1. General Information

Doosan Corporation (the Company) was incorporated on December 18, 1933, under the name of Sohwa-Kirin Beer, Ltd. to manufacture and sell beer. The Company has changed its name to Dongyang Beer, Ltd. in February 1948, to OB Beer, Ltd. in February 1996 and to Doosan Corporation on September 1, 1998.

Since June 1973, the Company listed its stock on the Korea Exchange. After several capital increases, the Company's share capital as at December 31, 2016, is ₩134,838 million, including ₩26,984 million of preferred shares.

The Company's ordinary shareholders as at December 31, 2016, are as follows:

	Number of ordinary shares owned	Percentage of ownership (%)
Related parties	9,369,395	46.37
Treasury shares[1]	5,276,455	26.11
Others	5,561,038	27.52
Total	20,206,888	100

[1] Includes 350,327 shares of treasury shares trust recognized as investments in associates and subsidiaries.

Meanwhile, 48.3% of preferred shares are owned by the related parties including the largest shareholder, and 51.7% of preferred shares are owned by other entities and individual shareholders.

2. Significant Accounting Policies

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

2.1 Basis of Preparation

The financial statements of the Company are the separate financial statements prepared in accordance with Korean IFRS 1027 *Separate Financial Statements*. Investments in subsidiaries, joint ventures and associates are recognized at cost under the direct equity method. Management applied the carrying amounts under the previous Korean GAAP at the time of transition to the Korean IFRS as deemed cost of investments.

The significant accounting policies under Korean IFRS followed by the Company in the preparation of its separate financial statements are summarized below, and these accounting policies, except for the effects of the changes in accounting policies that are described below, have been applied consistently to the separate financial statements for the current period and the accompanying comparative period.

The accompanying separate financial statements have been prepared on the historical cost basis, except for certain properties/non-current assets and financial instruments that are measured at fair values, as explained in the accounting policies below. Historical cost is based on the fair values of the consideration given in exchange for assets.

2.2 Changes in Accounting Policies and Disclosures

(a) New and amended standards adopted by the Company

The Company has applied the following standards and amendments for the first time for their annual reporting period commencing January 1, 2016. The adoption of these amendments did not have any impact on the current period or any prior period and is not likely to affect future periods.

- *Disclosure Initiative* – Amendments to Korean IFRS 1001 *Presentation of Financial Statements*

Korean IFRS 1001 *Presentation of Financial Statements* clarifies that materiality applies to the exclusion or inclusion or aggregation of the disclosures in the notes. The amendment clarifies that the share of OCI arising from equity-accounted should be presented in total for items which will and will not be reclassified to profit or loss. Additional amendments are made in relation to a particular order of the notes and other.

- *Clarification of Acceptable methods of Depreciation and Amortization* – Amendments to Korean IFRS 1016 *Property, Plant and Equipment*, and Korean IFRS 1038 *Intangible assets*

Amendments to Korean IFRS 1016 *Property, Plant and Equipment* clarify that a revenue-based method should not be used to calculate the depreciation of items of property, plant and equipment. Korean IFRS 1038 *Intangible assets* now includes a rebuttable presumption that the amortization of intangible assets based on revenue is inappropriate. This presumption can be overcome if either; the intangible asset is expressed as a measure of revenue, or it can be shown that revenue and the consumption of economic benefits generated by the asset are highly correlated.

- *Investment entities: Applying the Consolidation Exception* – Amendments to Korean IFRS 1028 *Investments in Associates and Joint Ventures*

- Amendments made to Korean IFRS 1028 *Investments in Associates and Joint Ventures* clarify that entities which are not investment entities but have an interest in an associate which is an investment entity have a policy choice when applying the equity method of accounting.

- *Accounting for Acquisitions of Interests in Joint Operations* – Amendments to Korean IFRS 1111 *Joint Arrangements*

Amendments to Korean IFRS 1111 *Joint Arrangements* clarify the accounting for the acquisition of an interest in a joint operation where the activities of the operation constitute a business. An investor requires to apply the principles of business combination accounting when the investor acquires an interest in a joint operation that constitutes a business.

- Annual Improvements to Korean IFRS 2012-2014 *Cycle*

Annual Improvements to Korean IFRS 2012-2014 *Cycle* consist of the following amendments.

- Korean IFRS 1105 *Non-current Assets Held for Sale and Discontinued Operation* – clarifies when an asset (or disposal group) is reclassified from 'held for sale' to 'held for distribution' or vice versa, this does not have to be accounted for as such.

- Korean IFRS 1107 *Financial Instruments: Disclosures* – clarifies the specific guidance for transferred financial assets to help management determine whether the terms of a servicing arrangement constitute 'continuing involvement', and also clarifies that the additional disclosures relating to the amendments in 2012 *'Offsetting of Financial Assets and Financial Liabilities'* only need to be included in interim reports if required by Korean IFRS 1034 *Interim Financial Reporting*.

- Korean IFRS 1019 *Employee Benefits* clarifies that when determining the discount rate for post-employment benefit obligations, it is the currency in which the liabilities are denominated that is important, and not the country where they arise.

- Korean IFRS 1034 *Interim Financial Reporting* clarifies what is meant by the reference in the standard to *'information disclosed elsewhere in the interim financial report'*; and also amended requirements for a cross-reference from the interim financial statements to the location of that information.

(b) New standards and interpretations not yet adopted by the Company

Certain new accounting standards and interpretations that have been published that are not mandatory for annual reporting period commencing January 1, 2016 and have not been early adopted by the Company are set out below.

- Amendments to Korean IFRS 1007 *Statement of Cash Flows*

Amendments to Korean IFRS 1007 *Statement of Cash flows* require to provide disclosures that enable users of financial statements to evaluate changes in liabilities arising from financing activities, including both changes arising from cash flows and non-cash flows. This amendment will be effective for annual periods beginning on or after January 1, 2017, with early adoption permitted. The Company does not expect the amendments to have a significant impact on the separate financial statements.

- Amendments to Korean IFRS 1012 *Income Tax*

Amendments to Korean IFRS 1012 clarify how to account for deferred tax assets related to debt instruments measured at fair value. Korean IFRS 1012 provides requirements on the recognition and measurement of current or deferred tax liabilities or assets. The amendments issued clarify the requirements on recognition of deferred tax assets for unrealized losses, to address diversity in practice. This amendment will be effective for annual periods beginning on or after January 1, 2017, with early adoption permitted. The Company does not expect the amendments to have a significant impact on the separate financial statements.

- Amendments to Korean IFRS 1102 *Share-based Payment*

Amendments to Korean IFRS 1102 clarify accounting for a modification to the terms and conditions of a share-based payment that changes the classification of the transaction from cash-settled to equity-settled. Amendments also clarify that the measurement approach should treat the terms and conditions of a cash-settled award in the same way as for an equity-settled award. This amendment will be effective for annual periods beginning on or after January 1, 2018, with early adoption permitted. The Company does not expect the amendments to have a significant impact on the separate financial statements.

- Korean IFRS 1109 *Financial Instruments*

The new standard for financial instruments issued on September 25, 2015 are effective for annual periods beginning on or after January 1, 2018 with early application permitted. This standard will replace Korean IFRS 1039 *Financial Instruments: Recognition and Measurement*. The Company will apply the standards for annual periods beginning on or after January 1, 2018.

