
Proceeds from long-term borrowings		258,849,691,723	11,656,500,000
Proceeds from issuance of bonds		1,447,919,299,190	954,042,108,512
Exercise of stock warrants		49,540,236,110	8,747,760
Net decrease in short-term borrowings		-	(349,801,445,232)
Repayment of long-term borrowings		(646,518,781,751)	(591,644,493,100)
Repayment of bonds		(962,019,463,446)	(498,648,637,732)
Payments for lease liabilities		(34,657,953,968)	(21,423,052,313)
Dividends paid		(29,443,749,600)	(53,980,207,600)
Net cash inflow (outflow) from financing activities		<u>428,938,025,738</u>	<u>(549,790,479,705)</u>
Effects of exchange rate changes on cash and cash equivalents		(69,334,390,641)	24,904,353,149
Net increase (decrease) in cash and cash equivalents		<u>907,285,668,711</u>	<u>(296,842,658,094)</u>
Cash and cash equivalents at the beginning of the year		756,173,371,116	1,053,016,029,210
Cash and cash equivalents at the end of the year	₩	<u>1,663,459,039,827</u>	₩ <u>756,173,371,116</u>

The above consolidated statements of cash flows should be read in conjunction with the accompanying notes.

Doosan Infracore Co., Ltd. and Subsidiaries

Notes to the Consolidated Financial Statements

December 31, 2020 and 2019

1. General Information

(1) The Parent Company

Doosan Infracore Co., Ltd. (the Parent Company) was incorporated on October 23, 2000, through a spin-off from Daewoo Heavy Industries Ltd. ("DHI") under the corporate restructuring agreement dated January 20, 2000, between DHI and its creditors, and approved by DHI's shareholders on June 27, 2000. The Parent Company operates and manages manufacturing and selling businesses of industrial machinery and equipment.

The spin-off of the Parent Company was done by acquiring assets and assuming liabilities of machinery business sector of DHI as at September 30, 2000, amounting to ₩ 2,494 billion and ₩ 2,806 billion, respectively. Accordingly, DHI's shareholders became shareholders of the Parent Company, the newly established company.

On February 2, 2001, the Parent Company listed its stock on the Korea Exchange, and changed its name to Doosan Infracore Co., Ltd. from Daewoo Heavy Industries & Machinery Ltd. on April 29, 2005. The Parent Company's common stock as at December 31, 2020, amount to ₩ 1,079,658 million, of which 34.97% is owned by Doosan Heavy Industries and Construction Co., Ltd.

(2) Consolidated Subsidiaries

1) The Parent Company's consolidated subsidiaries as at December 31, 2020 and 2019, are as follows:

Subsidiary	Main business	Location	Ownership interest held by the Group ¹ (%)		Ownership interest held by non-controlling interests ¹ (%)		Fiscal year end
			2020	2019	2020	2019	
Doosan Infracore China Co., Ltd.	Manufacturing and Sales	China	80.00	80.00	20.00	20.00	December 31
Doosan Infracore (China) Investment Co., Ltd.	Holdings	China	100.00	100.00	-	-	December 31
Doosan Infracore North America LLC.	Manufacturing and Sales	USA	100.00	100.00	-	-	December 31
Doosan Infracore Japan Corp.	Purchases	Japan	100.00	100.00	-	-	December 31
Doosan (China) Financial Leasing Corp.	Finance	China	100.00	100.00	7.80	7.80	December 31
Doosan Bobcat Chile S.A.	Sales	Chile	100.00	100.00	-	-	December 31
Doosan Infracore (Shandong) Co., Ltd.	Sales	China	100.00	100.00	13.00	13.00	December 31
Doosan Infracore Norway AS.	Manufacturing and Sales	Norway	100.00	100.00	-	-	December 31
Doosan Infracore South America Industria E Comercio De Maquinas De Construção LTDA	Sales	Brazil	99.99	99.99	0.01	0.01	December 31
Doosan Infracore Construction Equipment India Private Ltd.	Sales	India	100.00	100.00	-	-	March 31
D20 Capital, LLC ²	Finance investment	USA	100.00	100.00	-	-	December 31
Clue Insight Inc	Software Development and Sales	USA	72.47	71.98	27.53	28.02	December 31
Doosan Infracore Europe s.r.o. ³	Manufacturing and Sales	Czech	100.00	100.00	-	-	December 31
D20 CAPITAL FUND I, L.P. ⁴	Finance investment	USA	-	-	-	-	December 31
Doosan Infracore Hunan Corp.	Sales	China	100.00	-	20.00	-	December 31
Doosan Infracore Beijing Corp.	Sales	China	100.00	-	20.00	-	December 31
ECUBE Solution Co., Ltd.	Manufacturing and Sales	Korea	60.00	-	40.00	-	December 31
Doosan Bobcat Co., Ltd.	Holdings	Korea	51.05	51.05	48.95	48.95	December 31
Doosan Bobcat Global Collaboration Center, Inc	Other Service	USA	100.00	100.00	48.95	48.95	December 31
Doosan Bobcat Singapore Pte. Ltd	Holdings	Singapore	100.00	100.00	48.95	48.95	December 31
Doosan Bobcat Korea Co., Ltd.	Sales	Korea	100.00	100.00	48.95	48.95	December 31
Doosan Bobcat Chile Compact SpA	Sales	Chile	100.00	100.00	48.95	48.95	December 31
Doosan Bobcat India Private Ltd.	Manufacturing and Sales	India	100.00	100.00	48.95	48.95	March 31
Bobcat Corp.	Sales	Japan	100.00	100.00	48.95	48.95	December 31
Doosan Bobcat Mexico S.A. de C.V.	Other Service	Mexico	100.00	100.00	48.95	48.95	December 31

Doosan Infracore Co., Ltd. and Subsidiaries

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Doosan Bobcat China Co., Ltd.	Manufacturing and Sales	China	100.00	100.00	48.95	48.95	December 31
Clark Equipment Co.	Manufacturing and Sales	USA	100.00	100.00	48.95	48.95	December 31
Bobcat Equipment Ltd.	Sales	Canada	100.00	100.00	48.95	48.95	December 31
Doosan International Australia Pty Ltd.	Sales	Australia	100.00	100.00	48.95	48.95	December 31
Bobcat Bensheim GmbH.	Sales	Germany	100.00	100.00	48.95	48.95	December 31
Doosan Holdings France S.A.S.	Holdings	France	100.00	100.00	48.95	48.95	December 31
CJSC Doosan International Russia	Sales	Russia	100.00	100.00	48.95	48.95	December 31
Doosan International UK Ltd.	Sales	England	100.00	100.00	48.95	48.95	December 31
Doosan International South Africa Pty Ltd.	Sales	South Africa	100.00	100.00	48.95	48.95	December 31
Doosan Bobcat EMEA s.r.o.	Manufacturing and Sales	Czech	100.00	100.00	48.95	48.95	December 31
Bobcat France S.A.	Manufacturing	France	100.00	100.00	48.95	48.95	December 31
Geith International Ltd.	Sales	Ireland	100.00	100.00	48.95	48.95	December 31

¹ The 'ownership interests held by the Group' refers to the simply aggregated portion of ownership interests directly held by the Parent Company and its consolidated subsidiaries. The 'ownership interests held by non-controlling interests' refers to the portion of ownership interests that are not attributable to the owners of the Parent Company, directly or indirectly. The 'ownership interests held by non-controlling interests' may differ from the portion of interests calculated by subtracting aggregated total portion of interests directly held by the entities within the Group from 100% (In other words, it is calculated by subtracting the effective ownership interest held by the entities within the Group from 100%).

² For the year ended December 31, 2019, Doosan Ventures, LLC changed its name to D20 Capital, LLC.

³ For the year ended December 31, 2020, Doosan Infracore Czech Republic s.r.o. merged with Doosan Infracore Europe B.V. and changed its name to Doosan Infracore Europe s.r.o.

⁴ There are no shares owned by the Group, but the overall strength of the activities involved, the degree of exposure to variable profits and the ability to use force to influence the variable profits of the Group, etc. With that in mind, we have determined that the group has control.

2) Summarized financial information for major consolidated subsidiaries as at and for the year ended December 31, 2020 is as follows:

(in millions of Korean won)

	Assets	Liabilities	Sales	Profit for the year	Total comprehensive income
Doosan Infracore China Co., Ltd.	₩ 1,557,410	₩ 909,446	₩ 1,476,189	₩ 72,983	₩ 72,983
Doosan Infracore (China) Investment Co., Ltd.	226,536	5,034	10,435	4,314	4,314
Doosan Infracore North America LLC	279,903	194,292	285,039	11,829	11,829
Doosan (China) Financial Leasing Corp.	720,824	499,444	59,408	24,234	24,234
Doosan Infracore Europe B.V.	249,798	231,740	478,931	7,757	7,705
Doosan Bobcat Inc. and its subsidiaries	6,960,608	2,886,803	4,282,058	247,454	418,622

3) Financial information for subsidiaries attributable to significant non-controlling interests as at and for the year ended December 31, 2020, is as follows:

(in millions of Korean won)

	Net income allocated to non-controlling interests	Cumulative non-controlling interests	Dividends allocated to non-controlling interests
Doosan Infracore China Co., Ltd.	₩ 14,597	₩ 128,724	₩ -
Doosan Bobcat Inc. and its subsidiaries	121,131	1,994,166	29,444

Doosan Infracore Co., Ltd. and Subsidiaries
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(3) Changes in the Scope of Consolidation

1) Changes in the scope of consolidation for the year ended December 31, 2020, are as follows:

Subsidiary	Description	Reason
Doosan Infracore Europe B.V.	Excluded from consolidation	Merger
Doosan Infracore Hunan Corp.	Newly included in consolidation	New establishment corporation
Doosan Infracore Beijing Corp.	Newly included in consolidation	New establishment corporation
ECUBE Solution Co., Ltd.	Newly included in consolidation	New establishment corporation

2) Changes in the scope of consolidation for the year ended December 31, 2019, are as follows:

Subsidiary	Description	Reason
Doosan International Luxemburg S.a r.l.	Excluded from consolidation	Liquidation
Doosan Techno Holding Co., Ltd.	Excluded from consolidation	Liquidation
Doosan Infracore Europe S.A.	Excluded from consolidation	Liquidation
Doosan Benelux SA.	Excluded from consolidation	Liquidation
D20 Capital, LLC	Newly included in consolidation	New establishment corporation
Doosan Bobcat Global Collaboration Center, Inc.	Newly included in consolidation	New establishment corporation
Clue Insight Inc.	Newly included in consolidation	New establishment corporation
Doosan Infracore Czech Republic s.r.o.	Newly included in consolidation	New establishment corporation
D20 CAPITAL FUND I, L.P.	Newly included in consolidation	New establishment corporation

Doosan Infracore Co., Ltd. and Subsidiaries

Notes to the Consolidated Financial Statements

December 31, 2020 and 2019

2. Significant Accounting Policies

2.1 Basis of Preparation

The Group maintains its accounting records in Korean won and prepares statutory financial statements in the Korean language (Hangul) in accordance with International Financial Reporting Standards as adopted by the Republic of Korea (Korean IFRS). The accompanying consolidated financial statements have been condensed, restructured and translated into English from the Korean language financial statements.

Certain information attached to the Korean language financial statements, but not required for a fair presentation of the Group's financial position, financial performance or cash flows, is not presented in the accompanying consolidated financial statements.

The consolidated financial statements of the Group have been prepared in accordance with Korean IFRS. These are the standards, subsequent amendments and related interpretations issued by the International Accounting Standards Board (IASB) that have been adopted by the Republic of Korea.

The preparation of financial statements requires the use of critical accounting estimates. Management also needs to exercise judgement in applying the Group's accounting policies. The areas involving a higher degree of judgment or complexity, or areas where assumptions and estimates are significant to the consolidated financial statements are disclosed in Note 3.

(1) New and amended standards adopted by the Group

The Group has applied the following standards and amendments for the first time for their annual reporting period commencing January 1, 2020.

- Amendments to Korean IFRS 1001 *Presentation of Financial Statements* and Korean IFRS 1008 *Accounting policies, changes in accounting estimates and errors : Definition of Material*

The amendments clarify the definition of material. Information is material if omitting, misstating or obscuring it could reasonably be expected to influence the decisions that the primary users of general-purpose financial statements make on the basis of those financial statements. The amendments do not have a significant impact on the financial statements.

- Amendments to Korean IFRS 1103 *Business Combination : Definition of a Business*

The amended definition of a business requires an acquisition to include an input and a substantive process that together significantly contribute to the ability to create outputs and the definition of output excludes the returns in the form of lower costs and other economic benefits. If substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets, an entity may elect to apply an optional concentration test that permits a simplified assessment of whether an acquired set of activities and assets is not a business. The amendments do not have a significant impact on the financial statements.

- Amendments to Korean IFRS 1109 *Financial Instruments*, Korean IFRS 1039 *Financial Instruments: Recognition and Measurement* and Korean IFRS 1107 *Financial Instruments: Disclosure : Interest Rate Benchmark Reform*

The amendments allow to apply the exceptions in relation the application of hedge accounting while uncertainties arising from interest rate benchmark reform exist. The exceptions require the Group assumes that the interest rate benchmark on which the hedged items and the hedging instruments are based on is not altered as a result of interest rate benchmark reform, when determining whether the expected cash flows are highly probable, whether an economic relationship between the hedged item and the hedging instrument exists, and when assessing the hedging relationship is highly effective. The amendments do not have a significant impact on the financial statements.

Doosan Infracore Co., Ltd. and Subsidiaries

Notes to the Consolidated Financial Statements

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(2) New standards and interpretations not yet adopted by the Group

The following new accounting standards and interpretations have been published that are not mandatory for December 31, 2020 reporting periods and have not been early adopted by the Group.

- Amendments to Korean IFRS 1116 Lease : Practical expedient for COVID-19 - Related Rent Exemption, Concessions, Suspension

As a practical expedient, a lessee may elect not to assess whether a rent concession occurring as a direct consequence of the COVID-19 pandemic is a lease modification, and the amounts recognized in profit or loss as a result of applying this exemption should be disclosed. The amendments should be applied for annual periods beginning on or after June 1, 2020, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments to Korean IFRS 1109 Financial Instruments, Korean IFRS 1039 Financial Instruments: Recognition and Measurement, Korean IFRS 1107 Financial Instruments: Disclosure, Korean IFRS 1104 Insurance Contracts and Korean IFRS 1116 Lease : Interest Rate Benchmark Reform

In relation to interest rate benchmark reform, the amendments provide exceptions including adjust effective interest rate instead of book amounts when interest rate benchmark of financial instruments at amortized costs is replaced, and apply hedge accounting without discontinuance although the interest rate benchmark is replaced in hedging relationship. The amendments should be applied for annual periods beginning on or after January 1, 2021, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments to Korean IFRS 1103 Business Combination : Reference to the Conceptual Framework

The amendments update a reference of definition of assets and liabilities qualify for recognition in revised Conceptual Framework for Financial Reporting. However, the amendments add an exception for the recognition of liabilities and contingent liabilities within the scope of Korea IFRS 1037 Provisions, Contingent Liabilities and Contingent Assets, and Korean IFRS 2121 Levies. The amendments also confirm that contingent assets should not be recognized at the acquisition date. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments to Korean IFRS 1016 Property, Plant and Equipment : Proceeds before intended use

The amendments prohibit an entity from deducting from the cost of an item of property, plant and equipment any proceeds from selling items produced while the entity is preparing the asset for its intended use. Instead, the entity will recognize the proceeds from selling such items, and the costs of producing those items, in profit or loss. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Amendments to Korean IFRS 1037 Provisions, Contingent Liabilities and Contingent Assets : Onerous Contracts : Cost of Fulfilling a Contract

The amendments clarify that the direct costs of fulfilling a contract include both the incremental costs of fulfilling the contract and an allocation of other costs directly related to fulfilling contracts when assessing whether the contract is onerous. The amendments should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Annual improvements to Korean IFRS 2018-2020

Doosan Infracore Co., Ltd. and Subsidiaries

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Annual improvements of Korean IFRS 2018-2020 Cycle should be applied for annual periods beginning on or after January 1, 2022, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

- Korean IFRS 1101 *First time Adoption of Korean International Financial Reporting Standards* – Subsidiaries that are first-time adopters
- Korean IFRS 1109 *Financial Instruments* – Fees related to the 10% test for derecognition of financial liabilities
- Korean IFRS 1116 *Leases* – Lease incentives
- Korean IFRS 1041 *Agriculture* – Measuring fair value

- Amendments to Korean IFRS 1001 *Presentation of Financial Statements : Classification of Liabilities as Current or Non-current*

The amendments clarify that liabilities are classified as either current or non-current, depending on the substantive rights that exist at the end of the reporting period. Classification is unaffected by the likelihood that an entity will exercise right to defer settlement of the liability or the expectations of management. Also, the settlement of liability include the transfer of the entity's own equity instruments, however, it would be excluded if an option to settle them by the entity's own equity instruments if compound financial instruments is met the definition of equity instruments and recognized separately from the liability. The amendments should be applied for annual periods beginning on or after January 1, 2023, and earlier application is permitted. The Group does not expect that these amendments have a significant impact on the financial statements.

2.2 Consolidation

The Group has prepared the consolidated financial statements in accordance with Korean IFRS 1110 *Consolidated Financial Statements*.

1) Subsidiaries

Subsidiaries are all entities over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power to direct the activities of the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the Group. They are deconsolidated from the date that control ceases.

Subsidiaries are fully consolidated from the date on which control is transferred to the Group. They are deconsolidated from the date that control ceases.

The acquisition method of accounting is used to account for business combinations by the Group. The consideration transferred is measured at the fair values of the assets transferred, and identifiable assets acquired and liabilities and contingent liabilities assumed in a business combination are measured initially at their fair values at the acquisition date. The Group recognizes any non-controlling interest in the acquired entity on an acquisition-by-acquisition basis either at fair value or at the non-controlling interest's proportionate share of the acquired entity's net identifiable assets. All other non-controlling interests are measured at fair values, unless otherwise required by other standards. Acquisition-related costs are expensed as incurred.

The excess of consideration transferred, amount of any non-controlling interest in the acquired entity and acquisition-date fair value of any previous equity interest in the acquired entity over the fair value of the net identifiable assets acquired is recorded as goodwill. If those amounts are less than the fair value of the net identifiable assets of the business acquired, the difference is recognized directly in the profit or loss as a bargain purchase.

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Intercompany transactions, balances and unrealized gains on transactions between group companies are eliminated. Accounting policies of subsidiaries have been changed where necessary to ensure consistency with the policies adopted by the Group.

The Group treats transactions with non-controlling interests that do not result in a loss of control as transactions with equity owners of the Group. A change in ownership interest results in an adjustment between the carrying amounts of the controlling and non-controlling interest to reflect their relative interest in the subsidiary. Any difference between the amount of the adjustment to non-controlling interest and any consideration paid or received is recognized in a separate reserve within equity attributable to owners of the Parent Company. When the Group ceases to consolidate for a subsidiary because of a loss of control, any retained interest in the subsidiary is remeasured to its fair value with the change in carrying amount recognized in profit or loss.

2) Investments in Associates and Joint Ventures

Associates are entities over which the Group has significant influence but not control or joint control, where the Group in general holds 20% or more and 50% or less of the voting rights. Investments in joint ventures are investees sharing control over its economic activities with the Group based on a contractual agreement. The contractually agreed sharing of control of an arrangement only exists when financial and operating policy decisions of the investee require the unanimous consent of the parties sharing control.

Investments in associates and joint ventures (collectively referred to as the "associates, etc.") are accounted for using the equity method of accounting, after initially being recognized at cost. The carrying amount of the investments contains the goodwill identified on initial recognition and is presented at the amount less accumulated impairment losses.

The Group's proportionate interest of the investee's profit or loss and changes in other comprehensive income after the date of acquisition is respectively recognized in the Group's profit or loss and other comprehensive income. Cumulative changes after acquisition are adjusted from the carrying amount of the investment. If the Group's share of losses of the associates, etc. is greater than or equal to the investment in the associate, etc., including other unsecured notes, the Group discontinues to recognize further losses, except where it is obligated or required to be paid on behalf of the associates, etc. If there is an objective evidence of impairment for the investment in the associate, the Group recognizes the difference between the recoverable amount of the associate and its book amount as impairment loss. If an associate uses accounting policies other than those of the Group for like transactions and events in similar circumstances, if necessary, adjustments shall be made to make the associate's accounting policies conform to those of the Group when the associate's financial statements are used by the Group in applying the equity method.

Unrealized gains on transactions between the Group and its associates, etc. are eliminated to the extent of the Group's interest in the associates. If there is an objective evidence of impairment for the investment in the associate, the Group recognizes the difference between the recoverable amount of the associate and its book amount as impairment loss.

