SONGWON

FINANCIAL STATEMENTS 2018

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Introduction to the consolidated financial statements

On the following pages (6 – 87), consolidated financial statements for the year 2018 are presented. The financial statements disclosed are prepared according to the Korean International Financial Reporting Standards ("K-IFRS") and represent the statements submitted for approval to the Annual General Shareholders' Meeting on March 22, 2019 in Ulsan, Korea.

While the management of the Group is responsible for the preparation and presentation of the financial statements, the Group's independent auditor is responsible for expressing an opinion on these financial statements. The report on the consolidated financial statements – issued by our Group auditor, Ernst & Young Han Young – can be found on pages (3 – 5).

Independent auditors' report

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Independent auditor's report

To the shareholders and board of directors
Songwon Industrial Co., Ltd.

Opinion

We have audited the accompanying consolidated financial statements of Songwon Industrial Co., Ltd. and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as of December 31, 2018 and 2017, and the consolidated statements of comprehensive income, consolidated statements of changes in equity and consolidated statements of cash flows for the years then ended, and the notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Group as of December 31, 2018 and 2017, and its consolidated financial performance and cash flows for the years then ended in accordance with Korean International Financial Reporting Standards.

Basis for opinion

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

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

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

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

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

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

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

As part of an audit in accordance with Korean Auditing Standards (KGAAS) we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

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

The partner in charge of the audit resulting in this independent auditor's report is *Cho, Seong-Jin.*

Ernst & Young Han Young

February 25, 2019

This audit report is effective as of February 25, 2019, the independent auditor's report date. Accordingly, certain material subsequent events or circumstances may have occurred during the period from the auditor's report date to the time this report is used. Such events and circumstances could significantly affect the accompanying consolidated financial statements and may result in modifications to this report.

Consolidated statements of financial position

As of December 31, 2018 and 2017

	Notes	2018 Million KRW	2017 Million KRW
ASSETS			
Non-current assets		**480,898**	**487,614**
Property, plant and equipment	6.3, 7, 26, 27	439,322	441,721
Investment properties	6.3, 8, 26, 27	3,516	3,530
Intangible assets	6.3, 9, 10, 26	17,826	21,609
Investments accounted for using the equity method	1.2.3, 5, 11	4,760	7,035
Available-for-sale financial investments	12, 25.2	-	900
Other non-current assets		1,515	33
Other non-current financial assets	13, 25, 32	11,129	10,265
Deferred tax assets	29	2,830	2,521
Current assets		**391,646**	**377,507**
Inventories	14, 26	201,368	166,641
Trade and other receivables	15, 25.2, 32	115,969	130,894
Income tax receivables		610	518
Other current assets	16	4,387	3,502
Other current financial assets	13, 25, 32	6,006	20,548
Cash and cash equivalents	17, 25.2	63,306	55,404
Total assets		**872,544**	**865,121**
EQUITY AND LIABILITIES			
Equity		**411,198**	**378,127**
Non-controlling interests		*-714*	*-2,733*
Equity attributable to owners of the parent		*411,912*	*380,860*
Issued capital	18	12,000	12,000
Capital surplus	18	24,361	24,361
Reserves	18	27,591	27,255
Retained earnings	18	352,906	322,085
Accumulated other comprehensive income	18.4	-4,946	-4,841
Non-current liabilities		**84,690**	**162,354**
Interest-bearing loans and borrowings	19, 25, 26, 27	17,180	98,783
Pension liability	21	16,037	8,311
Other long-term employee-related liabilities	22	5,111	5,585
Other non-current financial liabilities	23, 25	3,361	4,625
Other non-current liabilities		41	40
Deferred tax liabilities	29	42,960	45,010
Current liabilities		**376,656**	**324,640**
Interest-bearing loans and borrowings	19, 25, 26, 27	267,930	208,754
Trade and other payables	24, 25, 32	100,529	109,538
Other current liabilities		1,883	1,801
Other current financial liabilities	23, 25	1,978	1,743
Income tax payable		4,336	2,804
Total liabilities		**461,346**	**486,994**
Total equity and liabilities		**872,544**	**865,121**

Consolidated statements of financial position

As of December 31, 2018 and 2017 (see note 2.3)

	2018 Thousand USD	2017 Thousand USD
ASSETS		
Non-current assets	**430,488**	**436,502**
Property, plant and equipment	393,272	395,418
Investment properties	3,147	3,160
Intangible assets	15,957	19,344
Investments accounted for using the equity method	4,261	6,298
Available-for-sale financial investments	-	806
Other non-current assets	1,356	30
Other non-current financial assets	9,962	9,189
Deferred tax assets	2,533	2,257
Current assets	**350,592**	**337,936**
Inventories	180,260	149,174
Trade and other receivables	103,813	117,173
Income tax receivables	546	464
Other current assets	3,927	3,135
Other current financial assets	5,376	18,394
Cash and cash equivalents	56,670	49,596
Total assets	**781,080**	**774,438**
EQUITY AND LIABILITIES		
Equity	**368,096**	**338,491**
Non-controlling interests	*-639*	*-2,447*
Equity attributable to owners of the parent	*368,735*	*340,938*
Issued capital	10,742	10,742
Capital surplus	21,807	21,807
Reserves	24,699	24,398
Retained earnings	315,914	288,324
Accumulated other comprehensive income	-4,427	-4,333
Non-current liabilities	**75,813**	**145,336**
Interest-bearing loans and borrowings	15,379	88,428
Pension liability	14,356	7,440
Other long-term employee-related liabilities	4,575	5,000
Other non-current financial liabilities	3,009	4,140
Other non-current liabilities	37	36
Deferred tax liabilities	38,457	40,292
Current liabilities	**337,171**	**290,611**
Interest-bearing loans and borrowings	239,844	186,873
Trade and other payables	89,990	98,056
Other current liabilities	1,685	1,612
Other current financial liabilities	1,771	1,560
Income tax payable	3,881	2,510
Total liabilities	**412,984**	**435,947**
Total equity and liabilities	**781,080**	**774,438**

Consolidated statements of comprehensive income

for the years ended December 31, 2018 and 2017

		2018	2017
	Notes	Million KRW	Million KRW
Sales*	6.1, 6.2, 32	788,738	724,853
Cost of sales*	28.5, 32	-632,582	-569,793
Gross profit*		**156,156**	**155,060**
Selling and administration costs*	28.2, 28.5, 32	-101,879	-100,594
Operating profit		**54,277**	**54,466**
Other income	28.3, 32	3,628	2,121
Other expenses	28.4, 32	-4,757	-2,102
Share of profit from investments accounted for using the equity method	11, 31	1,382	1,249
Finance income	28.7, 32	20,747	24,948
Finance expenses	28.6, 32	-28,944	-36,496
Profit before tax		**46,333**	**44,186**
Income tax expenses	29	-8,528	-9,480
Profit for the period		**37,805**	**34,706**
Other comprehensive income, net of taxes			
Net other comprehensive income to be reclassified to profit or loss in subsequent periods		*-648*	*-7,251*
(Losses) / gains on valuation of interest rate swaps	18.4	-118	355
Exchange differences on translation of foreign operations	18.4	-530	-7,606
Net other comprehensive income not to be reclassified to profit or loss		*-3,217*	*-157*
Gains on valuation of financial assets FVOCI	18.4	350	-
Re-measurement (losses) on defined benefit plans	18.4, 21	-3,567	-157
Total other comprehensive income, net of taxes		**-3,865**	**-7,408**
Total comprehensive income		**33,940**	**27,298**
Profit for the period attributable to:			
Owners of the parent	30	38,084	35,394
Non-controlling interests		-279	-688
Profit for the period		**37,805**	**34,706**
Total comprehensive income attributable to:			
Owners of the parent		34,412	27,794
Non-controlling interests		-472	-496
Total comprehensive income		**33,940**	**27,298**
Earnings per share		**KRW**	**KRW**
Basic / diluted, profit for the period attributable to ordinary equity holders of the parent	30	1,587	1,475

*refer to note 2.20. for further details

Consolidated statements of comprehensive income

for the years ended December 31, 2018 and 2017 (see note 2.3)

	2018	2017
	Thousand USD	Thousand USD
Sales*	706,061	648,873
Cost of sales*	-566,274	-510,067
Gross profit*	**139,787**	**138,806**
Selling and administration costs*	-91,200	-90,050
Operating profit	**48,587**	**48,756**
Other income	3,248	1,899
Other expenses	-4,258	-1,882
Share of profit from investments accounted for using the equity method	1,237	1,118
Finance income	18,572	22,333
Finance expenses	-25,910	-32,670
Profit before tax	**41,476**	**39,554**
Income tax expenses	-7,634	-8,486
Profit for the period	**33,842**	**31,068**
Other comprehensive income, net of taxes		
Net other comprehensive income to be reclassified to profit or loss in subsequent periods	*-580*	*-6,491*
(Losses) / gains on valuation of interest rate swaps	-106	318
Exchange differences on translation of foreign operations	-474	-6,809
Net other comprehensive income not to be reclassified to profit or loss	*-2,880*	*-140*
Gains on valuation of financial assets FVOCI	313	-
Re-measurement (losses) on defined benefit plans	-3,193	-140
Total other comprehensive income, net of taxes	**-3,460**	**-6,631**
Total comprehensive income	**30,382**	**24,437**
Profit for the period attributable to:		
Owners of the parent	34,092	31,684
Non-controlling interests	-250	-616
Profit for the period	**33,842**	**31,068**
Total comprehensive income attributable to:		
Owners of the parent	30,805	24,881
Non-controlling interests	-423	-444
Total comprehensive income	**30,382**	**24,437**
Earnings per share	**USD**	**USD**
Basic / diluted, profit for the period attributable to ordinary equity holders of the parent	1.42	1.32

*refer to note 2.20. for further details

Consolidated statements of changes in equity

for the years ended December 31, 2017 and 2018

	Attributable to owners of the parent							
	Issued capital	Capital surplus	Reserves	Retained earnings	Accumulated OCI	Total	Non-controlling interests	Total equity
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
As of January 1, 2017	**12,000**	**24,361**	**26,919**	**290,544**	**2,602**	**356,426**	**-2,237**	**354,189**
Profit for the period	-	-	-	35,394	-	35,394	-688	34,706
Gains on valuation of interest rate swaps, net of tax	-	-	-	-	355	355	-	355
Exchange differences on translation of foreign operations, net of tax	-	-	-	-	-7,798	-7,798	192	-7,606
Re-measurement losses on defined benefit plans, net of tax	-	-	-	-157	-	-157	-	-157
Total comprehensive income	**-**	**-**	**-**	**35,237**	**-7,443**	**27,794**	**-496**	**27,298**
Dividends	-	-	-	-3,360	-	-3,360	-	-3,360
Appropriation to reserves	-	-	336	-336	-	-	-	-
As of December 31, 2017	**12,000**	**24,361**	**27,255**	**322,085**	**-4,841**	**380,860**	**-2,733**	**378,127**
As of January 1, 2018	**12,000**	**24,361**	**27,255**	**322,085**	**-4,841**	**380,860**	**-2,733**	**378,127**
Profit for the period	-	-	-	38,084	-	38,084	-279	37,805
Losses on valuation of interest rate swaps, net of tax	-	-	-	-	-118	-118	-	-118
Exchange differences on translation of foreign operations, net of tax	-	-	-	-	-337	-337	-193	-530
Gains on valuation of financial assets FVOCI, net of tax	-	-	-	-	350	350	-	350
Re-measurement losses on defined benefit plans, net of tax	-	-	-	-3,567	-	-3,567	-	-3,567
Total comprehensive income	**-**	**-**	**-**	**34,517**	**-105**	**34,412**	**-472**	**33,940**
Dividends	-	-	-	-3,360	-	-3,360	-	-3,360
Appropriation to reserves	-	-	336	-336	-	-	-	-
Non-controlling interest due to acquisition in stages	-	-	-	-	-	-	2,491	2,491
As of December 31, 2018	**12,000**	**24,361**	**27,591**	**352,906**	**-4,946**	**411,912**	**-714**	**411,198**

Consolidated statements of changes in equity

for the years ended December 31, 2017 and 2018 (see note 2.3)

	Attributable to owners of the parent							
	Issued capital	Capital surplus	Reserves	Retained earnings	Accumulated OCI	Total	Non-controlling interests	Total equity
	TUSD	TUSD	TUSD	TUSD	TUSD	TUSD	TUSD	TUSD
As of January 1, 2017	**10,742**	**21,807**	**24,097**	**260,089**	**2,330**	**319,065**	**-2,003**	**317,062**
Profit for the period	-	-	-	31,684	-	31,684	-616	31,068
Gains on valuation of interest rate swaps, net of tax	-	-	-	-	318	318	-	318
Exchange differences on translation of foreign operations, net of tax	-	-	-	-	-6,981	-6,981	172	-6,809
Re-measurement losses on defined benefit plans, net of tax	-	-	-	-140	-	-140	-	-140
Total comprehensive income	**-**	**-**	**-**	**31,544**	**-6,663**	**24,881**	**-444**	**24,437**
Dividends	-	-	-	-3,008	-	-3,008	-	-3,008
Appropriation to reserves	-	-	301	-301	-	-	-	-
As of December 31, 2017	**10,742**	**21,807**	**24,398**	**288,324**	**-4,333**	**340,938**	**-2,447**	**338,491**
As of January 1, 2018	**10,742**	**21,807**	**24,398**	**288,324**	**-4,333**	**340,938**	**-2,447**	**338,491**
Profit for the period	-	-	-	34,092	-	34,092	-250	33,842
Losses on valuation of interest rate swaps, net of tax	-	-	-	-	-106	-106	-	-106
Exchange differences on translation of foreign operations, net of tax	-	-	-	-	-301	-301	-173	-474
Gains on valuation of financial assets FVOCI, net of tax	-	-	-	-	313	313	-	313
Re-measurement losses on defined benefit plans, net of tax	-	-	-	-3,193	-	-3,193	-	-3,193
Total comprehensive income	**-**	**-**	**-**	**30,899**	**-94**	**30,805**	**-423**	**30,382**
Dividends	-	-	-	-3,008	-	-3,008	-	-3,008
Appropriation to reserves	-	-	301	-301	-	-	-	-
Non-controlling interest due to acquisition in stages	-	-	-	-	-	-	2,231	2,231
As of December 31, 2018	**10,742**	**21,807**	**24,699**	**315,914**	**-4,427**	**368,735**	**-639**	**368,096**

Consolidated statements of cash flows

for the years ended December 31, 2018 and 2017

	Notes	2018 Million KRW	2017 Million KRW
Profit for the period		**37,805**	**34,706**
Adjustments total	**31**	**43,957**	**56,873**
Changes in operating assets and liabilities	**31**	**-15,930**	**-24,842**
Interest received		854	1,144
Payments of income tax		-8,471	-12,826
Dividends received from third parties		-	7
Net cash flow from operating activities		**58,215**	**55,062**
Proceeds from sale of property, plant and equipment	7, 31	99	86
Proceeds from sale of intangible assets	9, 31	-	48
Proceeds from sale of available-for-sale financial investments		-	628
Purchases of property, plant and equipment	7	-28,929	-43,482
Purchases of intangible assets	9	-1,412	-624
Purchase of available-for-sale financial investments		-	-5
Dividends received from investments using equity method	11	534	-
Acquisition of a subsidiary, net of cash acquired	5	-2,137	-
Decrease / (increase) of other financial assets, net		17,056	-6,378
Net cash flow from investing activities		**-14,789**	**-49,727**
Proceeds from borrowings (current)	31	602,310	404,387
Repayments of borrowings (current)	31	-625,990	-403,340
Proceeds from interest-bearing borrowings (non-current)	31	-	10,570
(Decrease) / increase in other financial liabilities, net		-1,120	5,790
Interest paid		-9,724	-9,348
Dividends paid	18	-3,360	-3,360
Net cash flow from financing activities		**-37,884**	**4,699**
Increase in cash and cash equivalents		5,542	10,034
Net foreign exchange differences		2,360	-3,930
Cash and cash equivalents as of January 1	17	55,404	49,300
Cash and cash equivalents as of December 31	**17**	**63,306**	**55,404**

Consolidated statements of cash flows

for the years ended December 31, 2018 and 2017 (see note 2.3)

	2018	2017
	Thousand USD	Thousand USD
Profit for the period	**33,842**	**31,068**
Adjustments total	**39,349**	**50,912**
Changes in operating assets and liabilities	**-14,260**	**-22,238**
Interest received	764	1,024
Payments of income tax	-7,583	-11,482
Dividends received from third parties	-	6
Net cash flow from operating activities	**52,112**	**49,290**
Proceeds from sale of property, plant and equipment	89	77
Proceeds from sale of intangible assets	-	43
Proceeds from sale of available-for-sale financial investments	-	562
Purchases of property, plant and equipment	-25,896	-38,924
Purchases of intangible assets	-1,264	-559
Purchase of available-for-sale financial investments	-	-4
Dividends received from investments using equity method	478	-
Acquisition of a subsidiary, net of cash acquired	-1,913	-
Decrease / (increase) of other financial assets, net	15,268	-5,709
Net cash flow from investing activities	**-13,238**	**-44,515**
Proceeds from borrowings (current)	539,176	361,999
Repayments of borrowings (current)	-560,373	-361,062
Proceeds from interest-bearing borrowings (non-current)	-	9,462
(Decrease) / increase in other financial liabilities, net	-1,003	5,183
Interest paid	-8,705	-8,368
Dividends paid	-3,008	-3,008
Net cash flow from financing activities	**-33,913**	**4,206**
Increase in cash and cash equivalents	4,961	8,982
Net foreign exchange differences	2,113	-3,518
Cash and cash equivalents as of January 1	49,596	44,132
Cash and cash equivalents as of December 31	**56,670**	**49,596**

1. Corporate information

1.1. The Group

SONGWON Industrial Group (the "Group") consists of the parent company Songwon Industrial Co., Ltd. (the "Company") and its consolidated subsidiaries as listed below. The Company was incorporated on December 15, 1965, under the law of the Republic of Korea to engage in the manufacture and commercial sale of antioxidants, stabilizers and polyurethanes. The Company's main manufacturing plants are located in Korea in Ulsan, Maeam and Suwon and in India in Ankleshwar.

The Company has listed its common shares on the Korea Exchange since June 1977, pursuant to the Korean Securities and Exchange Act.