The standard requires retrospective application with some exceptions. For example, an entity is not required to restate prior period in relation to classification and measurement (including impairment) of financial instruments. The standard requires prospective application of its hedge accounting requirements for all hedging relationships except the accounting for time value of options and other exceptions.

Korean IFRS 1109 *Financial Instruments* requires all financial assets to be classified and measured on the basis of the entity’s business model for managing financial assets and the contractual cash flow characteristics of the financial assets. A new impairment model, an expected credit loss model, is introduced and any subsequent changes in expected credit losses will be recognized in profit or loss. Also, hedge accounting rules amended to extend the hedging relationship, which consists only of eligible hedging instruments and hedged items, qualifies for hedge accounting.

An effective implementation of Korean IFRS 1109 requires preparation processes including financial impact assessment, accounting policy establishment, accounting system development and the system stabilization. The impact on the Company's financial statements due to the application of the standard is dependent on judgements made in applying the standard, financial instruments held by the Company and macroeconomic variables.

With the implementation of Korean IFRS 1109, the Company neither prepared for internal management process nor began to adjust accounting system for financial instruments reporting. Also, the Company did not analyze the financial effects of applying the standard.

(a) Classification and Measurement of Financial Assets

When implementing Korean IFRS 1109, the classification of financial assets will be driven by the Company's business model for managing the financial assets and contractual terms of cash flow. The following table shows the classification of financial assets measured subsequently at amortized cost, at fair value through other comprehensive income and at fair value through profit or loss. If a hybrid contract contains a host that is a financial asset, the classification of the hybrid contract shall be determined for the entire contract without separating the embedded derivative.

Business model for the contractual cash flows characteristics	**Solely represent payments of principal and interest**	**All other**
Hold the financial asset for the collection of the contractual cash flows	Measured at amortized cost[1]	Recognized at fair value through profit or loss[2]
Hold the financial asset for the collection of the contractual cash flows and trading	Recognized at fair value through other comprehensive income [1]	
Hold for trading	Recognized at fair value through profit or loss	

[1] A designation at fair value through profit or loss is allowed only if such designation mitigates an accounting mismatch (irrevocable).
[2] Equity investments not held for trading can be recorded in other comprehensive income (irrevocable).

With the implementation of Korean IFRS 1109, the criteria to classify the financial assets at amortized cost or at fair value through other comprehensive income are more strictly applied than the criteria applied with Korean IFRS 1039. Accordingly, the financial assets at fair value through profit or loss may increase by implementing Korean IFRS 1109 and may result an extended fluctuation in profit or loss.

As at December 31, 2016, the Company owns loan and trade receivables of ₩ 650,614 million and financial assets available-for-sales of ₩ 3,185 million.

According to Korean IFRS 1109, a debt instrument is measured at amortized cost if: a) the objective of the business model is to hold the financial asset for the collection of the contractual cash flows, and b) the contractual cash flows under the instrument solely represent payments of principal and interest. As at December 31, 2016, the Company measured loan and trade receivables of ₩ 650,614 million at amortized cost.

According to Korean IFRS 1109, a debt instrument is measured at fair value through other comprehensive income if the objective of the business model is achieved both by collecting contractual cash flows and selling financial assets; and the contractual cash flows represents solely payments of principal and interest on a specific date under contract terms.

According to Korean IFRS 1109, equity instruments that are not held for trading, the Company can make an irrevocable election at initial recognition to classify the instruments as assets measured at fair value through other comprehensive income, which all subsequent changes in fair value being recognized in other comprehensive income and not recycled to profit or loss.

According to Korean IFRS 1109, debt instruments those contractual cash flows do not represent solely payments of principal and interest and held for trading, and equity instruments that are not designated as instruments measured at fair value through other comprehensive income are measured at fair value through profit or loss.

(b) Impairment: Financial Assets and Contract Assets

Korean IFRS 1109 sets out a new forward looking 'expected loss' impairment model which replaces the incurred loss model under Korean IFRS 1039 that impaired assets if there is an objective evidence and applies to:

- Financial assets measured at amortized cost
- Debt investments measured at fair value through other comprehensive income, and
- Certain loan commitments and financial guaranteed contracts.

Under Korean IFRS 1109 'expected loss' model, a credit event (or impairment 'trigger') no longer has to occur before credit losses are recognized. The Company will always recognize (at a minimum) 12-month expected credit losses in profit or loss. Lifetime expected losses will be recognized on assets for which there is a significant increase in credit risk after initial recognition.

Stage[1]		Loss allowance
1	No significant increase in credit risk after initial recognition[2]	12-month expected credit losses (expected credit losses that result from those default events on the financial instrument that are possible within 12 months after the reporting date)
2	Significant increase in credit risk after initial recognition	Lifetime expected credit losses (expected credit losses that result from all possible default events over the life of the financial instrument)
3	Credit-impaired	

[1] A loss allowance for lifetime expected credit losses is required for a financial instrument if the credit risk on that financial instrument has increased significantly since initial recognition. It is also required for contract assets or trade receivables that are not, according to Korean IFRS 1115 *Revenue from Contracts with Customers*, considered to contain a significant financing component. Additionally, the Company can elect an accounting policy of recognizing lifetime expected credit losses for all contract assets and/or all trade receivables, including those that contain a significant financing component.
[2] If the financial instrument has low credit risk at the end of the reporting period, the Company may assume that the credit risk has not increased significantly since initial recognition.

Under Korean IFRS 1109, the asset that is credit-impaired at initial recognition would recognize all changes in lifetime expected credit losses since the initial recognition as a loss allowance with any changes recognized in profit or loss.

As at December 31, 2016, the Company owns debt investment carries at amortized cost of ₩ 650,614 million. And the Company recognized loss allowance of ₩ 24,457 million for these assets.

- Korean IFRS 1115 *Revenue from Contracts with Customers*

The Company will apply Korean IFRS 1115 *Revenue from Contracts with Customers* issued on November 6, 2015 for annual reporting periods beginning on or after January 1, 2018. Earlier adoption is permitted under Korean IFRS. This standard replaces Korean IFRS 1018 *Revenue*, Korean IFRS 1011 *Construction Contracts*, Interpretation 2031 *Revenue-Barter Transactions Involving Advertising Services*, Interpretation 2113 *Customer Loyalty Programs*, Interpretation 2115 *Agreements for the Construction of Real Estate* and Interpretation 2118 *Transfers of assets from customers.* The Company must apply Korean IFRS 1115 *Revenue from Contracts with Customers* within annual reporting periods beginning on or after January 1, 2018.

The new standard is based on the principle that revenue is recognized when control of a good or service transfers to a customer so the notion of control replaces the existing notion of risks and rewards. A new five-step process must be applied before revenue from contract with customer can be recognized:

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

As at December 31, 2016, the Company is preparing for internal management process and begin to adjust accounting system in relation to implementation of Korean IFRS 1115. The Company plans to analyze the financial effects of applying the standard and disclose the result of the analysis in the notes on the financial statements as at September 30, 2017.