Accounting policies of associate, etc. are changed if necessary for consistency with those of the Group.

For overseas investees whose financial statements are prepared in foreign currencies, the equity method is applied to financial statements translated in accordance with the accounting treatments of the translation of the financial statements of overseas subsidiaries. The amount of difference between the translated amount of assets less liabilities and translated amount of equity is recognized as changes in the investee's equity (accumulated other comprehensive income) to the extent equivalent to the Group's interest.

Doosan Infracore Co., Ltd. and Subsidiaries

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2.3 Foreign Currency Translation

1) Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which each entity operates (the "functional currency"). The consolidated financial statements are presented in Korean won, which is the Parent Company's functional and presentation currency.

2) Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities denominated in foreign currencies at year end exchange rates are generally recognized in profit or loss. They are deferred in other comprehensive income if they relate to qualifying cash flow hedges and qualifying effective portion of net investment hedges, or are attributable to monetary part of the net investment in a foreign operation.

Foreign exchange gains and losses that relate to borrowings are presented in the statement of profit or loss, within finance costs. All other foreign exchange gains and losses are presented in the statement of profit or loss within 'other income or other expenses'.

Non-monetary items that are measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined. Translation differences on assets and liabilities carried at fair value are reported as part of the fair value gain or loss. For example, translation differences on non-monetary assets and liabilities such as equities held at fair value through profit or loss are recognized in profit or loss as part of the fair value gain or loss and translation differences on non-monetary assets such as equities held at fair value through other comprehensive income are recognized in other comprehensive income.

3) Translation to the presentation currency

The results and financial position of foreign operations that have a functional currency different from the presentation currency are translated into the presentation currency as follows:

- ① Assets and liabilities for each statement of financial position presented are translated at the closing rate at the end of the reporting period.
- ② Income and expenses for each statement of profit or loss are translated at average exchange rates, unless this average is not reasonable approximation of the cumulative effect of the rates prevailing on the transaction dates, in which case income and expenses are translated at the rates on the dates of the transactions.
- ③ All resulting exchange differences are recognized in other comprehensive income.

Exchange differences from the net investment in the foreign operation and from borrowings and other foreign currency instruments designated as hedging instrument for such investment are recognized in other comprehensive income. On disposal of part or all foreign operation, which leads to the loss of control, all of the accumulated exchange differences in respect of that operation are reclassified to profit or loss. Goodwill and fair value adjustments arising from the acquisition of a foreign operation are recognized as assets and liabilities of the foreign operation and translated at the closing exchange rate.

Doosan Infracore Co., Ltd. and Subsidiaries

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2.4 Cash and Cash Equivalents

Cash and cash equivalents include cash on hand, bank deposits, and other short-term highly liquid investments that are readily convertible to a known amount of cash. Bank overdraft is classified as short-term borrowings in the consolidated statements of financial position.

2.5 Financial Assets

1) Classification

The Group classifies its financial assets in the following measurement categories:

- those to be measured at fair value through profit or loss
- those to be measured at fair value through other comprehensive income, and
- those to be measured at amortized cost.

The classification depends on the Group's business model for managing the financial assets and the contractual terms of the cash flows. For financial assets measured at fair value, gains and losses will either be recorded in profit or loss or other comprehensive income. For investments in debt instruments, this will depend on the business model in which the investment is held. The Group reclassifies debt investments when, and only when its business model for managing those assets changes.

For investments in equity instruments that are not held for trading, this will depend on whether the Group has made an irrevocable election at the time of initial recognition to account for the equity investment at fair value through other comprehensive income. The changes of fair value of equity investments that are not designated under the fair value option are recorded through profit or loss.

2) Recognition and Measurement

At initial recognition, the Group 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 that are directly attributable to the acquisition of the financial asset. Transaction costs of financial assets carried at fair value through profit or loss are expensed in profit or loss. Financial assets with embedded derivatives are considered in their entirety when determining whether their cash flows are solely payment of principal and interest.

① Debt instruments

Subsequent measurement of debt instruments depends on the Group's business model for managing the asset and the cash flow characteristics of the asset. The Group classifies its debt instruments into one of the following three measurement categories.

(a) Amortized cost

Assets that are held for collection of contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortized cost. A gain or loss on a debt investment that is subsequently measured at amortized cost and is not part of a hedging relationship is recognized in profit or loss when the asset is derecognized or impaired. Interest income from these financial assets is included in 'finance income' using the effective interest rate method.

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(b) Fair value through other comprehensive income

Assets that are held for collection of contractual cash flows and for selling the financial assets, where the assets' cash flows represent solely payments of principal and interest, are measured at fair value through other comprehensive income. Movements in the carrying amount are taken through other comprehensive income, except for the recognition of impairment loss (reversal of impairment loss), interest income and foreign exchange gains and losses which are recognized in profit or loss. When the financial asset is derecognized, the cumulative gain or loss previously recognized in other comprehensive income is reclassified from equity to profit or loss. Interest income from these financial assets is included in 'finance income' using the effective interest rate method. Foreign exchange gains and losses are presented in 'financial income or expenses' and impairment losses are presented in 'other expenses'.

(c) Fair value through profit or loss

Assets that do not meet the criteria for amortized cost or fair value through other comprehensive income are measured at fair value through profit or loss. A gain or loss on a debt investment that is subsequently measured at fair value through profit or loss and is not part of a hedging relationship is recognized in profit or loss and presented net in the statement of profit or loss within 'other income or expenses' in the year in which it arises.

② Equity instruments

The Group subsequently measures all equity investments at fair value. Where the Group's management has elected to present fair value gains and losses on equity investments, which held for long-term investment or strategic purpose, in other comprehensive income, there is no subsequent reclassification of fair value gains and losses to profit or loss following the derecognition of the investment. Dividend income from such investments continue to be recognized in profit or loss as 'finance income' when the right to receive payments is established.

Changes in the fair value of financial assets at fair value through profit or loss are recognized in 'other income and expenses' in the statement of profit or loss as applicable. Impairment loss (reversal of impairment loss) on equity investments measured at fair value through other comprehensive income are not reported separately from other changes in fair value.

3) Impairment

The Group assesses on a forward-looking basis the expected credit losses associated with its debt instruments carried at amortized cost and fair value through other comprehensive income. The impairment methodology applied depends on whether there has been a significant increase in credit risk. For trade receivables and lease receivables, the Group applies the simplified approach, which requires expected lifetime credit losses to be recognized from initial recognition of the receivables.

4) Derecognition

Regular way purchases and sales of financial assets are recognized or derecognized on trade-date, the date on which the Group commits to purchase or sell the asset. Financial assets are derecognized when the rights to receive cash flows from the financial assets have expired or have been transferred and the Group has transferred substantially all the risks and rewards of ownership.

If a transfer does not result in derecognition because the Group has retained substantially all the risks and rewards of ownership of the transferred asset, the Group continues to recognize the transferred asset in its entirety and recognizes a financial liability for the consideration received. The Group classified the financial liability as "borrowings" in the statement of financial position.

5) Offsetting of financial instruments

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Financial assets and liabilities are offset and the net amount reported in the statement of financial position where there is a legally enforceable right to offset the recognized amounts and there is an intention to settle on a net basis or realize the assets and settle the liability simultaneously. The legally enforceable right must not be contingent on future events and must be enforceable in the normal course of business and in the event of default, insolvency or bankruptcy of the Group or the counterparty.

2.6 Financial Liabilities

1) Classification and measurement

The Group's financial liabilities at fair value through profit or loss are financial instruments held for trading. A financial liability is held for trading if it is incurred principally for the purpose of repurchasing in the near term. A derivative that is not a designated as hedging instruments and an embedded derivative that is separated are also classified as other financial liabilities.

The Group classifies non-derivative financial liabilities, except for financial liabilities at fair value through profit or loss, financial guarantee contracts and financial liabilities that arise when a transfer of financial assets does not qualify for derecognition, as financial liabilities carried at amortized cost and present as 'trade and other payables', and 'borrowings' in the statement of financial position.

2) Derecognition

Financial liabilities are removed from the statement of financial position when it is extinguished; for example, when the obligation specified in the contract is discharged or cancelled or expired or when the terms of an existing financial liability are substantially modified. The difference between the carrying amount of a financial liability extinguished or transferred to another party and the consideration paid (including any non-cash assets transferred or liabilities assumed) is recognized in profit or loss.

3) Financial guarantee contract liabilities

Financial guarantee contracts are contracts that require the issuer to make specified payments to reimburse the holder for a loss incurred because a specified debtor fails to make payments when due in accordance with the terms of debt instruments.

Financial guarantee contract liabilities are initially measured at their fair values and, if not designated as at fair value through profit or loss, are subsequently measured at the higher of:

- ① the amount determined in accordance with the expected credit loss model under Korean IFRS 1109 *Financial Instruments* and
- ② the amount initially recognized less, where appropriate, the cumulative amount of income recognized in accordance with Korean IFRS 1115 *Revenue from Contracts with Customers*

2.7 Compound Financial Instruments

The liability component and equity component of compound financial instruments issued by the Group are separately classified based on the substance of the contractual terms. The compound financial instruments issued by the Group are classified and presented separately as the financial liability component and equity conversion option which can be converted into equity instruments at the option of the holder. The liability component of the compound instruments is recognized initially at the fair value of a similar bond that does not have an equity conversion option, and subsequently recognized at amortized cost by applying the effective interest rate until extinguished on conversion or maturity of the bonds. The equity component is determined by deducting the amount of the liability component from the fair value of the compound instrument as a whole. This is recognized and included in equity,

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net of income tax effects, and is not subsequently remeasured. If it is classified not as equity component but as derivatives, it is regarded as embedded derivatives estimated at the fair value of the same derivatives or calculated from a reasonable valuation model. The subsequent gains or losses arising from its fair value fluctuation are recognized in profit or loss.

2.8 Trade Receivables

Trade receivables are amounts owed by customer for products and services provided in the ordinary course of business. Receivables expected to be collected within one year are classified as current assets. Otherwise, they are classified as non-current assets. Trade receivables are initially measured at fair value and are presented as net of allowance for doubtful accounts, estimated on an individual basis based on past bad debt experience.

2.9 Inventories

Inventories are stated at the lower of cost or net realizable value. Cost of inventories includes fixed and variable manufacturing overheads allocated to inventories by the most appropriate method of each category. The cost of inventories is determined by the gross average method (the specific identification method for materials in transit). And during the year, perpetual inventory systems are used to value inventories, which are adjusted to physical inventory counts performed at the end of the year.

The Group periodically reviews changes in net realizable value of inventories (current replacement cost for raw materials) due to damage, obsolescence, decline in selling prices and others and recognizes loss on inventory valuation. Loss on inventory valuation is charged to cost of sales when it is ordinary and to other non-operating expense when it is extraordinary. When the previous circumstances that caused the loss on inventory valuation no longer exist and the new market value of inventories subsequently exceeds the carrying amount, the valuation loss is reversed to the extent not exceeding the initial carrying amount, and the reversal is deducted from cost of sales.

2.10 Property, Plant and Equipment

Property, plant and equipment are stated at cost, less subsequent accumulated depreciation and accumulated impairment losses except for lands to which the revaluation model is applied. When useful life of a certain part of property, plant and equipment is different compared to that of the whole asset, such part is recognized as a separate asset. The historical cost includes expenditure that is directly attributable to the acquisition of the item, including estimated costs of dismantling, removing or restoring the assets at the end of the expected useful life.

Subsequent costs, incurred to replace a part of previously recognized item of property, plant and equipment, are added to the carrying amount of an asset, or recognized as a separate asset, if it is probable that future economic benefits associated with the assets will flow into the Group and the cost of an asset can be measured reliably. In such cases, the carrying amount of what was replaced is derecognized accordingly. Routine maintenance and repairs are expensed as incurred through profit or loss.

Depreciation of all property, plant and equipment, except for land, is calculated using the straight-line method, which reflects the best estimate of the expected consumption pattern of future economic benefits inherent in the asset, to allocate their cost, net of their residual values.

The Group depreciates property, plant and equipment with a limited useful life over the following periods:

	Estimated useful life (years)
Buildings	20 – 40

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	Estimated useful life (years)
Structures	10 – 20
Machinery	3 – 15
Vehicles	3 – 10
Tools	3 – 10
Office equipment	3 – 14

If a part of a property, plant and equipment has a cost that is significant in relation to the total cost of property, plant and equipment, it is depreciated separately.

The Group reviews the depreciation method, the estimated useful lives and residual values of property, plant and equipment at the end of each annual reporting period. If expectations differ from previous estimates, the changes are accounted for as a change in an accounting estimate.

When the carrying amount of property, plant and equipment is higher than the recoverable amount, the carrying amount is adjusted to the recoverable amount and the difference is recognized as an impairment loss. Meanwhile, when the recoverable amount subsequently exceeds the carrying amount of the impaired asset, the excess is recorded as a reversal of impairment loss to the extent that the reversed asset does not exceed the carrying amount before the previous impairment, as adjusted by depreciation. Upon derecognition of a property, plant and equipment, the difference between the net disposal amount and carrying amount of the item is recognized as other non-operating income or expense.

2.11 Intangible Assets

Intangible assets are initially measured at cost and are carried at cost, less accumulated amortization and accumulated impairment losses. Subsequent expenditure on an intangible asset is capitalized only when it is probable that the expected future economic benefits that are attributable to the asset will increase.

Intangible assets, except for goodwill and those with indefinite useful lives, are amortized using the straight-line method with no residual value, with amortization beginning when the asset is available for use, over their estimated useful lives as follows. However, Membership rights that have an indefinite useful life are not subject to amortization because there is no foreseeable limit to the period over which the assets are expected to be utilized. Instead of being amortized they are tested for impairment in each reporting period.

	Estimated useful life (years)
Industrial rights	5 – 10
Development costs	3 – 12
Other intangible assets	3 – 7

Goodwill acquired through business combinations refers to the consideration paid in excess of the fair value of the Group's share of the identifiable net assets of the subsidiary on the date of acquisition. Goodwill recognized from the acquisition of certain subsidiary, is classified as intangible assets. Goodwill is tested for impairment annually and carried at the historical cost at the date of business acquisition, less accumulated impairment losses. Impairment loss recognized for goodwill is not reversed. For the purpose of impairment testing, goodwill is allocated to each of the Group's cash-generating units (or groups of cash-generating units) that is expected to benefit from the synergies of the combination.

Expenditures relating to development activities are capitalized when the results of development plan were for new product developments or substantial improvement of functions of existing products, there is technical and commercial feasibility of completing the development and the Group has the

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ability to measure the expenditures attributable to the development with reliability. Capitalized development costs include expenditure on materials, salaries and related overhead cost that is reasonably allocated. Capitalized development costs are presented at the acquisition cost, less accumulated amortization and accumulated impairment losses. Capitalized development costs are amortized using the straight-line method over the estimated useful life and amortization expenses are included in cost of goods and selling and administrative expenses. The expenditure on research and development, which does not meet conditions noted above, is expensed through profit or loss when it is incurred.

The estimated useful life and amortization method for intangible assets with finite useful lives are reviewed at the end of each reporting period. For intangible assets with indefinite useful life, assessment is revisited each period, with the effect of any changes in estimate being accounted for as a change in accounting estimate.

2.12 Investment Property

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

The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for as a change in accounting estimate.

2.13 Borrowing Costs

Borrowing costs that are directly attributable to the acquisition, construction or production of a qualifying asset are capitalized during the period of time that is required to complete and prepare the asset for its intended use. Other borrowing costs are expensed in the period in which they are incurred.

2.14 Impairment of Non-financial Assets

Goodwill and intangible assets that have an indefinite useful life are not subject to amortization and are tested annually for impairment. Other assets are tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognized for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs of disposal and value in use. For the purposes of impairment test, assets are grouped at the lowest levels which separately generates identifiable cash flows (cash-generating units). Non-financial assets other than goodwill that suffered an impairment are reviewed for possible reversal of the impairment at the end of each reporting period.

2.15 Trade and Other Payables

These amounts represent liabilities for goods and services provided to the Group prior to the end of reporting period which are unpaid. Trade and other payables are presented as current liabilities, unless payment is not due within 12 months after the reporting period. They are recognized initially at their fair value and subsequently measured at amortized cost using the effective interest method.

2.16 Borrowings

Borrowings are measured initially at fair value, net of transaction costs and subsequently at amortized cost using the effective interest method, with interest expense being recognized on an effective yield

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basis. The difference between the amount received and the redemption amount is amortized using the effective interest method and recognized in profit or loss. Borrowings are classified as non-current liabilities when the Group has an unconditional right to defer settlement of the liability for at least 12 months after the end of the reporting period. Otherwise, borrowings are classified as current liabilities.

2.17 Post-employment benefits

The Group operates both defined contribution and defined benefit pension plans.

A defined benefit plan is a pension plan that is not a defined contribution plan. Generally, post-employment benefits are payable after the completion of employment, and the benefit amount depended on the employee's age, periods of service or salary levels. The liability recognized in the statement of financial position in respect of defined benefit pension plans is the present value of the defined benefit obligation at the end of the reporting period less the fair value of plan assets. The defined benefit obligation is calculated annually by independent actuaries using the projected unit credit method. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using interest rates of high-quality corporate bonds that are denominated in the currency in which the benefits will be paid, and that have terms approximating to the terms of the related obligation. Remeasurement gains and losses arising from experience adjustments and changes in actuarial assumptions are recognized in the period in which they occur, directly in other comprehensive income. Changes in the present value of the defined benefit obligation resulting from plan amendments or curtailments are recognized immediately in profit or loss as past service costs.

Contributions to defined contribution plans are recognized as an expense when employees have rendered service that entitles them to the contributions.

2.18 Provisions and Contingent Liability

Provisions are recognized when 1) the Group has a present obligation (legal or constructive) as a result of a past event, 2) it is probable that the Group will be required to settle the obligation 3) and a reliable estimate can be made for the amount of the obligation. The amount of the provision is measured as present value of the prospective cash flows estimated to settle the present obligation when the difference between the face value and present value is material. At the end of each reporting period, the remaining provision balance is reviewed and assessed to determine whether the current best estimate is being recognized. The increase in provision due to passage of time is recognized as interest expense. If the existence of an obligation to transfer economic benefit is no longer probable, the related provision is reversed during the period. When some or all of the economic benefits required to settle a provision are expected to be recovered from a third party, a receivable is recognized as an asset if it is virtually certain that reimbursement will be received and the amount of the receivable can be measured reliably. In this case, profit from reimbursement is offset against the expense incurred in the recognition of provision through profit or loss.

2.19 Derivative Instruments

Derivatives are initially recognized at fair value on the date when a derivative contract is entered into and are subsequently remeasured at their fair value at the end of each reporting period. Changes in the fair value of any derivative instrument that does not qualify for hedge accounting are recognized immediately in profit or loss within 'other non-operating income (expenses)' or 'finance income (costs)' based on the nature of transactions.

- hedges of the fair value of recognized assets or liabilities or a firm commitment (fair value hedges)
- hedges of a particular risk associated with the cash flows of recognized assets and liabilities and highly probable forecast transactions (cash flow hedges), or

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- hedges of a net investment in a foreign operation (net investment hedges)

At inception of the hedge relationship, the Group documents the economic relationship between hedging instruments and hedged items including whether changes in the cash flows of the hedging instruments are expected to offset changes in the cash flows of hedged items.

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 more than 12 months; it is classified as a current asset or liability when the remaining maturity of the hedged item is less than 12 months. A non-derivative financial asset and a non-derivative financial liability is classified as a current or non-current based on its expected maturity and its settlement, respectively.

2.20 Dividend

Dividend payable is recognized as liability when declaration of the dividend is approved at the shareholders' meeting.

2.21 Share-based Payment Arrangement

The Group recognizes share options granted to employees at the fair value at the grant date. The fair value determined at the grant date of the share option is expensed on a straight-line basis over the vesting period, reflecting the expected rate of the share option's right extinction.

2.22 Revenue Recognition

In accordance with K-IFRS 1115, the Group recognizes revenue from all types of the contracts by using the five-step revenue recognition model. The five-step revenue recognition model is as follows:

- Identify contracts with customers
- Identify the separate performance obligation
- Determine the transaction price of the contract
- Allocate the transaction price to each of the separate performance obligations, and
- Recognize the revenue as each performance obligation is satisfied.

(1) Identify the separate performance obligation

The Group generally separates contracts to recognize revenue from service rendered, apart from sales of goods or products. The Group determines standard warranty coverage periods per product and country considering warranty periods required by law and others when entering into contracts with customers for the sales of products. If the Group provides an extended warranty beyond the standard warranty coverage period or a customer has the option to purchase an additional warranty separately, the warranty is considered as a separate performance obligation when revenue is recognized.