1.2. Scope of consolidation

1.2.1. Change in the scope of consolidation

As of December 31, 2018, the scope of consolidation for the consolidated financial statements encompasses 14 entities (2017: 10 entities). Additionally, one entity is classified as a joint venture (2017: 2 entities) and accounted for using the equity method.

In the course of 2018, the following changes in the legal structure of the Group and scope of consolidation took place:

- Establishment of Songwon Europe GmbH, Songwon Chemicals GmbH and Songwon Trading GmbH;
- Shareholding increase through an increase in capital equating to 22% additional shares of Qingdao Long Fortune Songwon Chemical Co., Ltd. (SWDM-CN). Therefore, the conditions for obtaining control were met and SWDM-CN became a subsidiary (formerly, a joint venture) from May 1, 2018 (refer to note 5 for further details).

The consolidated financial statements include the financial statements of the Company and of the subsidiaries listed in the following table. The table also includes joint ventures which are accounted for using the equity method.

		December 31, 2018		December 31, 2017	
Name	**Location**	**Status**	**Interest**	**Status**	**Interest**
Consolidated entities					
Songwon Industrial Co., Ltd.	Korea	Parent		Parent	
Songwon International-Japan K.K.	Japan	Subsidiary	100%	Subsidiary	100%
Songwon Specialty Chemicals-India Pvt. Ltd.	India	Subsidiary	100%	Subsidiary	100%
Songwon International-Americas Inc.	USA	Subsidiary	100%	Subsidiary	100%
Songwon International AG	Switzerland	Subsidiary	100%	Subsidiary	100%
Songwon Group Holding AG	Switzerland	Subsidiary	100%	Subsidiary	100%
Songwon Management AG	Switzerland	Subsidiary	100%	Subsidiary	100%
Songwon ATG GmbH	Germany	Subsidiary	100%	Subsidiary	100%
Songwon Europe GmbH	Germany	Subsidiary	100%	-	-
Songwon Chemicals GmbH	Germany	Subsidiary	100%	-	-
Songwon Trading GmbH	Germany	Subsidiary	100%	-	-
Qingdao Long Fortune Songwon Chemical Co., Ltd.*	China	Subsidiary	72%	-	-
Songwon International Middle East FZE	UAE	Subsidiary	100%	Subsidiary	100%
Songwon Polysys Additives LLC	UAE	Subsidiary	55.5%	Subsidiary	55.5%

*refer to note 5. for further details

Entities accounted for using the equity method (joint ventures)					
Songwon Baifu Chemicals (Tangshan) Co., Ltd.	China	Joint venture	30%	Joint venture	30%
Qingdao Long Fortune Songwon Chemical Co., Ltd.*	China	-	-	Joint venture	50%

*refer to note 5. for further details

1.2.2. Summarized statements of financial position and comprehensive income of subsidiaries

The summarized statements of financial position and comprehensive income of subsidiaries are as follows:

as of December 31, 2018	Total assets	Total liabilities	Total equity	Total revenue	Net income	Total comp. income
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
Songwon Industrial Co., Ltd.	812,959	402,205	410,754	618,101	7,529	2,793
Songwon International-Japan K.K.	37,520	28,871	8,649	96,025	2,009	2,009
Songwon Specialty Chemicals-India Pvt. Ltd.	34,660	13,873	20,787	18,393	2,799	2,799
Songwon International-Americas Inc.	50,608	23,778	26,830	158,772	17,306	17,306
Songwon International AG	62,939	38,878	24,061	210,501	7,555	7,669
Songwon Group Holding AG	115,526	3,615	111,911	-	7,031	7,031
Songwon Management AG	19,379	19,071	308	-	-977	310
Songwon ATG GmbH	10,654	1,263	9,391	8,223	244	244
Songwon Europe GmbH	221	169	52	850	20	20
Songwon Chemicals GmbH	107	72	35	376	3	3
Songwon Trading GmbH	150	109	41	562	10	10
Qingdao Long Fortune Songwon Chemical Co., Ltd.*	16,389	6,367	10,022	17,731	1,125	1,125
Songwon International Middle East FZE	5,686	2,867	2,819	21,189	1,705	1,705
Songwon Polysys Additives LLC	22,466	28,037	-5,571	12,214	-1,335	-1,335

*refer to note 5. for further details

as of December 31, 2017	Total assets Million KRW	Total liabilities Million KRW	Total equity Million KRW	Total revenue Million KRW	Net income Million KRW	Total comp. income Million KRW
Songwon Industrial Co., Ltd.	845,204	433,883	411,321	581,987	28,117	28,335
Songwon International-Japan K.K.	35,438	29,267	6,171	88,733	1,886	1,886
Songwon China Ltd.	-	-	-	-	-910	-910
Songwon Specialty Chemicals-India Pvt. Ltd.	32,992	14,200	18,792	13,731	-228	-177
Songwon International-Americas Inc.	48,720	39,927	8,793	139,304	-1,806	-1,806
Songwon International AG	67,108	46,967	20,141	180,209	9,339	9,440
Songwon Group Holding AG	112,170	7,031	105,139	-	2,253	2,253
Songwon Management AG	18,381	18,389	-8	-	-229	-400
Songwon ATG GmbH	13,023	1,302	11,721	7,141	471	471
Songwon International Middle East FZE	9,002	7,967	1,035	24,654	727	727
Songwon Polysys Additives LLC	21,464	25,595	-4,131	12,891	-1,542	-1,542

1.2.3. Interest in joint ventures

The Group has a 30% interest in Songwon Baifu Chemicals (Tangshan) Co., Ltd., classified as a jointly controlled entity which primarily engages in the production of thioesters. Determination was driven by the contractually agreed sharing of control with regard to relevant activities, requiring unanimous consent of the control-sharing parties. The established joint venture Qingdao Long Fortune Songwon Chemical Co., Ltd., which is involved in the production of One Pack System Blends, was fully consolidated as of May 1, 2018, due to the acquisition of additional shareholding (refer to note 5).

The summarized statements of financial position and summarized statements of comprehensive income of joint ventures (accounted for using the equity method) are as follows:

Statements of financial position	Cash and cash equivalents	Total current assets	Total non-current assets	Current financial liabilities	Total current liabilities	Non-current financial liabilities	Total non-current liabilities	Equity	Carrying amount
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
Songwon Baifu Chemicals (Tangshan) Co., Ltd.	2,365	9,584	7,108	2,164	2,590	-	-	14,102	4,231
Qingdao Long Fortune Songwon Chemical Co., Ltd.	2,488	12,917	3,085	6,760	7,066	3,328	3,328	5,608	2,804
December 31, 2017	**4,853**	**22,501**	**10,193**	**8,924**	**9,656**	**3,328**	**3,328**	**19,710**	**7,035**
Songwon Baifu Chemicals (Tangshan) Co., Ltd.	1,964	9,317	8,326	1,461	1,777	-	-	15,866	4,760
December 31, 2018	**1,964**	**9,317**	**8,326**	**1,461**	**1,777**	**-**	**-**	**15,866**	**4,760**

Statements of comprehensive income	Revenue	Depreciation & Amortization	Interest income	Interest expense	Profit before tax	Income tax expenses	Profit for the period	Other comp. income	Total comp. income
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
Songwon Baifu Chemicals (Tangshan) Co., Ltd.	26,500	-83	13	-11	3,600	-915	2,685	-1,413	1,272
Qingdao Long Fortune Songwon Chemical Co., Ltd.	25,598	-235	17	-250	1,142	-256	886	-684	202
December 31, 2017	**52,098**	**-318**	**30**	**-261**	**4,742**	**-1,171**	**3,571**	**-2,097**	**1,474**
Songwon Baifu Chemicals (Tangshan) Co., Ltd.	26,404	-128	14	-	4,943	-1,236	3,707	-163	3,544
Qingdao Long Fortune Songwon Chemical Co., Ltd.*	10,656	-84	11	-91	746	-207	539	160	699
December 31, 2018	**37,060**	**-212**	**25**	**-91**	**5,689**	**-1,443**	**4,246**	**-3**	**4,243**

*refer to note 5. for further details

The joint venture is measured using the equity method. All operations are continuing. The financial statements of the joint venture have the same reporting dates as the Group. In 2018, dividends of 534 Million KRW were received from Songwon Baifu Chemicals (Tangshan) Co., Ltd. (no dividends received in 2017), refer to note 11.

1.2.4. Non-controlling interests

1.2.4.1. Non-controlling interests

As of May 1, 2018, the conditions to fully consolidate Qingdao Long Fortune Songwon Chemical Co., Ltd. and disclose non-controlling interest were met. Refer to note 5 for further information regarding the step acquisition. No transactions with non-controlling interest related to acquisitions or disposals took place during the reporting period 2017.

1.2.4.2. Interest of non-controlling interests

The Group has two subsidiaries with non-controlling interests of 44.5% and 28% in: Songwon Polysys Additives LLC, United Arab Emirates (SWDM-AE) and Qingdao Long Fortune Songwon Chemical Co., Ltd., China (SWDM-CN) as of December 31, 2018. The net loss attributable to the non-controlling interests for the year 2018 amounted to -279 Million KRW (2017: net loss of -688 Million KRW). Summarized cash flow information of the partly owned subsidiaries is as follows:

	2018	**2017**
	Million KRW	Million KRW
Operating cash flow	811	-1,583
Investing cash flow	21	-215
Financing cash flow	1,988	1,747
Net cash flow	**2,820**	**-51**

2. Summary of significant accounting policies

2.1. Basis of preparation

The Group prepares statutory financial statements in the Korean language in accordance with Korean International Financial Reporting Standards (K-IFRS) enacted by the *Act on External Audit of Stock Companies*.

The financial statements have been prepared on a historical cost basis, except for certain items, such as financial instruments, which are mentioned separately in the following accounting principles. The financial statements are presented in Korean won (KRW) and all values are rounded to the nearest million (000,000), except when otherwise indicated.

The Group maintains its official accounting records in Korean won. In the event of any differences in the interpretation of the financial statements or the independent auditor's report thereon, the Korean version, which is used for regulatory reporting purposes, shall prevail.

2.2. Basis of consolidation

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

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

Generally, there is a presumption that a majority of voting rights results in control. To support this presumption and when the Group has less than a majority of the voting or similar rights of an investee, the Group considers all relevant facts and circumstances in assessing whether it has power over an investee, including:

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

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

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

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

2.3. Convenience translation into United States Dollar amounts

The parent company operates primarily in Korean won and its official accounting records are maintained in Korean won. The US dollar amounts provided in the financial statements represent supplementary information solely for the convenience of the reader. All won amounts are expressed in US dollars at the rate of 1,117.10 KRW to 1 USD, the exchange rate in effect on December 31, 2018. Such a presentation is not in accordance with generally accepted accounting principles and should not be construed as a representation that the Korean won amounts shown could be readily converted, realized or settled in US dollars at this or at any other rate.

2.4. Business combinations and goodwill

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

When the Group acquires a business, it assesses the financial assets and liabilities assumed for appropriate classification and designation in accordance with the contractual terms, economic circumstances and pertinent conditions as of the acquisition date. This includes the separation of embedded derivatives in host contracts by the acquiree.

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

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

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

2.5. Interest in joint arrangements

Joint ventures

A joint venture is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint venture. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control. The considerations made in determining joint control are similar to those necessary to determine control over subsidiaries.

The Group's investments in its joint ventures are accounted for using the equity method. Under the equity method, the investment in a joint venture is initially recognized at cost. The carrying amount of the investment is adjusted to recognize changes in the Group's share of net assets of the joint venture since the acquisition date.

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

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

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

At each reporting date, the Group determines whether there is objective evidence that the investment in the joint venture is impaired. If there is such evidence, the Group calculates the amount of impairment as the difference between the recoverable amount of the joint venture and its carrying value, and then recognizes the loss as "Share of profit of a joint venture" in the statements of comprehensive income.

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

Joint operations

A joint operation is defined as an arrangement in which the parties with joint control have rights to the assets and obligations for the liabilities relating to that arrangement. In respect of its interest in a joint operation, a joint operator must recognize all of its assets, liabilities, revenues and expenses, including its relative share of jointly controlled assets, liabilities, revenue and expenses.

The considerations made in determining joint control are similar to those necessary to determine control over subsidiaries.

2.6. Foreign currency translation

The financial statements are presented in Korean won, which is the parent company's functional currency. Each entity in the Group determines its own functional currency, and items included in the financial statements of each entity are measured using that functional currency.

Transactions in foreign currencies are initially recorded by the Group companies at their respective functional currency rates prevailing at the date of the transaction. Monetary assets and liabilities denominated in foreign currencies are retranslated at the functional currency spot rate of exchange ruling at the reporting date. Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rates as at the dates of the initial transactions. Non-monetary items measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value is determined.

The assets, including goodwill and liabilities of foreign subsidiaries, where the functional currency is other than the Korean won, are translated using the exchange rate at the end of the reporting period, while the statements of comprehensive income are translated using the average exchange rates during the period. Differences arising from such translations are recognized within equity and reclassified to net income when the gain or loss on disposal of the foreign subsidiary is recognized.

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

2.7. Property, plant and equipment

Property, plant and equipment are valued at cost less accumulated depreciation and accumulated impairment losses. Such costs include the cost of replacing part of the property, plant and equipment and borrowing costs for long-term construction projects, if the recognition criteria are met. Other repair and maintenance costs are recognized in the statements of comprehensive income as incurred. If the costs of certain components of an item of property, plant and equipment are significant in relation to the total cost of the item, they are accounted for and depreciated separately.

Depreciation expense is recognized using the straight-line method. The following useful lives are assumed:

Land	No depreciation
Buildings	18-54 years
Structures	10-40 years
Machinery	10-20 years
Other	1-10 years

Residual values and useful lives are reviewed annually and, if expectations differ from previous estimates, adjusted accordingly.

The gain or loss arising from the derecognition of a property, plant or equipment shall be determined as the difference between the net disposal proceeds and the carrying amount of the asset. It shall be recognized in the income statement when the asset is derecognized.

2.8. Intangible assets

Intangible assets acquired separately are measured on initial recognition at cost. The cost of intangible assets acquired in a business combination is its fair value as at the date of acquisition. Following initial recognition, intangible assets are carried at cost less any accumulated amortization and accumulated impairment losses.

Intangible assets with useful finite lives are amortized over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. The amortization period and the amortization method for an intangible asset with a finite useful life are reviewed at least at the end of each reporting period. Changes in the expected useful life or the expected consumption pattern of future economic benefits embodied in the asset are accounted for by changing the amortization period or method, as appropriate, and are treated as changes in accounting estimates. The amortization expense on intangible assets with finite lives is recognized in the income statement under cost of sales and selling and administration costs in the expense category that is consistent with the function of the intangible assets.

Intangible assets with indefinite useful lives (such as goodwill and memberships) are not amortized, but are tested for impairment annually either individually, or at the cash-generating unit level. The assessment of indefinite life is reviewed annually to determine whether the indefinite life continues to be supportable. If not, the change in useful life from indefinite to finite is made on a prospective basis.

Gains or losses arising from derecognition of an intangible asset are measured as the difference between the net disposal proceeds and the carrying amount of the asset, and are recognized in the income statement when the asset is derecognized.

Intangible assets with finite useful lives are amortized using the straight-line method with the following useful lives:

Software	3 -10 years
Industrial rights	10 years
Useful lives of items recognized in business combinations	
Customer relationships	5 - 9 years
Non-compete contracts	6 years
Process technologies	5 - 6 years

2.9. Investment property

The Group classifies the property to earn rentals or for capital appreciation, or both, as investment properties. As investment properties are accounted for using a cost model, the same accounting policies applied to property, plant and equipment are used for their accounting treatment, except for their classification and presentation.

2.10. Leases

The determination of whether an arrangement is, or contains, a lease is based on the substance of the arrangement at inception date, whether fulfillment of the arrangement is dependent on the use of a specific asset or assets, and the arrangement conveys a right to use the asset, even if that right is not explicitly specified in an arrangement.

Group as a lessee

Finance leases, which transfer substantially to the Group all the risks and benefits incidental to ownership of the leased item, are capitalized at the commencement of the lease at the fair value of the leased property or, if lower, at the present value of the minimum lease payments. Lease payments are apportioned between finance charges and reduction of the lease liability, so as to achieve a constant rate of interest on the remaining balance of the liability. Finance charges are recognized in finance costs in the income statement.

A leased asset is depreciated over the useful life of the asset. However, if there is no reasonable certainty that the Group will obtain ownership by the end of the lease term, the asset is depreciated over the shorter of its estimated useful life and the lease term.

Operating lease payments are recognized as an operating expense in the income statement on a straight-line basis over the lease term.

Group as a lessor

Leases in which the Group does not transfer substantially all the risks and benefits of ownership of the asset are classified as operating leases. Initial direct costs incurred in negotiating an operating lease are added to the carrying amount of the leased asset and recognized over the lease term on the same basis as rental income. Contingent rents are recognized as revenue in the period in which they are earned. The Group has not entered into finance lease agreements as a lessor.

2.11. Impairment of non-financial assets

The Group reviews non-financial assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. If any indication exists, or when annual impairment testing for assets, such as membership is required, the Group estimates the asset's recoverable amount. Recoverability of assets is measured by the comparison of the carrying amount of the asset to the recoverable amount, which is the higher of the asset's value in use and its fair value less costs to sell. If assets do not generate cash inflows that are largely independent of those from other assets or groups of assets, the impairment test is not performed at an individual asset level; instead, it is performed at the level of the cash-generating unit (CGU) that the asset belongs to.

Where the carrying amount of an asset or CGU exceeds its recoverable amount, the asset is considered impaired and is written down to its recoverable amount. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. In determining fair value less costs to sell, recent market transactions are taken into account, if available. If no such transactions can be identified, an appropriate valuation model is used.

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

The following criteria are also applied in assessing impairment of specific assets:

Goodwill

Goodwill is tested for impairment annually as of December 31, and whenever there are events or changes in circumstances (triggering events), which suggest that the carrying amount may not be recoverable. Goodwill is carried at cost less accumulated impairment losses.

For the purpose of impairment testing, goodwill acquired in a business combination is allocated to the (groups of) cash-generating unit(s) that is expected to benefit from the synergies of the business combination. If the carrying amount of the cash-generating unit(s), to which the goodwill is allocated, exceeds its recoverable amount, an impairment loss on goodwill is recognized. The recoverable amount is the higher of the cash-generating unit(s) fair value less costs to sell and its value in use.