2.3 Investments in Subsidiaries, joint Ventures and Associates

The Company has elected to use book amount under previous generally accepted accounting principles as deemed cost for subsidiaries, joint ventures and associates at the date of transition to Korean IFRS. After the date of transition, subsidiaries, joint ventures and associates are measured at cost.

The requirements of Korean IFRS 1036 are applied to determine whether it is necessary to recognize any impairment loss with respect to the Company's investment in a subsidiary or an associate. When necessary, the entire carrying amount of the investment is tested for impairment by comparing its recoverable amount (higher of value in use and fair value less costs to sell) with its carrying amount, any impairment loss recognized forms part of the carrying amount of the investment. Any reversal of that impairment loss is recognized in accordance with Korean IFRS 1036 to the extent that the recoverable amount of the investment subsequently increases.

2.4 Segment Reporting

Information of each operating segment is reported in a manner consistent with the internal business segment reporting provided to the chief operating decision-maker in accordance with Korean IFRS 1108 *Operating Segments* (Note 24 of the Consolidated financial statements).

2.5 Goodwill

Goodwill arising on an acquisition of a business is carried at cost as established at the date of acquisition of the business less accumulated impairment losses, if any.

For the purpose of impairment testing, goodwill is allocated to each of the Company's CGUs (or groups of CGUs) that is expected to benefit from the synergies of the combination.

A CGU to which goodwill has been allocated is tested for impairment annually, or more frequently when there is indication that the unit may be impaired. If the recoverable amount of the CGU is less than its book amount, the impairment loss is allocated first to reduce the book amount of any goodwill allocated to the unit and then to the other assets of the unit on a pro rata basis based on the book amount of each asset in the unit. Any impairment loss for goodwill is recognized directly in profit or loss. An impairment loss recognized for goodwill is not reversed in subsequent periods.

On disposal of the relevant CGU, the attributable amount of goodwill is included in the determination of the profit or loss on disposal.

2.6 Non-current assets held for sale

Non-current assets and disposal groups are classified as held for sale if their book amount will be recovered principally through a sale transaction rather than through continuing use. This condition is regarded as met only when the sale is highly probable and the non-current asset (or disposal group) is available for immediate sale in its present condition. Management must be committed to the sale, which should be expected to qualify for recognition as a completed sale within one year from the date of classification.

Non-current assets (and disposal groups) classified as held for sale are measured at the lower of their previous book amount and fair value, less costs to sell.

2.7 Revenue recognition

Revenue is measured at the fair value of the consideration received or receivable for the sale of goods and rendering of services arising in the course of the ordinary activities of the Company. Revenue is reduced for value-added tax, estimated customer returns, rebates and trade discounts. The Company recognizes revenue when the amount of revenue can be measured reliably and it is probable that the economic benefits associated with the transaction will flow to the Company and when transaction meets the revenue recognition criteria specified by activity.

(a) Sale of goods

Revenue from the sale of goods is recognized when the Company has transferred the significant risks and rewards of ownership of the goods to the buyer.

(b) Rendering of services

Revenue from a contract to provide services is recognized by reference to the stage of completion of the contract. Depending on the nature of the transaction, the Company determines the stage of completion by reference to surveys of work performed, services performed to date as a percentage of total services to be performed or the proportion that costs incurred to date bear to the estimated total costs of the transaction, as applicable.

(c) Dividend income and interest income

Dividend income from investments is recognized when the right to receive payment has been established.

Interest income is accrued on a timely basis, by reference to the principal outstanding and at the effective interest rate applicable, which is the rate that exactly discounts estimated future cash receipts through the expected life of the financial asset to that asset's net book amount on initial recognition.

(d) Rental income

The Company's policy for recognition of revenue from operating leases is described in Note 2.8.

2.8 Leases

Leases are classified as finance leases whenever the terms of the lease transfer substantially all the risks and rewards of ownership to the lessee. All other leases are classified as operating leases.

(a) The Company as lessor

Amounts due from lessees under finance leases are recognized as receivables at the amount of the Company's net investment in the leases. Finance lease income is allocated to accounting periods, so as to reflect a constant periodic rate of return on the Company's net investment outstanding in respect to the leases.

Rental income from operating leases is recognized on a straight-line basis over the term of the relevant lease. Initial direct costs incurred in negotiating and arranging an operating lease are added to the book amount of the leased asset and recognized on a straight-line basis over the lease term.

(b) The Company as lessee

Assets held under finance leases are initially recognized as assets of the Company at their fair value at the inception of the lease or, if lower, at the present value of the minimum lease payments. The corresponding liability to the lessor is included in the separate statements of financial position as a finance lease obligation.

Lease payments are apportioned between finance expenses and reduction of the lease obligation so as to achieve a constant rate of interest on the remaining balance of the liability. Finance expenses are recognized immediately in profit or loss, unless they are directly attributable to qualifying assets, in which case they are capitalized in accordance with the Company's general policy on borrowing costs (Note 2.10). Contingent rentals are recognized as expenses in the periods in which they are incurred.

Operating lease payments are recognized as an expense on a straight-line basis over the lease term, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed. Contingent rentals arising under operating leases are recognized as an expense in the period in which they are incurred.

2.9 Foreign currencies

The individual financial statements of each group entity are presented in the currency of the primary economic environment in which the entity operates (its functional currency). For the purpose of the separate financial statements, the results and financial position of each group entity are expressed in Korean won, which is the functional currency of the entity and the presentation currency for the separate financial statements.

In preparing the financial statements of the individual entities, transactions in currencies other than the entity's functional currency (foreign currencies) are recognized at the rates of exchange prevailing at the dates of the transactions. At the end of each reporting period, monetary items denominated in foreign currencies are retranslated at the rates prevailing at that date. Non-monetary items carried at fair value that are denominated in foreign currencies are retranslated at the rates prevailing at the date when the fair value was determined. Non-monetary items that are measured in terms of historical cost in a foreign currency are not retranslated.

Exchange differences are recognized in profit or loss for the period in which they arise except for:

- exchange differences on foreign currency borrowings relating to assets under construction for future productive use, which are included in the cost of those assets when they are regarded as an adjustment to interest costs on those foreign currency borrowings
- exchange differences on transactions entered into in order to hedge certain foreign currency risks (Note 2.23)

- exchange differences on monetary items receivable from or payable to a foreign operation for which settlement is neither planned nor likely to occur (therefore, forming part of the net investment in the foreign operation), which are recognized initially in other comprehensive income and reclassified from equity to profit or loss on disposal or partial disposal of the net investment.

2.10 Borrowing costs

Borrowing costs directly attributable to the acquisition, construction or production of qualifying assets, which are assets that necessarily take a substantial period of time to get ready for their intended use or sale, are added to the cost of those assets, until such time as the assets are substantially ready for their intended use or sale.

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization.

All other borrowing costs are recognized in profit or loss for the period in which they are incurred.