(2) Performance obligation recognized at once

Revenue on sales of goods is recognized when the products have been delivered to the customer. Delivery does not occur until the products have been shipped to the specified location, the risks of obsolescence and loss have been transferred to the customer, and the customer has accepted the products in accordance with the sales contract or the acceptance provisions have lapsed or the Group has objective evidences that all criteria for acceptance have been satisfied.

(3) Sales with a right of return

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In accordance with K-IFRS 1115, the Group estimates an amount of variable consideration by using the expected value which the Group expects to better predict the amount of consideration. The Group recognizes revenue with transaction price including variable consideration only to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the refund period has lapsed. The refund liability is measured at the amount of consideration received for which the Group does not expect to be entitled.

2.23 Government Grants

Grants from the government are recognized at their fair value where there is a reasonable assurance that the grant will be received and the Group will comply with all attached conditions. Government grants related to assets are presented in the statement of financial position by deducting the grant in arriving at the carrying amount of the asset, and government grants related to income are deferred and later deducted from the related expense.

2.24 Current and Deferred Tax

The tax expense for the period consists of current and deferred tax. Current and deferred tax is recognized in profit or loss, except to the extent that it relates to items recognized in other comprehensive income or directly in equity. In this case, the tax is also recognized in other comprehensive income or directly in equity, respectively.

The current income tax expense is measured at the amount expected to be paid to the taxation authorities, using the tax rates (and tax laws) that have been enacted or substantively enacted by the end of the reporting period. Management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation. The Group recognizes current income tax on the basis of amounts expected to be paid to the tax authorities.

Deferred income tax is provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. However, deferred income tax is not accounted for if it arises from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither accounting profit nor taxable profit or loss.

Deferred tax assets are recognized only if it is probable that future taxable amounts will be available to utilize those temporary differences and losses.

The Group recognizes a deferred tax liability all taxable temporary differences associated with investments in subsidiaries, associates, and interests in joint arrangements, except to the extent that the Group is able to control the timing of the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. In addition, The Group recognizes a deferred tax asset for all deductible temporary differences arising from such investments to the extent that it is probable the temporary difference will reverse in the foreseeable future and taxable profit will be available against which the temporary difference can be utilized.

Deferred tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets and liabilities and when the deferred tax balances relate to the same taxation authority. Current tax assets and tax liabilities are offset when the Group has a legally enforceable right to offset and intends either to settle on a net basis, or to realize the assets and settle the liability simultaneously.

2.25 Earnings per Share

Basic earnings per common share are computed by dividing net income attributable to owners of the Group by the weighted-average number of common shares outstanding during the period. Diluted earnings per common share are computed by dividing diluted net income attributable to the owners of the Group, which is adjusted by adding back the after-tax amount of expenses related to dilutive

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potential ordinary shares, by weighted-average number of common shares and dilutive potential ordinary shares outstanding during the period. Anti-dilutive potential ordinary shares are disregarded in the calculation of diluted earnings per share.

2.26 Assets Held for sale

Non-current assets (or disposal group) are classified as held for sale when their carrying amount will be recovered principally through a sale transaction rather than through continuing use and a sale is considered highly probable. The assets are measured at the lower amount between their carrying amount and the fair value less costs to sell.

Non-current assets that are classified either as held for sale or as a part of a disposal group classified as held for sale are not depreciated (or amortized). If the fair value, less costs to sell, of the non-current assets, or disposal groups, held for sale decreases, impairment loss is recognized immediately through profit or loss. When it increases subsequently, the gain is recognized at the amount not exceeding the accumulated impairment loss.

2.27 Lease

Lessor accounting under Korean IFRS 1116

Lease income from operating leases where the Group is a lessor is recognized in income on a straight-line basis over the lease term. Initial direct costs incurred in obtaining an operating lease are added to the carrying amount of the underlying asset and recognized as expense over the lease term on the same basis as lease income. The respective leased assets are included in the statement of financial position based on their nature.

Lessee accounting under Korean IFRS 1116

Contracts may contain both lease and non-lease components. The Group allocates the consideration in the contract to the lease and non-lease components based on their relative stand-alone prices. However, for leases of real estate for which the Group is lessee, the Group applies the practical expedient which has elected not to separate lease and non-lease components and instead accounts for these as a single lease component.

Lease terms are negotiated on an individual basis and contain a wide range of different terms and conditions. The lease agreements do not impose any covenants, but leased assets may not be used as security for borrowing purposes.

The Group determines the lease term as the non-cancellable period of a lease, together with both (a) periods covered by an option to extend the lease if the lessee is reasonably certain to exercise that option; and (b) periods covered by an option to terminate the lease if the lessee is reasonably certain not to exercise that option. When the lessee and the lessor each has the right to terminate the lease without permission from the other party, the Group should consider a termination penalty in determining the period for which the contract is enforceable.

Assets and liabilities arising from a lease are initially measured on a present value basis. Lease liabilities include the net present value of the following lease payments:

- Fixed payments (including in-substance fixed payments), less any lease incentives receivable
- Variable lease payment that are based on an index or a rate, initially measured using the index or rate as at the commencement date
- Amounts expected to be payable by the Group (the lessee) under residual value guarantees

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- The exercise price of a purchase option if the Group (the lessee) is reasonably certain to exercise that option, and
- Payments of penalties for terminating the lease, if the lease term reflects the Group (the lessee) exercising that option

Also, lease liabilities are measured including lease payments to be paid in accordance with an extension option which is reasonably certain to exercise.

The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be determined, the lessee's incremental borrowing rate is used, being the rate that the lessee would have to pay to borrow the funds necessary to obtain an asset of similar value in a similar economic environment with similar terms and conditions.

The Group is exposed to potential future increases in variable lease payments based on an index or rate, which are not included in the lease liability until they take effect. When adjustments to lease payments based on an index or rate take effect, the lease liability is reassessed and adjusted against the right-of-use asset.

Each lease payment is allocated between the liability and finance cost. The finance cost is charged to profit or loss over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period.

Right-of-use assets are measured at cost comprising the following:

- the amount of the initial measurement of lease liability
- any lease payments made at or before the commencement date less any lease incentives received
- any initial direct costs, and
- restoration costs

The right-of-use asset is depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis. If the Group is reasonably certain to exercise a purchase option, the right-of-use asset is depreciated over the underlying asset's useful life. Although the Group elected to apply the revaluation model to its land and buildings that are presented in property, plant and equipment, the Group elected not to apply that revaluation model to buildings held by the Group that are presented in the right-of-use assets.

Payments associated with short-term leases and leases of low-value assets are recognized on a straight-line basis as an expense in profit or loss.

2.28 Segment Reporting

Information of each operating segment is reported in a manner consistent with the internal business segment reporting provided to the chief operating decision-maker. The chief operating decision-maker is responsible for allocating resources and assessing performance of the operating segments.

2.29 Accounting Treatment Related to the Emission Rights Cap and Trade Scheme

The Group classifies the emission rights as intangible assets. The allowance received free of charge from the government are measured at zero, while those purchased are measured at acquisition cost. Also, if the emission rights granted free of charge by the government in relation to certain implementation year are sufficient to fulfill the obligation under the emission liability of current period, the emission liability is measured as zero. However, if there is a shortage, Emissions obligations are

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measured as the sum of the carrying amount of the allocated allowances that will be the best estimate of expenditure required to settle the obligation at the end of reporting period for any excess emission.

2.30 Approval of Issuance of the Financial Statements

The consolidated financial statements 2020 were approved for issue by the Board of Directors on February 8, 2021 and are subject to change with the approval of shareholders at their Annual General Meeting on March 25, 2021.

3. Critical Accounting Estimates and Assumptions

The preparation of the consolidated financial statements requires the Group to make estimates and assumptions concerning the future. Management also needs to exercise judgement in applying the Group's accounting policies. Estimates and assumptions are continually evaluated and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances. As the resulting accounting estimates will, by definition, seldom equal the related actual results, it can contain a significant risk of causing a material adjustment.

The estimates and assumptions 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. Additional information of significant judgement and assumptions of certain items are included in relevant notes.

(1) Impact of Coronavirus disease 2019 ("COVID-19")

In order to prevent the spread of COVID-19 during 2020, a variety of prevention and control measures, including movement restrictions, are being implemented worldwide. As a result, the global economy is being affected extensively. Also, various forms of government support policies have been announced to cope with COVID-19. The impact of COVID-19 and government support policies were not reflected in the consolidated financial statements because the impact on the estimates of variable consideration, the recoverability of accounts receivables and the recognition of provisions cannot be reasonably estimated due to uncertainties remained as at December 31, 2020.

(2) Provisions for product warranty

The Group provides warranty for products when the related revenue is recognized. At the end of each reporting period, provisions are recorded at the best estimated costs to settle current and future warranty obligations. The Group continuously introduces new products using advanced complex technology, and accordingly, these estimates may change in future due to additional provisions required under local legislation and practice.

(3) Impairment of goodwill

The Group performs test for goodwill impairment testing annually. Recoverable amount of cash-generating units is based on calculation of value in use. The value-in-use calculation requires accounting estimates.

(4) Allowance for doubtful accounts of receivables

In order to calculate the impairment of receivables, the management of the Group estimates an expected bad debt considering the aging of receivables, past experience of bad debt and economic and industrial factors.

(5) Impairment of capitalized development cost

The Group performs an assessment for impairment of capitalized development costs at the end of each reporting period by reviewing project's business forecast, technical feasibility and future

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economic benefit. The assessment on indication of impairment or calculation of recoverable amount of capitalized development costs involves management's estimates and judgments.

(6) Revenue recognition – Deductions from revenue

The Group offers its customers a variety of promotion and incentive programs and related costs are recognized as deductions from the revenue. Any unsettled amounts are recognized on an accrual basis. These liabilities related to revenue deductions are estimated based on historical experience and judgement of management when the related revenue is recognized. The Group's revenue is affected by these estimated revenue deductions.

4. Financial Risk Management

The purpose of the Group's financial risk management is to improve financial structure and efficiency of fund management to create stable and sustainable management performance even under various financial risks such as market risk, credit risk and liquidity risk.

Financial risk management activities are mainly managed by the finance department, and, in close cooperation with the relevant departments, the department is engaged in activities such as identification, valuation and hedging of financial risks, and focusing on minimizing the impact of financial risks through regular monitoring.

(1) Market Risk

1) Foreign exchange risk

The Group is exposed to foreign exchange risk as it makes international transactions in foreign currencies. Foreign exchange risk arises from forecast transactions, recognized assets and liabilities and net investments in foreign operations.

Foreign exchange risk is managed by the Group's Regulation on foreign currencies. The Group's basis for foreign currency management is to reduce the volatility of profit or loss. The Group reduces exposure to foreign exchange risk by matching the inflow and the outflow of foreign currencies (natural hedge), and manages foreign exchange risk by using currency derivatives, such as currency forwards, for the remaining exposures.

The Group's monetary assets and liabilities denominated in foreign currencies and exposed to foreign exchange risk as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	December 31, 2020				
	USD	EUR	CNY	Others ¹	Total
Financial assets	₩ 810,866	₩ 151,609	₩ 148,916	₩ 79,989	₩ 1,191,380
Financial liabilities	(604,309)	(141,391)	(20,126)	(39,509)	(805,335)
Net assets (liabilities)	₩ 206,557	₩ 10,218	₩ 128,790	₩ 40,480	₩ 386,045

(in millions of Korean won)

	December 31, 2019				
	USD	EUR	CNY	Others ¹	Total
Financial assets	₩ 634,955	₩ 219,002	₩ 123,919	₩ 131,976	₩ 1,109,852
Financial liabilities	(815,871)	(269,320)	(16,424)	(69,247)	(1,170,862)
Net assets (liabilities)	₩ (180,916)	₩ (50,318)	₩ 107,495	₩ 62,729	₩ (61,010)

¹ Others are assets and liabilities denominated in foreign currencies other than USD, EUR and CNY.

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A sensitivity analysis on the Group's profit before income tax, assuming a 10% increase and decrease in functional currency exchange rates (functional currency per foreign currency) of the respective entity holding the assets and liabilities, for the years ended December 31, 2020 and 2019, is as follows:

(in millions of Korean won)	2020		2019	
	10% increase in foreign exchange currency rate	10% decrease in foreign exchange currency rate	10% increase in foreign exchange currency rate	10% decrease in foreign exchange currency rate
Profit (loss) before income tax expense	₩ 38,605	₩ (38,605)	₩ (6,101)	₩ 6,101

2) Interest rate risk

The Group's interest rate risk is related to borrowings and bank deposits with floating interest rates, and the related interest income and expense are exposed to interest rate risk. Borrowings and bank deposits with fixed interest rates do not have influence on current profit or loss and equity due to the changes in market interest rates.

To manage the Group's interest rate risk in advance, the Group tries to minimize external borrowings by using internal funds, reducing borrowings with high interest rates, improving the structure of long-term and short-term borrowings, maintaining the appropriate balance between borrowings with floating interest rate, and fixed interest rate and regularly monitoring domestic and international interest rate changes with action plans.

Financial assets and liabilities with floating interest rates exposed to interest rate risk as at December 31, 2020 and 2019, is as follows:

(in millions of Korean won)	December 31, 2020		December 31, 2019	
Financial assets	₩ 142,046	₩ 67,876		
Financial liabilities	962,204	1,041,713		

The table below summarizes the impact of increases/decreases of interest rate on the Group's profit (loss) before income tax. The analysis is based on the assumption that the interest rate has increased/decreased by 100 basis points with all other variables held constant.

(in millions of Korean won)	2020		2019	
	100 bp increase	100 bp decrease	100 bp increase	100 bp decrease
Profit (loss) before income tax expense	₩ (8,202)	₩ 8,202	₩ (9,738)	₩ 9,738

3) Price risk

The Group is exposed to equity securities price risk arises from investments held by the Group that are classified either as at fair value in the consolidated statement of financial position.

(2) Credit Risk

Credit risk arises during the normal course of transactions and investing activities where customers or other parties are unable to comply with contractual obligations. The Group sets out and monitors credit limits for its customers and counterparts on a periodic basis considering financial conditions, historical experiences and other factors.

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Credit risk arises from cash and cash equivalents, derivatives and deposits with banks and financial institutions, as well as credit exposures to major customers, including receivables and definite term contracts.

Main objectives of credit risk management are to efficiently manage credit risk based on the Group's credit policies, to promptly support decision-making processes and to minimize financial losses through safeguarding receivables. Where default is expected for receivables that represents impairment indicators or are past due at the end of reporting period, the Group assesses related credit risk and reflects it on allowances in its consolidated statement of financial position.

- Exposure to credit risk

Maximum exposures of financial assets of the Group exposed to credit risk as at December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	December 31, 2020		December 31, 2019	
Cash and cash equivalents	₩	1,663,459	₩	756,173
Short-term and long-term financial instrument		140,523		145,852
Trade and other receivables		1,358,281		1,369,117
Long-term trade and other receivables		4,969		3,802
Deposits		42,256		42,150
Derivative assets		416		18,989
Short-term and long-term financial instrument (excluding equity securities) ¹		136,905		13,374
Total	₩	3,346,809	₩	2,349,457

¹ Some of the assets enhance the credit of other related parties (Note 35).

Aging analysis of the Group's receivables as at December 31, 2020 and 2019, is as follows:

<i>(in millions of Korean won)</i>		December 31, 2020						
	Individually impaired receivables	Receivables assessed for impairment on a collective basis					Total	
		Within due	0-3 months	3-6 months	6-12 months	Over 12 months		
Trade receivables	₩ 219,125	₩ 521,963	₩ 62,623	₩ 5,409	₩ 5,224	₩ 9,596	₩ 823,940	
Financial lease receivables	-	648,265	9,854	779	221	7,975	667,094	
Other receivables	36,205	41,261	31,982	73	112	16,489	126,122	
Accrued income	-	5,318	-	-	-	3	5,321	
Short-term loans	26,112	61	-	-	-	-	26,173	
Long-term trade receivables	-	4,961	-	-	-	45	5,006	
Long-term other receivables	4,148	-	-	-	-	-	4,148	
Total	₩ 285,590	₩ 1,221,829	₩ 104,459	₩ 6,261	₩ 5,557	₩ 34,108	₩ 1,657,804	
Loss allowance provision for trade receivables	₩ (202,008)	₩ (3,708)	₩ (559)	₩ (407)	₩ (958)	₩ (7,802)	₩ (215,442)	

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		December 31, 2019						
		Individually impaired receivables	Receivables assessed for impairment on a collective basis					Total
			Within due	0-3 months	3-6 months	6-12 months	Over 12 months	
Trade receivables	₩	315,651	₩ 599,361	₩ 82,375	₩ 9,425	₩ 4,773	₩ 12,783	₩ 1,024,368
Financial lease receivables		-	540,145	13,179	1,042	476	10,334	565,176
Other receivables		35,770	60,694	15,752	2,781	305	26,513	141,815
Accrued income		-	4,974	-	-	-	-	4,974
Short-term loans		15,113	155	-	-	-	-	15,268
Long-term trade receivables		-	3,669	-	-	-	-	3,669
Long-term other receivables		5,703	21	-	-	-	-	5,724
Long-term loans		-	171	-	-	-	-	171
Total	₩	372,237	₩ 1,209,190	₩ 111,306	₩ 13,248	₩ 5,554	₩ 49,630	₩ 1,761,165
Loss allowance provision for trade receivables	₩	(280,102)	₩ (2,405)	₩ (863)	₩ (1,229)	₩ (1,055)	₩ (9,345)	₩ (294,999)

Receivables with specific impairment indicators such as insolvency and bankruptcy are individually assessed using appropriate allowance rates. A group of financial assets with similar credit risk natures that are not individually significant is assessed on a collective basis based on aging analysis and the Group's historical experience on collection.

(3) Liquidity Risk

Liquidity risk represents the risk that the Group may encounter difficulties in fulfilling its obligations to repay financial liabilities or in being not able to have additional funding for its normal business operations due to liquidity shortage.

The Group prepares cash flow budgets for a three-month period as well as annual fiscal year to forecast cash flows from operating, investing and financing activities. Through these forecasts, the Group secures and maintains an appropriate level of liquidity volume and accordingly manages liquidity risk in advance.

Details of the Group's liquidity risk analysis as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

		December 31, 2020					
		Nominal cash flows					
Book amount		Total	Less than 1 year	Less than 2 year	Less than 5 year	More than 5 years	
Financial liabilities	₩ 6,018,717	₩ 6,298,294	₩ 3,408,752	₩ 1,365,549	₩ 1,507,388	₩ 16,605	

(in millions of Korean won)

		December 31, 2019					
		Nominal cash flows					
Book amount		Total	Less than 1 year	Less than 2 year	Less than 5 year	More than 5 years	
Financial liabilities	₩ 5,626,663	₩ 5,811,263	₩ 4,018,394	₩ 653,398	₩ 1,116,360	₩ 23,111	

The amounts of financial liabilities by remaining maturity included in above represent undiscounted contractual nominal cash flows (including interest expenses), assuming the earliest period in which the Group can be required to pay, and therefore differ from the financial liabilities recognized in the

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consolidated statements of financial position. In addition to the above financial liabilities, the maximum amount of the guarantee that can be borne by the Group's financial guarantee contracts as of the end of the reporting period is as follows in note 33.

(4) Capital Risk

The Group's objectives when managing capital are to safeguard the Group's ability to continue as a going concern, so the Group can continue to provide returns for shareholders and benefits for other stakeholders, and to maintain an optimal capital structure to reduce the cost of capital.

In order to maintain or adjust the capital structure, the Group may adjust the amount of dividends paid to shareholders, return capital to shareholders, issue new shares or sell assets to reduce debt. Consistent with others in the industry, the Group monitors capital on the basis of the gearing ratio. This ratio is calculated as total debt divided by total equity.