Impairment losses relating to goodwill cannot be reversed in future periods.

Intangible assets with indefinite useful lives

Intangible assets with indefinite useful lives are tested for impairment annually as of December 31, either individually, or at the cash-generating unit level, as appropriate and when circumstances indicate that the carrying value may be impaired.

2.12. Borrowing costs

Borrowing costs directly attributable to the acquisition, construction or production of an asset, that necessarily takes a substantial period of time to get ready for its intended use or sale, are capitalized as part of the cost of the respective assets.

2.13. Inventories

Inventory is valued at the lower of the acquisition or production cost and net realizable value, cost being generally determined on the basis of a weighted average. Production costs comprise direct material and labor and applicable manufacturing overheads, including depreciation charges based on normal operating capacity. Net realizable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and selling expenses.

2.14. Cash and cash equivalents

Cash and cash equivalents in the statements of financial position comprise cash at banks, as well as on hand and short-term deposits with a maturity of three months or less.

2.15. Provisions

A provision is recognized when the Group has a present legal or constructive obligation as a result of a past event. It is probable that an outflow of economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation. If the effect is material, provisions are recognized at present value by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money.

Greenhouse gas emissions

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

2.16. Pensions and other long-term employment benefits

Pensions

The Group operates three defined benefit pension plans: one in Korea, one in Switzerland and one in India. The cost of providing benefits under the defined benefit plan is determined using the projected unit credit method.

Re-measurements, comprising actuarial gains and losses, the effect of the asset ceiling, excluding net interest and the return on plan assets (excluding net interest), are recognized immediately in the statements of financial position with a corresponding debit or credit to retained earnings through OCI in the period in which they occur. Re-measurements are not reclassified to profit or loss in subsequent periods.

Past service costs are recognized in profit or loss on the earlier of:

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

Net interest is calculated by applying the discount rate to the net defined benefit liability or asset. The pension expenses are recognized in the income statement under cost of sales and selling and administration costs.

Other long-term employment benefits

The parent company also implements a bonus plan designed to present a prescribed quantity of gold and entitles compensated vacation to long-term service employees. Accounting policies of the bonus plan are mostly the same as the defined benefit plan, except that re-measurements are recognized immediately in profit or loss.

2.17. Taxes

Current income tax

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

Deferred tax

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

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

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

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

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

The carrying amount of deferred tax assets is reviewed at each reporting date and reduced to the extent that it is no longer probable that sufficient taxable profit will be available to allow all or part of the deferred tax asset to be utilized. Unrecognized deferred tax assets are reassessed at each reporting date, and recognized to the extent that it has become probable that future taxable profits will allow the deferred tax asset to be recovered. Deferred tax assets and liabilities are measured at the tax rates that are expected to apply in the year when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted at the reporting date.

Deferred tax relating to items recognized outside profit or loss is recognized outside profit or loss. Deferred tax items are recognized in correlation to the underlying transaction, either in other comprehensive income, or directly in equity.

Deferred tax assets and deferred tax liabilities are offset, if a legally enforceable right exists to set off current tax assets against current income tax liabilities and the deferred taxes relate to the same taxable entity and the same taxation authority.

2.18. Revenue from contracts with customers

The Group is in the business of the manufacture and commercial sale of antioxidants, stabilizers and polyurethane. Revenue from contracts with customers is recognized when control of the goods or services are transferred to the customer at an amount that reflects the consideration to which the Group expects to be entitled in exchange for those goods or services. The Group has generally concluded that it is the principal in its revenue arrangements, except for the agency services below, because it typically controls the goods or services before transferring them to the customer.

Sales of Goods

The Group has concluded that revenue from sale of goods should be recognized at the point in time when control of the asset is transferred to the customer, generally on delivery of the goods.

Sale of services

The Group provides transportation service in combination with the sales of goods. The services can be provided by others and are not significantly modified or customized. There are two performance obligations in a contract for bundled sales of goods and transportation services, because its promises to transfer goods and provide transportation services, are capable of being distinct and separately identifiable. The Group allocates the transaction price based on the relative stand-alone selling prices of goods and transportation services. The Group concluded that revenue for transportation services, will be recognized over time because the customer simultaneously receives and consumes the benefits provided by the Group.

Contract balances

1) Contract assets

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

2) Trade receivables

A receivable represents the Group's right to an amount of consideration that is unconditional (i.e., only the passage of time is required before payment of the consideration is due). Refer to accounting policies of financial assets in the note 2.19.

3) Contract liabilities

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

2.19. Financial instruments

A financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity.

Financial assets

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

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

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

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

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

1) Subsequent measurement

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

- Financial assets at amortized cost (debt instruments);
- Financial assets at FVOCI with recycling of cumulative gains and losses (debt instruments);
- Financial assets designated at FVOCI with no recycling of cumulative gains and losses upon derecognition (equity instruments);
- Financial assets at FVtPL.

2) Financial assets at amortized cost (debt instruments)

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

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

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

3) Financial assets at FVOCI (debt instruments)

The Group measures debt instruments at FVOCI if both of the following conditions are met:

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

For debt instruments at FVOCI, interest income, foreign exchange revaluation and impairment losses or reversals are recognized in the statement of profit or loss and computed in the same manner as for financial assets measured at amortized cost. The remaining fair value changes are recognized in OCI. Upon derecognition, the cumulative fair value change recognized in OCI is recycled to profit or loss. The Group's debt instruments at FVOCI includes investments in quoted debt instruments included under other non-current financial assets.

4) Financial assets designated at FVOCI (equity instruments)

Upon initial recognition, the Group can elect to classify irrevocably its equity investments as equity instruments designated at FVOCI when they meet the definition of equity under K-IFRS 1032 and are not held for trading. The classification is determined on an instrument-by-instrument basis.

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

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

5) Financial assets at FVtPL

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

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

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

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

6) Derecognition

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

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

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

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

7) Impairment of financial assets

Further disclosures relating to impairment of financial assets are also provided in the sections:

- Significant accounting judgments, estimates and assumptions
- Debt instruments at FVOCI
- Trade and other receivables

The Group recognizes an allowance for expected credit losses (ECLs) for all debt instruments not held at FVtPL. ECLs are based on the difference between the contractual cash flows due in accordance with the contract and all the cash flows that the Group expects to receive, discounted at an approximation of the original effective interest rate. The expected cash flows will include cash flows from the sale of collateral held or other credit enhancements that are integral to the contractual terms.

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

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

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

The Group considers a financial asset in default when contractual payments are 180 days past due. However, in certain cases, the Group may also consider a financial asset to be in default when internal or external information indicates that the Group is unlikely to receive the outstanding contractual amounts in full before taking into account any credit enhancements held by the Group. A financial asset is written off when there is no reasonable expectation of recovering the contractual cash flows.

Financial liabilities

1) Initial recognition and measurement

Financial liabilities are classified, at initial recognition, as financial liabilities at PVtPL, loans and borrowings, payables, or as derivatives designated as hedging instruments in an effective hedge, as appropriate.

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

The Group's financial liabilities include mainly trade and other payables, interest-bearing loans and borrowings as well as derivative liabilities.

2) Subsequent measurement

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

3) Financial liabilities at FVtPL

Financial liabilities at FVtPL include financial liabilities held for trading and financial liabilities designated upon initial recognition as at PVtPL.

Financial liabilities are classified as held for trading if they are incurred for the purpose of repurchasing in the near term. This category also includes derivative financial instruments entered into by the Group that are not designated as hedging instruments in hedge relationships as defined by K-IFRS 1109. Separated embedded derivatives are also classified as held for trading unless they are designated as effective hedging instruments.

Gains or losses on liabilities held for trading are recognized in the statement of profit or loss.

Financial liabilities designated upon initial recognition at FVtPL are designated at the initial date of recognition, and only if the criteria in K-IFRS 1109 are satisfied.

4) Loans and borrowings

This is the category most relevant to the Group. After initial recognition, interest-bearing loans and borrowings are subsequently measured at amortized cost using the EIR method. Gains and losses are recognized in profit or loss when the liabilities are derecognized as well as through the EIR amortization process.

Amortized cost is calculated by taking into account any discount or premium on acquisition and fees or costs that are an integral part of the EIR. The EIR amortization is included as finance costs in the statement of profit or loss.

This category generally applies to interest-bearing loans and borrowings. For more information, refer to Note 25.

5) Derecognition

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

Offsetting of financial instruments

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

Derivative financial instruments and hedge accounting

1) Initial recognition and subsequent measurement

The Group uses derivative financial instruments, such as forward exchange contracts and interest rate swaps, to hedge its foreign currency risks, interest rate risks and commodity price risks. Such derivative financial instruments are initially recognized at fair value on the date on which a derivative contract is entered into and are subsequently remeasured at fair value. Derivatives are carried as financial assets when the fair value is positive and as financial liabilities when the fair value is negative.

For the purpose of hedge accounting, hedges are classified as:

- Fair value hedges when hedging the exposure to changes in the fair value of a recognized asset or liability or an unrecognized firm commitment;
- Cash flow hedges when hedging the exposure to variability in cash flows that is either attributable to a particular risk associated with a recognized asset or liability, or a highly probable forecast transaction or the foreign currency risk in an unrecognized firm commitment;
- Hedges of a net investment in a foreign operation.

At the inception of a hedge relationship, the Group formally designates and documents the hedge relationship to which it wishes to apply hedge accounting and the risk management objective and strategy for undertaking the hedge.

Before January 1, 2018, the documentation includes identification of the hedging instrument, the hedged item or transaction, the nature of the risk being hedged, and how the Group will assess the effectiveness of changes in the hedging instrument's fair value in offsetting the exposure to changes in the hedged item's fair value or cash flows attributable to the hedged risk. Such hedges are expected to be highly effective in achieving offsetting changes in fair value or cash flows and are assessed on an ongoing basis to determine that they actually have been highly effective throughout the financial reporting periods for which they were designated.

Beginning January 1, 2018, the documentation includes identification of the hedging instrument, the hedged item, the nature of the risk being hedged and how the Group will assess whether the hedging relationship meets the hedge effectiveness requirements (including analysis of the sources of hedge ineffectiveness and how the hedge ratio is determined). A hedging relationship qualifies for hedge accounting if it meets all of the following effectiveness requirements:

- There is 'an economic relationship' between the hedged item and the hedging instrument.
- The effect of credit risk does not 'dominate the value changes' that result from that economic relationship.
- The hedge ratio of the hedging relationship is the same as that resulting from the quantity of the hedged item that the Group actually hedges and the quantity of the hedging instrument that the Group actually uses to hedge that quantity of hedged item.

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

2) Fair value hedges

The change in the fair value of a hedging instrument is recognized in the statement of profit or loss as other expense. The change in the fair value of the hedged item attributable to the risk hedged is recorded as part of the carrying value of the hedged item and is also recognized in the statement of profit or loss as other expenses.

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

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

When an unrecognized firm commitment is designated as a hedged item, the subsequent cumulative change in the fair value of the firm commitment attributable to the hedged risk is recognized as an asset or liability with a corresponding gain or loss recognized in profit or loss. The Group had forward exchange contracts in order to hedge the risk of foreign exchange rate fluctuation of assets and liabilities denominated in foreign currencies. The Group applies fair value hedge accounting for forward exchange contracts (note 25.1.1).

3) Cash flow hedges

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

The amounts accumulated in OCI are accounted for, depending on the nature of the underlying hedged transaction. If the hedged transaction subsequently results in the recognition of a non-financial item, the amount accumulated in equity is removed from the separate component of equity and included in the initial cost or other carrying amount of the hedged asset or liability. This is not a reclassification adjustment and will not be recognized in OCI for the period. This also applies where the hedged forecast transaction of a non-financial asset or non-financial liability subsequently becomes a firm commitment for which fair value hedge accounting is applied.

For any other cash flow hedges, the amount accumulated in OCI is reclassified to profit or loss as a reclassification adjustment in the same period or periods during which the hedged cash flows affect profit or loss.

If cash flow hedge accounting is discontinued, the amount that has been accumulated in OCI must remain in accumulated OCI if the hedged future cash flows are still expected to occur. Otherwise, the amount will be immediately reclassified to profit or loss as a reclassification adjustment. After discontinuation, once the hedged cash flow occurs, any amount remaining in accumulated OCI must be accounted for depending on the nature of the underlying transaction as described above.

The Group had interest rate swap agreements about some borrowings. The Group applies cash flow hedge accounting for interest rate swap contracts (note 25.1.2).

4) Hedges of a net investment

Hedges of a net investment in a foreign operation, including a hedge of a monetary item that is accounted for as part of the net investment, are accounted for in a way similar to cash flow hedges. Gains or losses on the hedging instrument relating to the effective portion of the hedge are recognized as OCI while any gains or losses relating to the ineffective portion are recognized in the statement of profit or loss. On disposal of the foreign operation, the cumulative value of any such gains or losses recorded in equity is transferred to the statement of profit or loss.

2.20. New and amended standards and interpretations

The Group applied K-IFRS 1115 and K-IFRS 1109 for the first time using the modified retrospective approach. The nature and effect of the changes as a result of adoption of these new accounting standards are described below.

Several other amendments and interpretations apply for the first time in 2018, but do not have an impact on the consolidated financial statements of the Group. The Group has not early adopted any standards, interpretations or amendments that have been issued but are not yet effective.

K-IFRS 1115 from Contracts with Customers

K-IFRS 1115 supersedes K-IFRS 1011 *Construction Contracts*, K-IFRS 1018 *Revenue* and related Interpretations and it applies, with limited exceptions, to all revenue arising from contracts with its customers. K-IFRS 1115 establishes a five-step model to account for revenue arising from contracts with customers and requires that revenue be recognized at an amount that reflects the consideration to which an entity expects to be entitled in exchange for transferring goods or services to a customer.

K-IFRS 1115 requires entities to exercise judgement, taking into consideration all of the relevant facts and circumstances when applying each step of the model to contracts with their customers. The standard also specifies the accounting for the incremental costs of obtaining a contract and the costs directly related to fulfilling a contract. In addition, the standard requires extensive disclosures.

The comparative prior year numbers 2017 were not restated due to the implication of the modified retrospective approach. The Group applied K-IFRS 1115 retrospectively to only the most current period presented in the financial statements. To do so, the Group had to recognize the cumulative effect of initially applying K-IFRS 1115 as an adjustment to the opening balance of retained earnings at the date of initial application.

The effect of adopting K-IFRS 1115 is, as follows:

Impact on retained earnings as of January 1, 2018

	Before adoption amount	Adjustment	After adoption amount
Retained earnings	322,085	-	322,085

Impact on statement of profit or loss (increase / (decrease) in profit) for the financial year 2018

	Before adoption amount	Adjustment	After adoption amount
Revenue from contracts with customers(*1)	788,738	-	788,738
Cost of sales(*2)	-623,398	-9,184	-632,582
Selling and general administrative expenses(*1)	-111,063	9,184	-101,879

(*1) Contracts to provide transfer of goods and shipping services

(*2) Prior to the adoption of K-IFRS 1115, for contracts to provide transfer of goods and shipping services, the Group did not allocate the transaction price because it provides the transfer of goods with shipping services. In accordance with K-IFRS 1115, the Group determined that there are two performance obligations in such contracts and allocated the transaction price on their relative stand-alone selling prices basis. Expenses directly related to the shipping services are accounted for as cost of goods sold. As a result, selling and administrative expenses decreased by 9,184 Million KRW and other cost of sales increased by 9,184 Million KRW.

K-IFRS 1109 Financial Instruments

K-IFRS 1109 *Financial Instruments* replaces K-IFRS 1039 *Financial Instruments: Recognition and Measurement* for periods beginning on or after January 1, 2018, bringing together all three aspects of the accounting for financial instruments: classification and measurement; impairment; and hedge accounting.

On the date of initial application, January 1, 2018, the measurement categories and carrying amounts of financial assets in K-IFRS 1039 and K-IFRS 1109 are as follows.

	K-IFRS 1039 measurement category	**K-IFRS 1039 measurement book value**	**K-IFRS 1109 measurement category**	**K-IFRS 1109 measurement book value**
Cash and short-term deposits	Loans and receivables	55,404	Amortized cost	55,404
Trade receivables	Loans and receivables	126,698	Amortized cost	126,698
Other receivables	Loans and receivables	4,196	Amortized cost	4,196
Equity shares	Available for sale	900	FVOCI	900
Bank deposit	Loans and receivables	10,196	Amortized cost	2,642
			FVtPL	7,554
Loans	Loans and receivables	19,641	Amortized cost	19,641
Deposit	Loans and receivables	753	Amortized cost	753
Derivative instrument (interest rate swap)	Hedge accounting	223	Hedge accounting	223

The assessment of the Group's business model was made as of the date of initial application, January 1, 2018, and then applied retrospectively to those financial assets that were not derecognized before January 1, 2018. The assessment of whether contractual cash flows on debt instruments are solely comprised of principal and interest was made based on the facts and circumstances as of the initial recognition of the assets.

The classification and measurement requirements of K-IFRS 1109 did not have a significant impact on the Group. The Group continued measuring at fair value all financial assets previously held at fair value under K-IFRS 1039.

The following are the changes in the classification of the Group's financial assets:

1) *Trade receivables and other non-current financial assets*

Trade receivables and other non-current financial assets (i.e., loan to an associate and loan to a director) previously classified as loans and receivables are held to collect contractual cash flows and give rise to cash flows representing solely payments of principal and interest. These are now classified and measured as debt instruments at amortized cost.

2) *Quoted debt instruments*

Quoted debt instruments previously classified as available-for-sale (AFS) financial assets are now classified and measured as debt instruments at FVOCI. The Group expects not only to hold the assets to collect contractual cash flows, but also to sell a significant amount on a relatively frequent basis. The Group's quoted debt instruments are regular government and corporate bonds that passed the SPPI test.

3) *Equity investments*

Equity investments in non-listed companies previously classified as AFS financial assets are now classified and measured as equity instruments designated at FVOCI. The Group elected to classify irrevocably its non-listed equity investments under this category as it intends to hold these investments for the foreseeable future. There were no impairment losses recognized in profit or loss for these investments in prior periods.

K-IFRS 1109 retained most of the existing requirements of K-IFRS 1039 for the classification and measurement of financial liabilities.

The application of K-IFRS 1109 did not have a significant impact to the Group's accounting policies related to financial liabilities.