2.11 Post-employment benefit costs and termination benefits

The Company operates a defined benefit pension plan. For post-employment benefit obligations, the cost of providing benefits is determined using the projected unit credit method, with actuarial valuations being carried out at the end of each reporting period. Remeasurement, comprising actuarial gains and losses, the effect of the changes to the asset ceiling (if applicable) and the return on plan assets (excluding interest), is reflected immediately in the separate statements of financial position with a charge or credit recognized in other comprehensive income for the period in which they occur. Remeasurement recognized in other comprehensive income is reflected immediately in retained earnings and will not be reclassified to profit or loss. Past service cost is recognized in profit or loss for the period of a plan amendment. Net interest is calculated by applying the discount rate at the beginning of the period to the net defined benefit liability or asset. Defined benefit costs are composed of service cost (including current service cost, past service cost, as well as gains and losses on curtailments and settlements), net interest expense (income) and remeasurement.

The Company presents the service cost and net interest expense (income) components in profit or loss, and the remeasurement component in other comprehensive income. Curtailment gains and losses are accounted for as past service costs.

The post-employment benefit obligation recognized in the separate statements of financial position represents the actual deficit or surplus in the Company's defined benefit plans. Any surplus resulting from this calculation is limited to the present value of any economic benefits available in the form of refunds from the plans or reductions in future contributions to the plans.

A liability for a termination benefit is recognized at the earlier of when the entity can no longer withdraw the offer of the termination benefit and when the entity recognizes any related restructuring costs.

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

2.12 Share-based payment arrangements

Equity-settled share-based payments to employees are measured at the fair value of the equity instruments at the grant date.

The fair value determined at the grant date of the equity-settled share-based payments is expensed on a straight-line basis over the vesting period, based on the Company's estimate of equity instruments that will eventually vest. At the end of each reporting period, the Company revises its estimate of the number of equity instruments expected to vest. The impact of the revision of the original estimates, if any, is recognized in profit or loss such that the cumulative expense reflects the revised estimate, with a corresponding adjustment in other component of equity.

2.13 Current and Deferred Tax

Income tax expense represents the sum of the tax currently payable and deferred tax.

(a) Current tax

The tax currently payable is based on taxable profit for the period. Taxable profit differs from profit as reported in the separate statement of profit or loss and comprehensive income because of items of income or expense that are taxable or deductible in other years and items that are never taxable or deductible. The Company's liability for current tax is calculated using tax rates that have been enacted or substantively enacted by the end of the reporting period.

(b) Deferred tax

Deferred tax is recognized on temporary differences between the book amounts of assets and liabilities in the separate financial statements and the corresponding tax bases used in the computation of taxable profit. Deferred tax liabilities are generally recognized for all taxable temporary differences. Deferred tax assets are generally recognized for all deductible temporary differences to the extent that it is probable that taxable profits will be available against which those deductible temporary differences can be utilized. Such deferred tax assets and liabilities are not recognized if the temporary difference arises from goodwill or from the initial recognition (other than in a business combination) of other assets and liabilities in a transaction that affects neither the taxable profit, nor the accounting profit.

The book amount of deferred tax assets is reviewed at the end of each reporting period and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the asset to be recovered.

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

(c) Current and deferred tax for the year

Current tax and deferred tax are recognized in profit or loss, except when they relate to items that are recognized in other comprehensive income or directly in equity, in which case, the current tax and deferred tax are also recognized in other comprehensive income or directly in equity, respectively. Where current tax or deferred tax arises from the initial accounting for a business combination, the tax effect is included in the accounting for the business combination.

2.14 Government grants

Government grants are not recognized until there is reasonable assurance that the Company will comply with the conditions attaching to them and that the grants will be received.

The benefit of a government loan at a below-market rate of interest is treated as a government grant, measured as the difference between proceeds received and the fair value of the loan based on prevailing market interest rates.

Government grants related to assets are presented in the separate statements of financial position by deducting the grant from the book amount of the asset. The related grant is recognized in profit or loss over the life of a depreciable asset as a reduced depreciation expense.

Government grants related to income are recognized in profit or loss on a systematic basis over the periods in which the Company recognizes as expenses the related costs for which the grants are intended to compensate. Government grants that are receivable as compensation for expenses or losses already incurred or for the purpose of giving immediate financial support to the Company with no future-related costs are recognized in profit or loss in the period in which they become receivable.

2.15 Property, Plant and Equipment

Property, plant and equipment are initially stated at cost and subsequently recorded at cost, less accumulated depreciation, and accumulated impairment losses, except for land, which is recorded using revaluation model. The cost of an item of property, plant and equipment is directly attributable to their purchase or construction, which includes any costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. It also includes the initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located.

Subsequent costs are recognized in book amount of an asset or as a separate asset, if it is probable that future economic benefits associated with the assets will flow into the Company and the cost of an asset can be measured reliably. Costs associated with routine repairs and maintenance are expensed as they are incurred.

The Company does not depreciate land. Depreciation expense is computed using the straight-line method, based on the estimated useful lives of the assets as follows:

	Useful lives
Buildings	5 - 50 years
Structures	2 - 30
Machinery	2 – 15
Others	2 - 10

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

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

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected to arise from the continued use of the asset. Any gain or loss arising on derecognition of the property (calculated as the difference between the net disposal proceeds and the book amount of the asset) is included in profit or loss for the period in which the property is derecognized.

2.16 Investment properties

Investment properties are properties held to earn rentals and/or for capital appreciation (including property under construction for such purposes). Investment properties are measured initially at cost, including transaction costs. Subsequent to initial recognition, investment properties are stated at fair value, with any gains or losses arising on fair value fluctuation recognized in profit or loss.

Subsequent costs are recognized in book amount of an asset or as a separate asset, if it is probable that future economic benefits associated with the assets will flow into the Company and the cost of an asset can be measured reliably. Costs associated with routine repairs and maintenance are expensed as they are incurred.

An investment property is derecognized upon disposal or when the investment property is permanently withdrawn from use and no future economic benefits are expected from the disposal. Any gain or loss arising on derecognition of the property (calculated as the difference between the net disposal proceeds and the book amount of the asset) is included in profit or loss for the period in which the property is derecognized.

2.17 Intangible Assets

(a) Intangible assets acquired separately

Intangible assets with finite useful lives that are acquired separately are carried at cost, less accumulated amortization and accumulated impairment losses. Amortization is recognized on a straight-line basis over their estimated useful lives. The estimated useful life and amortization method are reviewed at the end of each reporting period, with the effect of any changes in estimate being accounted for on a prospective basis. Intangible assets with indefinite useful lives that are acquired separately are carried at cost, less accumulated impairment losses.

(b) Internally generated intangible assets - research and development expenditure

Expenditure on research activities is recognized as an expense in the period in which it is incurred.

Expenditure arising from development (or from the development phase of an internal project) is recognized as an intangible asset, if, and only if, the development project is designed to produce new or substantially improved products, and the Company can demonstrate the technical and economical feasibility and measure reliably the resources attributable to the intangible asset during its development.

Subsequent to initial recognition, internally generated intangible assets are reported at cost, less accumulated amortization and accumulated impairment losses, on the same basis as intangible assets that are acquired separately.

(c) Intangible assets acquired in a business combination

Intangible assets that are acquired in a business combination are recognized separately from goodwill and are initially recognized at their fair value at the acquisition date (which is regarded as their cost). Subsequent to initial recognition, intangible assets acquired in a business combination are reported at cost, less accumulated amortization and accumulated impairment losses, on the same basis as intangible assets that are acquired separately.