Gearing ratios as at December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	December 31, 2020		December 31, 2019	
Debt	₩	7,537,888	₩	7,071,041
Equity		4,488,999		4,267,552
Debt-to-equity ratio		167.92%		165.69%

5. Restricted Financial Instruments

Details of restricted financial instruments as at December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	December 31, 2020		December 31, 2019		Description
Short-term financial instruments	₩	55,497	₩	73,794	Win-win Growth Fund, Pledged for borrowings and others
Long-term financial instruments		583		620	Bank transaction deposits and others
Total	₩	56,080	₩	74,415	

6. Short-term and Long-term Investment Securities

(1) Short-term and long-term investment securities as at December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	December 31, 2020	
Short-term Investment securities:		
Financial Assets at Amortized Cost	₩	99,803
Financial assets at fair value through profit or loss		11,358
Subtotal	₩	111,161
Long-term Investment securities:		
Financial Assets at Amortized Cost	₩	15,332
Financial assets at fair value through other comprehensive income		936
Financial assets at fair value through profit or loss		24,180
Subtotal	₩	40,448

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December 31, 2019

Short-term Investment securities:

Financial Assets at Amortized Cost	₩	39
Financial assets at fair value through profit or loss		9,280
Subtotal	₩	9,319

Long-term Investment securities:

Financial Assets at Amortized Cost	₩	1,682
Financial assets at fair value through other comprehensive income		937
Financial assets at fair value through profit or loss		11,653
Subtotal	₩	14,272

(2) Short-term and long-term investment securities comprise the following investments at December 31, 2020 and 2019:

(in millions of Korean won)

December 31, 2020

Current Financial Assets at Amortized Cost:

Government bonds and public bonds	₩	23
Debt Securities		99,780
Subtotal	₩	99,803

Non-current Financial Assets at Amortized Cost:

Government bonds and public bonds	₩	77
Debt Securities		15,255
Subtotal	₩	15,332

Non-current Financial assets at fair value through other comprehensive income:

Investments in non-listed company	₩	936
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Current Financial assets at fair value through profit or loss:

Financial assets held for trading	₩	7,784
Beneficiary certificates		3,574
	₩	11,358

Non-current Financial assets at fair value through profit or loss:

Beneficiary certificates	₩	17,545
Investments in funds		651
Investments in non-listed company		5,984
Subtotal	₩	24,180

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December 31, 2019

Current Financial Assets at Amortized Cost:

Government bonds and public bonds	₩	39
Debt Securities		-
Subtotal	₩	39

Non-current Financial Assets at Amortized Cost:

Government bonds and public bonds	₩	82
Debt Securities		1,600
Subtotal	₩	1,682

Non-current Financial assets at fair value through other comprehensive income:

Investments in non-listed company	₩	937
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Current Financial assets at fair value through profit or loss:

Financial assets held for trading	₩	9,280
Beneficiary certificates		-
	₩	9,280

Non-current Financial assets at fair value through profit or loss:

Beneficiary certificates	₩	11,011
Investments in funds		642
Investments in non-listed company		-
Subtotal	₩	11,653

(3) Change in financial assets at fair value for the year ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020					
	Beginning balance	Acquisition	Disposal	Valuation	Others	Ending balance
Financial assets at fair value through other comprehensive income	₩ 937	₩ -	₩ (1)	₩ -	₩ -	₩ 936
Financial assets at fair value through profit or loss	20,933	17,685	(3,224)	482	(338)	35,538
Total	₩ 21,870	₩ 17,685	₩ (3,225)	₩ 482	₩ (338)	₩ 36,474

(in millions of Korean won)

	2019					
	Beginning balance	Acquisition	Disposal	Valuation	Others	Ending balance
Financial assets at fair value through other comprehensive income	₩ 91,972	₩ -	₩ (89,098)	₩ (1,937)	₩ -	₩ 937
Financial assets at fair value through profit or loss	19,427	5,343	-	(3,668)	(169)	20,933
Total	₩ 111,399	₩ 5,343	₩ (89,098)	₩ (5,605)	₩ (169)	₩ 21,870

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7. Trade and Other Receivables

(1) Trade and other receivables as at December 31, 2020 and 2019, consist of the following:

(in millions of Korean won)

		December 31, 2020		
		Gross amount¹	Provision for impairment	Carrying amount
Current:				
Trade receivables	₩	821,500	₩ (215,442)	₩ 606,058
Financial lease receivables		655,100	(8,192)	646,908
Other receivables		126,122	(52,301)	73,821
Accrued income		5,321	-	5,321
Short-term loans		26,173	-	26,173
Total	₩	1,634,216	₩ (275,935)	₩ 1,358,281
Non-current:				
Long-term trade receivables	₩	4,969	₩ -	₩ 4,969
Long-term loans		-	-	-
Long-term other receivables		4,148	(4,148)	-
Total	₩	9,117	₩ (4,148)	₩ 4,969

(in millions of Korean won)

		December 31, 2019		
		Gross amount¹	Provision for impairment	Carrying amount
Current:				
Trade receivables	₩	1,019,364	₩ (294,999)	₩ 724,365
Financial lease receivables		554,463	(10,192)	544,271
Other receivables		141,815	(46,463)	95,352
Accrued income		4,974	-	4,974
Short-term loans		15,268	(15,113)	155
Total	₩	1,735,884	₩ (366,767)	₩ 1,369,117
Non-current:				
Long-term trade receivables	₩	3,610	₩ -	₩ 3,610
Long-term loans		171	-	171
Long-term other receivables		5,724	(5,703)	21
Total	₩	9,505	₩ (5,703)	₩ 3,802

¹ The Group recognizes the transfer of trade receivable as collateralized borrowing for those that do not meet the requirements for the elimination of financial instruments (Note 17).

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(2) Changes in provision for impairment of loans and receivables for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

		2020			
		Beginning balance	Provision for (reversal of) allowance	Write off and Others ¹	Ending balance
Trade receivables	₩	294,999	₩ (5,114)	₩ (74,443)	₩ 215,442
Financial lease receivables		10,192	(2,330)	330	8,192
Other receivables		46,463	6,906	(1,068)	52,301
Short-term loans		15,113	-	(15,113)	-
Long-term other receivables		5,703	(1,555)	-	4,148
Total	₩	372,470	₩ (2,093)	₩ (90,294)	₩ 280,083

¹ Includes gain or loss arising from changes in foreign exchange rates.

(in millions of Korean won)

		2019			
		Beginning balance	Provision for (reversal of) allowance	Write off and Others ¹	Ending balance
Trade receivables	₩	342,896	₩ (7,984)	₩ (39,913)	₩ 294,999
Financial lease receivables		11,647	(878)	(577)	10,192
Other receivables		38,695	6,911	857	46,463
Short-term loans		14,841	-	272	15,113
Long-term other receivables		5,454	251	(2)	5,703
Total	₩	413,533	₩ (1,700)	₩ (39,363)	₩ 372,470

¹ Includes gain or loss arising from changes in foreign exchange rates.

(3) Gross investment in finance lease and present value of minimum lease payments as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	December 31, 2020	December 31, 2019
Within one year	₩ 429,520	₩ 425,981
Later than one year but not later than five years	237,571	139,167
Total	667,091	565,148
Present value of discount	(11,991)	(10,685)
Net investment in a lease	₩ 655,100	₩ 554,463

In relation to the above lease, there is no unguaranteed residual value as at December 31, 2020. And there are no contingent rental payments incurred during the year ended December 31, 2020.

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(4) Gain or loss related to finance lease for the years ended at December 31, 2020 and 2019, is as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Interest income from finance lease	₩	18,258	₩	25,415
Commissions received from finance lease		36,493		31,648
Total	₩	54,751	₩	57,063

8. Inventories

Inventories as at December 31, 2020 and 2019, are as follows:

	December 31, 2020			December 31, 2019		
	Acquisition cost	Valuation allowance	Carrying amount	Acquisition cost	Valuation allowance	Carrying amount
Merchandise	₩ 236,072	₩ (22,990)	₩ 213,082	₩ 321,097	₩ (21,725)	₩ 299,372
Finished goods	521,429	(36,079)	485,350	628,442	(31,787)	596,655
Semi-finished goods	99,577	(514)	99,063	145,155	(281)	144,874
Work in progress	76,887	-	76,887	82,076	-	82,076
Raw materials	480,190	(19,319)	460,871	500,436	(22,459)	477,977
Supplies	2,074	(21)	2,053	1,959	(52)	1,907
Materials in transit	252,602	-	252,602	183,429	-	183,429
Total	₩ 1,668,831	₩ (78,923)	₩ 1,589,908	₩ 1,862,594	₩ (76,304)	₩ 1,786,290

Inventories recognized as cost of sales during the year ended December 31, 2020, amounted to ₩ 5,835,459 million (2019: ₩ 5,837,772 million). Loss on valuation of inventories added to cost of sales amounted to ₩ 2,619 million for the same period (2019: deducted ₩ 6,693 million).

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9. Derivative Instruments

(1) Details of derivative instruments are as follows:

Purpose	Type of derivative instruments	Description
Cash flow hedge	Foreign currency forward	A contract to avoid cash flow risk arising from forecasted sales in foreign currencies
	Foreign currency swap	A contract to pay fixed interest rate in Korean Won and receive fixed interest rate in foreign currency on future interest and principal payment date to avoid the risk of cash flow fluctuations due to exchange rate fluctuations
Held for trading	Foreign currency forward	A contract to avoid cash flow fluctuations not applying hedge accounting

(2) Details of valuation of derivative instruments as at December 31, 2020 and 2019, are as follows:

(in thousands of foreign currencies and millions of Korean won)

December 31, 2020						
	Buy		Sell		Derivative assets (liabilities)	Other comprehensive income (loss) ¹
	Currency	Amount	Currency	Amount		
Foreign currency forward	KRW	40,575	EUR	30,000	₩ 389	₩ 389
	JPY	750,000	KRW	8,037	(127)	(127)
	EUR	8,296	GBP	7,467	(67)	(3)
	Subtotal				₩ 195	259
Foreign currency swap	USD	600,000	KRW	703,460	₩ (43,774)	₩ 6,536
	Subtotal				₩ (43,774)	₩ 6,536
Total					₩ (43,579)	₩ 6,795

¹ The amounts are not adjusted for deferred income tax effect.

(in thousands of foreign currencies and millions of Korean won)

December 31, 2019						
	Buy		Sell		Derivative assets (liabilities)	Other comprehensive income (loss) ¹
	Currency	Amount	Currency	Amount		
Foreign currency forward	KRW	119,220	USD	100,000	₩ 3,551	₩ 3,551
	KRW	39,699	EUR	30,000	693	693
	JPY	1,092,000	KRW	11,793	(157)	(157)
	EUR	9,644	GBP	8,423	(335)	(148)
	Subtotal				₩ 3,752	₩ 3,939
Foreign currency swap	USD	600,000	KRW	682,312	₩ 12,770	₩ (1,019)
	Subtotal				₩ 12,770	₩ (1,019)
Total					₩ 16,522	₩ 2,920

¹ The amounts are not adjusted for deferred income tax effect.

Derivative instruments are classified as non-current assets (liabilities) if their remaining maturities exceed 12 months from the end of the reporting period; otherwise, they are classified as current assets (liabilities).

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Gain or loss relating to the ineffective portion is recognized in profit or loss in applying cash flow hedge.

10. Financial Instruments by Category

(1) Fair value of financial assets and liabilities by category as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

Financial assets	December 31, 2020					
	Financial assets at amortized cost	Financial assets at fair value through other comprehensive income	Financial assets at fair value through profit or loss	Other financial assets ¹	Total	Fair value
Cash and cash equivalents	₩ 1,663,459	₩ -	₩ -	₩ -	₩ 1,663,459	₩ 1,663,459
Short-term financial instruments	139,940	-	-	-	139,940	139,940
Short-term investment securities	99,803	-	11,358	-	111,161	111,161
Trade and other receivables	1,328,871	29,410	-	-	1,358,281	1,358,281
Long-term and short-term derivative assets	-	-	-	416	416	416
Long-term financial instruments	583	-	-	-	583	583
Long-term investment securities	15,332	936	24,180	-	40,448	40,448
Long-term trade and other receivables	4,969	-	-	-	4,969	4,969
Other non-current assets	42,256	-	-	-	42,256	42,256
Total	₩ 3,295,213	₩ 30,346	₩ 35,538	₩ 416	₩ 3,361,513	₩ 3,361,513

¹ Other financial assets include derivatives designated as hedging instruments, which are not subject to financial instruments by category.

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Financial liabilities	December 31, 2020					
	Financial liabilities at amortized cost		Other financial liabilities ¹		Total	Fair value
Trade and other payables	₩	1,600,710	₩	-	₩ 1,600,710	₩ 1,600,710
Borrowings and bonds		4,289,140		-	4,289,140	4,289,140
Long-term and short-term derivative liabilities		-		43,995	43,995	43,995
Other current liabilities		39,620		-	39,620	39,620
Other non-current payables		6		-	6	6
Other non-current liabilities		32,264		-	32,264	32,264
Financial guarantee liabilities		-		3,520	3,520	3,520
Long-term and short-term lease liabilities		-		77,399	77,399	77,399
Total	₩	5,961,740	₩	124,914	₩ 6,086,654	₩ 6,086,654

¹ Other financial liabilities include derivatives designated as hedging instruments, financial guarantee liabilities and lease liabilities which are not subject to financial instruments by category.

(in millions of Korean won)

won)		December 31, 2019											
		Financial assets at amortized cost		Financial assets at fair value through other comprehensive income		Financial assets at fair value through profit or loss		Other financial assets ¹		Total		Fair value	
Financial assets													
Cash and cash equivalents	₩	756,173	₩	-	₩	-	₩	-	₩	756,173	₩	756,173	
Short-term financial instruments		144,971		-		-		-		144,971		144,971	
Short-term investment securities		39		-		9,280		-		9,319		9,319	
Trade and other receivables		1,356,867		12,250		-		-		1,369,117		1,369,117	
Long-term and short-term derivative assets		-		-		-		18,989		18,989		18,989	
Long-term financial instruments		881		-		-		-		881		881	
Long-term investment securities		1,682		937		11,653		-		14,272		14,272	
Long-term trade and other receivables		3,802		-		-		-		3,802		3,802	
Other non-current assets		42,153		-		-		-		42,153		42,153	
Total	₩	2,306,568	₩	13,187	₩	20,933	₩	18,989	₩	2,359,677	₩	2,359,677	

¹ Other financial assets include derivatives designated as hedging instruments, which are not subject to financial instruments by category.

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Financial liabilities	December 31, 2019			
	Financial liabilities at amortized cost	Other financial liabilities ¹	Total	Fair value
Trade and other payables	₩ 1,599,449	₩ -	₩ 1,599,449	₩ 1,599,449
Borrowings and bonds	3,903,539	-	3,903,539	3,903,539
Long-term and short-term derivative liabilities	-	2,466	2,466	2,466
Other current liabilities	43,858	-	43,858	43,858
Other non-current payables	1,370	-	1,370	1,370
Other non-current liabilities	40,494	-	40,494	40,494
Financial guarantee liabilities	-	2,401	2,401	2,401
Long-term and short-term lease liabilities	-	79,406	79,406	79,406
Total	₩ 5,588,710	₩ 84,273	₩ 5,672,983	₩ 5,672,983

¹ Other financial liabilities include derivatives designated as hedging instruments, financial guarantee liabilities and lease liabilities which are not subject to financial instruments by category.

(2) Fair value hierarchy classifications of the financial instruments that are measured at fair value as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	December 31, 2020			
	Level 1	Level 2	Level 3	Total
Financial assets at fair value:				
Financial assets at fair value through other comprehensive income	₩ -	₩ 29,410	₩ 936	₩ 30,346
Financial assets at fair value through profit or loss	7,784	3,574	24,180	35,538
Other financial assets	-	416	-	416
Total	₩ 7,784	₩ 33,400	₩ 25,116	₩ 66,300
Financial liabilities at fair value:				
Other financial liabilities	₩ -	₩ 43,995	₩ -	₩ 43,995

(in millions of Korean won)

	December 31, 2019			
	Level 1	Level 2	Level 3	Total
Financial assets at fair value:				
Financial assets at fair value through other comprehensive income	₩ -	₩ 12,250	₩ 937	₩ 13,187
Financial assets at fair value through profit or loss	9,280	-	11,653	20,933
Other financial assets	-	18,989	-	18,989
Total	₩ 9,280	₩ 31,239	₩ 12,590	₩ 53,109
Financial liabilities at fair value:				
Other financial liabilities	₩ -	₩ 2,466	₩ -	₩ 2,466

The defined levels of the above fair value hierarchy classifications of the financial instruments that are measured at fair value, are as follows:

Classification	Description
Level 1	Quoted prices (unadjusted) in active markets for identical assets or liabilities

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Level 2	All inputs other than quoted prices included in level 1 that are observable (either directly that is, prices, or indirectly that is, derived from prices) for the asset or liability
Level 3	Unobservable inputs for the asset or liability

- Level 1: The fair value of financial instruments traded in active markets (such as publicly traded derivatives and equity securities) is based on quoted market prices at the end of the reporting period. The quoted market price used for financial assets held by the Group is the current bid price. These instruments are included in level 1.
- Level 2: The fair value of financial instruments that are not traded in an active market (for example, over-the-counter derivatives) is determined using valuation techniques which maximize the use of observable market data and rely as little as possible on entity-specific estimates. If all significant inputs required to fair value an instrument are observable, the instrument is included in level 2.
- Level 3: If one or more of the significant inputs is not based on observable market data, the instrument is included in level 3. This is the case for unlisted equity securities.

(3) Valuation technique and inputs used in the fair value measurements for hedge derivatives (categorized within Level 2 of the fair value hierarchy) as at December 31, 2020, are as follows:

Valuation technique	Observable Inputs	Description
Present value technique	Forward exchange rate	Based on forward exchange rate disclosed on the market of which remaining period to the maturity equals to that of the forward contract. If there is not any forward exchange rate disclosed under the same conditions stated above, it is calculated by using interpolation method.
	Discount rate	Measured based on the yield curve derived from the weighted average borrowing rate at the end of the reporting period.

(4) Changes in level 3 for recurring fair value measurements for the year ended December 31, 2020, are as follows:

(in millions of Korean won)	Beginning balance	Total comprehensive income				Purchases (Issues)	Sales (Settlements)	Others ¹	Ending balance					
		Profit or loss		Other comprehensive income										
Financial assets at fair value through other comprehensive income	₩	937	₩	-	₩	-	₩	(1)	₩	-	₩	936		
Financial assets at fair value through profit or loss		11,653		4,061		-		15,325		(5,269)		(1,590)		24,180
Total	₩	12,590	₩	4,061	₩	-	₩	15,325	₩	(5,270)	₩	(1,590)	₩	25,116

¹ Changes due to exchange differences.

(5) Net gains or losses on each category of financial instruments for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)		2020											
		Profit or loss											
		Interest income (expense)		Dividend income		Gain on valuation		Impairment reversal		Gain (loss) on disposal		Other	
Financial assets:													
Financial assets at		₩	18,021	₩	-	₩	-	₩	2,095	₩	(10,099)	₩	-

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amortized cost							
Financial assets at fair value through profit or loss	453	560	1,559	-	1,988	-	
Total	₩ 18,474	₩ 560	₩ 1,559	₩ 2,095	₩ (8,111)	₩ -	
Financial liabilities:							
Financial liabilities at amortized cost	₩ (169,675)	₩ -	₩ -	₩ -	₩ (23,136)	₩ (529)	
Financial liabilities at fair value through profit or loss	-	-	-	-	(2,112)	-	
Other financial liabilities	(4,063)	-	-	-	-	(11,674)	
Total	₩ (173,738)	₩ -	₩ -	₩ -	₩ (25,248)	₩ (12,203)	

(in millions of
Korean won)

	2019						
	Profit or loss						
	Interest income (expense)	Dividend income	Loss on valuation	Impairment reversal	Gain (loss) on disposal	Other	
Financial assets:							
Financial assets at amortized cost	₩ 17,845	₩ -	₩ -	₩ 822	₩ (14,333)	₩ -	
Financial assets at fair value through other comprehensive income	-	12,462	-	-	-	-	
Financial assets at fair value through profit or loss	1,987	520	(3,674)	-	5,840	-	
Total	₩ 19,832	₩ 12,982	₩ (3,674)	₩ 822	₩ (8,493)	₩ -	
Financial liabilities:							
Financial liabilities at amortized cost	₩ (188,696)	₩ -	₩ -	₩ -	₩ (401)	₩ (538)	
Financial liabilities at fair value through profit or loss	-	-	-	-	(11,789)	-	
Other financial liabilities	(3,326)	-	-	-	-	(10,241)	
Total	₩ (192,022)	₩ -	₩ -	₩ -	₩ (12,190)	₩ (10,779)	

Among the financial instruments above, the gain of ₩ 3,875 million from derivatives designated as a cash flow hedge was recognized as other comprehensive income(before tax) for the year ended December 31, 2020 (2019: gain of ₩ 5,282 million) (Note 9).

In addition, foreign exchange differences, either realized or not, related to foreign currency transactions (other than derivative contracts) mostly resulted from loans and receivables and financial liabilities measured at amortized cost.

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11. Interests in Associates and Joint ventures

(1) Set out below are the associates and joint ventures of the Group as at December 31, 2020 that are material to the Group.