K-IFRS 2122 Foreign Currency Transactions and Advance Considerations

The Interpretation clarifies that, in determining the spot exchange rate to use on initial recognition of the related asset, expense or income (or part of it) on the derecognition of a non-monetary asset or non-monetary liability relating to advance consideration, the date of the transaction is the date on which an entity initially recognizes the non-monetary asset or non-monetary liability arising from the advance consideration. If there are multiple payments or receipts in advance, then the entity must determine a date of the transactions for each payment or receipt of advance consideration. This Interpretation does not have any impact on the Group’s consolidated financial statements.

K-IFRS 1040 Investment Property – Transfers of Investment Property Transfers of Investment Property

The amendments clarify when an entity should transfer property, including property under construction or development into, or out of investment property. The amendments state that a change in use occurs when the property meets, or ceases to meet, the definition of investment property and there is evidence of the change in use. A mere change in management’s intentions for the use of a property does not provide evidence of a change in use. These amendments do not have any impact on the Group’s consolidated financial statements.

K-IFRS 1102 Share-based Payment — Classification and Measurement of Share-based Payment Transactions

The KASB issued amendments to K-IFRS 1102 *Share-based Payment* that address three main areas: the effects of vesting conditions on the measurement of a cash-settled share-based payment transaction; the classification of a share-based payment transaction with net settlement features for withholding tax obligations; and accounting where a modification to the terms and conditions of a share-based payment transaction changes its classification from cash settled to equity settled. On adoption, entities are required to apply the amendments without restating prior periods, but retrospective application is permitted if elected for all three amendments and other criteria are met. The Group’s accounting policy for cash-settled share-based payments is consistent with the approach clarified in the amendments. In addition, the Group has no share-based payment transaction with net settlement features for withholding tax obligations and had not made any modifications to the terms and conditions of its share-based payment transaction. Therefore, these amendments do not have any impact on the Group’s consolidated financial statements.

3. Significant accounting judgments, estimates and assumptions

The preparation of the Group's financial statements requires management to make judgments, estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities, and the disclosure of contingent liabilities, at the end of the reporting period. However, uncertainty about these assumptions and estimates could result in outcomes that require a material adjustment to the carrying amount of the asset or liability affected in future periods. The key assumptions concerning the future and other key sources of estimation uncertainty at the reporting date, which have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year, are described below.

Notes	Description	Nature of estimation
7, 8, 9, 10	**Impairment of non-financial assets / goodwill**	Impairment exists when the carrying value of an asset or cash-generating unit exceeds its recoverable amount, which is the higher of its fair value less costs to sell and its value in use. The determination of the recoverable amount of a cash-generating unit involves the use of estimates by management. The fair value less costs to sell calculation is based on available data from binding sales transactions in an arm's length transaction of similar assets or observable market prices less incremental costs for disposing of the asset. The value in use calculation is based on a discounted cash flow model. The cash flows are derived from the expectations for the next three to five years and do not include restructuring activities that the Group is not yet committed to or significant future investments that will enhance the asset's performance of the cash-generating unit being tested. The recoverable amount based on the value in use is most sensitive to the discount rate used for the discounted cash flow model (WACC), as well as the expected future cash-inflows and the growth rate used for extrapolation purposes. The recoverable amount based on the fair value less cost to sell is most sensitive to the market prices, premiums and the estimate of cost to sell. These estimates, including the methodologies used, can have a material impact on the fair value and ultimately, the amount of any goodwill impairment.
9	**Customer relations**	Customer relations are classified as finite lived intangible assets under note 2.8 and amortized over their estimated useful life. The estimated useful life is based on estimates of the time period during which this intangible asset generates cash flows, as well as historic empirical data concerning customer loyalty. Calculation of the present value of estimated future cash flows includes essential assumptions, especially of future sales. In addition, discounting is based on assumptions and estimations concerning business-specific capital costs, which are themselves dependent on national risks, and additional risks resulting from the volatility of the respective business.
21, 22	**Pension and other employment benefits**	The cost of defined benefit pension plans and other similar long-term employee benefits, and the present value of the pension obligation are determined using actuarial valuations. An actuarial valuation involves making various assumptions, which may differ from actual developments in the future. These include the determination of the discount rate, future salary increases, mortality rates and future pension increases. Due to the complexity of the valuation, the underlying assumptions and its long-term nature, a defined benefit obligation is highly sensitive to changes in these assumptions.
29.2	**Deferred tax assets**	Deferred tax assets are recognized for all unused tax losses, to the extent that it is probable that taxable profit will be available against which the losses can be utilized. Significant management judgment is required to determine the amount of deferred tax assets that can be recognized, based upon the likely timing and the level of future taxable profits together with future tax planning strategies.
25	**Fair value of financial instruments**	Where the fair value of financial assets and financial liabilities recorded in the statement of financial position cannot be derived from active markets, their fair value is determined using valuation techniques including the discounted cash flow model. The inputs to these models are taken from observable markets where possible, but where this is not feasible, a degree of judgment is required in establishing fair values. The judgments include considerations of inputs, such as liquidity risk, credit risk and volatility. Changes in assumptions about these factors could affect the reported fair value of financial instruments.

4. Standards issued but not yet effective

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

K-IFRS 1116 Leases

K-IFRS 1116 *Leases* replaces the existing standard on accounting for leases, K-IFRS 1017, K-IFRS 2104 *Determining whether an Arrangement contains a Lease*, K-IFRS 2015 *Operating Leases-Incentives*, and K-IFRS 2027 *Evaluating the Substance of Transactions Involving the Legal Form of a Lease*. The Group will apply the standard as at January 1, 2019. The Group will transition to K-IFRS 1116 in accordance with the modified retrospective approach; the prior-year figures will not be adjusted.

K-IFRS 1116 introduces a uniform lessee accounting model. Applying this model, a lessee is required to recognize a right-of-use asset representing the lessee's right to use the underlying asset and a financial liability representing the lessee's obligation to make future lease payments. There are exemptions for short-term leases and leases of low-value assets. The Group will make use of the relief options provided for leases of low-value assets and short-term leases.

For leases that have been classified to date as operating leases in accordance with K-IFRS 1017, the lease liability will be recognized at the present value of the remaining lease payments, discounted using the lessee's incremental borrowing rate at the time the standard is first applied. In principle, right-of-use assets are initially recognized at the value of the corresponding liabilities. In some cases, the value of right-of-use assets may differ from the value of the liabilities due to offsetting against prepayments or provisions.

Lessees will be also required to remeasure the lease liability upon the occurrence of certain events (e.g., a change in the lease term, a change in future lease payments resulting from a change in an index or rate used to determine those payments). The lessee will generally recognize the amount of the remeasurement of the lease liability as an adjustment to the right-of-use asset.

Lessor accounting remains comparable to that provided by the existing Leasing standard – lessors continue to classify their leases as operating or finance leases. The previous determination pursuant to K-IFRS 1017 and K-IFRS 2104 of whether a contract is lease is maintained for existing contracts, in accordance with K-IFRS 1116.

The Group is assessing the potential effect of the amendments on its consolidated financial statements. The Group will apply these amendments on the required effective date.

Amendments to K-IFRS 1109: Prepayment Features with Negative Compensation

Under K-IFRS 1109, a debt instrument can be measured at amortized cost or at fair value through other comprehensive income, provided that the contractual cash flows are 'solely payments of principal and interest on the principal amount outstanding' (the SPPI criterion) and the instrument is held within the appropriate business model for that classification. The amendments to K-IFRS 1109 clarify that a financial asset passes the SPPI criterion regardless of the event or circumstance that causes the early termination of the contract and irrespective of which party pays or receives reasonable compensation for the early termination of the contract.

The amendments should be applied retrospectively and are effective from January 1, 2019, with earlier application permitted. These amendments have no impact on the consolidated financial statements of the Group.

Amendments to K-IFRS 1110 and K-IFRS 1028: Sale or Contribution of Assets between an Investor and its Associate or Joint Venture

The amendments address the conflict between K-IFRS 1110 and K-IFRS 1028 in dealing with the loss of control of a subsidiary that is sold or contributed to an associate or joint venture. The amendments clarify that the gain or loss resulting from the sale or contribution of assets that constitute a business, as defined in K-IFRS 1103, between an investor and its associate or joint venture, is recognized in full. Any gain or loss resulting from the sale or contribution of assets that do not constitute a business, however, is recognized only to the extent of unrelated investors' interests in the associate or joint venture. The KASB has deferred the effective date of these amendments indefinitely, but an entity that early adopts the amendments must apply them prospectively. The Group will apply these amendments when they become effective.

Amendments to K-IFRS 1019: Plan Amendment, Curtailment or Settlement

The amendments to K-IFRS 1019 address the accounting when a plan amendment, curtailment or settlement occurs during a reporting period. The amendments specify that when a plan amendment, curtailment or settlement occurs during the annual reporting period, an entity is required to:

- Determine current service cost for the remainder of the period after the plan amendment, curtailment or settlement, using the actuarial assumptions used to remeasure the net defined benefit liability (asset) reflecting the benefits offered under the plan and the plan assets after that event;
- Determine net interest for the remainder of the period after the plan amendment, curtailment or settlement using: the net defined benefit liability (asset) reflecting the benefits offered under the plan and the plan assets after that event; and the discount rate used to remeasure that net defined benefit liability (asset).

The amendments also clarify that an entity first determines any past service cost, or a gain or loss on settlement, without considering the effect of the asset ceiling. This amount is recognized in profit or loss. An entity then determines the effect of the asset ceiling after the plan amendment, curtailment or settlement. Any change in that effect, excluding amounts included in the net interest, is recognized in other comprehensive income.

The amendments apply to plan amendments, curtailments, or settlements occurring on or after the beginning of the first annual reporting period that begins on or after January 1, 2019, with early application permitted. These amendments will apply only to any future plan amendments, curtailments, or settlements of the Group.

Amendments to K-IFRS 1028: Long-term Interests in Associates and Joint Ventures

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

The amendments also clarified that, in applying K-IFRS 1109, an entity does not take account of any losses of the associate or joint venture, or any impairment losses on the net investment, recognized as adjustments to the net investment in the associate or joint venture that arise from applying K-IFRS 1028 *Investments in Associates and Joint Ventures*.

The amendments should be applied retrospectively and are effective from January 1, 2019, with early application permitted. Since the Group does not have such long-term interests in its associate and joint venture, the amendments will not have an impact on its consolidated financial statements.

IFRIC Interpretation 23 Uncertainty over Income Tax Treatment

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

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

The Group has to determine whether to consider each uncertain tax treatment separately or together with one or more other uncertain tax treatments. The approach that better predicts the resolution of the uncertainty should be followed. The interpretation is effective for annual reporting periods beginning on or after January 1, 2019, but certain transition reliefs are available. The Group will apply the interpretation from its effective date. Since the Group operates in a complex multinational tax environment, applying the Interpretation may affect its consolidated financial statements. In addition, the Group may need to establish processes and procedures to obtain information that is necessary to apply the Interpretation on a timely basis.

Annual Improvements 2015-2017 Cycle (issued in December 2017)

These improvements include:

1) K-IFRS 1103 Business Combinations

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

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

2) K-IFRS 1111 Joint Arrangements

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

An entity applies those amendments to transactions in which it obtains joint control on or after the beginning of the first annual reporting period beginning on or after January 1, 2019, with early application permitted. These amendments are currently not applicable to the Group but may apply to future transactions.

3) K-IFRS 1012 Income Taxes

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

An entity applies those amendments for annual reporting periods beginning on or after January 1, 2019, with early application is permitted. When an entity first applies those amendments, it applies them to the income tax consequences of dividends recognized on or after the beginning of the earliest comparative period. Since the Group’s current practice is in line with these amendments, the Group does not expect any effect on its consolidated financial statements.

4) K-IFRS 1023 Borrowing Costs

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

An entity applies those amendments to borrowing costs incurred on or after the beginning of the annual reporting period in which the entity first applies those amendments. An entity applies those amendments for annual reporting periods beginning on or after January 1, 2019, with early application permitted. Since the Group’s current practice is in line with these amendments, the Group does not expect any effect on its consolidated financial statements.

5. Business combinations

5.1. Business combinations in 2018

Step acquisition of Qingdao Long Fortune Songwon Chemical Co., Ltd.

Since August 2015, Qingdao Long Fortune Songwon Chemical Co., Ltd. (SWDM-CN) is consolidated in the financial statements of the Group using the equity method. In April 2018, the Group acquired additional 22% of the shares through a capital increase. The conditions to fully consolidate and disclose non-controlling interest were met and SWDM-CN was fully consolidated as of May 1, 2018.

The assets, liabilities and contingent liabilities of SWDM-CN were measured at fair value on the date of acquisition. If the costs exceed the fair value of the acquired identifiable assets, liabilities and contingent liabilities, the balance is reported as goodwill. If the costs fall under the fair value of the acquired identifiable assets, liabilities and contingent liabilities, the bargain purchase gain is recorded in the consolidated statements of comprehensive income.

Assets acquired and liabilities assumed

The assessment of the fair values of the identifiable assets and liabilities of the acquired business at the date of acquisition were (figures represent a 100% interest):

	Million KRW
Assets	
Property, plant and equipment	1,483
Other non-current assets	1,554
Deferred tax assets	128
Inventories	6,012
Trade and other receivables	7,841
Other current assets	299
Cash and cash equivalents	2,103
Total assets	**19,420**
Liabilities	
Other non-current financial liabilities	34
Trade and other payables	7,208
Other current liabilities	33
Income tax payable	657
Total liabilities	**7,932**
Total identifiable net assets at fair value	**11,488**
Bargain purchase gain arising on acquisition	-2,258
Consideration satisfied by:	
Consideration transferred on acquisition of 22% shareholdings	4,240
Preliminary revaluation of previously held interest in SWDM-CN	2,499
Non-controlling interest measured at fair value	2,491
Total consideration	**9,230**

Gain arising on acquisition (bargain purchase gain)

In 2017, SWDM-CN achieved a small positive net income. Under the consideration of the higher burden of environmental regulations as well as new competitors entering the market, the bargain purchase gain is reasonable. In addition, the Asian market remains to be volatile driven by spot business for SWDM-CN. The resulting gain of 2,258 Million KRW (bargain purchase gain) was recognized as other operating income in the consolidated statements of comprehensive income.

From the date of acquisition, May 1, 2018 through December 31, 2018, the acquired company has contributed 17,480 Million KRW of revenue and 894 Million KRW (gain) to the net profit before tax of the Group. If the business combination had taken place on January 1, 2018, revenue from continuing operations of the Group would have been 793,357 Million KRW and the net profit before tax from continuing operations for the Group would have been 46,497 Million KRW.

Revaluation of previously held interest

The Group held an equity interest of 50% before the increase and accounted for SWDM-CN as a joint venture using the equity method. In this business acquisition, which was achieved in stages, the Group re-measured its previously held interest. The resulting loss of 656 Million KRW is included in the consolidated statements of comprehensive income.

5.2. Business combinations in 2017

During the financial year 2017 there were no business combinations.

6. Segment information

For management purposes, SONGWON Industrial Group is organized into one main operating segment. All of the Group's activities are interrelated, and each activity is dependent on the others. Accordingly, all significant operating decisions are based upon analysis of the Group as one segment. The results from this operating segment are equivalent to the financial statements of the Group as a whole.

The Group is operating worldwide and therefore, discloses geographic segment information.

6.1. Product information

	2018	2017
	Million KRW	Million KRW
Alkylphenols and Intermediates	2,343	1,670
Plasticizers	8,121	8,192
Polyester Diols	11,668	10,850
Polymer Stabilizers (AOX and UVs)	554,304	495,345
Polyurethanes	43,819	40,536
PVC Stabilizers	37,792	47,936
SAP and Flocculants	7,972	8,483
Tin Intermediates	82,351	84,117
Others	40,368	27,724
Total sales	**788,738**	**724,853**

	2018	2017
	Million KRW	Million KRW
Sales of goods	779,554	724,853
Sales of services*	9,184	-
Total sales	**788,738**	**724,853**

*Sales of services is a sale recognized over time in accordance with K-IFRS 1115, refer to note 2.18. for further details

6.2. Geographic information

	2018	2017
	Million KRW	Million KRW
Korea	180,006	194,963
Rest of Asia	220,740	192,072
Europe	176,991	150,549
North and South America	162,894	138,717
Australia	2,431	2,764
Middle East and Africa	45,676	45,788
Total sales	**788,738**	**724,853**

The revenue information above is based on the location of the customer. Korea is disclosed separately due to the size of the material Korean home market whereas all other countries have been summarized to regions. Therefore, no country revenues are disclosed separately.

The Group did not have a single customer with more than 10% of the Group's total revenue during the current reporting periods.

6.3. Non-current assets

	2018	2017
	Million KRW	Million KRW
Korea	405,051	407,183
Rest of Asia	21,402	22,509
Europe	13,249	16,033
North and South America	4,689	4,896
Middle East and Africa	16,273	16,239
Total	**460,664**	**466,860**

Non-current assets for this purpose consist of property, plant and equipment, investment properties and intangible assets.

7. Property, plant and equipment

	Land	Buildings	Structures	Machinery	Other	Construction in progress	Total
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
Cost							
As of January 1, 2017	**147,904**	**85,352**	**65,640**	**462,827**	**17,895**	**10,537**	**790,155**
Additions	-	470	36	310	1,833	39,733	42,382
Disposals	-	-	-6	-1,843	-936	-	-2,785
Reclassifications	-	4,866	524	40,193	212	-45,795	-
Net exchange differences	-	-1,972	1	-1,617	-212	-160	-3,960
As of December 31, 2017	**147,904**	**88,716**	**66,195**	**499,870**	**18,792**	**4,315**	**825,792**
As of January 1, 2018	**147,904**	**88,716**	**66,195**	**499,870**	**18,792**	**4,315**	**825,792**
Additions	1,604	78	59	733	1,571	23,048	27,093
Disposals	-	-	-152	-9,374	-2,002	-	-11,528
Reclassifications	-	947	841	21,036	1,069	-23,893	-
Business acquisition	-	-	-	1,139	292	52	1,483
Net exchange differences	-	492	-	-147	4	-24	325
As of December 31, 2018	**149,508**	**90,233**	**66,943**	**513,257**	**19,726**	**3,498**	**843,165**
Depreciation							
As of January 1, 2017	**-**	**-20,132**	**-34,311**	**-292,056**	**-12,172**	**-**	**-358,671**
Depreciation charge	-	-2,404	-3,101	-20,675	-1,544	-	-27,724
Disposals	-	-	5	1,152	903	-	2,060
Net exchange differences	-	97	-	141	26	-	264
As of December 31, 2017	**-**	**-22,439**	**-37,407**	**-311,438**	**-12,787**	**-**	**-384,071**
As of January 1, 2018	**-**	**-22,439**	**-37,407**	**-311,438**	**-12,787**	**-**	**-384,071**
Depreciation charge	-	-2,429	-3,137	-22,232	-1,693	-	-29,491
Disposals	-	-	151	7,691	1,984	-	9,826
Net exchange differences	-	-40	-	-13	-54	-	-107
As of December 31, 2018	**-**	**-24,908**	**-40,393**	**-325,992**	**-12,550**	**-**	**-403,843**
Net book value							
As of December 31, 2018	**149,508**	**65,325**	**26,550**	**187,265**	**7,176**	**3,498**	**439,322**
As of December 31, 2017	**147,904**	**66,277**	**28,788**	**188,432**	**6,005**	**4,315**	**441,721**

No impairment of fixed assets has been recognized in 2018 as well as in 2017. Non-cash transactions amounting to 2,148 Million KRW (2017: 3,984 Million KRW) are included in the additions for the year ending 2018.