(d) Derecognition of intangible assets

An intangible asset is derecognized on disposal, or when no future economic benefits are expected from its use. Gains or losses arising from derecognition of an intangible asset, measured as the difference between the net disposal proceeds and the book amount of the asset, are recognized in profit or loss when the asset is derecognized.

(e) Depreciation of intangible assets

Intangible assets (membership) with indefinite useful lives are not amortized. Intangible assets other than not amortized intangible assets are using the straight-line method, based on the estimated useful lives of the assets as follows:

	Useful lives
Development costs	5 - 10 years
Industrial rights	5

Other intangible assets	4 - 15

2.18 Impairment of tangible and intangible assets other than goodwill

At the end of each reporting period, the Company reviews the book amount of its tangible and intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). When it is not possible to estimate the recoverable amount of an individual asset, the Company estimates the recoverable amount of the CGU to which the asset belongs.

Intangible assets with indefinite useful lives and intangible assets not yet available for use are tested for impairment at least annually, and whenever there is an indication that the asset may be impaired.

Recoverable amount is the higher of fair value, less costs to sell and value in use. If the recoverable amount of an asset (or a CGU) is estimated to be less than its book amount, the book amount of the asset (or the CGU) is reduced to its recoverable amount and the reduced amount is recognized in profit or loss.

Where an impairment loss subsequently reverses, the book amount of the asset (or a CGU) is increased to the revised estimate of its recoverable amount, but so that the increased book amount does not exceed the book amount that would have been determined had no impairment loss been recognized for the asset (or the CGU) in prior years. A reversal of an impairment loss is recognized immediately in profit or loss.

2.19 Inventories

Inventories are stated at the lower of cost and net realizable value. Cost of inventories, except for those in transit, are measured under the weighted-average method and consists of the purchase price, cost of conversion and other costs incurred in bringing the inventories to their present location and condition. Net realizable value represents the estimated selling price for inventories, less all estimated costs of completion and costs necessary to make the sale.

When inventories are sold, the book amount of those inventories is recognized as an expense (cost of sales) in the period in which the related revenue is recognized. The amount of any write-down of inventories to net realizable value and all losses of inventories is recognized as an expense in the period the write-down or loss occurs. The amount of any reversal of any write-down of inventories, arising from an increase in net realizable value, is recognized as a reduction in the amount of inventories recognized as an expense in the period in which the reversal occurs.

2.20 Provisions

Provisions are recognized when the Company has a present obligation (legal or constructive) as a result of a past event, it is probable that the Company will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation.

The amount recognized as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. When a provision is measured using the cash flows estimated to settle the present obligation, its book amount is the present value of those cash flows (where the effect of the time value of money is material). The discount rate used is a pretax rate that reflects current market assessments of the time value of money and the risks specific to the liability. Where discounting is used, the increase in the provision due to the passage of time is recognized in profit or loss as borrowing cost.

When some or all of the economic benefits required to settle a provision are expected to be recovered from a third party, a receivable is recognized as an asset if it is virtually certain that reimbursement will be received and the amount of the receivable can be measured reliably.

At the end of each reporting period, the remaining provision balance is reviewed and assessed to determine if the current best estimate is being recognized. If the existence of an obligation to transfer economic benefit is no longer probable, the related provision is reversed during the period.

2.21 Financial instruments

Financial assets and financial liabilities are recognized when an entity becomes a party to the contractual provisions of the instruments. Financial assets and financial liabilities are initially measured at fair value. Transaction costs that are directly attributable to the acquisition or issue of financial assets and financial liabilities are added to, or deducted from, the fair value of the financial assets or financial liabilities, as appropriate, on initial recognition. Transaction costs directly attributable to the acquisition of financial assets or financial liabilities at fair value through profit or loss ("FVTPL") are recognized immediately in profit or loss.

Financial assets are classified into the following specified categories: 'financial assets at FVTPL', 'held-to-maturity investments', 'available-for-sale ("AFS") financial assets' and 'loans and receivables'. The classification depends on the nature and purpose of the financial assets, and is determined at the time of initial recognition.

(a) Effective interest method

The effective interest method is a method of calculating the amortized cost of a debt instrument and of allocating interest income over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipts (including all fees and points paid or received that form an integral part of the effective interest rate, transaction costs and other premiums or discounts) through the expected life of the debt instrument, or, where appropriate, a shorter period, to the net book amount on initial recognition.

Income is recognized on an effective interest basis for debt instruments other than those financial assets classified as at FVTPL.

(b) Financial assets at FVTPL

Financial assets are classified as at FVTPL when the financial asset is either held for trading or it is designated as at FVTPL. A financial asset is classified as held for trading, if it has been acquired principally for the purpose of selling it in the near term; or on initial recognition it is part of a portfolio of identified financial instruments that the Company manages together and has a recent actual pattern of short-term profit-taking; or it is a derivative that is not designated and effective as a hedging instrument. Financial assets at FVTPL are stated at fair value, with any gains or losses arising on remeasurement recognized in profit or loss.

(c) Held-to-maturity investments

Non-derivative financial assets with fixed or determinable payments and fixed-maturity dates that the Company has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are measured at amortized cost using the effective interest method, less any impairment, with revenue recognized on an effective yield basis.

(d) AFS financial assets

AFS financial assets are non-derivatives that are either designated as AFS or are not classified as (a) loans and receivables, (b) held-to-maturity investments or (c) financial assets at FVTPL.

They are subsequently measured at fair value at the end of each reporting period. Changes in the book amount of AFS monetary financial assets are recognized in other comprehensive income (as investments revaluation reserve). When the investment is disposed of, or is determined to be impaired, the cumulative gain or loss previously accumulated in other comprehensive income is reclassified to profit or loss.

Dividends on AFS equity instruments are recognized in profit or loss when the Company's right to receive the dividends is established.

AFS equity investments that do not have a quoted market price in an active market and whose fair value cannot be reliably measured and derivatives that are linked to and must be settled by delivery of such unquoted equity investments are measured at cost, less any identified impairment losses at the end of each reporting period.

(e) Loans and receivables

Non-derivative financial assets that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables.' Loans and receivables are measured at amortized cost using the effective interest method, less any impairment. Interest income is recognized by applying the effective interest rate, except for short-term receivables when the effect of discounting is immaterial.

(f) Impairment of financial assets

Financial assets, other than those at FVTPL, are assessed for indicators of impairment at the end of each reporting period. Financial assets are considered to be impaired when there is objective evidence that more events occurred after the initial recognition of the financial asset and the estimated future cash flows of the investment have been affected.

For AFS equity investments, a significant or prolonged decline in the fair value of the security below its cost is considered to be objective evidence of impairment.

For certain categories of financial asset, such as trade receivables, assets that are assessed not to be impaired individually are, in addition, assessed for impairment on a collective basis. Objective evidence of impairment for a portfolio of receivables could include the Company's past experience of collecting payments, an increase in the number of delayed payments in the portfolio past the average credit period, as well as observable changes in national or local economic conditions that correlate with default on receivables.

For financial assets carried at amortized cost, the amount of the impairment loss recognized is the difference between the asset's book amount and the present value of estimated future cash flows, discounted at the financial asset's original effective interest rate.