Name of entity	Type of business	Location	Date of financial statements
Major associates:			
Doosan Cuvex Co., Ltd.	Operation of resort and golf club	Korea	December 31
DBC Co., Ltd.	Property leasing	Korea	December 31
Major joint ventures:			
Tianjin Lovol Doosan Engine Co., Ltd.	Manufacturing and Sales	China	December 31

(2) Details of investments in associates and joint ventures as at December 31, 2020 and 2019, are summarized as follows:

(in millions of Korean won)

(in millions of Korean won)

Name of entity	Percentage of ownership (%)	Acquisition cost		Carrying amount		Proportionate share of net assets	
		December 31, 2020	December 31, 2019	December 31, 2020	December 31, 2019	December 31, 2020	December 31, 2019
Associates:							
Doosan Cuvex Co., Ltd.	35.49	₩ 68,059	₩ 32,068	₩ 67,867	₩ 30,683	₩ 66,024	₩ 29,381
DBC Co., Ltd.	49.90	53,066	53,066	51,752	52,221	51,051	51,520
Others		13,003	5,333	7,072	-	7,072	(1,485)
Subtotal		₩ 134,128	₩ 90,467	₩ 126,691	₩ 82,904	₩ 124,147	₩ 79,416
Joint ventures:							
Tianjin Lovol Doosan Engine Co., Ltd.	50.00	₩ 28,163	₩ 25,640	₩ 16,327	₩ 17,787	₩ 18,546	₩ 20,311
Others		718	1,826	202	2,288	397	2,440
Subtotal		28,881	27,466	16,529	20,075	18,943	22,751
Total		₩ 163,009	₩ 117,933	₩ 143,220	₩ 102,979	₩ 142,890	₩ 102,167

(3) Changes in investment in associates and joint ventures for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

Name of entity	Valuation method	2020						
		Beginning balance	Acquisition	Share of profit (loss)	Share of associates' changes in retained earnings	Disposal	Others	Ending balance
Doosan Cuvex Co., Ltd. ¹	Equity method	₩ 30,683	₩ 35,991	₩ 1,148	₩ 45	₩ -	₩ -	₩ 67,867
DBC Co., Ltd.	Equity method	52,221	-	(468)	(1)	-	-	51,752
Tianjin Lovol Doosan Engine Co., Ltd. ²	Equity method	17,787	2,523	(4,217)	-	-	234	16,327
Others	Equity method, fair value through profit or loss method	2,288	7,670	379	-	(2,223)	(840)	7,274
Total		₩ 102,979	₩ 46,184	₩ (3,158)	₩ 44	₩ (2,223)	₩ (606)	₩ 143,220

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¹ Doosan Cuvex Co., Ltd. participated in the capital increase and acquired 6.85% of the shares for ₩ 35,991 million for the year ended December 31, 2020.

² The Group acquired additional shares of Tianjin Lovol Doosan Engine Co., Ltd. for ₩ 2,523 million, and there are no changes in percentage of ownership for the year ended December 31, 2020.

(in millions of Korean won)

Name of entity	Valuation method	2019							
		Beginning balance	Acquisition	Share of profit (loss)	Impairment	Share of other comprehensive income of associates	Share of associates' changes in retained earnings	Others	Ending balance
Doosan Cuvex Co., Ltd. ¹	Equity method	₩ 29,127	₩ -	₩ 2	₩ -	₩ 1,733	₩ (179)	₩ -	₩ 30,683
DBC Co., Ltd.	Equity method	24,142	28,474	(395)	-	-	-	-	52,221
Tianjin Lovol Doosan Engine Co., Ltd. ²	Equity method	8,235	12,913	(3,139)	-	-	-	(222)	17,787
Others	Equity method	6,408	-	(14)	(4,156)	-	-	50	2,288
Total		₩ 67,912	₩ 41,387	₩ (3,546)	₩ (4,156)	₩ 1,733	₩ (179)	₩ (172)	₩ 102,979

¹ The Group acquired an additional 26.7% of DBC Co., Ltd. for ₩ 28,474 million for the year ended December 31, 2019.

² The Group acquired additional shares of Tianjin Lovol Doosan Engine Co., Ltd. for ₩ 12,913 million, and there are no changes in percentage of ownership for the year ended December 31, 2019.

(4) The tables below provide summarized financial information for investment in major associates and joint ventures.

(in millions of Korean won)

Name of entity	December 31, 2020						December 31, 2019	
	Total assets	Total liabilities	Sales	Profit (loss) for the year	Total comprehensive income		Total assets	Total liabilities
Doosan Cuvex Co., Ltd.	₩ 306,979	₩ 120,953	₩ 69,373	₩ 3,451	₩ 3,463		₩ 220,792	₩ 118,214
DBC Co., Ltd.	542,068	439,762	-	(938)	(938)		322,297	219,050
Tianjin Lovol Doosan Engine Co., Ltd.	44,048	6,957	-	(8,435)	(8,435)		41,629	1,007

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(5) The tables below provide a reconciliation of the summarized financial information presented to the carrying amount of its interest in the joint venture or associate.

(in millions of Korean won)

	December 31, 2020					
	Net assets at the end of the year (a)	Group's share in % (b)	Group's share in KRW(a*b)	Adjustments		Carrying amount
				Basis differences	Intergroup transaction	
Doosan Cuvex Co., Ltd. ¹	₩ 186,026	35.49	₩ 66,024	₩ 1,843	₩ -	₩ 67,867
DBC Co., Ltd.	102,307	49.90	51,051	701	-	51,752
Tianjin Lovol Doosan Engine Co., Ltd.	37,091	50.00	18,546	-	(2,219)	16,327
Others	924		397	-	(195)	202

¹ Interests of preferred shares are not included.

12. Property, Plant and Equipment

(1) Changes in property, plant and equipment for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020									
	Land	Buildings	Structures	Machinery	Vehicles	Tools	Equipment	Construction in progress	Total	
Opening net book amount	₩ 784,400	₩ 415,714	₩ 42,945	₩ 414,530	₩ 3,318	₩ 71,534	₩ 18,095	₩ 120,920	₩ 1,871,456	
Acquisitions / Capital expenditure	-	16,586	1,808	113,439	2,165	32,886	9,126	34,018	210,028	
Transfers	-	12,543	(4,463)	24,225	82	(4,092)	1,503	(54,842)	(25,044)	
Disposals	-	(5,012)	(145)	(1,453)	(290)	(18)	(174)	(434)	(7,526)	
Classified as assets held for sale ¹	-	(8,876)	-	-	-	-	(2)	-	(8,878)	
Depreciation	-	(20,616)	(3,239)	(109,007)	(1,134)	(23,707)	(7,381)	-	(165,084)	
Others	(3,802)	(4,431)	194	(12,530)	(14)	86	(359)	(2,584)	(23,440)	
Closing net book amount	₩ 780,598	₩ 405,908	₩ 37,100	₩ 429,204	₩ 4,127	₩ 76,689	₩ 20,808	₩ 97,078	₩ 1,851,512	
Acquisition cost	₩ 490,195	₩ 704,282	₩ 91,082	₩ 1,224,895	₩ 13,625	₩ 313,178	₩ 80,240	₩ 97,618	₩ 3,015,115	
Accumulated depreciation (include accumulated impairment losses)	(5,929)	(294,507)	(53,982)	(794,076)	(9,498)	(236,489)	(59,432)	-	(1,453,913)	
Accumulated gain on revaluation	296,332	-	-	-	-	-	-	-	296,332	
Government grants	-	(3,867)	-	(1,615)	-	-	-	(540)	(6,022)	

¹ The Group has entered into a sales contract for buildings owned by Doosan Bobcat China Co.,Ltd. and classifies the assets as held for sale.

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2019

won)											Construction							
	Land		Buildings		Structures		Machinery		Vehicles		Tools		Equipment		in progress		Total	
Opening net book																		
amount	₩	794,174	₩	406,001	₩	33,579	₩	371,008	₩	3,332	₩	55,874	₩	11,989	₩	106,676	₩	1,782,633
Acquisitions / Capital																		
expenditure		2,147		20,016		1,630		48,227		1,770		35,592		11,385		145,360		266,127
Revaluation		36,658		-		-		-		-		-		-		-		36,658
Transfers		(14,910)		7,148		10,702		90,081		8		1,979		(353)		(129,487)		(34,832)
Disposals		(34,413)		(3,109)		(63)		(1,891)		(828)		(378)		(114)		(3,708)		(44,504)
Depreciation		-		(19,113)		(3,094)		(96,988)		(1,013)		(21,592)		(4,987)		-		(146,787)
Impairment loss		(64)		-		-		-		-		-		-		-		(64)
Others		808		4,771		191		4,093		49		59		175		2,079		12,225
Closing net book																		
amount	₩	784,400	₩	415,714	₩	42,945	₩	414,530	₩	3,318	₩	71,534	₩	18,095	₩	120,920	₩	1,871,456
Acquisition cost	₩	493,997	₩	702,088	₩	97,325	₩	1,176,528	₩	13,597	₩	289,369	₩	82,936	₩	120,920	₩	2,976,760
Accumulated																		
depreciation																		
(include																		
accumulated																		
impairment losses)		(5,929)		(282,374)		(54,380)		(760,051)		(10,279)		(217,835)		(64,841)		-		(1,395,689)
Accumulated gain on																		
revaluation		296,332		-		-		-		-		-		-		-		296,332
Government grants		-		(4,000)		-		(1,947)		-		-		-		-		(5,947)

Land, after initial recognition, is measured using a revaluation model. As at December 31, 2020, the carrying amount of land would be ₩ 490,195 million if measured based on a cost model.

Certain land, buildings and machinery are pledged as collaterals as at December 31, 2020, in connection with the borrowings from Korea Development Bank and others. Also, certain property, plant and equipment are pledged as collaterals in relation to the Group's private bonds as at December 31, 2020 (Note 34).

(2) The Group revalued its land assets as follows:

For the year ended December 31, 2013, the Group initially remeasured all land assets using fair value at the date of the revaluation. As at December 31, 2020, the fair values of land assets are determined from appraisal that is undertaken by independently qualified valuers, Kyungil Appraisal and Realty Advisa Co., Ltd. ("Kyungil") and others on November 30, 2019. KYUNGIL and others are members of Korea Association of Property Appraisers and comprise certified professionals that have a significant amount of industry experience.

Fair value of a land is determined by reference to Officially Assessed Reference Land Price ("OARLP"), announced by the Ministry of Land, Infrastructure, and Transport, and recent market transactions of similar and recently sold parcels nearby the subject land in order to derive an indication of the most probable sales price (or value) of the land.

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(3) Fair value measurements of land asset by fair value hierarchy level as at December 31, 2020, are as follows:

(in millions of Korean won)

Type	Level 1	Level 2	Level 3	Total
Land	₩	- ₩	- ₩	780,598 ₩

(4) Valuation methodologies and inputs used for fair value measurements of land assets are as follows:

Valuation methodology	Significant inputs that are not based on observable market data (unobservable inputs)	Correlation between unobservable inputs and fair value arguments
Officially Assessed Reference Land Price	Fluctuation rate of land price and others	Fair value increases (decreases) if rate of land price increases (decreases)
OARLP of similar parcels nearby the subject land, reflating corrections necessary for differences between the subject and the comparable	Parcel conditions and others	Fair value increases (decrease) if corrections of parcel conditions and others increase (decrease)
	Land conditions affecting the sales price and others	Fair value increases (decreases) if correction of land conditions affecting the sales price increases (decreases)

(5) The effect of applying revaluation model to land for the year ended December 31, 2019, is as follows:

(in millions of Korean won)

Beginning balance	Acquisitions	Revaluation	Impairment loss	Disposals	Others	Ending balance
₩ 794,174	₩ 2,147	₩ 36,658	₩ (64)	₩ (34,413)	₩ (14,102)	₩ 784,400

(6) Borrowing costs added to the cost of property, plant and equipment for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020	2019
Borrowing costs added to the cost of property, plant and equipment	₩ 42	₩ 446
Interest rate (%)	3.97%	4.20%

(7) Classification of depreciation expenses for the years ended December 31, 2020 and 2019, is as follows:

(in millions of Korean won)

	2020	2019
Cost of sales	₩ 132,796	₩ 111,357
Selling and administrative expenses	12,715	16,612
Research and development expenses, etc.	19,573	18,818
Total	₩ 165,084	₩ 146,787

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13. Intangible Assets

(1) Changes in intangible assets for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020					
	Goodwill	Industrial rights	Development cost	Greenhouse Gas Emission Rights	Other Intangible Assets	Total
Beginning balance	₩ 3,025,412	₩ 1,154,180	₩ 275,254	₩ 2,200	₩ 105,322	₩ 4,562,368
Additions – internal development	-	-	76,903	-	-	76,903
Acquisitions	-	-	-	3,000	17,621	20,621
Transfers	-	1,362	(328)	-	16,346	17,380
Disposals	-	-	-	(2,200)	(2,152)	(4,352)
Amortization	-	(984)	(54,057)	-	(29,651)	(84,692)
Impairment loss	-	-	(6,471)	-	-	(6,471)
Reversal of impairment loss	-	-	-	-	4,539	4,539
Others	(64,779)	(32,655)	(5,960)	-	(2,228)	(105,622)
Ending balance	₩ 2,960,633	₩ 1,121,903	₩ 285,341	₩ 3,000	₩ 109,797	₩ 4,480,674
Acquisition cost	₩ 2,994,866	₩ 1,283,819	₩ 981,707	₩ 3,000	₩ 507,603	₩ 5,770,995
Accumulated amortization	-	(161,916)	(589,011)	-	(372,675)	(1,123,602)
Accumulated impairment loss	(34,233)	-	(107,355)	-	(25,131)	(166,719)

(in millions of Korean won)

	2019					
	Goodwill	Industrial rights	Development cost	Greenhouse Gas Emission Rights	Other Intangible Assets	Total
Beginning balance	₩ 2,920,112	₩ 1,091,733	₩ 233,055	₩ 2,200	₩ 81,556	₩ 4,328,656
Additions – internal development	-	-	93,672	-	-	93,672
Acquisitions	23,807	32,680	-	-	32,623	89,110
Transfers	-	635	191	-	17,031	17,857
Disposals	(3,741)	-	-	-	(62)	(3,803)
Amortization	-	(921)	(49,472)	-	(26,577)	(76,970)
Impairment loss	-	-	(5,587)	-	-	(5,587)
Others	85,234	30,053	3,395	-	751	119,433
Ending balance	₩ 3,025,412	₩ 1,154,180	₩ 275,254	₩ 2,200	₩ 105,322	₩ 4,562,368
Acquisition cost	₩ 3,060,674	₩ 1,324,903	₩ 926,235	₩ 2,200	₩ 484,194	₩ 5,798,206
Accumulated amortization	-	(170,723)	(549,808)	-	(349,247)	(1,069,778)
Accumulated impairment loss	(35,262)	-	(101,173)	-	(29,625)	(166,060)

The aggregated carrying amount of goodwill and others with indefinite useful lives in other intangible assets item is ₩ 4,092,051 million and ₩ 4,185,909 million as at December 31, 2020 and 2019, respectively.

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The Group performed the Industrial rights impairment test using the recoverable value at December 31, 2020. And, did not recognize any impairment losses as the book value did not exceed the recoverable amount.

(2) Greenhouse Gas Emission Rights

Changes in the Greenhouse Gas Emission Rights for the years ended December 31, 2020 and 2019, are as follows:

	2020		2019	
	Quantity	Amount	Quantity	Amount
Beginning balance	165,927	₩ 2,200	118,763	₩ 2,200
Allocation with nil consideration (allocation cancellation)	(763)	-	143,361	-
Purchases	100,000	3,000	-	-
Sales	(100,000)	(2,200)	(3,000)	-
Surrendered to the government ¹	(109,405)	-	(93,197)	-
Ending balance	55,759	₩ 3,000	165,927	₩ 2,200

¹ The quantity of surrendered to the government for the year ended December 31, 2020 is an estimation, which will be settled in 2021. On the other hand, the amount of emission obligations recognized in the consolidated financial statements is ₩ 1,327 million as at December 31, 2020.

(3) Carrying amount and remaining amortization period of each significant development project as at December 31, 2020, is as follows:

	Name of development asset	Carrying amount		Remaining amortization period ¹
Development costs in development	Development project for Stage 5	₩	12,659	-
	Development project for Stage5 excavator/wheel loader		21,713	-
	Development project for Loader R Series 8X		7,487	-
Amortized development costs	Development project for Stage 5		30,411	46~59 months
	Development project for electronic generator engine		13,277	52 months
	Development project for Stage5 excavator/wheel loader		26,710	44~53 months
	Loader R Series 7X		23,326	48 months

¹ Remaining amortization period is presented only when amortization was begun. Otherwise, remaining amortization period is presented as “-”.

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(4) Impairment losses on intangible assets for the year ended December 31, 2020, is as follows:

(in millions of Korean won)

Related account	Separate asset	Acquisition cost	After amortization Book value	Impairment loss		Carrying amount	Recoverable amount valuation method
				2020	Accumulated		
Development costs	Development of DL06 engine ¹	₩ 5,202	₩ 2,615	₩ 297	₩ 2,615	₩ -	Value in use
	Development of DX12 engine ¹	13,367	13,248	6,174	6,174	7,074	Value in use
Total		₩ 18,569	₩ 15,863	₩ 6,471	₩ 8,789	₩ 7,074	

¹ Certain part of the carrying amount was recognized as impairment loss due to the decrease in value-in-use compared to the estimation made at the time of development.

(5) Reversal of impairment losses on intangible assets for the year ended December 31, 2020, is as follows:

(in millions of Korean won)

Related account	Separate asset	Reversal of impairment losses	Carrying amount	Recoverable amount valuation method
Other intangible assets	Golf membership ¹	₩ 4,539	₩ 12,157	Fair value

¹ Recoverable amount was estimated to reflect the fair value of individual assets.

(6) Classification of impairment losses (reversal) for the years ended December 31, 2020 and 2019, is as follows:

(in millions of Korean won)

	2020	2019
Non-operating expenses	₩ 6,471	₩ 5,587
Non-operating incomes	(4,539)	-
Total	₩ 1,932	₩ 5,587

(7) Borrowing costs added to the cost of intangible assets for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020	2019
Borrowing costs added to the cost of intangible assets	₩ 1,805	3,359
Interest rate (%)	3.97	4.20

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(8) Classification of amortization expenses for the years ended December 31, 2020 and 2019, is as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Cost of sales	₩	56,175	₩	52,003
Selling and administrative expenses		28,490		24,825
Research and development expenses, etc.		27		142
Total	₩	84,692	₩	76,970

(9) The Group recognized total research and development costs of ₩ 202,694 million (2019: ₩ 190,235 million) as expenses in Selling and administration expenses.

(10) Impairment test of goodwill

The table below summarizes goodwill allocation for each operating segment.

<i>(in millions of Korean won)</i>	Doosan Bobcat Inc. and subsidiaries		Doosan Infracore Norway AS		Total	
Classification						
Goodwill	₩	2,957,965	₩	2,668	₩	2,960,633

The Group uses cash flow projections based on financial budgets approved by the directors covering five-year periods for a value-in-use calculation. The financial budgets are determined based on historical result and expectation of market growth. The assumptions for the calculation of value-in-use, as at December 31, 2020, are as follows:

Classification	Doosan Bobcat Inc. and subsidiaries	Doosan Infracore Norway AS
Growth rate	1.50%	1.50%
Discount rate	7.50%	11.20%

Cash flows beyond that five-year periods have been extrapolated using the fifth-year cash flow. The growth rate does not exceed long-term average growth rate of market, and the discount rates used reflect relevant risks specific to the cash-generating units.

The Group calculated recoverable amount for each cash-generating unit based on value-in-use, and concluded that there was no impairment loss to recognize for the year ended December 31, 2020, since the total carrying amount did not exceed the recoverable amount.

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14. Investment Properties

Changes in investment properties for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020			2019		
	Land	Building	Total	Land	Building	Total
Beginning balance	₩ 112,577	₩ 26,253	₩ 138,830	₩ 23,673	₩ 2,635	₩ 26,308
Additions	978	458	1,436	70,618	19,324	89,942
Transfers ¹	-	-	-	18,286	5,342	23,628
Disposals	-	(78)	(78)	-	-	-
Depreciation	-	(1,399)	(1,399)	-	(991)	(991)
Impairment loss	(2,651)	(635)	(3,286)	-	(57)	(57)
Reversal of impairment loss	136	-	136	-	-	-
Others	(112)	-	(112)	-	-	-
Ending balance	₩ 110,928	₩ 24,599	₩ 135,527	₩ 112,577	₩ 26,253	₩ 138,830
Acquisition cost	₩ 127,740	₩ 30,639	₩ 158,379	₩ 127,655	₩ 32,518	₩ 160,173
Accumulated depreciation	-	(4,274)	(4,274)	-	(5,134)	(5,134)
Accumulated impairment losses	(16,812)	(1,766)	(18,578)	(15,078)	(1,131)	(16,209)

¹ Replaced from property, plant and equipment during the prior period.