Capitalized borrowing costs

Borrowing costs, which are directly attributable to the acquisition or production of a qualified asset, are capitalized as part of the cost of that asset. No borrowing costs have been capitalized during the 2018 and 2017 financial years.

Finance leases

There are no assets held under leasing agreements, which may be considered as an asset purchase in economic terms (finance lease), in the Group. Payment on leased assets defined as operating lease and having a rental character are expensed over the lease period.

Contractual commitments and pledged assets

A pledged asset is an asset that is transferred to a lender for the purpose of securing debt. The lender of the debt maintains possession of the pledged asset but does not have ownership unless a default occurs (refer to note 27). For contractual commitments to purchase property, plant and equipment, refer to note 26.3.

8. Investments properties

	Land	Buildings	Structures	Total
	Million KRW	Million KRW	Million KRW	Million KRW
Cost				
As of January 1, 2017	**3,279**	**505**	**32**	**3,816**
Net exchange differences	-1	-7	-	-8
As of December 31, 2017	**3,278**	**498**	**32**	**3,808**
Net exchange differences	1	6	-	7
As of December 31, 2018	**3,279**	**504**	**32**	**3,815**
Depreciation				
As of January 1, 2017	**-**	**-243**	**-24**	**-267**
Depreciation charge	-	-16	-1	-17
Net exchange differences	-	6	-	6
As of December 31, 2017	**-**	**-253**	**-25**	**-278**
Depreciation charge	-	-18	-1	-19
Net exchange differences	-	-2	-	-2
As of December 31, 2018	**-**	**-273**	**-26**	**-299**
Net book value				
As of December 31, 2018	**3,279**	**231**	**6**	**3,516**
As of December 31, 2017	**3,278**	**245**	**7**	**3,530**

Investment properties are stated at cost less any accumulated depreciation and impairment losses, if any. The same useful lives have been used as for property, plant and equipment.

	2018	2017
	Million KRW	Million KRW
Rental income	17	16
Operational expenses	35	40

Songwon Industrial Co., Ltd. owns an office building in Busan which is subleased and the fair value of the office building amounts to 5,000 Million KRW. Moreover, Songwon Japan K.K. owns an object which is subleased. The fair value of the building and land is 36 Million KRW.

Furthermore, no investment properties were disposed during 2018 and 2017.

Disclosure of pledged assets can be found in note 27.

9. Intangible assets

	Industrial rights	Software	Memberships	Customer relationships	Capitalization process technology	Goodwill	Construction in progress	Total
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
Cost								
As of January 1, 2017	**3,329**	**2,772**	**853**	**32,351**	**3,818**	**44,890**	**1,361**	**89,374**
Additions	-	24	-	-	-	-	600	624
Disposals	-	-87	-20	-	-	-	-203	-310
Reclassifications	273	-	-	-	-	-	-273	-
Net exchange differences	-1	-108	-2	-4,724	-676	-4,099	-	-9,610
As of December 31, 2017	**3,601**	**2,601**	**831**	**27,627**	**3,142**	**40,791**	**1,485**	**80,078**
As of January 1, 2018	**3,601**	**2,601**	**831**	**27,627**	**3,142**	**40,791**	**1,485**	**80,078**
Additions	23	69	-	-	-	-	1,320	1,412
Impairment	-	-	-	-	-	-	-694	-694
Reclassifications	1,915	-	-	-	-	-	-1,915	-
Net exchange differences	-	39	-	1,058	152	1,138	-	2,387
As of December 31, 2018	**5,539**	**2,709**	**831**	**28,685**	**3,294**	**41,929**	**196**	**83,183**
Accumulated amortization								
As of January 1, 2017	**-1,365**	**-2,381**	**-**	**-21,760**	**-2,301**	**-34,315**	**-**	**-62,122**
Amortization charge	-335	-173	-	-3,529	-506	-	-	-4,543
Disposals	-	45	-	-	-	-	-	45
Net exchange differences	-	78	-	3,860	553	3,660	-	8,151
As of December 31, 2017	**-1,700**	**-2,431**	**-**	**-21,429**	**-2,254**	**-30,655**	**-**	**-58,469**
As of January 1, 2018	**-1,700**	**-2,431**	**-**	**-21,429**	**-2,254**	**-30,655**	**-**	**-58,469**
Amortization charge	-403	-83	-	-3,314	-475	-	-	-4,275
Net exchange differences	-	-32	-	-1,139	-163	-1,279	-	-2,613
As of December 31, 2018	**-2,103**	**-2,546**	**-**	**-25,882**	**-2,892**	**-31,934**	**-**	**-65,357**
Net book value								
As of December 31, 2018	**3,436**	**163**	**831**	**2,803**	**402**	**9,995**	**196**	**17,826**
As of December 31, 2017	**1,901**	**170**	**831**	**6,198**	**888**	**10,136**	**1,485**	**21,609**

Intangible assets with finite lives are amortized over the useful life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. In the financial year 2018, the Group impaired unregistered industrial rights of 694 Million KRW recognized under construction in progress (financial year 2017: no impairment).

The intangible assets with indefinite useful lives are tested for impairment on an annual basis. An impairment test was carried out for goodwill and membership items on the basis of calculated value in use. For further details of the impairment test, refer to note 10. The goodwill items consist of items acquired in a business combination. In the financial years 2018 and 2017, no business combination took place that led to a capitalization of intangible assets.

9.1. Details of individually significant intangible assets

		December 31, 2018	December 31, 2017	
Description	**Remark**	**Million KRW**	**Million KRW**	**Remaining life**
Industrial rights	REACH	2,224	1,240	6.6
Industrial rights	1330 Technology	832	621	7
Membership	New Seoul Country	778	778	Indefinite
Goodwill	Acquisition of Songwon Group Holding AG (formerly: Songwon International AG)	1,836	1,836	Indefinite
Goodwill	Acquisition of ATG Additive Technology Greiz GmbH	4,735	4,739	Indefinite
Goodwill	Acquisition of Songwon Polysys Additives LLC	123	118	Indefinite
Goodwill	Acquisition of Business SeQuent Scientific Limited	3,301	3,443	Indefinite
Intangible assets acquired in a business combination	Customer relationships	2,803	6,198	1
Intangible assets acquired in a business combination	Capitalization process technologies	402	888	1
Construction-in-progress	REACH	196	1,485	n/a
Significant intangible assets total		**17,230**	**21,346**	

10. Impairment testing of goodwill and intangibles with indefinite lives

10.1. Impairment test on goodwill and intangible assets with indefinite useful life

Goodwill acquired through business combinations and memberships with indefinite useful lives have been allocated to the cash-generating units (CGUs) according to their business activities. Goodwill acquired in a business combination is allocated to each cash-generating unit expected to benefit from the synergies of the business combination. The goodwill acquired during the acquisition of Songwon Group Holding AG (formerly: Songwon International AG), Songwon ATG GmbH, Songwon Polysys Additives LLC, as well as memberships are allocated to the CGU comprising the acquired entities and the parent company, which correspond almost to the entire Group. The goodwill resulting from the business acquisition of SeQuent Scientific Limited was allocated to the distinct CGU of Songwon Specialty Chemicals – India Pvt. Ltd., India (SWDM-IN).

The allocation of the goodwill and intangible assets with indefinite useful life to the cash generating unit is as follows:

Description	**December 31, 2018**	**December 31, 2017**
	Million KRW	Million KRW
Goodwill of Songwon Specialty Chemicals-India Pvt. Ltd., India (SWDM-IN)	3,301	3,443
Goodwill of the rest of the Group (main CGU)	6,694	6,693
Memberships with indefinite useful lives of the rest of the Group (main CGU)	778	778
Total tested goodwill and intangible assets with indefinite useful lives	**10,773**	**10,914**

The Group performed its annual impairment test in December 2018 and 2017. The recoverable amount of the CGUs – to which goodwill and intangible assets with indefinite lives are allocated – has been determined based on its value in use, calculated using the discounted cash flow (DCF) model.

As of December 31, 2018, the recoverable amount of the main CGU (rest of the Group) equals to 705,662 Million KRW (2017: 682,185 Million KRW). The recoverable amount of the CGU of Songwon Specialty Chemicals – India Pvt. Ltd., India amounts to 40,227 Million KRW or 2,502 Million INR (2017: 31,675 Million KRW or 1,889 Million INR).

There was no impairment loss recognized in the financial year 2018 and 2017, according to the impairment test on goodwill and memberships. As of the measurement date, the recoverable amount based on the value in use in 2018 and 2017, exceeded the carrying amount of the relevant CGUs.

10.2. Key assumptions used in calculation of value in use

The calculation of the CGU value in use reflects the future cash flows for the next three years for the main CGU and for the next five years for SWDM-IN discounted to the present value at the weighted average cost of capital (WACC) and an estimated residual value. The projected cash flows for the main and SWDM-IN CGUs are estimated on the basis of the Budget 2019 and the Business Plan 2019 - 2023 respectively, as approved by management, and mid-term assumptions. For the free cash flows extending beyond the detailed planning period, a terminal value was computed by capitalizing the normalized cash flows using a constant growth rate. The long-term growth rate is in line with blended long-term inflation expectations for relevant countries.

In addition, a market risk premium of 6.00% (2017: 6.00%) and a small cap premium of 3.48% (2017: 3.67%) were applied for the calculation of the WACC.

The key assumptions underlying the calculation are as follows:

Parameters for the determination of the recoverable amount of the CGU	Description
Average annual growth	Average annual growth is calculated on the basis of mid-term assumptions.
WACC	WACC is calculated using the Capital Asset Pricing Model (CAPM). The latter comprises the weighted cost of own equity and of external borrowing costs. The application of WACC pre-tax and WACC post-tax results in the same value in use.
Long-term growth rate	Long-term growth rate is calculated on the basis of expected inflation rates for currencies of relevant countries.

Parameters for the determination of the recoverable amount of the main CGU	2018	2017
Average annual growth	4.45%	4.40%
Pre-tax WACC	12.23%	10.50%
Post-tax WACC	9.99%	10.40%
Long-term growth rate	2.21%	2.49%

Parameters for the determination of the recoverable amount of the CGU of SWDM-IN	2018	2017
Average annual growth	12.20%	2.60%
Pre-tax WACC	15.31%	16.38%
Post-tax WACC	13.88%	15.89%
Long-term growth rate	4.09%	4.80%

The following changes in material assumptions led to a situation where the value in use equals the carrying amount:

Parameters for the determination of the recoverable amount of the CGU	Sensitivity analysis main CGU (rest of the Group)	Sensitivity analysis SWDM-IN
Average annual growth	0.00%	0.00%
Pre-tax WACC	12.62%	21.64%
Post-tax WACC	10.29%	18.74%
Long-term growth rate	1.89%	0.00%

11. Investment accounted for using the equity method

The changes in the interest in joint ventures are summarized as follows:

	As of January 1, 2017	Dividends	Share of result from equity method revaluation	Change in scope of consolidation	Exchange rate effects	As of December 31, 2017
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
Songwon Baifu Chemicals (Tangshan) Co., Ltd.	3,849	-	806	-	-424	4,231
Qingdao Long Fortune Songwon Chemical Co., Ltd.	2,703	-	443	-	-342	2,804
Total	**6,552**	**-**	**1,249**	**-**	**-766**	**7,035**

	As of January 1, 2018	Dividends	Share of result from equity method revaluation	Change in scope of consolidation	Exchange rate effects	As of December 31, 2018
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
Songwon Baifu Chemicals (Tangshan) Co., Ltd.	4,231	-534	1,112	-	-49	4,760
Qingdao Long Fortune Songwon Chemical Co., Ltd.*	2,804	-	270	-3,154	80	-
Total	**7,035**	**-534**	**1,382**	**-3,154**	**31**	**4,760**

*refer to note 5 for further details

12. Available-for-sale financial investments

	December 31, 2018				December 31, 2017			
	Number of shares	% to equity	Cost	Book value	Number of shares	% to equity	Cost	Book value
Description			Million KRW	Million KRW			Million KRW	Million KRW
Ulsan Broad-casting Corp.	-	-	-	-	180,000	3.00%	900	900
Total			**-**	**-**			**900**	**900**

Due to K-IFRS 1109, available-for-sale financial investments have been reclassified to equity instruments at FVOCI (refer to note 13.2).

13. Other financial assets

Description	December 31, 2018 Non-current	December 31, 2018 Current	December 31, 2017 Non-current	December 31, 2017 Current
	Million KRW		Million KRW	
Financial instruments at amortized cost (bank deposit)	635	2,291	8,187	2,009
Financial instrument at FVtPL	8,863	1,710	-	-
Interest-bearing loans	-	1,346	1,641	18,000
Derivative assets at FVOCI	1	69	131	92
Derivative assets at FVtPL	-	4	-	-
Equity Instrument at FVOCI	1,354	-	-	-
Guarantee deposits	276	586	306	447
Total	**11,129**	**6,006**	**10,265**	**20,548**

13.1. Loans

Details of loans as of December 31, 2018 and 2017 are as follows:

Description	December 31, 2018 Annual interest rate (%)	December 31, 2018 Million KRW	December 31, 2017 Annual interest rate (%)	December 31, 2017 Million KRW
Loans to related party (note 32)	0.25	1,346	-	-
Loans to related party (note 32)	-	-	3.00	18,000
Loans to related party (note 32)	-	-	7.06	1,641
Total		**1,346**		**19,641**

13.2. Equity instruments at FVOCI

Details of equity instruments at FVOCI as of December 31, 2018 and 2017 are as follows:

	December 31, 2018				December 31, 2017			
	Number of shares	% to equity	Cost	Fair value	Number of shares	% to equity	Cost	Fair value
Description			Million KRW	Million KRW			Million KRW	Million KRW
Ulsan Broad-casting Corp.	180,000	3.00%	900	1,354	-	-	-	-
Total			**900**	**1,354**			**-**	**-**

Investments in equity instruments that do not have a quoted market price in an active market are measured using appropriate valuation techniques.

14. Inventories

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Raw materials and supplies	41,559	33,752
Work in progress	809	199
Finished goods	120,436	108,134
Goods in transit	37,057	24,438
Consignment stocks	1,507	118
Total inventories at the lower of cost and net realizable value	**201,368**	**166,641**

As of December 31, 2018, inventory write-off amounted to 3,804 Million KRW for raw material and finished goods (December 31, 2017: 3,480 Million KRW).

15. Trade and other receivables

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Trade and notes receivables (net) – third parties	112,769	121,822
Trade and notes receivables (net) – related parties	-	4,876
Other receivables (net) – third parties	3,133	3,853
Other receivables (net) – related parties	-	268
Accrued income – third parties	65	35
Accrued income – related parties	2	40
Total	**115,969**	**130,894**

Other receivables third parties include customs, rental income receivables and others.

The movements of the allowance for doubtful receivables are as follows:

	Million KRW
January 1, 2017	**-1,139**
Charge for the period	-1,163
Unused amounts reversed	489
December 31, 2017	**-1,813**
January 1, 2018	**-1,813**
Charge for the period	-1,161
Utilized	178
Unused amounts reversed	608
December 31, 2018	**-2,188**

The ageing analysis of trade and other receivables is as follows:

	Total	Neither past, due nor impaired	Past due, but not impaired			
			≤ 90 days	91-120 days	121-180 days	> 180 days
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
December 31, 2018	**115,969**	108,852	6,459	27	66	565
December 31, 2017	**130,894**	120,904	9,644	88	258	-

Refer to note 25.3.2 on credit risk of trade receivables, which discusses how the Group manages and measures credit quality of trade receivables that are neither past due, nor impaired.

16. Other current assets

Other current assets as of December 31, 2018 and 2017, consist of the following:

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Advance payments	429	185
Prepaid expenses	2,755	2,663
VAT refundable	1,203	654
Total	**4,387**	**3,502**

17. Cash and cash equivalents

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Cash on hand	72	95
Bank accounts	56,813	52,618
Time deposit (< 3 months)	6,421	2,691
Total	**63,306**	**55,404**

Cash at banks earns interest at floating rates based on daily bank deposit rates. Time deposits are made for varying periods of between one day and three months, depending on the Group’s immediate cash requirements, and earn interest at the respective short-term deposit rates.

18. Issued capital and reserves

18.1. Share capital

In accordance with the Articles of Incorporation, the company is authorized to issue 100,000,000 shares of common stock with a par value of 500 KRW per share. As of December 31, 2018 and 2017, the company issued 24,000,000 shares of common stock with a carrying value of 12,000 Million KRW.

18.2. Capital surplus

As of December 31, 2018 and 2017, the company’s capital surplus amounts to 24,361 Million KRW. It comprised paid-in capital in excess of par value of 20,065 Million KRW and gain on disposal of treasury stock of 4,296 Million KRW.

18.3. Reserves

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Legal reserve	1,776	1,440
Asset revaluation surplus	25,815	25,815
Total	**27,591**	**27,255**

Legal reserves

In accordance with the Korean Commercial Code, an amount equal to at least 10% of cash dividends is required to be appropriated as a legal reserve until the reserve equals 50% of paid-in capital. The legal reserve may not be utilized for cash dividends, but may only be used to offset a deficit, if any, or be transferred to capital. Appropriation to the legal reserve from retained earnings, pursuant to the approval of the General Meeting of Shareholders during 2018 and 2017, amounted to 336 Million KRW in both years.