For financial assets that are carried at cost, the amount of the impairment loss recognized is the difference between the asset's book amount and the present value of estimated future cash flows, discounted at the current market rate of return for a similar financial asset. Such impairment loss will not be reversed in subsequent periods.

When an AFS financial asset is considered to be impaired, cumulative gains or losses previously recognized in other comprehensive income are reclassified to profit or loss for the period.

For financial assets measured at amortized cost, if, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognized, the previously recognized impairment loss is reversed through profit or loss to the extent that the book amount of the investment at the date the impairment is reversed does not exceed what the amortized cost would have been had the impairment not been recognized.

In respect to AFS equity securities, impairment losses previously recognized in profit or loss are not reversed through profit or loss. Any increase in fair value subsequent to an impairment loss is recognized in other comprehensive income. In respect to AFS debt securities, impairment losses are subsequently reversed through profit or loss if an increase in the fair value of the investment can be objectively related to an event occurring after the recognition of the impairment loss.

(g) Derecognition of financial assets

The Company derecognizes a financial asset only when the contractual rights to the cash flows from the asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity. If the Company neither transfers nor retains substantially all the risks and rewards of ownership and continues to control the transferred asset, the Company recognizes its retained interest in the asset and an associated liability for amounts it may have to pay. If the Company retains substantially all the risks and rewards of ownership of a transferred financial asset, the Company continues to recognize the financial asset and also recognizes a collateralized borrowing for the proceeds received.

On derecognition of a financial asset in its entirety, the difference between the asset's book amount and the sum of the consideration received and receivable, and the cumulated gain or loss that had been recognized in other comprehensive income and accumulated in equity is recognized in profit or loss.

On derecognition of a financial assets other than in its entirety (e.g., when the Company retains an option to repurchase part of a transferred asset, or it retains a residual interest, and such a retained interest indicates that the transferor has neither transferred nor retained substantially all the risks and rewards of ownership and has retained control of the transferred asset), the Company allocates the previous book amount of the financial asset between the part it continues to recognize under continuing involvement and the part it no longer recognizes on the basis of the relative fair value of those parts on the date of the transfer.

2.22 Financial liabilities and equity instruments

(a) Classification as debt or equity

Debt and equity instruments are classified as either financial liabilities or equity in accordance with the substance of the contractual arrangement and the definitions of financial liability and an equity instrument.

(b) Equity instruments

An equity instrument is any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities. Equity instruments issued by the Company are recognized at the proceeds received, net of direct issue costs.

Repurchase of the Company's own equity instruments is recognized and deducted directly in equity. No gain or loss is recognized in profit or loss on the purchase, sale, issue or cancellation of the Company's own equity instruments.

(c) Compound instruments

The component parts of compound instruments (convertible bonds) issued by the Company are classified separately as financial liabilities and equity in accordance with the substance of the contractual arrangements and the definitions of a financial liability and equity instrument. Conversion option that will be settled by the exchange of a fixed amount of cash or another financial asset for a fixed number of the Company's own equity instruments is an equity instrument.

At the date of issue, the fair value of the liability component is estimated using the prevailing market interest rate for a similar non-convertible instrument. This amount is recorded as a liability on an amortized cost basis using the effective interest method until extinguished upon conversion or at the instrument's maturity date.

The conversion option classified as equity is determined by deducting the amount of the liability component from the fair value of the compound instrument as a whole. This is recognized and included in equity, net of income tax effects, and is not subsequently remeasured. In addition, the conversion option classified as equity will remain in equity until the conversion option is exercised, in which case, the balance recognized in equity will be transferred to share premium. No gain or loss is recognized in profit or loss upon conversion or expiration of the conversion option.

(d) Financial liabilities

Financial liabilities are recognized when the Company becomes a party to the contractual provisions of the instruments. Financial liabilities are initially measured at fair value. Transaction costs that are directly attributable to the issue of financial liabilities are deducted from the fair value of the financial liabilities on initial recognition. Transaction costs directly attributable to acquisition of financial liabilities at FVTPL are recognized immediately in profit or loss.

Financial liabilities are classified as either financial liabilities at FVTPL or other financial liabilities.

(e) Financial liabilities at FVTPL

Financial liabilities are classified as financial liabilities at FVTPL when the financial liability is either held for trading or it is designated as financial liabilities at FVTPL.

Financial liabilities at FVTPL are stated at fair value, with any gains or losses arising on remeasurement recognized in profit or loss. The net gain or loss recognized in profit or loss incorporates any interest paid on the financial liability and is included in the 'Other non-operating income and expense' line item in the separate statements of profit or loss.

(f) Other financial liabilities

Other financial liabilities are subsequently measured at amortized cost using the effective interest method, with interest expense recognized on an effective yield basis.

(g) Financial guarantee contracts

A financial guarantee contract is a contract that requires the issuer to make specified payments to reimburse the holder for a loss it incurs because a specified debtor fails to make payments when due in accordance with the terms of a debt instrument.

Financial guarantee contract liabilities are initially measured at their fair values and, if not designated as financial liabilities at FVTPL, are subsequently measured at the higher of:

- the amount of the obligation under the contract, as determined in accordance with Korean IFRS 1037 and
- the amount initially recognized less, cumulative amortization recognized in accordance with the Korean IFRS 1018, *Revenue*

(h) Derecognition of financial liabilities

The Company derecognizes financial liabilities when the Company's obligations are discharged, canceled or expired. The difference between the book amount of the financial liability derecognized and the consideration paid or payable is recognized in profit or loss.

2.23 Derivative financial instruments

The Company enters into a variety of derivative financial instruments to manage its exposure to interest rate and foreign exchange rate risk, including foreign exchange forward contracts, interest rate swaps and cross currency swaps.

Derivatives are initially recognized at fair value at the date the derivative contract is entered into and are subsequently remeasured to their fair value at the end of each reporting period. The resulting gain or loss is recognized in profit or loss immediately, unless the derivative is designated and effective as a hedging instrument, in such case the timing of the recognition in profit or loss depends on the nature of the hedge relationship.

A derivative with a positive fair value is recognized as a financial asset; a derivative with a negative fair value is recognized as a financial liability. A derivative is presented as a non-current asset or a non-current liability, if the remaining maturity of the instrument is more than 12 months and it is not expected to be realized or settled within 12 months. Other derivatives are presented as current assets or current liabilities.

(a) Embedded derivatives

Derivatives embedded in non-derivative host contracts are treated as separate derivatives when they meet the definition of a derivative, their risks and characteristics are not closely related to those of the host contracts and the contracts are not measured at FVTPL.

(b) Hedge accounting

The Company designates certain hedging instruments, which include derivatives, embedded derivatives and non-derivatives in respect to foreign currency risk, as either fair value hedges, cash flow hedges or hedges of net investments in foreign operations.

At the inception of the hedge relationship, the entity documents the relationship between the hedging instrument and the hedged item, along with its risk management objectives and its strategy for undertaking various hedge transactions. Furthermore, at the inception of the hedge and on an ongoing basis, the Company documents whether the hedging instrument is highly effective in offsetting changes in fair values or cash flows of the hedged item.