Fair value of land in Investment properties as at December 31, 2020, is ₩ 122,350 million. Meanwhile, during the year, rental income from investment property is ₩ 6,467 million (2019: ₩ 4,734 million).

15. Lease

(1) Changes in right-of-use assets for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020						
	Land	Buildings	Machinery	Vehicles	Tools	Equipment	Total
Beginning balance	₩ 17,810	₩ 63,965	₩ 1,236	₩ 8,576	₩ 19	₩ 4,071	₩ 95,677
Acquisition	1,121	29,396	-	6,905	-	1,721	39,143
Termination of lease agreement	-	(5,395)	-	(233)	-	-	(5,628)
Depreciation	(895)	(26,020)	(658)	(5,817)	(3)	(2,864)	(36,257)
Classified as assets held for sale	(2,887)	-	-	-	-	-	(2,887)
Others	204	(1,315)	9	(446)	-	(91)	(1,639)
Ending balance	₩ 15,353	₩ 60,631	₩ 587	₩ 8,985	₩ 16	₩ 2,837	₩ 88,409
Acquisition cost	₩ 16,751	₩ 97,627	₩ 1,911	₩ 16,926	₩ 27	₩ 7,690	₩ 140,932
Accumulated depreciation	(1,398)	(36,996)	(1,324)	(7,941)	(11)	(4,853)	(52,523)

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	2019							
	Land	Buildings	Machinery	Vehicles	Tools	Equipment	Total	
Beginning balance	₩ -	₩ -	₩ -	₩ -	₩ -	₩ -	₩ -	-
Change in accounting policy	17,972	52,851	1,882	6,597	25	4,927	84,254	
Acquisition	275	25,991	40	6,529	-	1,185	34,020	
Termination of lease agreement	-	-	-	(191)	-	-	(191)	
Depreciation	(772)	(15,889)	(743)	(4,374)	(8)	(2,227)	(24,013)	
Others	335	1,012	57	15	2	186	1,607	
Ending balance	₩ 17,810	₩ 63,965	₩ 1,236	₩ 8,576	₩ 19	₩ 4,071	₩ 95,677	
Acquisition cost	₩ 18,573	₩ 79,716	₩ 1,975	₩ 12,949	₩ 27	₩ 6,284	₩ 119,524	
Accumulated depreciation	(763)	(15,751)	(739)	(4,373)	(8)	(2,213)	(23,847)	

(2) Changes in lease liabilities for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	Lease liabilities	
	2020	2019
Beginning balance	₩ 79,406	₩ -
Change in accounting policy	-	66,500
Payment for lease liabilities	(38,721)	(24,749)
Acquisition of right-of-use assets ¹	39,095	34,020
Termination of lease agreement	(5,343)	(499)
Interest expenses	4,063	3,326
Others	(1,101)	808
Ending Balance	₩ 77,399	₩ 79,406

¹ When lease liabilities were newly acquired during the year ended December 31, 2020, the lessee's incremental borrowings rate applied to the measurement was 1.98% to 5.499%.

(3) Classification of depreciation of right-of-use assets for the years ended December 31, 2020 and 2019, is as follows:

(in millions of Korean won)

	2020	2019
Cost of sales	₩ 13,173	₩ 8,654
Selling and administrative expenses	22,237	14,784
Research and development cost, etc.	847	575
Total	₩ 36,257	₩ 24,013

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(4) Details of the Group's maturity analysis of lease liabilities as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	December 31, 2020				
	Nominal cash flows				
	Total	Less than 1 year	Less than 2 years	Less than 5 years	More than 5 years
Lease liabilities	₩ 86,171	₩ 27,576	₩ 19,474	₩ 27,546	₩ 11,575

(in millions of Korean won)

	December 31, 2019				
	Nominal cash flows				
	Total	Less than 1 year	Less than 2 years	Less than 5 years	More than 5 years
Lease liabilities	₩ 90,676	₩ 29,801	₩ 19,531	₩ 22,053	₩ 19,291

(5) Expenditures on short-term leases or leases of low-value assets for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020	2019
Cost of sales	₩ 310	₩ 1,050
Selling and administrative expenses	6,020	10,722
Research and development cost, etc.	67	372
Total	₩ 6,397	₩ 12,144

(6) The consolidated statements of profit or loss shows the following amounts relating to leases:

(in millions of Korean won)

	2020	2019
Depreciation of right-of-use assets		
Land	₩ 895	₩ 772
Buildings	26,020	15,889
Machinery	658	743
Vehicles	5,817	4,374
Tools	3	8
Equipment	2,864	2,227
Total	₩ 36,257	₩ 24,013
Interest expense relating to lease liabilities	₩ 4,063	₩ 3,326
Expense relating to short-term leases and leases of low-value assets	6,397	12,144

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(7) The total cash outflow for lease for the years ended December 31, 2020 and 2019, is as follows:

(in millions of Korean won)

	2020		2019	
Lease liabilities	₩	38,721	₩	24,749
Expense relating to short-term leases and leases of low-value assets		6,397		12,144
Total	₩	45,118	₩	36,893

16. Trade and Other Payables

Trade and other payables as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	December 31, 2020		December 31, 2019	
Current :				
Trade payables	₩	1,019,128	₩	953,513
Other payables		246,541		268,610
Accrued expenses		335,041		377,326
Total	₩	1,600,710	₩	1,599,449
Non-current :				
Other payables	₩	6	₩	1,370

17. Borrowings and Bonds

(1) Details of carrying amount of bonds as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

Category	Annual interest rate (%) as at December 31, 2020	December 31, 2020		December 31, 2019	
Public bonds	1.00~5.88	₩	1,710,200	₩	1,158,680
Private bonds	3.50~4.95		576,100		298,000
Convertible bonds	2.81~2.87		33,900		-
Bond with warrant	2.00		100,526		494,546
Subtotal		₩	2,420,726	₩	1,951,226
Less: present value of discount on bonds			(16,901)		(9,601)
Less: present value of discount on convertible bonds			(188)		-
Less: present value of discount on bonds with warrant			(602)		(4,636)
Add: Redemption Premium on convertible bonds			2,326		-
Add: Redemption Premium on bonds with warrant			15,499		76,247
Conversion right adjustment			(2,985)		-
Adjustment on bonds with warrants			(9,482)		(73,165)
Subtotal		₩	2,408,393	₩	1,940,071
Less: current portion(including present value of discount)			(612,593)		(1,037,595)

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Total	₩	1,795,800	₩	902,476
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(2) Details of carrying amount of long-term and short-term borrowings as at December 31, 2020 and 2019, are as follows:

1) Short-term borrowings

(in millions of Korean won)

Category	Creditor	Annual interest rate (%) as at December 31, 2020	December 31, 2020	December 31, 2019
Borrowings in Korean Won	Korea Exim Bank and others	2.55~3.34	₩ 516,994	₩ 329,083
Borrowings in foreign currencies	Korea Development Bank and others	3M Libor+2.53, 2.30~4.89	343,444	172,613
Usance	Nonghyup Bank and others	0.30~1.00	62,296	79,374
Transferred receivables ¹	Hana Bank and others	-	8,106	10,013
Total			₩ 930,840	₩ 591,083

¹ Financial liabilities related to transferred trade receivables that do not meet the derecognition criteria amounted to ₩ 8,106 million and ₩ 10,013 million as at December 31, 2020 and 2019, respectively. Trade receivables are pledged as collaterals for these liabilities.

2) Long-term borrowings

(in thousands of foreign currencies and millions of Korean won)

Category	Creditor	Annual interest rate (%) as at December 31, 2020	December 31, 2020	December 31, 2019
Borrowings in Korean Won	Korea Development Bank	2.81	₩ 24,000	₩ 30,000
	Korea Development Bank and others	3.35~4.20	160,000	350,000
	HSBC	CD 3M+2.86	30,000	-
	Subtotal		214,000	380,000
Borrowings in foreign currencies	Industrial and Commercial Bank of China	4.75	CNY 70,000	-
	Korea Exim Bank	-	-	USD 119,000
	Korea Exim Bank	-	-	EUR 38,000
	US multiple institutions of investors and banks	3M Libor+1.75	USD 643,563	USD 657,013
	BNP Paribas	2.25~3.15	USD 20,035	USD 13,193
	Innovasjon Norge, etc.	3.65~5.50	NOK 23,008	NOK 13,270
	Bank of New York	8.00	USD 4,250	USD 4,250
	Chilean Government	3.50	USD 1,694	-
	Cinda Financial Leasing Co., Ltd	5.46	CNY 5,322	CNY 111,490
	China Railway Construction Financial Leasing Co., Ltd.	-	-	CNY 45,377
	Bank of Tianjin Financial Leasing Co., Ltd.	-	-	CNY 43,404
	Subtotal		EUR -	EUR 38,000
			USD 669,542	USD 793,456

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(in thousands of foreign currencies and millions of Korean won)

Category	Creditor	Annual interest rate (%) as at December 31, 2020	December 31, 2020	December 31, 2019
			CNY 75,322	CNY 200,271
			NOK 23,008	NOK 13,270
	Korean won equivalent		₩ 958,006	₩ 1,382,721
	Less: present value of discount		(8,100)	(10,336)
	Subtotal		₩ 949,906	₩ 1,372,385
	Less: current portion		(80,918)	(621,376)
	Total		₩ 868,988	₩ 751,009

(3) Detailed terms of bonds with warrant and convertible bonds as at December 31, 2020, are as follows:

1) Details of changes and issuance conditions of bonds with warrant issued by the Group as at December 31, 2020 are as follows:

Date of issue	Maturity date	Coupon rate(%)	YTM(%)	Exercisable period	Exercise price	Issuing price
2017-08-01	2022-08-01	2.00%	4.75%	From one month after date of issue to one month before maturity	₩ 8,030 per share	₩ 500,000 million

① Early redemption clause

The early redemption right is exercisable as a whole or in part against the par value of bond with stock warrants at the interest payment date in 3 years after the date of issuance of bonds. According to the exercise of the early repayment right, ₩ 393,821 million was repaid on August 3, 2020, and the remaining amount will be paid on the maturity date.

③ Maturity redemption

The coupon rate for the bond is 2.00% and for bonds not converted until maturity, 115.4175% of the remaining principal amount will be paid on August 1, 2022 with a yield to maturity rate of 4.75% compounded quarterly.

③ Calculation of the exercise price

The exercise price will be adjusted when there is an increase in paid-in capital through issuance of shares at a price lower than the market price, stock dividends, or capitalization of reserves, before exercising the stock warrants or when there is an issuance of stock purchase warrants or debt securities with warrants. The exercise price of stock warrants was adjusted to ₩7,620 from October 31, 2018, ₩7,170 from April 30, 2019, ₩6,430 from July 31, 2019.

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2) Details of bonds with warrants as at December 31, 2020 are as follows:

(in millions of Korean won)

	Beginning balance	Issuance/ Redemption	Exercise/ Amortization	Ending balance
Bonds with warrant	₩ 494,546	₩ (393,821)	₩ (199)	₩ 100,526
Redemption Premium on bonds with warrant	76,247	(60,717)	(31)	15,499
Present value of discount	(4,636)	2,935	1,099	(602)
Stock warrants adjustment	(73,165)	46,209	17,474	(9,482)
Carrying amount	492,992	(405,394)	18,343	105,941
Compensation for stock warrants (other capital surplus)	₩ 41,478	₩ -	₩ (5,536)	₩ 35,942

Due to the exertion of stock warrant, as at December 31, 2020, 11.13% of the outstanding balance of 31st warrant was exercised and 1.13% of the principal amount of the bonds was paid. The cumulative number of shares issued as a result of the exertion of stock warrants for 31st warrants is 8,476,311.

3) Details of changes and issuance conditions of convertible bonds issued by the Group as at December 31, 2020 are as follows:

Date of issue	Maturity date	Coupon rate(%)	YTM(%)	Exercisable period	Exercise price	Issuing price
2020-06-08	2023-06-08	2.87%	4.82%	From one month after date of issue to one month before maturity	₩ 6,291 per share	₩ 2,400 million

① Early redemption clause

The early redemption right is exercisable as a whole or in part against the par value of convertible bonds on June 8, 2022, at the interest payment date in two years after the date of issuance of bonds.

② Maturity redemption

106.2537% of the remaining principal amount will be paid on June 8, 2023, at maturity date.

③ Calculation of the exercise price

The exercise price will be adjusted when there is an increase in paid-in capital, issuance of shares without consideration through issuance of shares at a price lower than the market price, stock dividends, or capitalization of reserves, before exercising the stock warrants or convertible bonds.

Date of issue	Maturity date	Coupon rate(%)	YTM(%)	Exercisable period	Exercise price	Issuing price
2020-08-03	2023-08-03	2.81%	4.96%	From one month after date of issue to one month before maturity	₩ 7,421 per share	₩ 31,500 million

① Early redemption clause

The early redemption right is exercisable as a whole or in part against the par value of convertible bonds on August 3, 2022, at the interest payment date in two years after the date of issuance of bonds.

② Maturity redemption

106.9085% of the remaining principal amount will be paid on August 3, 2023, at maturity date.

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③ Calculation of the exercise price

The exercise price will be adjusted when there is an increase in paid-in capital, issuance of shares without consideration through issuance of shares at a price lower than the market price, stock dividends, or capitalization of reserves, before exercising the stock warrants or convertible bonds.

2) Details of convertible bonds as at December 31, 2020 are as follows:

(in millions of Korean won)

	Beginning balance		Issuance		Amortization		Ending balance	
Convertible bonds	₩	-	₩	33,900	₩	-	₩	33,900
Redemption Premium on convertible bonds		-		2,326		-		2,326
Present value of discount		-		(217)		29		(188)
Conversion right adjustment		-		(3,429)		444		(2,985)
Carrying amount		-		32,580		473		33,053
Compensation for conversion right (other capital surplus)	₩	-	₩	836	₩	-	₩	836

18. Net Defined Benefit Liabilities

(1) Details of net defined benefit liabilities recognized in the statements of financial position as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	December 31, 2020		December 31, 2019	
Present value of funded defined benefit obligations	₩	1,056,969	₩	1,058,837
Fair value of plan assets ¹		(617,988)		(629,499)
Net defined benefit liabilities	₩	438,981	₩	429,338

¹ The contributions to the National Pension Fund of ₩ 141 million are included in the fair value of plan assets as at December 31, 2020 (2019: ₩ 141 million).

(2) Profit and loss recognized for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020		2019	
Current service cost	₩	45,127	₩	35,778
Past service cost and (gains or) losses on settlements		(4,801)		(8,646)
Net interest cost		14,511		17,717
Total	₩	54,837	₩	44,849

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(3) Classification of post-employment benefits for the years ended December 31, 2020 and 2019, is as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Cost of sales	₩	29,258	₩	22,890
Selling and administrative expenses		18,924		16,585
Research and development expenses, etc.		6,655		5,374
Total	₩	54,837	₩	44,849

(4) Changes in the defined benefit obligations for the years ended December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Beginning balance	₩	1,058,837	₩	973,888
Current service cost		45,127		35,778
Past service cost and gains or losses on settlements		(4,801)		(8,646)
Transfer in		421		4,550
Transfer out		(1,732)		(616)
Interest expense		30,370		37,865
Remeasurements:				
Actuarial gain from change in demographic assumptions		(3,043)		(1,539)
Actuarial loss from change in financial assumptions		95,141		120,484
Actuarial loss (gain) from others		(13,055)		13,489
Contributions from employees		3,068		3,027
Payments from plans		(103,800)		(148,281)
Exchange differences		(49,564)		28,838
Ending balance	₩	1,056,969	₩	1,058,837

(5) Changes in the fair value of plan assets for the years ended December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Beginning balance	₩	629,499	₩	567,782
Expected return on plan assets		15,859		20,148
Transfer in		553		2,764
Transfer out		(443)		(338)
Remeasurements:		60,337		77,387
Contributions from employees		24		25
Contributions from employers		19,469		73,021
Payments from plans:		(83,114)		(127,711)
Exchange differences		(24,196)		16,421
Ending balance	₩	617,988	₩	629,499

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Actual gain or loss on plan assets is recognized as ₩ 76,196 million (gain) and ₩ 97,535 million (gain) for the years ended December 31, 2020 and 2019, respectively. The Group plans to contribute ₩ 64,271 million to the defined benefit plans in 2021.

(6) The significant actuarial assumptions as at December 31, 2020 and 2019, are as follows:

(in percentage, %)	2020	2019
Discount rate	1.00~2.60	1.30~3.30
Salary increase rate	0.00~4.20	0.08~4.20

(7) Plan assets as at December 31, 2020 and 2019 consist of:

(in millions of Korean won)	December 31, 2020		December 31, 2019	
Time deposits	₩	188,837	₩	175,251
Equity instruments		156,705		156,575
Debt instruments		228,091		256,732
Others		44,355		40,941
Total	₩	617,988	₩	629,499

(8) The sensitivity of the defined benefit obligation to changes in the principal assumptions is:

(in millions of Korean won)	2020		2019	
	Amount	Rate	Amount	Rate
Discount rate:				
1% increase	₩ (146,024)	(13.82%)	₩ (131,521)	(12.42%)
1% decrease	187,663	17.75%	165,911	15.67%
Salary increase rate:				
1% increase	41,973	3.97%	37,023	3.50%
1% decrease	(27,651)	(2.62%)	(24,420)	(2.31%)

(9) The weighted average maturity of the defined benefit obligation is 15.79 years.

19. Provisions

Changes in provision for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020						
	Beginning balance	Increases	Decreases	Others	Ending balance	Less: current portion	Non-current portion
Product warranties	₩ 286,469	₩ 128,462	₩ (133,256)	₩ (3,360)	₩ 278,315	₩ (234,255)	₩ 44,060
Others	2,768	4,957	(3,908)	21,094	24,911	(6,444)	18,467
Total	₩ 289,237	₩ 133,419	₩ (137,164)	₩ 17,734	₩ 303,226	₩ (240,699)	₩ 62,527

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	2019						
	Beginning balance	Increases	Decreases	Others	Ending balance	Less: current portion	Non-current portion
Product warranties	₩ 197,492	₩ 210,018	₩ (125,601)	₩ 4,560	₩ 286,469	₩ (234,214)	₩ 52,255
Others	1,952	8,095	(7,038)	(241)	2,768	(2,768)	-
Total	₩ 199,444	₩ 218,113	₩ (132,639)	₩ 4,319	₩ 289,237	₩ (236,982)	₩ 52,255

The Group recognizes provision by estimating expected expenses in relation to product warranty, defect repair services and others on the basis of the warranty period and historical experience and etc.

20. Share Capital and Capital Surplus

Changes in share capital and capital surplus for the year ended December 31, 2020, are as follows:

(in millions of Korean won)

Date	Description	Number of common stocks issued	Share capital	Capital Surplus	Consideration for Stock Warrants	Consideration for conversion rights	Other capital surplus
2020.01.01	Beginning balance	208,161,279	₩ 1,040,806	₩ 148,609	₩ 41,478	₩ -	₩ (35,731)
2020.03.25	Cancellation of share options	-	-	-	-	-	153
2020.03.31	Cancellation of share options	-	-	-	-	-	42
2020.05.31	Exercise of stock warrants	186	1	-	-	-	-
2020.06.30	Exercise of stock warrants	1,188,379	5,942	2,512	(846)	-	-
2020.06.30	Issuance of convertible bonds	-	-	-	-	70	-
2020.06.30	Cancellation of share options	-	-	-	-	-	66
2020.07.31	Exercise of stock warrants	3,558	18	5	(3)	-	-
2020.07.31	Cancellation of share options	-	-	-	-	-	27
2020.08.31	Exercise of stock warrants	753,570	3,768	1,593	(537)	-	-
2020.08.31	Issuance of convertible bonds	-	-	-	-	766	-
2020.09.30	Exercise of stock warrants	3,157,703	15,788	6,728	(2,249)	-	-
2020.10.31	Exercise of stock warrants	1,397,857	6,989	2,906	(996)	-	-
2020.10.31	Cancellation of share options	-	-	-	-	-	225
2020.11.30	Exercise of stock warrants	1,250,188	6,251	2,642	(890)	-	-
2020.12.31	Exercise of stock warrants	18,905	95	43	(15)	-	-
2020.12.31	Ending balance	215,931,625	₩ 1,079,658	₩ 165,038	₩ 35,942	₩ 836	₩ (35,218)

The Parent Company's total number of authorized shares is 400,000,000 shares and the total number of ordinary shares issued is 215,931,625 shares (2019: 208,161,279 shares) with a par value of ₩ 5,000 per share. As at December 31, 2020, the number of non-voting shares under the Commercial Law is 505 shares (2019: 505 shares).