Asset revaluation reserve

The Group re-valued certain parts of its property, plant and equipment in accordance with the Korean Asset Revaluation Act on January 1, 1984, and January 1, 1999, resulting in a revaluation surplus of 2,884 Million KRW and 64,277 Million KRW, respectively. An asset revaluation surplus amounting to 62,343 Million KRW, net of related revaluation tax, was credited to capital surplus. As of December 31, 2018 and 2017, the asset revaluation surplus is 25,815 Million KRW.

The asset revaluation surplus of 23,312 Million KRW and 13,216 Million KRW were utilized in disposition of accumulated deficit pursuant to the approval of the stockholders on March 6, 2008, and March 7, 2009, respectively. The asset revaluation surplus may not be utilized for cash dividends, but may only be used to offset a deficit, if any, or be transferred to capital.

Dividends

Dividends approved by the shareholders are as follows:

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Subject to the year	2017	2016
Dividends on ordinary shares in KRW	3,360,000,000	3,360,000,000
Number of shares	24,000,000	24,000,000
Dividends per share in KRW	140	140

18.4. Accumulated other comprehensive income

Accumulated other comprehensive income, net of tax, as of December 31, 2018 and 2017, is composed of the following:

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Exchange differences on translation of foreign operations	-5,351	-5,014
Interest rate swaps	55	173
Financial assets FVOCI	350	-
Total	**-4,946**	**-4,841**

Details of other comprehensive income for the year ended December 31, 2018 and 2017, are as follows:

Description	2018	2017
	Million KRW	Million KRW
Pre-tax amounts:		
(Losses) / gains on valuation of interest rate swaps	-153	460
Gains / (losses) on valuation of financial assets FVOCI	454	-
Exchange differences on translation of foreign operations	-530	-7,606
Re-measurement (losses) on defined benefit plans	-4,778	-190
Pre-tax amounts total	**-5,007**	**-7,336**
Tax effects:		
Gains / (losses) on valuation of interest rate swaps	35	-105
Losses / (gains) on valuation of financial assets FVOCI	-104	-
Re-measurement losses on defined benefit plans	1,211	33
Tax effects total	**1,142**	**-72**
Net amounts:		
(Losses) / gains on valuation of interest rate swaps	-118	355
Gains / (losses) on valuation of financial assets FVOCI	350	-
Exchange differences on translation of foreign operations	-530	-7,606
Re-measurement losses on defined benefit plans	-3,567	-157
Net amounts total	**-3,865**	**-7,408**

19. Interest-bearing loans and borrowings

Interest-bearing loans and borrowings as of December 31, 2018 and 2017, are as follows:

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Long-term borrowings	17,180	98,783
Non-current interest-bearing loans and borrowings	**17,180**	**98,783**
Current portion of long-term borrowings	82,742	21,454
Short-term borrowings	185,188	187,300
Current interest-bearing loans and borrowings	**267,930**	**208,754**
Total	**285,110**	**307,537**

Details of long-term borrowings as of December 31, 2018 and 2017, are as follows:

		Maturity date	Annual interest rate	2018	2017
Banks	Description		(%)	Million KRW	Million KRW
Woori Bank	General Loan	08.05.2019~ 03.07.2020	3MCD+1.02~1.57	43,833	55,167
Korea Development Bank	General Loan	15.09.2019~ 15.03.2020	1.75~3.00	2,209	4,331
Busan Bank	General Loan	08.05.2019	MOR+1.52	6,333	7,667
KEB Hana Bank	General Loan	08.05.2019	3MCD+1.90	26,667	32,000
Kyongnam Bank	General Loan	08.05.2019	MOR+1.90	6,333	7,665
KEB Abu Dhabi	General Loan	14.05.2019*	4.30	5,920	5,661
Polysys Industries LLC	General Loan	31.12.2019	6.50	5,133	4,608
Pan Gulf Holding Company W.L.L.	General Loan	31.12.2019	6.50	3,494	3,138
Subtotal				**99,922**	**120,237**
Less current portion				**-82,742**	**-21,454**
Non-current portion				**17,180**	**98,783**

*Maturity date will be extended by one year (roll over is at the discretion of the entity), therefore categorized as long-term borrowing.

Details of short-term borrowings as of December 31, 2018 and 2017, are as follows:

		Annual interest rate	2018	2017
Banks	Description	(%)	Million KRW	Million KRW
Woori Bank	Trade loan	3.2~4.18	26,137	26,230
KEB Hana Bank	General & trade loan	1.07~3.43	17,527	15,102
Korea Development Bank	General & trade loan	0.43~3.81	96,322	93,563
Busan Bank	General & trade loan	1.51~3.61	20,231	14,083
Kyongnam Bank	General & trade loan	3.20~3.88	17,971	30,322
NH Bank	General loan	2.98	7,000	8,000
Subtotal			**185,188**	**187,300**

20. Emission rights and emission liabilities

1) Details of annual quantity of allocated emission allowances as of December 31, 2018, are as follows (Unit: Korean Allowance Unit - KAU):

	2015	2016	2017	Total
Allocated emission allowance	161,630	153,985	204,928	520,543

	2018	2019	2020	Total
Allocated emission allowance	122,199	122,199	122,199	366,597

2) Changes in emission allowances during each planned period are as follows (Units: KAU and Million KRW):

	2015		2016		2017		Total (1st planned period)	
	Quantity	Book value	Quantity	Book value	Quantity	Book value	Quantity	Book value
Beginning	**-**	**-**	**32,769**	**-**	**-**	**-**	**-**	**-**
Allocation	161,693	-	154,498	-	151,361	-	467,552	-
Allocation cancel	-63	-	-513	-	-	-	-576	-
Additional allocation	-	-	-	-	53,567	-	53,567	-
Purchase	-	-	22,000	453	-	-	22,000	453
Borrowed	-	-	24,319	-	-24,319	-	-	-
Disposal	-	-	-110,581	-	-22,000	-	-132,581	-
Delivery to government	-128,861	-	-122,492	-453	-131,427	-	-382,780	-453
Carryforward	-32,769	-	-	-	-27,182	-	-27,182	-
Ending	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

	2018		2019		2020	
	Quantity	Book value	Quantity	Book value	Quantity	Book value
Beginning	**27,182**	**-**	**6,376**	**-**	**-**	**-**
Allocation	122,199	-	122,199	-	122,199	-
Allocation cancel	-	-	-	-	-	-
Additional allocation	-	-	-	-	-	-
Purchase	-	-	-	-	-	-
Borrowed	-	-	-	-	-	-
Disposal	-	-	-	-	-	-
Delivery to government	-143,005	-	-	-	-	-
Carryforward	-	-	-	-	-	-
Ending	**6,376**	**-**	**-**	**-**	**-**	**-**

3) There are no emission rights provided as collateral as of December 31, 2018.

4) No emission liabilities are recognized as of the end of the reporting period.

5) Allocated greenhouse gas emissions free of charge in 2018 were 122,199 KAU.

6) Estimated greenhouse gas emissions in 2018 were 143,005 KAU.

21. Pension liability

	2018	2017
Pension plan	Million KRW	Million KRW
Net defined benefit liability	**16,037**	**8,311**
Korean	7,955	902
Swiss	8,082	7,409
Indian	-	-
Net defined benefit asset	**10**	**33**
Korean	-	-
Swiss	-	-
Indian	10	33

The Group has three defined benefit pension plans: one pension plan in Korea, one in Switzerland and one in India.

The following tables summarize the components of net benefit expense recognized in the income statement and the funded status and amounts recognized in the statement of financial position for the respective plans.

21.1. Defined benefit obligation

Changes in the defined benefit obligation:

	Korean plan	**Swiss plan**	**Indian plan**	**Total**
	Million KRW	Million KRW	Million KRW	Million KRW
Defined benefit obligation as of January 1, 2017	**53,877**	**31,444**	**218**	**85,539**
Pension cost charged to profit or loss				
Service costs	4,373	1,397	27	5,797
Interest	1,841	200	17	2,058
Sub-total included in profit or loss	*6,214*	*1,597*	*44*	*7,855*
Benefits (paid) / received	-755	1,925	-4	1,166
Re-measurement gains / (losses) in OCI				
Actuarial changes arising from changes in demographic assumptions	-	-	-	-
Actuarial changes arising from changes in in financial assumptions	-1,726	-194	-74	-1,994
Experience adjustments	1,614	361	-4	1,971
Sub-total included in OCI	*-112*	*167*	*-78*	*-23*
Employee contributions	-	778	-	778
Exchange differences	-	-2,641	-9	-2,650
Defined benefit obligation as of December 31, 2017	**59,224**	**33,270**	**171**	**92,665**
Pension cost charged to profit or loss				
Service costs	4,638	1,543	21	6,202
Interest	2,183	244	14	2,441
Sub-total included in profit or loss	*6,821*	*1,787*	*35*	*8,643*
Benefits (paid) / received	-2,088	1,021	-	-1,067
Re-measurement gains / (losses) in OCI				
Actuarial changes arising from changes in demographic assumptions	441	-	-	441
Actuarial changes arising from changes in in financial assumptions	4,006	-676	1	3,331
Experience adjustments	231	365	-3	593
Sub-total included in OCI	*4,678*	*-311*	*-2*	*4,365*
Employee contributions	-	867	-	867
Plan amendment	-	1,558	-	1,558
Exchange differences	-	1,307	-7	1,300
Defined benefit obligation as of December 31, 2018	**68,635**	**39,499**	**197**	**108,331**
Weighted average duration 2017 (years)	9.54	18.28	8.76	
Weighted average duration 2018 (years)	10.40	17.30	8.34	

21.2. Plan assets

Changes in the fair value of plan assets:

	Korean plan	Swiss plan	Indian plan	Total
	Million KRW	Million KRW	Million KRW	Million KRW
Plan assets as of January 1, 2017	**48,562**	**23,936**	**193**	**72,691**
Pension cost charged to profit or loss				
Interest	1,532	154	13	1,699
Administration expenses	-	-70	-	-70
Sub-total included in profit or loss	*1,532*	*84*	*13*	*1,629*
Benefits (paid) / received	-482	1,925	-4	1,439
Re-measurement gains / (losses) in OCI				
Return on plan assets (excluding amounts included in interest expenses)	-290	76	1	-213
Sub-total included in OCI	*-290*	*76*	*1*	*-213*
Employer contributions	9,000	1,104	13	10,117
Employee contributions	-	778	-	778
Exchange differences	-	-2,042	-12	-2,054
Plan assets as of December 31, 2017	**58,322**	**25,861**	**204**	**84,387**
Pension cost charged to profit or loss				
Interest	2,000	190	14	2,204
Administration expenses	-	-87	-	-87
Sub-total included in profit or loss	*2,000*	*103*	*14*	*2,117*
Benefits (paid) / received	-1,374	1,021	-	-353
Re-measurement gains / (losses) in OCI				
Return on plan assets (excluding amounts included in interest expenses)	-1,768	1,357	-2	-413
Sub-total included in OCI	*-1,768*	*1,357*	*-2*	*-413*
Employer contributions	3,500	1,193	-	4,693
Employee contributions	-	867	-	867
Exchange differences	-	1,015	-9	1,006
Plan assets as of December 31, 2018	**60,680**	**31,417**	**207**	**92,304**

The Group expects to contribute comparable amounts (as in 2018) to its defined benefit pension plan in 2019.

21.3. Net pension liability

Changes in the net defined benefit liability are as follows:

	Korean plan	Swiss plan	Indian plan	Total
	Million KRW	Million KRW	Million KRW	Million KRW
Net defined benefit liability as of January 1, 2017	**-5,315**	**-7,508**	**-25**	**-12,848**
Pension cost charged to profit or loss				
Service costs	-4,373	-1,397	-27	-5,797
Administration expenses	-	-70	-	-70
Net interests	-309	-46	-4	-359
Sub-total included in profit or loss	*-4,682*	*-1,513*	*-31*	*-6,226*
Benefits received	273	-	-	273
Re-measurement gains / (losses) in OCI				
Actuarial changes arising from changes in in financial assumptions	1,726	194	74	1,994
Return on plan assets (excluding amounts included in interest expenses)	-290	76	1	-213
Experience adjustments	-1,614	-361	4	-1,971
Sub-total included in OCI	*-178*	*-91*	*79*	*-190*
Employer contributions	9,000	1,104	13	10,117
Employee contributions	-	-	-	-
Exchange differences	-	599	-3	596
Net defined benefit asset as of December 31, 2017	**-**	**-**	**33**	**33**
Net defined benefit liability as of December 31, 2017	**-902**	**-7,409**	**-**	**-8,311**
Pension cost charged to profit or loss				
Service costs	-4,638	-1,543	-21	-6,202
Administration expenses	-	-87	-	-87
Net interests	-183	-54	-	-237
Sub-total included in profit or loss	*-4,821*	*-1,684*	*-21*	*-6,526*
Benefits (paid)	714	-	-	714
Re-measurement gains / (losses) in OCI				
Actuarial changes arising from changes in demographic assumptions	-441	-	-	-441
Actuarial changes arising from changes in in financial assumptions	-4,006	676	-1	-3,331
Return on plan assets (excluding amounts included in interest expenses)	-1,768	1,357	-2	-413
Experience adjustments	-231	-365	3	-593
Sub-total included in OCI	*-6,446*	*1,668*	*-*	*-4,778*
Employer contributions	3,500	1,193	-	4,693
Employee contributions	-	-	-	-
Plan amendment	-	-1,558	-	-1,558
Exchange differences	-	-292	-2	-294
Net defined benefit asset as of December 31, 2018	**-**	**-**	**10**	**10**
Net defined benefit liability as of December 31, 2018	**-7,955**	**-8,082**	**-**	**-16,037**

The re-measurement losses recognized in the statements of comprehensive income were losses of -3,567 Million KRW (2017: losses of -157 Million KRW), net of tax. The total amount at December 31, 2018, of accumulated loss included in retained earnings is -25,578 Million KRW (2017: accumulated loss of -22,011 Million KRW), net of tax.

The principal assumptions used in determining pension benefit obligations for the Group's plans are shown below:

	Determining net expense		Determining pension benefit obligation	
			December 31,	
	2018	2017	2018	2017
Discount rate				
Korean plan	3.80%	3.50%	3.20%	3.80%
Swiss plan	0.85%	0.70%	0.85%	0.70%
Indian plan	7.50%	7.05%	7.50%	7.60%
Future salary increases				
Korean plan	5.00%	5.00%	5.00%	5.00%
Swiss plan	2.00%	2.00%	2.00%	2.00%
Indian plan	5.00%	10.00%	5.00%	5.00%

A quantitative sensitivity analysis for significant assumptions as of December 31, 2018, is as follows:

	Sensitivity level	Impact on net defined benefit obligation
Discount rate	Change	Million KRW
Korean plan	+1.00%	-6,535
	-1.00%	7,745
Swiss plan	+0.25%	-1,064
	-0.25%	1,128
Indian plan	+1.00%	-187
	-1.00%	209

Salary increase	Change	Million KRW
Korean plan	+1.00%	-7,522
	-1.00%	6,489
Swiss plan	+0.25%	153
	-0.25%	-150
Indian plan	+1.00%	209
	-1.00%	-187

The sensitivity analysis above has been determined based on a method that extrapolates the impact on defined benefit obligation as a result of reasonable changes in key assumptions occurring at the end of the reporting period.

22. Other long-term employee-related liabilities

Other long-term employee-related liabilities consist of the following:

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Other long-term employee benefits - Korea	2,450	2,252
Other long-term employee benefits - Others	393	260
Share-based payment-related liability	2,268	3,073
Total other long-term employee-related liabilities	**5,111**	**5,585**

22.1. Other long-term employee benefits - Korea

The parent company implements a bonus plan designed to present a prescribed quantity of gold and entitle compensated vacation to long-term service employees. Accounting policies of the bonus plan are mostly the same as that of the defined benefit plan, except that all the past service cost and actuarial variances are recognized immediately in profit or loss.

Description	Million KRW
As of January 1, 2017	**2,053**
Current service costs	231
Interest costs	62
Re-measurement gains	28
Total payment	-122
As of December 31, 2017	**2,252**
Current service costs	254
Interest costs	75
Re-measurement gains	59
Total payment	-190
As of December 31, 2018	**2,450**

Description	December 31, 2018	December 31, 2017
Discount rate	3.20%	3.50%
Compensation increase	5.00%	5.00%
Compensation per day for vacation	KRW 100,160 -195,840	KRW 77,360 - 185,440
Rate of increase in gold price	5.10%	6.20%
Gold price per 3.75 grams	KRW 181,000	KRW 175,000

22.2. Other long-term employee benefits - Others

The remaining other long-term employee benefits refer to legally established termination benefits of Group companies located in United Arab Emirates of 287 Million KRW (as of December 31, 2017: 178 Million KRW) and to expenses for the defined contribution plan of Songwon Specialty Chemicals India Pvt. Ltd. of 106 Million KRW (as of December 31, 2017: 82 Million KRW).

22.3. Share-based payment related liability

On March 31, 2013, the Group granted virtual stock options to eligible employees of subsidiaries according to the Virtual Stock Option and Long-term Incentive Plan (“LTIP”). The virtual stock options granted are an entitlement in money, and are neither a stock, nor any other listed or unlisted security and do not grant any right to physically acquire stocks. Settlement of options exercised is in cash only. Upon exercise, SONGWON shall pay the receiver the greater of the difference between the fair market value at the exercise date (listed stock price of Songwon Industrial Co., Ltd.) minus the strike price or 0 (zero). The virtual stock options, granted under the LTIP, are subject to a vesting period of two to four years during which the receiver of the options must be continuously employed by the Group.

The fair value of options, granted as of December 31, 2018 and 2017, was estimated using the following assumptions:

Description	2018	2017
Dividend yield	0.60%	0.26%
Expected volatility	45.00%	45.00%
Risk-free interest rate	2.77%	2.15%
Weighted average expected life of share options (years)	4.5	3.6
Model used	Binomial tree	Binomial tree

The carrying amount of the liability relating to the LTIP on December 31, 2018, was 2,268 Million KRW (December 31, 2017: 3,073 Million KRW). 83,400 share options vested as of December 31, 2018, and 38,775 vested as of December 31, 2017.

The income for employee services received during the year 2018, recognized in the statements of comprehensive income, amounted to 262 Million KRW (2017: expenses of 1,424 Million KRW). There were no cancellations and modifications to the awards during the years 2018 and 2017.