(c) Fair value hedges

Changes in the fair value of derivatives that are designated and qualify as fair value hedges are recognized in profit or loss immediately, together with any changes in the fair value of the hedged asset or liability that are attributable to the hedged risk. The change in the fair value of the hedging instrument and the change in the hedged item attributable to the hedged risk are recognized in the line of the separate statements of income relating to the hedged item.

Hedge accounting is discontinued when the Company revokes the hedging relationship, when the hedging instrument expires or is sold, terminated or exercised, or when it no longer qualifies for hedge accounting. The fair value adjustment to the book amount of the hedged item arising from the hedged risk is amortized to profit or loss from that date.

(d) Cash flow hedges

The effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges is recognized in other comprehensive income. The gain or loss relating to the ineffective portion is recognized immediately in profit or loss, and is included in the 'Finance income and cost' line item.

Amounts previously recognized in other comprehensive income and accumulated in equity are reclassified to profit or loss in the periods when the hedged item is recognized in profit or loss, in the same line of the separate statements of comprehensive income as the recognized hedged item.

Hedge accounting is discontinued when the Company revokes the hedging relationship, when the hedging instrument expires or is sold, terminated or exercised, or it no longer qualifies for hedge accounting. Any gain or loss accumulated in equity at that time remains in equity, and is recognized when the forecast transaction is ultimately recognized in profit or loss. When a forecast transaction is no longer expected to occur, the gain or loss accumulated in equity is recognized immediately in profit or loss.

2.24 Fair value

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, regardless of whether that price is directly observable or estimated using another valuation technique. In estimating the fair value of an asset or a liability, the Company takes into account the characteristics of the asset or liability if market participants would take those characteristics into account when pricing the asset or liability at the measurement date. Fair value for measurement and/or disclosure purposes in these separate financial statements is determined on such a basis, except for share-based payment transactions that are within the scope of Korean IFRS 1102, leasing transactions that are within the scope of Korean IFRS 1017, *Leases*, and measurements that have some similarities to fair value, but are not fair value, such as net realizable value in Korean IFRS 1002, *Inventories,* or value in use in Korean IFRS 1036.

In addition, for financial reporting purposes, fair value measurements are categorized into Levels 1, 2 or 3, based on the degree to which the inputs to the fair value measurements are observable and the significance of the inputs to the fair value measurement in its entirety, which are described in Note 10.

2.25 Approval of Issuance of the Financial Statements

The separate financial statements 2016 were approved for issue by the Board of Directors on February 28, 2017 and are subject to change with the approval of shareholders at their Annual General Meeting.

3. Critical Accounting Estimates and Assumptions

In the application of the Company accounting policies, which are described in Note 2, management is required to make judgments, estimates and assumptions about the book amounts of assets and liabilities that are not readily apparent from other sources. The estimates and underlying assumptions are reviewed on an ongoing basis. Actual results may differ from these estimates.

Revisions to accounting estimates are recognized in the period in which the estimate is revised, if the revision affects only that period. The revisions are recognized in the period of revision and future periods, if the revision affects both current and future periods.

(a) Revenue recognition

Revenue from a contract to provide services is recognized by reference to the stage of completion of the contract. The stage of completion of the contract is determined as reasonable estimation and is subject to change as related factors change.

(b) Impairment of goodwill

Determining whether goodwill is impaired requires an estimation of the value in use of the CGUs to which goodwill has been allocated. The value in use calculation requires to estimate the future cash flows expected to arise from the CGU and a suitable discount rate in order to calculate present value.

(c) Defined benefit obligation

The Company's defined benefit obligation is determined based on the actuarial valuation carried out at the end of each annual reporting period. Actuarial assumptions are the Company's best estimates of the variables, such as discount rates, rates of expected future salary increases and mortality rates.

(d) Provision

Provisions for the expected cost of warranty obligations are recognized at the best estimate of the expenditure required to settle the Company's current and future obligations. Provisions are determined by the estimate based on past experience.

(e) Fair value model on investment properties

As stated in Note 14, the Company uses evaluation methods, including inputs that are not based on observable market data to assess revalued amount of fair value of investment properties. The Company's management believes that valuation technique and assumptions that are used for fair value model on investment properties are fair.

(f) Deferred tax

Recognition and measurement of deferred tax assets and liabilities require the management's judgment, in particular, whether to recognize if the scope of deferred tax assets is affected by management's judgment and assumption in the future.

(g) Useful lives of property, plant and equipment and intangible assets

It is required to estimate useful lives for depreciation and amortization.

4. Financial Risk Management

The Company is exposed to various financial risks, such as market (foreign currency risk and interest rate risk), credit and liquidity, relating to the operations of the Company. The purpose of risk management policy is to minimize potential risks, which could have adverse effect on financial performance.

Financial risk management activities are performed by the Treasury and International Finance department in accordance with the aforementioned documented risk management policies. In addition, the Company enters into derivative contracts to hedge against certain risks.

4.1 Market risk

(a) Foreign currency risk

The Company's exposure to the risk of changes in foreign exchange rates relates primary to the Company's international operating activities. The Company's objectives of foreign currency risk management is to minimize uncertainty and volatility arising from fluctuations in foreign currency. Foreign currency risk is managed in accordance with to the Company's policy on foreign currency, and currency trading for speculative purpose is prohibited.

The Company reduces exposure to foreign currency risk by matching the inflow and the outflow of foreign currencies (natural hedge) and manages foreign currency risk by using currency derivatives, such as currency forwards, for the remaining exposure.

The book amount of the Company's monetary assets and liabilities denominated in foreign currencies, which represents the maximum exposure to foreign currency risk as at December 31, 2016 and 2015, is as follows:

(in millions of Korean won)	2016					
	USD	EUR	JPY	GBP	Others [1]	Total
Assets	₩ 205,371	₩ 21,657	₩ 1,885	₩ 27,387	₩ 17,400	₩ 273,700
Liabilities	(213,184)	(1,606)	(2,187)	(312)	(598)	(217,887)
Net assets (liabilities)	₩ (7,813)	₩ 20,051	₩ (302)	₩ 27,075	₩ 16,802	₩ 55,813

(in millions of Korean won)	2015					
	USD	EUR	JPY	GBP	Others [1]	Total
Assets	₩ 172,232	₩ 25,670	₩ 529	₩ 26,754	₩ 8,435	₩ 233,620
Liabilities	(153,118)	(1,285)	(1,394)	(470)	(286)	(156,553)
Net assets (liabilities)	₩ 19,114	₩ 24,385	₩ (865)	₩ 26,284	₩ 8,149	₩ 77,067

[1] Others are assets and liabilities denominated in foreign currencies other than USD, EUR, JPY and GBP.

Net loss on foreign currency translation recognized in profit or loss for the periods ended December 31, 2016 and 2015, is ₩ 4,876 million and ₩ 3,588 million, respectively.

The table below summarizes the impact of increases/decreases of currency exchange rates on profit before income tax expense for the period. The analysis is based on the assumption that the currency exchange rates has increased/decreased by 10% with all other variables held constant.

(in millions of Korean won)	Impact on profit before income tax expense			
		2016		**2015**
Increase	₩	5,581	₩	7,707
Decrease		(5,581)		(7,707)

The above sensitivity analysis is based on monetary assets and liabilities denominated in foreign currencies other than the Company's functional currency as at December 31, 2016 and 2015.