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21. Other Components of Equity

(1) Other components of equity as at December 31, 2020 and 2019, consist of:

<i>(in millions of Korean won)</i>	December 31, 2020	December 31, 2019
Treasury share	₩ (2)	₩ (2)
Loss on disposal of treasury share	(7,909)	(7,909)
Share options	1,168	1,682
Other capital adjustments	(64,420)	(64,420)
Total	₩ (71,163)	₩ (70,649)

(2) Share-based Payments

The Group granted share options number of times to its directors. Methods to grant share options, issuance of new shares, issuance of treasury shares or cash settlement, are decided by the Board of Directors at their meeting to be held on stock exercise date. These share options carry a two-year service vesting condition, subsequent to the resolution made at the shareholders' meeting. The number of granted options as at December 31, 2020, is as follows:

(in Korean won except for share data)

Date of grant	Description	Number of granted options	Exercisable period	Exercisable price	Expected fair value at the date of grant
2011.03.25	7th grant	11,700	2014.03.25~2021.03.24	₩ 30,700	₩ 16,800
2012.03.30	8th grant	37,100	2015.03.30~2022.03.29	22,300	11,951
2013.03.29	9th grant	33,300	2016.03.29~2023.03.28	15,700	8,477
2014.03.21	10th grant	38,300	2017.03.21~2024.03.20	13,600	6,436
Total		120,400			

Changes in share option for the year ended December 31, 2020, are as follows:

	Number of common stocks to be issued (in shares)				Valuation amount (in millions of Korean won)		
	Beginning balance	Forfeited	Ending balance		Beginning balance	Forfeited	Ending balance
6th grant	14,500	(14,500)	-	₩	153	₩ (153)	₩ -
7th grant	13,300	(1,600)	11,700		223	(27)	196
8th grant	39,400	(2,300)	37,100		471	(27)	444
9th grant	38,200	(4,900)	33,300		324	(41)	283
10th grant	79,400	(41,100)	38,300		511	(265)	246
Total	184,800	(64,400)	120,400	₩	1,682	₩ (513)	₩ 1,169

There is no expense recognized due to share option granted in prior year. In addition, there is no compensation cost to be recognized for the year ended December 31, 2020, and for prospective period.

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The Group calculated the compensation costs by applying fair value approach. Assumptions used in determining fair value of share options are as follows:

	Risk-free interest rate ¹	Expected exercisable period	Expected volatility	Expected dividend yield ratio
7th grant	4.19%	6.5 years	58.01%	1.07%
8th grant	3.80%	6.5 years	57.96%	0.44%
9th grant	2.57%	6.5 years	54.12%	0.21%
10th grant	3.27%	6.5 years	42.29%	0.00%

¹ Risk-free interest rate is based on 5-year and 10-year treasury bond yield rate.

22. Accumulated Other Comprehensive Income

(1) Changes in accumulated other comprehensive income for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020				
	Share of other comprehensive income of associates	Exchange differences	Cash flow hedges	Revaluation reserves of property, plant and equipment	Total
Beginning balance	₩ 2,042	₩ (359,839)	₩ 48	₩ 197,931	₩ (159,818)
Increase	-	-	2,946	-	2,946
Decrease	-	(46,802)	-	(1,801)	(48,603)
Ending balance	₩ 2,042	₩ (406,641)	₩ 2,994	₩ 196,130	₩ (205,475)

(in millions of Korean won)

(in millions of Korean won)	2019											
	Gain (loss) on valuation of financial assets at fair value through other comprehensive income		Share of other comprehensive income of associates		Exchange differences		Cash flow hedges		Revaluation reserves of property, plant and equipment		Total	
Beginning balance	₩	2,540	₩	428	₩	(421,392)	₩	(4,435)	₩	166,054	₩	(256,805)
Increase		-		1,614		61,553		4,483		31,877		99,527
Decrease		(2,540)		-		-		-		-		(2,540)
Ending balance	₩	-	₩	2,042	₩	(359,839)	₩	48	₩	197,931	₩	(159,818)

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(2) Income tax effects directly recognized in accumulated other comprehensive income (loss) as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	December 31, 2020		
	Before tax	Deferred tax assets (liabilities)	After tax
Share of other comprehensive income of associates	₩ 2,042	₩ -	₩ 2,042
Exchange differences	(406,641)	-	(406,641)
Unrealized loss on valuation of derivatives	6,796	(3,802)	2,994
Gain on revaluation of property, plant and equipment	296,332	(100,202)	196,130
Total	₩ (101,471)	₩ (104,004)	₩ (205,475)

(in millions of Korean won)

	December 31, 2019		
	Before tax	Deferred tax assets (liabilities)	After tax
Share of other comprehensive income of associates	₩ 2,042	₩ -	₩ 2,042
Exchange differences	(359,839)	-	(359,839)
Unrealized loss on valuation of derivatives	2,920	(2,872)	48
Gain on revaluation of property, plant and equipment	296,333	(98,402)	197,931
Total	₩ (58,544)	₩ (101,274)	₩ (159,818)

23. Retained Earnings

(1) Retained earnings as at December 31, 2020 and 2019, consist of:

(in millions of Korean won)

	December 31, 2020	December 31, 2019
Retained earnings before appropriation	₩ 1,408,126	₩ 1,257,868

(2) The appropriation of retained earnings for the years ended December 31, 2020 and 2019, is as follows:

(in millions of Korean won)

	2020	2019
1. Unappropriated retained earnings carried over from prior year	₩ 1,257,868	₩ 1,049,189
2. Profit for the year	148,834	239,913
3. Revaluation and disposal of property, plant and equipment	1,800	61
4. Remeasurements of net defined benefit liabilities	(417)	(31,295)
5. Changes in retained earnings of equity method investment securities	41	(171)
6. Valuation of equity instruments at fair value	-	171
7. Unappropriated retained earnings to be carried forward	₩ 1,408,126	₩ 1,257,868

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24. Segment Information

The Group's operating segments are as follows:

Business segment	Main products
Engines ("EG")	Engine of the commercial cars and buses, engine parts
Construction Equipment ("CE")	Crawler excavator, excavator parts and others
Construction Equipment ("Bobcat")	Compact (Skid Steer Loader, Compact Track Loader, Mini Excavator), Heavy Excavator, and Portable Power

(1) Profit or loss by each segment for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020			
	Total segment revenue	Inter-segment revenue	Revenue from external customers	Operating profit
EG	₩ 861,055	₩ (394,835)	₩ 466,220	₩ 2,207
CE	5,385,581	(2,155,799)	3,229,782	262,528
Bobcat	4,282,058	(43,955)	4,238,103	393,864
Subtotal	10,528,694	(2,594,589)	7,934,105	658,599
Consolidation adjustments	(2,594,589)	2,594,589	-	-
Total	₩ 7,934,105	₩ -	₩ 7,934,105	₩ 658,599

(in millions of Korean won)

	2019			
	Total segment revenue	Inter-segment revenue	Revenue from external customers	Operating profit
EG	₩ 1,109,515	₩ (531,372)	₩ 578,143	₩ 82,353
CE	5,428,316	(2,279,883)	3,148,433	281,029
Bobcat	4,509,550	(50,286)	4,459,264	477,015
Subtotal	11,047,381	(2,861,541)	8,185,840	840,397
Consolidation adjustments	(2,861,541)	2,861,541	-	-
Total	₩ 8,185,840	₩ -	₩ 8,185,840	₩ 840,397

(2) Segment assets at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	December 31, 2020	December 31, 2019
EG	₩ 837,182	₩ 915,003
CE	2,995,751	2,924,196
Bobcat	6,960,608	6,704,236
Other	4,587,684	4,096,999
Subtotal	15,381,225	14,640,434
Consolidation adjustments	(3,354,339)	(3,301,841)
Total	₩ 12,026,886	₩ 11,338,593

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(3) Segment liabilities as at December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>		December 31, 2020	December 31, 2019
EG	₩	685,399	₩ 730,703
CE		3,521,561	3,570,184
Bobcat		2,886,803	2,725,170
Other		1,505,656	1,122,334
Subtotal		8,599,419	8,148,391
Consolidation adjustments		(1,061,531)	(1,077,350)
Total	₩	7,537,888	₩ 7,071,041

(4) The sales information by regional segment for the years ended December 31, 2020 and 2019, is as follows:

<i>(in millions of Korean won)</i>		2020		
		Total segment revenue	Inter-segment revenue	Revenue from external customers
Asia Pacific & Emerging Market	₩	3,240,603	₩ (1,484,886)	₩ 1,755,717
China		1,698,024	(187,051)	1,510,973
Europe & Middle East & Africa		1,782,854	(502,230)	1,280,624
North America & Oceania		3,807,213	(420,422)	3,386,791
Subtotal		10,528,694	(2,594,589)	7,934,105
Consolidation adjustments		(2,594,589)	2,594,589	-
Total	₩	7,934,105	₩ -	₩ 7,934,105

<i>(in millions of Korean won)</i>		2019		
		Total segment revenue	Inter-segment revenue	Revenue from external customers
Asia Pacific & Emerging Market	₩	3,585,178	₩ (1,692,225)	₩ 1,892,953
China		1,475,915	(176,907)	1,299,008
Europe & Middle East & Africa		1,963,715	(560,876)	1,402,839
North America & Oceania		4,022,573	(431,533)	3,591,040
Subtotal		11,047,381	(2,861,541)	8,185,840
Consolidation adjustments		(2,861,541)	2,861,541	-
Total	₩	8,185,840	₩ -	₩ 8,185,840

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25. Revenue

The Group has recognized the following amounts relating to revenue in the statement of profit or loss:

<i>(in millions of Korean won)</i>		2020
1. Revenue from contracts with customers		
Type of revenue:		
- Revenue of manufactured products / merchandise	₩	7,708,798
- Other revenue		165,211
Subtotal	₩	7,874,009
Timing of revenue recognition:		
- At a point in time	₩	7,610,682
- Over time		263,327
Subtotal	₩	7,874,009
2. Revenue from other sources		
- Rental income	₩	61,986
- profit or loss from hedge		(1,890)
Subtotal	₩	60,096
Total	₩	7,934,105

<i>(in millions of Korean won)</i>		2019
1. Revenue from contracts with customers		
Type of revenue:		
- Revenue of manufactured products / merchandise	₩	8,006,653
- Other revenue		127,118
Subtotal	₩	8,133,771
Timing of revenue recognition:		
- At a point in time	₩	7,900,244
- Over time		233,527
Subtotal	₩	8,133,771
2. Revenue from other sources		
- Rental income	₩	64,499
- profit or loss from hedge		(12,430)
Subtotal	₩	52,069
Total	₩	8,185,840

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(2) Assets and Liabilities related to Contracts with Customers

The Group has recognized the following assets and liabilities related to contracts with customers:

<i>(in millions of Korean won)</i>	December 31, 2020		December 31, 2019	
Refund liabilities	₩	11,360	₩	14,099
Product warranties/Incentive and others		365,180		469,040
Shipping•insurance service		3,022		2,517
Total	₩	379,562	₩	485,656

26. Breakdown of Expenses by Nature

Breakdown of Expenses by Nature for the years ended December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Purchases of inventories (raw materials and merchandise)	₩	4,066,885	₩	4,417,515
Changes in inventories		207,760		(271,611)
Employee benefits expenses		948,230		871,084
Depreciation and amortization		287,432		248,761
Other expenses		1,765,199		2,079,694
Total	₩	7,275,506	₩	7,345,443

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27. Selling and Administrative Expenses

Selling and administrative expenses for the years ended December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Salaries	₩	298,714	₩	289,411
Post-employment benefits		21,301		18,198
Employee benefits		61,849		59,906
Printing		4,896		4,212
Freight and custody		1,817		2,094
Communications		9,323		9,633
Utilities		4,399		4,643
Maintenance		3,854		3,817
Insurance		15,122		18,652
Depreciation		14,114		17,527
Right of use asset depreciation		22,237		14,784
Amortization		28,490		24,825
Research and development		202,694		190,235
Advertising expenses		67,636		79,751
Sales commission		84,385		70,043
Taxes and dues		12,225		13,008
Travel expenses		14,079		37,231
Commission expenses		137,683		151,330
Education and training expenses		9,700		10,265
Reversal of bad debt expenses		(7,444)		(7,984)
Others		62,536		60,643
Total	₩	1,069,610	₩	1,072,224

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28. Finance Income and Expenses

Finance income and expenses for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020		2019	
Finance income:				
Interest income	₩	18,474	₩	19,832
Gain on dividends		560		12,982
Gain on foreign currency transactions		89,546		64,847
Gain on foreign currency translations		88,965		45,044
Gain on derivative transactions		1,543		5,840
Gain on debt redemption		-		1,767
Financial guarantee income		448		279
Subtotal	₩	<u>199,536</u>	₩	<u>150,591</u>
Finance expenses:				
Interest expenses	₩	(173,738)	₩	(192,022)
Loss on foreign currency transactions		(80,561)		(58,524)
Loss on foreign currency translations		(93,071)		(54,815)
Loss on derivative transactions		(2,112)		(11,789)
Loss on repayment of borrowings		(23,136)		(2,168)
Financial guarantee expenses		(12,122)		(10,519)
Other finance expenses		(529)		(539)
Subtotal	₩	<u>(385,269)</u>	₩	<u>(330,376)</u>
Net finance expenses	₩	<u>(185,733)</u>	₩	<u>(179,785)</u>

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29. Other non-operating Income and Expenses

Other non-operating income and expenses for the years ended December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Other non-operating income:				
Gain on valuation of long-term investment securities	₩	394	₩	8
Gain on disposal of long-term investment securities		1,467		-
Gain on disposal of property, plant and equipment		1,336		364
Gain on disposal of intangible assets		745		-
Reversal of impairment loss on intangible assets		4,538		-
Reversal of impairment loss on investment properties		136		-
Others		17,511		13,564
Subtotal	₩	26,127	₩	13,936
Other non-operating expenses:				
Loss on disposal of trade receivables	₩	(10,099)	₩	(14,333)
Loss on valuation of short-term investment securities		(1,496)		(3,200)
Loss on valuation of long-term investment securities		(38)		(482)
Loss on disposal of long-term investment securities		(1,022)		-
Loss on disposal of other investment securities		-		(1,141)
Reversal of impairment loss on other receivables (expense)		(5,350)		(7,162)
Loss on disposal of property, plant and equipment		(342)		(4,164)
Impairment loss on property, plant and equipment		-		(64)
Impairment loss on intangible assets		(6,471)		(5,587)
Loss on disposal of intangible assets		(20)		-
Loss on disposal of investment properties		(25)		-
Impairment loss on investment properties		(3,286)		(57)
Loss on lease contracts		(6)		(9)
Donations		(11,815)		(11,445)
Others		(7,609)		(16,193)
Subtotal	₩	(47,579)	₩	(63,837)
Total	₩	(21,452)	₩	(49,901)

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30. Income Tax Expense

(1) Income tax expense for the years ended December 31, 2020 and 2019, consists of:

<i>(in millions of Korean won)</i>	2020		2019	
Current tax:	₩	107,259	₩	91,183
Deferred tax		29,610		87,321
Total income tax expense	₩	136,869	₩	178,504
Deferred tax charged directly to equity		26,312		28,807
Income tax expense	₩	163,181	₩	207,311

(2) The Group offsets deferred tax assets and deferred tax liabilities if the Group has a legally enforceable right to set off current tax assets against current tax liabilities and the deferred tax assets and the deferred tax liabilities relate to income taxes levied by the same taxation authority. Changes in deferred tax assets and liabilities for the years ended December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>		2020		
		Beginning	Increases (Decreases)	Ending
Advances from government	₩	1,069	₩ 69	₩ 1,138
Allowance for doubtful accounts		67,975	(34,815)	33,160
Provision for product warranties		53,086	20,897	73,983
Net defined benefit liabilities		100,569	5,295	105,864
Investment in associates		(18,191)	3,426	(14,765)
Provision for temporary depreciation		(3,715)	-	(3,715)
Gain on revaluation of land		(123,603)	1,780	(121,823)
Derivative assets(liabilities)		(742)	(903)	(1,645)
Net loss carryforwards		11,921	(59)	11,862
Others		(174,206)	(25,300)	(199,506)
Total	₩	(85,837)	₩ (29,610)	₩ (115,447)

<i>(in millions of Korean won)</i>		2019		
		Beginning	Increases (Decreases)	Ending
Advances from government	₩	1,230	₩ (161)	₩ 1,069
Allowance for doubtful accounts		80,595	(12,620)	67,975
Provision for product warranties		24,768	28,318	53,086
Net defined benefit liabilities		96,968	3,601	100,569
Investment in associates		(19,195)	1,004	(18,191)
Provision for temporary depreciation		(3,715)	-	(3,715)
Gain on revaluation of land		(118,291)	(5,312)	(123,603)
Derivative assets(liabilities)		1,713	(2,455)	(742)
Net loss carryforwards		10,088	1,833	11,921
Others		(72,677)	(101,529)	(174,206)
Total	₩	1,484	₩ (87,321)	₩ (85,837)

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(3) Temporary differences which have not been recognized as deferred tax assets as at December 31, 2020 and 2019, are as follows (except for investments in subsidiaries and associates):

<i>(in millions of Korean won)</i>	December 31, 2020		December 31, 2019	
Tax loss carryforwards	₩	1,054,801	₩	945,199
Deductible temporary differences		275,375		212,647
Tax credits carryover		22,208		20,934

The probability of deferred tax assets being realized depends on the Group's ability to generate taxable income in future years, the economic situation and industry forecast. The Group periodically reviews such matters.

(4) Temporary differences from investments in subsidiaries, joint ventures and associates, which are not recognized as deferred tax assets (liabilities) are as follows:

<i>(in millions of Korean won)</i>	December 31, 2020		December 31, 2019	
Subsidiaries	₩	(516,430)	₩	(609,680)

(5) The tax on the Group's profit before tax differs from the theoretical amount that would arise using the weighted average tax rate applicable to profits of the consolidated entities as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Profit before income tax expense	₩	448,255	₩	603,009
Tax at domestic tax rates applicable to profits in the respective countries	₩	160,607	₩	198,349
Adjustments:				
Non-temporary difference		(7,186)		13,371
Effect of change in recognition of deferred income tax		(3,893)		(2,985)
Tax credits		(15,980)		(38,088)
Additional income tax		40		2,913
Others		29,593		33,751
Income tax expense	₩	163,181	₩	207,311
Average effective tax rate (Income tax expense / Profit before income tax)		36.4%		34.4%

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31. Earnings per Share

(1) Basic earnings per share

Basic earnings per share is calculated by dividing the profit attributable to owners of the Group by the weighted average number of ordinary shares outstanding during the financial year excluding treasury shares.

Basic earnings per share attributable to owners of the Group for the years ended December 31, 2020 and 2019, are computed as follows:

<i>(in Korean won, shares)</i>	2020	2019
Profit attributable to the ordinary equity holders of the Parent Company	₩ 148,834,138,692	₩ 239,913,446,929
Weighted average number of ordinary shares outstanding ¹	210,466,058	208,160,644
Basic earnings per share	₩ 707	₩ 1,153

¹ The weighted average number of ordinary shares outstanding is calculated as follows:

<i>(in shares)</i>	2020	2019
Ordinary shares at the beginning ¹	208,160,774	208,157,572
Exercise of stock warrants	2,305,284	3,072
Weighted average number of ordinary shares outstanding	210,466,058	208,160,644

¹ Treasury shares are excluded.

(2) Diluted earnings per share

Diluted earnings per share for the years ended December 31, 2020 and 2019, are computed as follows.

<i>(in Korean won, shares)</i>	2020	2019
Profit attributable to ordinary shares before adjustment	₩ 148,834,138,692	₩ 239,913,446,929
Adjustment:	663,046,975	-
Profit attributable to ordinary shares after adjustment	149,497,185,667	239,913,446,929
Weighted average number of ordinary shares outstanding after adjustment ¹	212,758,718	210,607,775
Diluted earnings per share	₩ 703	₩ 1,139

¹ The details of weighted-average number of ordinary shares outstanding after adjustment used to calculate diluted earnings per share are as follows:

<i>(in shares)</i>	2020	2019
Ordinary shares at the beginning	210,466,058	208,160,644
Exercise of stock warrants	325,662	2,447,131
Convertible bonds ¹	1,966,998	-
Weighted average number of Ordinary shares outstanding	212,758,718	210,607,775

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¹ 4,626,207 convertible bonds were issued for the year ended December 31, 2020.