Movements during the year

The following table illustrates the number and weighted average exercise prices (WAEP) of, and movements in, share options during the reporting period:

	2018		2017	
Description	**Number**	**KRW**	**Number**	**KRW**
Outstanding as of January 1	**318,676**	**13,359**	**418,500**	**11,270**
Granted during the year	110,250	27,000	100,751	17,100
Forfeited during the year	-12,375	19,054	-151,125	10,955
Exercised during the year	-28,150	10,253	-49,450	10,645
Outstanding as of December 31	**388,401**	**17,275**	**318,676**	**13,359**
Exercisable as of December 31	**83,400**	**10,891**	**38,775**	**10,237**

The weighted average remaining contractual life for the share options, outstanding as of December 31, 2018, was 6.9 years (December 31, 2017: 8.0 years). The weighted average fair value of options granted during the reporting period was 6,505 KRW (2017: 15,556 KRW).

The exercise price for options outstanding at the end of the reporting period was 8,120 KRW – 27,000 KRW (2017: 8,120 KRW – 17,100 KRW).

23. Other financial liabilities

Other financial liabilities as of December 31, 2018 and 2017, are as follows:

	December 31, 2018		December 31, 2017	
Description	**Non-current**	**Current**	**Non-current**	**Current**
	Million KRW		Million KRW	
Derivative liabilities (note 25)	-	45	-	-
Deposits	3,361	1,398	4,625	1,237
Accrued interest expenses	-	533	-	504
Unpaid dividends	-	2	-	2
Total	**3,361**	**1,978**	**4,625**	**1,743**

24. Trade and other payables

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Trade payables	54,319	56,928
Trade payables (related parties)	1,148	1,834
Other accounts payables	17,855	26,026
Other accounts payables (related parties)	5	4
Withholdings	1,303	1,090
Accrued expenses	25,887	23,607
Guarantee deposits	12	49
Total	**100,529**	**109,538**

Trade and other payables do not bear interest and usually become due within 30-60 days.

25. Additional information on financial instruments

25.1. Derivatives financial instruments

	December 31, 2018		December 31, 2017	
Description	Assets	Liabilities	Assets	Liabilities
	Million KRW		Million KRW	
Forward exchange contracts (current portion)	4	45	-	-
Interest rate swaps (current portion)	69	-	92	-
Interest rate swaps (non-current portion)	1	-	131	-
Total	**74**	**45**	**223**	**-**

25.1.1. Forward exchange contracts

Forward exchange contracts which the Group entered into in order to hedge the risk of foreign exchange rate fluctuation of assets denominated in foreign currencies, as of December 31, 2018, are as follows:

Contractual party	Position	Contract amount	Maturity dates	Contractual exchange rate (KRW)
Citibank Korea	sell	EUR 3,300,000	31.01.2019~18.06.2019	1,317.00
Woori Bank	sell	EUR 2,400,000	31.01.2019~28.06.2019	1,318.00
Citibank Korea	sell	JPY 27,993,934	04.01.2019	10.2650
Woori Bank	sell	JPY 265,000,000	31.01.2019~31.05.2019	10.2500

As of December 31, 2017, there are no currency forward contracts, which the Group entered into in order to hedge the risk of foreign exchange rate fluctuation of assets denominated in foreign currencies.

25.1.2. Interest rate swaps

As of December 31, 2018 and 2017, the Group has entered into the following interest rate swap contracts:

As of December 31, 2018

Description	Bonds contract	Interest rate swap contract
Contract date	08.03.2016	08.03.2016
Maturity date	08.05.2019	08.05.2019
Contract amount	40,000 Million KRW	40,000 Million KRW
Fixed interest rate	n/a	3.48%
Floating interest rate	3MCD+1.90%	3MCD+1.90%
Contract date	08.03.2016	08.03.2016
Maturity date	08.05.2019	08.05.2019
Contract amount	60,000 Million KRW	60,000 Million KRW
Fixed interest rate	n/a	3.30%
Floating interest rate	3MCD+1.57%	3MCD+1.57%
Contract date	03.07.2017	03.07.2017
Maturity date	03.07.2020	03.07.2020
Contract amount	10,000 Million KRW	10,000 Million KRW
Fixed interest rate	n/a	2.73%
Floating interest rate	3MCD+1.02%	3MCD+1.02%

As of December 31, 2017

Description	Bonds contract	Interest rate swap contract
Contract date	08.03.2016	08.03.2016
Maturity date	08.05.2019	08.05.2019
Contract amount	40,000 Million KRW	40,000 Million KRW
Fixed interest rate	n/a	3.48%
Floating interest rate	3MCD+1.90%	3MCD+1.90%
Contract date	08.03.2016	08.03.2016
Maturity date	08.05.2019	08.05.2019
Contract amount	60,000 Million KRW	60,000 Million KRW
Fixed interest rate	n/a	3.30%
Floating interest rate	3MCD+1.57%	3MCD+1.57%
Contract date	03.07.2017	03.07.2017
Maturity date	03.07.2020	03.07.2020
Contract amount	10,000 Million KRW	10,000 Million KRW
Fixed interest rate	n/a	2.73%
Floating interest rate	3MCD+1.02%	3MCD+1.02%

The Group applies cash flow hedge accounting on interest rate swaps; in the current reporting period and in 2017 there was an interest rate swap designated as cash flow hedge. The balances included in accumulated other comprehensive income are 55 Million KRW as of December 31, 2018, and 173 Million KRW as of December 31, 2017, respectively (refer to note 18.4), net of income tax.

25.2. Fair values

Set out below is a comparison by class of the carrying amounts and fair value of the Group's financial instruments that are carried in the financial statements.

As of December 31, 2018

		Carrying amount		Fair value	
		Non-current	Current	Non-current	Current
		Million KRW	Million KRW	Million KRW	Million KRW
Financial assets	**Financial assets at amortized cost**				
	Other financial assets	911	4,223	911	4,223
	Trade and other receivables	-	115,969	-	115,969
	Cash and cash equivalents	-	63,306	-	63,306
	Total	*911*	*183,498*	*911*	*183,498*
	Financial assets at FVOCI				
	Other financial assets	1,354	-	1,354	-
	Interest rate swaps	1	69	1	69
	Total	*1,355*	*69*	*1,355*	*69*
	Financial assets at FVtPL				
	Forward exchange contracts	-	4	-	4
	Other financial assets	8,863	1,710	8,863	1,710
	Total	*8,863*	*1,714*	*8,863*	*1,714*
Total		**11,129**	**185,281**	**11,129**	**185,281**
Financial liabilities	**Financial liabilities at amortized cost**				
	Other financial liabilities	3,361	1,933	3,361	1,933
	Trade and other payables	-	100,529	-	100,529
	Interest-bearing loans and borrowings	17,180	267,930	17,180	267,930
	Total	*20,541*	*370,392*	*20,541*	*370,392*
	Financial liabilities at FVtPL				
	Forward exchange contracts	-	45	-	45
	Total	*-*	*45*	*-*	*45*
Total		**20,541**	**370,437**	**20,541**	**370,437**

As of December 31, 2017

		Carrying amount		Fair value	
		Non-current	Current	Non-current	Current
		Million KRW	Million KRW	Million KRW	Million KRW
Financial assets	**Loans and receivables**				
	Other financial assets	10,134	20,456	10,134	20,456
	Trade and other receivables	-	130,894	-	130,894
	Cash and cash equivalents	-	55,404	-	55,404
	Total	*10,134*	*206,754*	*10,134*	*206,754*
	Financial assets at FVOCI				
	Other financial assets (Derivatives)	131	92	131	92
	Total	*131*	*92*	*131*	*92*
	Available-for-sale financial investments				
	Available-for-sale financial investments	900	-	900	-
	Total	*900*	*-*	*900*	*-*
Total		**11,165**	**206,846**	**11,165**	**206,846**

Financial liabilities	**Financial liabilities at amortized cost**				
	Other financial liabilities	4,625	1,743	4,625	1,743
	Trade and other payables	-	109,538	-	109,538
	Interest-bearing loans and borrowings	98,783	208,754	98,783	208,754
	Total	*103,408*	*320,035*	*103,408*	*320,035*
Total		**103,408**	**320,035**	**103,408**	**320,035**

The fair value of the financial assets and liabilities are included at the amount at which the instrument could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale.

The following methods and assumptions were used to estimate the fair values:

- Cash and cash equivalents, trade and other receivables, trade payables and other current liabilities approximate their carrying amounts largely due to the short-term maturities of these instruments.
- Fair value of financial assets at FVOCI and financial assets at FVtPL are derived from quoted market prices in active markets, if available.
- Fair value of unquoted financial assets at FVOCI and financial assets at FVtPL are estimated using appropriate valuation techniques (refer to note 25.2.1).

25.2.1. Fair value hierarchy

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

Description	**Valuation technique**
Level 1	Quoted (unadjusted) prices in active markets for identical assets or liabilities
Level 2	Other techniques for which all inputs which have a significant effect on the recorded fair value are observable either directly or indirectly
Level 3	Techniques which use inputs that have a significant effect on the recorded fair value that are not based on observable market data

As of December 31, 2018 and 2017, the Group held the following financial instruments carried at fair value on the statements of financial position:

		December 31, 2018	Level 1	Level 2	Level 3
		Million KRW	Million KRW	Million KRW	Million KRW
Financial assets	**Derivatives**				
	Forward exchange contracts	4	-	4	-
	Interest Rate Swaps	70	-	70	-
	Total	*74*	-	*74*	-
	Debt instruments				
	Exchange traded fund at FVtPL	630	630	-	-
	Total	*630*	*630*	-	-
	Equity instruments				
	Equity instruments at FVOCI	1,354	-	-	1,354
	Total	*1,354*	-	-	*1,354*
Total		**2,058**	**630**	**74**	**1,354**

Financial liabilities	**Derivatives**				
	Forward exchange contracts	45	-	45	-
Total		**45**	**-**	**45**	**-**

		December 31, 2017	Level 1	Level 2	Level 3
		Million KRW	Million KRW	Million KRW	Million KRW
Financial assets	**Derivatives**				
	Interest Rate Swaps	223	-	223	-
Total		**223**	**-**	**223**	**-**

During the reporting periods ended December 31, 2018 and 2017, there were no transfers between Level 1 and Level 2 fair value measurements. For the financial assets and financial liabilities for which the fair value is disclosed (refer to note 25.2) the carrying amount is a reasonable approximation of fair values and is measured using Level 3 measurement methods, except for cash and cash equivalents.

25.3. Financial risk management objectives and policies

The Group's principal financial liabilities comprise loans and borrowings, trade and other payables, and other financial liabilities. The main purpose of these financial liabilities is to finance the Group's operations. The Group has trade accounts and other accounts receivables, cash and cash equivalents and other financial assets that arrive directly from its operations. The Group also holds available-for-sale investments and enters into derivative transactions and applies hedge accounting for cash flow hedges if applicable.

The Group is exposed to market, credit and liquidity risk. The Group's management oversees the management of these risks through appropriate risk assessment and monitoring activities to minimize their effects.

25.3.1. Market risk

Market risk is the risk that the fair value of future cash flows of a financial instrument will fluctuate because of changes in market prices. Market prices comprise two types of risk:

- Interest rate risk; and,
- Foreign currency risk.

Financial instruments affected by market risk include loans and borrowings, deposits, financial assets at FVOCI, financial assets at FVtPL and derivative financial instruments. The sensitivity analyses in the following sections relate to the position as of December 31, 2018 and 2017.

Interest rate risk

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The Group's exposure to the risk of changes in market interest rates relates primarily to the Group's interest-bearing loans and borrowings and bank deposits with floating interest rates.

The Group's exposure to the risk of changes in market interest rates relates substantially to the Group's interest-bearing loans and borrowings with floating interest rates, which makes the Group expose to cash flows risk. Responsively, the Group is minimizing the risk partially through interest rate swap contract or choosing the best favorable financing instruments by switching to the loans with more favorable conditions or improving the Group's credit rating.

Interest rate sensitivity

The following table demonstrates the sensitivity to a reasonably possible change in interest rates. The Group's exposure to the risk of changes in market interest rates relates primarily to the Group's interest-bearing loans and borrowings as well as bank deposits with floating interest rates. With all other variables held constant, the Group's profit before tax is affected through the impact on floating rate borrowings as follows:

	Increase / (decrease)	Effect on profit before tax
	in %	Million KRW
December 31, 2018	1.00	-1,094
	-1.00	1,094
December 31, 2017	1.00	-1,144
	-1.00	1,144

Foreign currency risk

The Group's exposure to the risk of changes in foreign exchange rates relates primarily to the Group's operating activities. The risk of foreign exchange primarily relates to US Dollars (USD), Euro (EUR), Japanese Yen (JPY), Chinese Yuan Renminbi (CNY), Swiss Francs (CHF), United Arab Emirates Dirham (AED) and to the Indian Rupee (INR).

Foreign exchange risks arise when commercial transactions, recognized assets or liabilities are denominated in a currency that is not the entity's functional currency.

The objective of the management of foreign currency risk is to maximize the value of the firm through minimizing the fluctuation of net profit and uncertainty arising from the fluctuation in foreign currency. To accomplish this, the Group uses a strategy to accord the collection terms of receivables and payment terms of payables denominated in USD considering the similar volume of exports and imports. In regard to EUR, USD and JPY, the Group manages the risk through currency forward contracts.

Foreign currency sensitivity

The Group carries out a sensitivity analysis for the dominant foreign currencies: US Dollars (USD), Euro (EUR), Japanese Yen (JPY), Chinese Yuan Renminbi (CNY), Swiss Francs (CHF), United Arab Emirates Dirham (AED) and to Indian Rupee (INR). The assumed possible currency fluctuations are based on historical observations and future prognoses. Incorporated into calculations are the financial instruments. The following table demonstrates the sensitivity of consolidated net profit before tax to a reasonably possible shift in exchange rates related to financial instruments held in the balance sheet. Assuming that the other variables are constant but only the foreign exchange rate changes by 10%, the impacts on net profit for the years ended on December 31, 2018 and 2017, are as follows:

	December 31, 2018		December 31, 2017	
Currency	**10% increase**	**10% decrease**	**10% increase**	**10% decrease**
	Million KRW	Million KRW	Million KRW	Million KRW
USD	1,472	-1,472	64	-64
EUR	516	-516	-1,056	1,056
JPY	-44	44	275	-275
CNY	-38	38	176	-176
CHF	235	-235	602	-602
AED	-79	79	-80	80
INR	986	-986	1,081	-1,081
Total	**3,048**	**-3,048**	**1,062**	**-1,062**

The Group's exposure to foreign currency changes for all other currencies is not material.

25.3.2. Credit risk

Credit risk is the risk that the counterparty will not meet its obligations under a financial instrument or customer contract, leading to a financial loss. The Group is exposed to credit risk from its operating activities (primarily for trade and other receivables) and investing activities.

The Group maintains a policy to keep trade relationship only with the customers with high credit rating assessed by credit assessment, considering their financial position, past experience of defaults and other indicators of default. If the credit rating of a customer worsens, the Group sets an individual credit limit on that customer and intensively manages its credit risk. In addition, the Group minimizes the credit risk by maintaining the exposure to the credit risk at insignificant level through ongoing management including periodical reviews of all the customers. The maximum exposure to credit risk at the reporting date is the carrying value of each class of financial assets disclosed in note 13.

The Group is also exposed to the credit risk with regard to bank deposits, as well as cash and cash equivalents in which the maximum exposure to credit risk at the reporting date is the carrying value. The exposure to the related credit risk, however, is relatively restricted because the Group maintains relationships with the financial institutions with high credit ratings.

25.3.3. Liquidity risk

Liquidity risk is the risk that the Group will encounter difficulty in meeting obligations associated with financial liabilities due to the unfavorable economy of the industry or financial markets.

The Group manages its liquidity risk through its own strategy and plans which consider the maturity of financial instruments and expected operating cash flows and include the policy to map out the maturity of financial assets and liabilities.

In addition, the Group maintains credit facilities with the banks including overdraft to respond to unexpected shortage in liquidity. The Group manages funding schedules and ongoing review procedures, considering the appropriate mix of long-term and short-term loans and borrowings, to maintain the consistency and flexibility in obtaining liquidity and stable financing in response to expansion of the business.

The details of maturity profile of the Group's financial liabilities, excluding financial derivative instruments, based on contractual undiscounted payments as of December 31, 2018 and 2017, are as follows:

As of December 31, 2018	Less than a month	1 to 3 months	3 to 12 months	1 to 5 years	> 5 years	Total
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
Interest-bearing loans and borrowings	24,177	53,213	190,540	17,180	-	285,110
Other financial liabilities	425	1,496	12	3,361	-	5,294
Trade and other payables	73,461	22,813	4,255	-	-	100,529
Total	**98,063**	**77,522**	**194,807**	**20,541**	**-**	**390,933**

As of December 31, 2017	Less than a month	1 to 3 months	3 to 12 months	1 to 5 years	> 5 years	Total
	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW	Million KRW
Interest-bearing loans and borrowings	8,954	69,015	130,785	98,783	-	307,537
Other financial liabilities	429	1,252	62	4,625	-	6,368
Trade and other payables	77,555	25,485	6,498	-	-	109,538
Total	**86,938**	**95,752**	**137,345**	**103,408**	**-**	**423,443**

25.3.4. Capital management

The capital managed by the Group is identical to the total amount of equity presented in the consolidated statements of financial position. The primary objective of the Group's capital management is to ensure its continued ability to provide consistency for its equity shareholders through a combination of capital growth and distribution. In order to achieve this objective, the Group monitors its gearing to balance risk and returns at an acceptable level, and also maintains a sufficient funding base to enable the company to meet its working capital and strategic investment needs. To maintain or adjust the capital structure, the company may adjust the dividend payment to shareholders, return capital to shareholders or issue new shares considering not only the short-term position, but also its long-term operational and strategic objectives. At Group level the debt ratio is reviewed regularly. The debt-equity ratio as of December 31, 2018 and 2017, is 112% and 129%, respectively.

On a monthly basis, all subsidiaries have to report key performance indicators, which also include capital management information.

26. Commitments and contingencies

26.1. Contingent liability

There are no current proceedings of lawsuits, claims, investigations and negotiations due to product liability, mercantile law, environmental protection, health and safety etc., which could have significant influence on business operations and the Group's financial position or income.

26.2. Operating lease commitments

The Group has entered into commercial leases on certain motor vehicles, items of machinery and offices. These leases have duration between 1 and 30 years with a renewal option included in some contracts. There are no restrictions placed upon the Group by entering into these leases. Future minimum rentals payable under non-cancellable operating leases as of December 31, 2018 and 2017, are as follows:

Description	December 31, 2018	December 31, 2017
	Million KRW	Million KRW
Within one year	-2,670	-2,363
After one year but not more than five years	-7,638	-8,259
More than five years	-1,612	-2,049
Total	**-11,920**	**-12,671**

26.3. Other commitments

As part of the ordinary business, the Group enters into various contractual commitments for the purchase of fixed assets and intangible assets as well as investment properties and promotion properties. As of December 31, 2018, the Group entered into commitments to purchase property, plant and equipment, as well as raw materials amounting to 2,815 Million KRW (December 31, 2017: 11,274 Million KRW).

The Group has provided one blank promissory note to Hanwha Chemical Co., Ltd. as security on the supply contracts.

One check and one promissory note which the Group received from KEB Hana Bank are outstanding as of December 31, 2018, due to bankruptcy declared by the issuers of the check.

Details of the Group’s available short-term credit line facilities (excluding general loans) as of December 31, 2018, are as follows:

Description	Currency	Credit limit	Used	Unused
USANCE and L/C for import	Thousand USD	23,400	6,922	16,478
D/A and D/P	Thousand USD	111,500	48,778	62,722
	Million KRW	32,000	2,971	29,029
Trade loans	Million KRW	15,000	437	14,563
Secured loan of credit sales	Million KRW	9,000	3,182	5,818
Other foreign currency guarantees	Thousand USD	18,270	12,161	6,109
	Total Million KRW	**56,000**	**6,590**	**49,410**
	Total Thousand USD	**153,170**	**67,861**	**85,309**

27. Assets pledged as collateral and guarantees

Details of property, plant and equipment and investment properties pledged by the Group as collateral for interest-bearing loans and borrowings as of December 31, 2018 and 2017, presented in the maximum value registered to Korean court, are as follows:

Pledged to	Pledged assets		December 31, 2018	December 31, 2017
Property, plant and equipment				
(Joint collateral in connection with long-term loan)				
Busan Bank	Land, buildings and machinery	MKRW	30,000	30,000
Kyongnam Bank	Land, buildings and machinery	MKRW	18,000	18,000
Property, plant and equipment				
(Collateral for other than syndicated or long-term loan)				
Busan Bank	Land, buildings and machinery	TUSD	24,000	24,000
Korea Development Bank	Land, buildings, investment properties and machinery	MKRW	57,000	57,000
Woori Bank	Land, buildings and machinery	MKRW	120,000	120,000
KEB Hana Bank	Land, buildings and machinery	MKRW	60,000	60,000
Total		**MKRW**	**285,000**	**285,000**
		TUSD	**24,000**	**24,000**

No other items of property, plant and equipment are pledged as collateral for interest-bearing loans and borrowings as of December 31, 2018 and 2017.

The Group has received payment guarantees amounting to 210,600 Million KRW and 32,076 Thousand USD provided by Jongho Park, the Chairman of the Board of Directors of the Group, in connection with the Group's borrowings from banks as of December 31, 2018.

The bank deposits pledged as collateral in connection with interest-bearing loans and borrowings as of December 31, 2018 and 2017, are as follows:

Description	December 31, 2018	December 31, 2017
Bank deposits – current (in Thousand USD)	2,049	3,089
Bank deposits – non-current (in Thousand USD)	-	163

The Company is provided with a performance guarantee from Seoul Guarantee Insurance Co., Ltd. and the insured amount is 950 Million KRW.

28. Operating profit and other income / expenses

28.1. Research and development expenses

Research and development expenses of 4,811 Million KRW (2017: 4,303 Million KRW) are recorded in the income statement. Development expenses are not capitalized because the conditions for capitalization have not been met.

28.2. Selling and administration expenses

Description	2018	2017
	Million KRW	Million KRW
Sales-related costs	-25,752	-31,891
Personnel expenses	-48,018	-43,476
Travelling and entertainment	-6,546	-6,290
Depreciation and amortization	-4,625	-4,828
Administration expenses	-10,429	-8,388
Bad debt loss	-553	-674
Others	-5,956	-5,047
Total	**-101,879**	**-100,594**

28.3. Other income

Description	2018	2017
	Million KRW	Million KRW
Fee income	121	95
Miscellaneous income	3,380	1,958
Gains on disposal of property, plant and equipment	57	25
Gains on disposal of intangible assets	-	27
R&D sales income	53	-
Rental income (third parties)	17	16
Total	**3,628**	**2,121**

28.4. Other expenses

Description	2018	2017
	Million KRW	Million KRW
Miscellaneous expenses	-2,403	-1,194
Losses on disposal of property, plant and equipment	-1,660	-664
Losses on disposal of intangible assets	-	-244
Impairment of intangible assets	-694	-
Total	**-4,757**	**-2,102**

28.5. Expenses classified by nature

Description	2018	2017
	Million KRW	Million KRW
Purchased material	-456,716	-407,242
Freight and logistic costs	-22,869	-27,813
Energy costs	-39,376	-37,322
Personnel expenses	-114,793	-103,896
Depreciation and amortization	-33,790	-32,281
Other expenses	-71,674	-63,935
Total	**-739,218**	**-672,489**
Thereof recorded in cost of sales	-632,582	-569,793
Thereof recorded in selling and administration costs	-101,879	-100,594
Thereof recorded in other expenses	-4,757	-2,102
Total	**-739,218**	**-672,489**

28.6. Finance expenses

Description	2018	2017
	Million KRW	Million KRW
Interest on borrowings	-10,028	-9,902
Total interest expenses	**-10,028**	**-9,902**
Losses on foreign exchange	-18,172	-25,031
Losses on derivative transactions	-2	-1,357
Losses on valuation of derivatives	-45	-
Losses on valuation of financial assets FVtPL	-358	-
Bank charges	-339	-206
Total finance expenses	**-28,944**	**-36,496**

28.7. Finance income

Description	**2018**	**2017**
	Million KRW	Million KRW
Gains on foreign exchange	17,182	22,890
Gains on derivative transactions	2,662	801
Gains on valuation of derivatives	4	-
Gains on disposal of available-for-sale financial investments	-	50
Interest on loans and receivables (third parties)	292	265
Interest on loan and receivables (related parties)	607	935
Dividends received from third parties	-	7
Total finance income	**20,747**	**24,948**

28.8. Net gains and losses of the classes of financial instruments

Description	**2018**	**2017**
	Million KRW	Million KRW
Financial assets at amortized cost	4,924	-
Loans and receivables	-	24
Financial assets at FVOCI	232	-
Financial assets at FVtPL	2,306	-555
Available-for-sale financial assets	-	57
Financial liabilities at amortized cost	-15,043	-10,868
Financial liabilities at FVtPL	-45	-
Total net gains and losses of the classes of financial instruments	**-7,626**	**-11,342**

Net gains and losses of financial instruments recognized in the consolidated statements of comprehensive income		
Finance expense*	-28,605	-36,290
Finance income	20,747	24,948
Total	*-7,858*	*-11,342*
Net gains and losses of financial instruments recognized in the consolidated statements of other comprehensive income		
Financial assets at FVOCI	232	-
Total	*232*	-
Total	**-7,626**	**-11,342**

*excluding bank charges

29. Income tax expenses

The major components of income tax expense in the statements of comprehensive income are as follows:

29.1. Consolidated statements of comprehensive income

Description	2018	2017
	Million KRW	Million KRW
Current income tax charge	-8,994	-8,077
Adjustments in respect of current income tax of previous year	-497	105
Deferred income taxes relating to changes of temporary differences, net	914	-2,357
Deferred income taxes relating to tax loss carry forwards	-1,177	921
Deferred income taxes related to changes in tax rate	84	-
Deferred income taxes recognized directly in other comprehensive income	1,142	-72
Income tax expenses	**-8,528**	**-9,480**

Description	2018	2017
	Million KRW	Million KRW
Accounting profit before income taxes	**46,333**	**44,186**
At parent company's statutory income tax rate of 21.79% (2017: 22.85%)	-10,094	-10,097
Increase/ (decrease) in income taxes resulting from:		
Adjustments in respect of current income tax of previous years	-497	105
Non-temporary differences	127	-593
Tax credits	1,023	835
Non-deductible expenses / (non-taxable income)	511	-192
Tax audit	-33	399
Effect of different tax rates in tax jurisdiction	-42	295
Others	477	-232
At the effective income tax rate 18.41% (2017: 21.45%)	**-8,528**	**-9,480**

29.2. Deferred tax

Deferred tax relates to the following:

	Consolidated statements of financial positions		Consolidated statements of comprehensive income	
	December 31,		December 31,	
Description	**2018**	**2017**	**2018**	**2017**
	Million KRW	Million KRW	Million KRW	Million KRW
Pension obligation	1,884	1,229	-556	406
Other long-term employment benefits	809	784	25	217
Trade receivables	52	-68	120	-104
Inventories	626	492	134	-2,380
Fixed assets	-11,442	-12,758	1,316	796
(Loss) on revaluation of land	-27,786	-27,688	-98	-405
Other non-current financial assets	-104	-	-	-
Other current financial assets	64	-1,281	1,345	-1,281
Other current assets	-17	-	-17	-16
Accrued income	-3	-12	9	5
Other current financial liabilities	285	387	-102	40
Other current liabilities	243	141	102	93
Intangible assets	-76	-	-76	-
Gain / (loss) on interest swaps	-16	-263	212	379
Loss available for offsetting against future taxable income	-	1,177	-1,177	921
Investments in subsidiaries	-4,649	-4,629	-20	-
Translation difference			-254	-74
Deferred tax (expenses) / income			**963**	**-1,403**
Net deferred tax liabilities	**-40,130**	**-42,489**		

Reflected in the statements of financial positions as follows:		
Deferred tax assets	**2,830**	**2,521**
Deferred tax liabilities	**-42,960**	**-45,010**

The Group offsets tax assets and liabilities if, and only if, it has a legally enforceable right to do so, and the deferred tax assets and deferred tax liabilities relate to income taxes levied by the same tax authority.

Reconciliation of deferred tax liabilities, net:

	2018	**2017**
Description	Million KRW	Million KRW
Opening balance as of January 1	**-42,489**	**-41,088**
Deferred tax recognized in statements of comprehensive income	963	-1,403
Deferred tax recognized in other comprehensive income (note 18.4)	1,142	-72
Translation differences	254	74
Closing balance as of December 31	**-40,130**	**-42,489**

Expecting sufficient taxable income, the Group recognized deferred income tax assets to the extent of future taxable income. For the following deductible temporary differences, no deferred tax assets as of December 31, 2018 and 2017, were recognized.

Description	2018	2017
	Million KRW	Million KRW
Temporary differences related to investments in subsidiaries	1,758	2,360
Total	**1,758**	**2,360**

As of December 31, 2018, there are no unused recognized tax loss carry forwards and tax credit carry forwards available. Expected timing of expiration of recognized tax loss carry forwards and tax credit carry forwards, as of December 31, 2017, are as follows:

	Recognized deferred tax assets	
December 31, 2017	Million KRW	Million KRW
less 1 year	-	-
1-5 years	-	-
5 years and later	1,177	-
Total	**1,177**	**-**

30. Earnings per share

Basic earnings per share amounts are calculated by dividing net profit for the year attributable to ordinary equity holders of the parent company by the average number of ordinary shares outstanding during the year. There is no difference between basic and diluted earnings per share in 2018 and 2017.

The following reflects the income and share data used in the basic per share computations:

Description	2018	2017
	KRW	KRW
Net profit attributable to ordinary equity holders of the parent	38,083,876,612	35,393,839,500
Weighted average number of ordinary shares	24,000,000	24,000,000
Earnings per share (basic / diluted)	**1,587**	**1,475**

31. Cash flow statement

Cash and cash equivalents in the statement of cash flow are equal to those in the statement of financial position.

The Group's statement of cash flow is prepared using the indirect method. The adjustments to the net profit for the period of the non-cash and non-operating items and changes in operating assets and liabilities for the years ended December 31, 2018 and 2017, are as follows:

		2018	2017
Adjustments	Notes	Million KRW	Million KRW
Depreciation of property, plant and equipment	7	29,491	27,724
Depreciation of investment properties	8	19	17
Amortization of intangible assets	9	4,275	4,543
Impairment of non-current financial assets		5	-
Losses on disposals of property, plant and equipment, net	7	1,603	639
Gain on disposal of available-for-sale financial investments		-	-50
Losses on disposal of intangible assets, net	9	-	217
Impairment of intangible assets, net	9	694	-
Share of result from investments accounted using the equity method	11	-1,382	-1,249
Financial income		-9,023	-7,303
Financial expenses		9,747	22,855
Income tax expenses	29	8,528	9,480
Total		**43,957**	**56,873**

Changes in operating assets and liabilities		
Trade receivables	16,653	-16,294
Other receivables	2,818	-818
Other current assets	-751	-764
Other current financial assets	-104	38
Inventories	-28,316	-18,393
Trade payables	-4,258	10,526
Other payables	-4,502	4,529
Other current financial liabilities	235	226
Other current liabilities	-21	-1,579
Pension liabilities	2,855	-3,750
Other long-term employment benefits	-539	1,437
Total	**-15,930**	**-24,842**

Changes in liabilities arising from financing activities for the years ended December 31, 2018 and 2017, are as follows:

	Short-term liabilities	Long-term liabilities	Other financial liabilities
	Million KRW	Million KRW	Million KRW
As of January 1, 2017	**188,907**	**112,220**	**748**
Cash flows	1,047	10,570	5,790
Foreign exchange movement	-3,487	-1,720	-170
Reclassification	22,287	-22,287	-
As of December 31, 2017	**208,754**	**98,783**	**6,368**
Cash flows	-23,680	-	-1,120
Foreign exchange movement	114	638	91
Reclassification	82,742	-82,241	-
As of December 31, 2018	**267,930**	**17,180**	**5,339**

32. Related party disclosures

The following table provides the total amount of transactions that have been entered into with related parties for the relevant financial years and balances as per year-end:

		2018	2017
Related party	**Description**	Million KRW	Million KRW
Jongho Park, Chairman of the Board of Directors	Finance income	562	817
Maurizio Butti, Chief Executive Officer	Finance income	2	-
Songwon Moolsan Co., Ltd.	Selling and administration costs	-58	-52
Songwon Baifu Chemicals (Tangshan) Co., Ltd. (Joint venture)	Sales	62	-
	Cost of sales	-15,138	-16,235
Qingdao Long Fortune Songwon Chemical Co., Ltd.*	Sales	5,761	15,711
	Cost of sales	-138	-
	Selling and administration costs	-332	-562
	Other income	11	147
	Finance income	43	118
Total	**Sales**	**5,823**	**15,711**
	Cost of sales	**-15,276**	**-16,235**
	Selling and administration costs	**-390**	**-614**
	Other income	**11**	**147**
	Finance income	**607**	**935**

		2018	2017
Related party	**Description**	Million KRW	Million KRW
Jongho Park, Chairman of the Board of Directors	Trade and other receivables	-	40
	Other current financial assets	-	18,000
Maurizio Butti, Chief Executive Officer	Trade and other receivables	2	-
	Other current financial assets	1,346	-
Songwon Moolsan Co., Ltd.	Other non-current financial assets	24	24
	Trade and other payables	5	4
Songwon Baifu Chemicals (Tangshan) Co., Ltd. (Joint venture)	Trade and other payables	1,148	1,834
Qingdao Long Fortune Songwon Chemical Co., Ltd.*	Other non-current financial assets	-	1,641
	Trade and other receivables	-	5,144
Total	**Other non-current financial assets**	**24**	**1,665**
	Trade and other receivables	**2**	**5,184**
	Other current financial assets	**1,346**	**18,000**
	Trade and other payables	**1,153**	**1,838**

*refer to note 5. for further details

32.1. The ultimate parent

Songwon Industrial Co., Ltd. is the ultimate parent based and listed in Korea.

32.2. Terms and conditions of transactions with related parties

The sales to and purchases from related parties are made at terms equivalent to those that prevail in arm's length transactions. Outstanding balances at the year-end are unsecured, interest free and settlement occurs in cash. There have been no guarantees provided or received for any related party receivables or payables. For the year ended December 31, 2018, the Group has not recorded any impairment of receivables relating to amounts owed by related parties (December 31, 2017: none). This assessment is undertaken periodically through examining the financial position of the related party and the market in which the related party operates.

32.3. Transactions with key management personnel

In the financial year 2018, the Group granted a loan of 10,000 Million KRW to the Chairman of the Board of Directors of the Group, Jongho Park at usual market conditions. In the financial year 2018, the Chairman of the Board of Directors fully repaid his loan of in total 28,000 Million KRW (outstanding loans as of December 31, 2017: 18,000 Million KRW). Additionally, the Group granted a loan of 1,346 Million KRW to the Chief Executive Officer, Maurizio Butti at usual market conditions in the financial year 2018 (2017: none).

32.4. Compensation of key management personnel of the Group

Description	**2018**	**2017**
	Million KRW	Million KRW
Short-term employee benefits	13,269	15,586
Post-employment benefits	779	799
Other long-term benefits	1,467	1,497
Share based payments	-248	239
Total compensation paid to key management personnel	**15,267**	**18,121**

The amounts disclosed in the table are the amounts recognized as an expense during the reporting period related to key management personnel. Key management personnel are those persons with authority and responsibility for planning, directing and controlling the activities of the entity, directly or indirectly, including any director (whether executive or otherwise) of that entity.

32.5. Other related parties

Other related parties are Songwon Moolsan Co., Ltd. (Korea) which has significant influence on the Group due to the interest held in the share capital of the parent company of 23.88%. Further, the subsidiary of Songwon Moolsan Co., Ltd., Kyungshin Industrial Co., Ltd., which holds interest in the share capital of the parent company of 9.15%, is identified as a related party of the Group.

33. Events after the reporting period

On January 29, 2019, the Group acquired an additional 26% interest in Songwon Polysys Additives LLC with the effective date as of January 1, 2019. Therefore, the Group's participation in Songwon Polysys Additives LLC increased from 55.5% to 81.5%.

The consolidated financial statements for the year ended December 31, 2018, were approved by the Board of Directors of the parent company on January 31, 2019.