Share options that could be used to dilute basic earnings per share in the future, which were not considered in the calculation of diluted earnings per share due to an anti-dilutive effect for the years ended December 31, 2020 and 2019, are as follows:

<i>(in shares)</i>	2020	2019
Share options	120,400	184,800

32. Dividends

The Group did not pay any dividends for the year ended December 31, 2020.

33. Commitments and Contingencies

(1) As at December 31, 2020, the Group is involved in pending lawsuits as a defendant with total claims amounting to ₩ 50,401 million (excluding billing amount for share purchase price of Doosan Infracore China Co., Ltd.). The outcome of the lawsuit and its effects cannot be reasonably estimated as at December 31, 2020.

(2) In 2011, an external investor acquired 20% of interest in Doosan Infracore China Co., Ltd., a subsidiary of the Parent Company, for ₩ 380 billion. According to the shareholders' agreement entered into with the Parent Company, both parties have the right to request the counterparty to jointly sell their respective shares to a third party. Although, in principal, the Parent Company has to jointly sell its stake in case the external investor request for such sale, the Parent Company also has the right to purchase the external investor's share first at the price proposed by the external investor.

In November 2015, the external investor filed a lawsuit claiming partial payment of stock purchase price contending that a share purchase agreement shall be deemed to be executed following the Group's purported failure to cooperate with the external investor's request for due diligence information. On February 21, 2018 the Seoul High Court overturned the 1st ruling and recognized the Parent Company's breach of duty and ruled the Company to pay the claim amount of ₩ 10 billion.

However, on January 14, 2021, the Supreme Court (Case No. 2018 다 223054) accepted the Parent Company's allegation that there was an error in the judicial decision of the verdict in the first trial, reversed the initial ruling and remanded the case back to the Seoul High Court.

As the Parent Company won the case at Supreme Court, the pledge of 8,288,196 ordinary shares of Doosan Bobcat Inc. was terminated on January 20, 2021.

(3) As at December 31, 2020, the Group has entered into bank overdraft agreements amounting to ₩ 2,830,538 million with various financial institutions.

(4) Financial covenant

As at December 31, 2020, the Group issued 57th and 67th series bonds denominated in USD 300 million, respectively. In accordance with the agreement for issuing the 57th and 67th series bonds, an early redemption clause exists for when and if the Group's guarantor, the Korea Development Bank, becomes privatized. In addition, the Group has pledged its 11,362,886 and 13,884,989 shares of Doosan Bobcat Inc. as collaterals and, if the price falls below par, additional shares or deposits equivalent to the difference should be secured.

The Group has pledged 8,595,047 shares of Doosan Bobcat Inc. as collateral for borrowings of ₩ 160,000 million from the Korea Development Bank and 4 other financial institutions. In relation to

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the borrowings, if the ratio does not meet the certain collateral limit predetermined in the agreement, additional shares or deposits must be secured as collaterals. Also, in case the Group receives a credit rating equal to or lower than BB0 from more than two of the domestic credit rating agencies, NICE Investors Service Co., Ltd., Korea Investor Service Inc., and Korea Ratings Corporation, it will be a trigger for the financial institutions to collect the loans before the maturity.

As at December 31, 2020, the Group issued 61st series bonds denominated in ₩ 50,000 million, in case the Group receives a credit rating equal to or lower than BB+ from more than one of the domestic credit rating agencies such as NICE Investors Service Co., Ltd., Korea Investor Service Inc., and Korea Ratings Corporation, it will be a trigger for the financial institutions to collect the bonds before the maturity.

The Group has pledged 3,650,000 shares of Doosan Bobcat Inc. as collateral for borrowings of ₩ 100,000 million from Standard Chartered Bank Korea Ltd. In relation to the borrowings, if the ratio does not meet the certain collateral limit predetermined in the agreement, either additional shares or deposits must be secured as collaterals.

As at December 31, 2020, the Group entered into a loan agreement of ₩ 60,000 million from Mizuho Bank, in case the Group receives a credit rating equal to or lower than BB+ from more than one of the domestic credit rating agencies, it will be a trigger for the financial institutions to collect the bonds before the maturity.

(5) The financial liabilities related to the transferred receivables that the Group continues to recognize because the Group substantially retains all of the risks and rewards of ownership as at December 31, 2020, amount to ₩ 8,106 million.

(6) As at December 31, 2020, guarantees provided by the Group for third parties are as follows:

(in thousands of foreign currencies and millions of Korean won)

Guarantor	Beneficiary		Guaranteed amount		Korean won equivalent
Doosan Infracore China Co., Ltd.	End User	CNY	923,127	₩	154,125
Clark Equipment Co. and others	End User	USD	142,972		155,553
Doosan Bobcat EMEA s.r.o. and others	End User	USD	171		186
Doosan Bobcat Korea Co., Ltd.	End User	USD	12,417		13,510
Total				₩	323,374

Meanwhile, as at December 31, 2020, the Group entered into agreements with the Korea Development Bank for the guarantees of 57th and 67th foreign currency-denominated bonds of USD 300,000 thousand respectively. In addition, the company entered into agreements with various banks for performance guarantees of USD 422 thousand regarding exports and imports, and with Seoul Guarantee Insurance Company and Machinery Financial Cooperative for performance and payment guarantees of ₩ 10,381 million in total. Regarding guarantees provided by Machinery Financial Cooperative, equity investment of ₩ 200 million in Machinery Financial Cooperative is also pledged as a collateral.

(7) Other commitments and contingencies

The Group terminated the lease contract of the Doosan Bundang Center with DBC Co., Ltd. in January 2021 and entered into a new lease contract with Bundang Doosan Tower REIT Co., Ltd.

During the year ended December 31, 2020, the Group entered into an investment contracts with ZIGG CAPITAL I,L.P. and 4 others. The contracts amount to USD 3,885 thousand.

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34. Pledged Assets

(1) The Group's assets pledged as collaterals for long-term and short-term borrowings as at December 31, 2020, are as follows:

(in thousand of USD, DM and NOK, in millions of Korean won)

Pledgee	Collateralized asset	Amount of Borrowings		Collateralized amount	
Korea Development Bank	Land, buildings and machinery ¹	KRW	211,200	KRW	371,112
		USD	15,000	USD	95,025
			-	DM	84,000
Korea Exim Bank	Inventories	KRW	150,000	KRW	195,000
Ubest 5th Co.,Ltd	Land and buildings, etc.	KRW	80,000	KRW	96,000
Innovation Norge and others	Buildings and machinery etc	NOK	23,008	NOK	295,446

¹ The Parent Company's rights to property and inventory insurance benefits are pledged as collaterals to the Korea Development Bank.

(2) The Group entered into a new borrowing of USD 1,345,000 thousand and a limit loan agreement of USD 150,000 thousand, on May 18, 2017. In addition, the Group issued bonds of USD 300,000 thousand on May 29, 2020, and entered into a limit loan agreement of USD 20,000 thousand on December 15, 2020. The Group has pledged total shares of Clark Equipment Co., Doosan Bobcat EMEA s.r.o., Doosan Bobcat Global Collaboration Center, Inc. and Doosan Bobcat Singapore Pte. Ltd., as collaterals for the borrowing, bonds and loan commitment. Also, Clark Equipment's certain property, plant and equipment, intangible assets, equity shares in its subsidiaries and etc are provided as collateral. The balance of the related borrowings as at December 31, 2020 is USD 943,563 thousand.

(3) The Group's associate, DBC Co., Ltd. has entered to a PF loan agreement amounting to ₩ 375,000 million for construction of the Doosan Bundang Center. In relation to the borrowings, the Group has pledged 1,057,880 shares of DBC Co, Ltd. held by the Group as a collateral (secured amount ₩ 53,066 million). The collateral provided was terminated in January 2021.

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35. Related Party Transactions

The Group's related party disclosures for the years ended December 31, 2020 and 2019, are as follows:

(1) Nature of relationship

Relationship	Name
Ultimate parent	Doosan Corporation
Next most senior parent	Doosan Heavy Industries and Construction Co., Ltd.
Joint ventures and associates	Doosan Cuvex Co., Ltd., DBC Co., Ltd., Tianjin Lovol Doosan Engine Co., Ltd., and others
Other related parties ^{1, 2}	Doosan Construction & Engineering Co., Ltd., Oricom Inc., Doosan Bears Inc. and others

¹ Other related parties include entities which belong to a large enterprise group in accordance with the Monopoly Regulation and Fair Trade Act, although the entities are not the related party of the Group in accordance with Korean IFRS 1024.

² During the year ended December 31, 2020, Doosan Solus Co., Ltd. and Neoplux Co., Ltd. were excluded from related parties.

(2) Significant transactions with related parties for the years ended December 31, 2020 and 2019, are as follows

(in millions of Korean won)

(in millions of Korean won)		2020											
Relationship	Sales	Disposal of property, plant and equipment and intangible assets		Other income	Purchases		Acquisition of property, plant and equipment and intangible assets		Other expenses		Acquisition Right of use asset		
Ultimate parent	₩ 64,289	₩	499	₩	260	₩	67,898	₩	8,445	₩	49,497	₩	2,193
Next most senior parent	1,731		-		24		-		-		-		-
Joint ventures and associates	26,333		-		793		576		77		11,494		-
Others	4,200		-		1,600		109,136		2,215		91,897		145
Total	₩ 96,553	₩	499	₩	2,677	₩	177,610	₩	10,737	₩	152,888	₩	2,338

(in millions of Korean won)

(in millions of Korean won)		2019											
Relationship	Sales	Disposal of property, plant and equipment and intangible assets		Other income	Purchases		Acquisition of property, plant and equipment and intangible assets		Other expenses	Acquisition Right of use asset			
Ultimate parent	₩ 70,567	₩	2	₩	6	₩	82,226	₩	53,324	₩	52,321	₩	5,285
Next most senior parent	1,602		-		-		-		39,525		1		-
Joint ventures and associates	14,185		-		134		167		-		10,694		-
Others	1,173		-		2,289		86,470		15,864		100,989		1,828
Total	₩ 87,527	₩	2	₩	2,429	₩	168,863	₩	108,713	₩	164,005	₩	7,113

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(3) Outstanding balances of significant receivables and payables for related parties as at December 31, 2020 and 2019, are as follows:

(in millions of Korean won)	2020					
	Trade receivables	Other receivables	Loans	Trade payables	Other payables	Lease liabilities
Ultimate parent	₩ 24,052	₩ 5,068	₩ -	₩ 5,564	₩ 8,309	₩ 1,872
Next most senior parent	538	11	-	-	763	-
Joint ventures and associates	3,539	11,018	-	69	698	-
Others	64	18,190	26,112	62,366	4,305	966
	<u>₩ 28,193</u>	<u>₩ 34,287</u>	<u>₩ 26,112</u>	<u>₩ 67,999</u>	<u>₩ 14,075</u>	<u>₩ 2,838</u>

(in millions of Korean won)	2019					
	Trade receivables	Other receivables	Trade payables	Other payables	Lease liabilities	
Ultimate parent	₩ 11,269	₩ 4,575	₩ 7,057	₩ 10,365	₩ 5,285	
Next most senior parent	102	76	-	1,078	-	
Joint ventures and associates	1,434	4,526	-	725	-	
Others	312	15,122	33,598	5,962	1,864	
Total	<u>₩ 13,117</u>	<u>₩ 24,299</u>	<u>₩ 40,655</u>	<u>₩ 18,130</u>	<u>₩ 7,149</u>	

(4) Fund transactions (including equity transactions) with related parties for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)		2020	
		Loan transaction	Equity transaction
		Lending	Contribution
	D20 CAPITAL FUND I, L.P. and its associates	₩ -	₩ 5,310
Associate and joint ventures	Doosan Cuvex Co., Ltd. ¹	-	35,991
	Tianjin Lovol Doosan Engine Co., Ltd. ²	-	2,523
	Ainstein AI, Inc. ³	-	2,360
Others	Doosan Heavy Industries America Holdings INC.	28,321	-
	Total	<u>₩ 28,321</u>	<u>₩ 46,184</u>

¹ Doosan Cuvex Co., Ltd. participated in the capital increase and acquired 6.85% of the shares for ₩ 35,991 million for the year ended December 31, 2020.

² The Group acquired additional shares of Tianjin Lovol Doosan Engine Co., Ltd. for ₩ 2,523 million, and there are no changes in percentage of ownership for the year ended December 31, 2020.

³ The Group acquired 9.09% of Ainstein AI, Inc. for ₩ 2,360 million for the year ended December 31, 2020.

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		2019			
		Loan transaction		Equity transaction	Dividends
		Lending	Repayment	Contribution	Income
Next most-senior parent	Doosan Heavy Industries and Construction Co., Ltd.	₩ -	₩ -	₩ -	₩ 12,640
Associate and joint ventures	Tianjin Lovol Doosan Engine Co., Ltd.	-	-	12,913	-
	DBC Co., Ltd. ¹	-	-	28,474	-
Others	Doosan Heavy Industries America Holdings INC.	93,252	93,252	-	-
	Total	₩ 93,252	₩ 93,252	₩ 41,387	₩ 12,640

¹ The Group acquired certain portion of interest in DBC Co., Ltd. originally held by the related parties. It purchased ₩ 23,096 million of shares from Doosan Heavy Industries and Construction Co., Ltd., the next most senior parent, and ₩ 5,378 million of shares from Doosan Construction & Engineering Co., Ltd., one of other related parties, respectively.

(5) The Group's lease contracts with related parties amount to ₩ 2,338 million (2019: ₩ 7,113 million), and lease payments to related parties amount to ₩ 6,823 million (2019: ₩ 1,153 million).

(6) Details of collaterals provided by and provided to the related parties as at December 31, 2020 are described in Note 34.

(7) The Group defines key management personnel including registered officer and non-registered officer who have the authority and responsibility for planning, operation and control. Compensation to the key management personnel of the Group for the years ended December 31, 2020 and 2019, is as follows:

(in millions of Korean won)

	2020	2019
Employee benefits	₩ 20,525	₩ 26,757
Post-employment benefits	1,437	1,246
Total	₩ 21,962	₩ 28,003

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36. Consolidated Statements of Cash Flows

(1) Details of adjustments, and changes in operating assets and liabilities in the consolidated statement of cash flows for the years ended December 31, 2020 and 2019, are as follows:

<i>(in millions of Korean won)</i>	2020		2019	
Adjustments:				
1. Income tax expense	₩	163,181	₩	207,311
2. Finance income		(50,565)		(39,449)
3. Finance expenses		238,687		228,808
4. Post-employment benefits (defined benefit plan)		54,837		44,849
5. Depreciation		166,483		147,778
6. Amortization		84,692		76,970
7. Right of use asset depreciation		36,257		24,013
8. Gain on disposal of property, plant and equipment		(1,336)		(364)
9. Gain on disposal of intangible assets		(745)		-
10. Loss on disposal of property, plant and equipment		342		4,164
11. Loss on disposal of intangible assets		20		1,141
12. Reversal of impairment loss on investment properties		(136)		-
13. Loss on disposal of investment properties		25		-
14. Impairment loss on property, plant and equipment		-		64
15. Impairment loss on intangible assets		6,471		5,587
16. Reversal of impairment loss on intangible assets		(4,538)		-
17. Impairment loss on investment properties		3,286		57
18. Gain on valuation of short-term investment securities		(1,516)		(8)
19. Loss on valuation of short-term investment securities		1,496		3,682
20. Gain on valuation of long-term investment securities		(2,654)		-
21. Loss on valuation of long-term investment securities		60		-
22. Loss on disposal of long-term financial assets		2,045		-
23. Loss on equity method investments		3,158		7,702
24. Dividend income		(560)		(12,982)
25. Others		14,751		222
Total	₩	713,741	₩	699,545

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	2020	2019
Changes in operating assets and liabilities:		
1. Changes in trade receivables	₩ 217,059	₩ 58,419
2. Changes in other receivables	19,392	3,268
3. Changes in derivative assets	260	775
4. Changes in inventories	263,734	(243,179)
5. Changes in other current assets	11,849	3,881
6. Changes in other non-current assets	1,434	(4,229)
7. Changes in trade payables	(151,662)	(157,692)
8. Changes in other payables	(38,210)	80,622
9. Changes in derivative liabilities	(271)	(10,746)
10. Changes in provisions	(23,820)	89,349
11. Changes in other current liabilities	8,007	(5,975)
12. Payment of defined benefit obligations (defined benefit plan)	(100,732)	(145,254)
13. Transferred out to affiliates	(1,420)	1,508
14. Changes in plan assets	63,620	54,665
15. Changes in other non-current liabilities	17,821	(4,757)
Total	₩ 287,061	₩ (279,345)

(2) Significant non-cash transactions for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020	2019
Changes in non-trade payables related to property, plant and equipment acquisition	₩ (10,358)	₩ (570)

(3) Changes in liabilities arising from financial activities for the years ended December 31, 2020 and 2019, are as follows:

(in millions of Korean won)

	2020						
	Beginning balance	Cash flows	Non-cash variances			Ending balance	
			Changes in exchange rates	Changes in fair value	Others		
Short-term borrowings	₩ 591,083	₩ 345,269	₩ (5,512)	₩ -	₩ -	₩ 930,840	
Long-term borrowings (including current portion of long-term borrowings)	1,372,384	(387,669)	(43,729)	4,786	4,135	949,907	
Bonds (including current portion of bonds)	1,447,080	867,896	(52,650)	7,073	-	2,269,399	
Bonds with warrants (including current portion of bonds with warrants)	492,992	(428,519)	-	18,550	22,919	105,942	
Convertible bonds	-	32,581	-	472	-	33,053	
Lease liabilities	79,406	(34,658)	(863)	-	33,514	77,399	
Liabilities to avoid risks arising from bonds	(12,770)	25,050	37,978	(8,450)	1,966	43,774	
Total	₩ 3,970,175	₩ 419,950	₩ (64,776)	₩ 22,431	₩ 62,534	₩ 4,410,314	

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(in millions of Korean won)

	2019											
	Beginning balance		Cash flows		Non-cash variances				Ending balance			
					Changes in exchange rates	Changes in fair value	Others					
Short-term borrowings	₩	937,600	₩	(349,801)	₩	3,284	₩	-	₩	-	₩	591,083
Long-term borrowings (including current portion of long-term borrowings)		1,881,810		(579,988)		59,584		4,711		6,267		1,372,384
Bonds (including current portion of bonds)		983,221		448,616		9,360		5,883		-		1,447,080
Bonds with warrants (including current portion of bonds with warrants)		466,179		4		-		26,830		(21)		492,992
Lease liabilities		-		(21,423)		499		-		100,330		79,406
Liabilities to avoid risks arising from bonds		1,756		6,781		(9,998)		(8,214)		(3,095)		(12,770)
Total	₩	4,270,566	₩	(495,811)	₩	62,729	₩	29,210	₩	103,481	₩	3,970,175

37. Business Combination

- ZTR Mowers Segment

1) Upon approval of board of directors on December 2, 2019, the Group has acquired the ZTR Mower business of Schiller Grounds Care, INC's on December 31, 2019. The Group expects a synergy effect between ZTR Mower business and its existing business in the US as a result of this acquisition.

2) Details of the purchase consideration paid to Schiller Grounds Care, INC, and the acquired assets and liabilities recognized as a result of the acquisition at the acquisition date are as follows. In relation to this acquisition, the Group recognized the goodwill amounting to ₩ 23,646 million in prior year, however, the balance of goodwill and certain inventories were adjusted through its reassessment, which has no effects on the Group's total equity. Fair value measurement of assets and liabilities acquired through the business combination was completed on October 26, 2020.

(in millions of Korean won)

	Amount
1. Consideration transferred	
Cash	₩ 87,281
Tax liabilities	1,361
2. Recognized amounts of identifiable assets acquired and liabilities assumed	
Trade receivables and others	₩ 3,270
Inventories	16,668
Other current assets	144
Property, plant and equipment	10,050
Intangible assets ¹	46,732
Trade and other payables	(4,323)
Other current liabilities	(4,274)
Other non-current liabilities	(3,997)
Fair value of identifiable net assets	64,270
3. Goodwill	₩ 24,372

¹ Intangible assets include identifiable right of trademark which amounts to ₩ 29,910 million.

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38. Events After the Reporting Period

(1) Doosan Heavy Industries & Construction Co., Ltd., the largest shareholder of the Group, has separated some assets, liabilities, manpower, and contract relations that are not directly related to the business divisions by the Group in accordance with the resolution of the Board of Directors on February 5, 2021. It has been decided to sell the ordinary shares of the Parent Company.

(2) On March 11, 2021, Doosan Bobcat Inc., a subsidiary of the Group, entered into a contract for acquiring 100% shares of a newly established company by split-off the industrial vehicle business divisions of Doosan Corporation.