(b) Interest rate risk

The Company's interest rate risk is related to borrowings and bank deposits with floating interest rates, and related interest income and expense are exposed to interest rate risk. The Company is exposed to interest rate risk mainly due to its borrowing with floating interest rates. The purpose of interest rate risk management is to minimize uncertainty and financial expense arising from interest rate fluctuation.

To manage its interest rate risk, the Company minimizes external borrowings using internal funds and reduces borrowings with high interest rates and maintains an appropriate balance between borrowings with floating interest rate and fixed-interest rate and short-term and long-term borrowings. The Company manages its interest rate risk preemptively through regular monitoring and adjustments to the changing domestic and overseas markets conditions and nature of its interest rates.

The book amount of the Company's financial assets and liabilities with floating interest rates exposed to interest rate risk as at December 31, 2016 and 2015, is as follows:

(in millions of Korean won)		**2016**		**2015**
Financial assets	₩	154,175	₩	155,865
Financial liabilities		(554,804)		(352,212)
Net liabilities	₩	(400,629)	₩	(196,347)

The table below summarizes the impact of increases/decreases of interest rates on profit before income tax expense. The analysis is based on the assumption that the interest rates has increased/decreased by 1% (100 basis points) with all other variables held constant.

(in millions of Korean won)	Impact on profit before income tax expense			
		2016		**2015**
Increase	₩	(4,006)	₩	(1,963)
Decrease		4,006		1,963

(c) Price risk

The Company is exposed to equity price risks arising from its listed equity investments among AFS equity investments. The Company periodically measures the risk as the fair value or future cash flows of equity investments may fluctuate due to the changes in market prices. Important investments in the Company's portfolio are individually managed, and acquisition and disposal are approved by the Board of Directors.

4.2 Credit risk

The credit risk refers to risk of financial losses to the Company when the counterparty defaults on the obligations of the contract. The credit risk arises from AFS financial assets, which are not equity securities, deposits in financial institution, financial derivatives and guarantee limit, as well as from the Company's normal transaction and investing activity. To manage credit risk, the Company evaluates the creditworthiness of each customer or counterparty considering the financial status, past experience and other factors. The Company establishes credit limit for each customer and counterparty.

The Company evaluates the credit worthiness using opened financial information and information provided by credit-rating institution when the Company contracts with new customers. The Company decides credit transaction limit, and is provided with collaterals and guarantee based on evaluation.

Also, the Company revaluates customers' credit worthiness periodically, reassesses credit transaction limit and readjust level of collateral. The Company reports the present condition of delayed collection and collection measures periodically of financial assets which has delayed collection and takes measures by causes of delay.

The book amount of the Company's financial assets and liabilities, which represents the maximum exposure to credit risk as at December 31, 2016 and 2015, is as follows:

(in millions of Korean won)		2016		2015
Loans and receivables				
Cash and cash equivalents	₩	155,824	₩	166,196
Financial instruments		69		89
Trade and other receivables		453,464		363,803
Deposits provided		41,257		18,521
Available for sale financial assets				
Short-term investment securities		1,497		1,497
Derivative assets		402		1,369
	₩	652,513	₩	551,475

Apart from the above financial assets, the maximum exposure to credit risk of financial guarantee contract is the maximum amount to be paid if the guarantee will be charged (Note 30).

Details of trade and other receivables among the financial assets as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016			
	Receivables not past due	**Past due but not impaired**	**Impaired**	**Total**
Trade receivables	₩ 221,054	₩ 45,667	₩ 33,947	₩ 300,668
Other receivables	83,132	35,289	1,017	119,438
Accrued income	1,584	-	-	1,584
Loans	56,227	-	5	56,232
	₩ 361,997	₩ 80,956	₩ 34,969	₩ 477,922

(in millions of Korean won)	2015			
	Receivables not past due	**Past due but not impaired**	**Impaired**	**Total**
Trade receivables	₩ 193,412	₩ 63,110	₩ 29,930	₩ 286,452
Other receivables	82,277	11,528	1,019	94,824
Accrued income	122	-	-	122
Loans	5,456	-	7	5,463
	₩ 281,267	₩ 74,638	₩ 30,956	₩ 386,861

The Company has recognized the provision for impairment of ₩24,457 million as at December 31, 2016 (2015: ₩ 23,058 million).

The aging analysis of financial assets not impaired as at December 31, 2016 and 2015, is as follows:

(in millions of Korean won)	2016				
	Less than 3 months	**Between 3 and 6 months**	**Between 6 month and 1 year**	**Over 1 year**	**Total**
Trade receivables	₩ 24,890	₩ 12,169	₩ 7,595	₩ 1,013	₩ 45,667
Other receivables	26,896	1,319	2,443	4,631	35,289
	₩ 51,786	₩ 13,488	₩ 10,038	₩ 5,644	₩ 80,956

(in millions of Korean won)	2015				
	Less than 3 months	**Between 3 and 6 months**	**Between 6 month and 1 year**	**Over 1 year**	**Total**
Trade receivables	₩ 37,507	₩ 11,467	₩ 4,392	₩ 9,744	₩ 63,110
Other receivables	5,603	348	2,052	3,525	11,528
	₩ 43,110	₩ 11,815	₩ 6,444	₩ 13,269	₩ 74,638

Provision for impaired trade receivables is recognized by applying appropriate allowance rate for receivables that are assessed to be impaired individually due to insolvency, bankruptcy and others. A group of financial assets that is not individually significant but have similar credit risk characteristics is assessed for impairment on a collective basis. Provision for impaired trade receivables is recognized based on aging analysis and the Company's past experience of receivables collection.

AFS financial assets, held-to-maturity financial assets, deposits in financial institutions and derivative instruments are individually assessed to be impaired.

4.3 Liquidity risk

Liquidity risk is the risk that the Company is unable to meet its payment obligations arising from financial liabilities as they fall due.

The Company regularly establishes funding plan in order to manage liquidity risk. Ongoing analysis and review on the budget and actual cash outflow to correspond maturity structure of financial assets and financial liabilities have been made.

Maturity analysis of financial liabilities except for derivatives as at December 31, 2016 and 2015, is as follows:

(in millions of Korean won)	2016					
		Nominal cash flows according to contract				
	Book amount	**Total**	**Less than 1 year**	**Between 1 and 2 years**	**Between 2 and 5 years**	**Over 5 years**
Financial liabilities	₩ 1,467,766	₩ 1,469,641	₩ 934,573	₩ 408,924	₩ 126,144	₩ -
Interest on financial liabilities	-	51,050	30,651	15,386	5,013	-
	₩ 1,467,766	₩ 1,520,691	₩ 965,224	424,310	₩ 131,157	₩ -

(in millions of Korean won)	2015					
		Nominal cash flows according to contract				
	Book amount	**Total**	**Less than 1 year**	**Between 1 and 2 years**	**Between 2 and 5 years**	**Over 5 years**
Financial liabilities	₩ 1,152,455	₩ 1,152,820	₩ 729,531	₩ 49,377	₩ 360,434	₩ 13,478
Interest on financial liabilities	-	51,503	22,012	14,703	14,499	289
	₩ 1,152,455	₩ 1,204,323	₩ 751,543	₩ 64,080	₩ 374,933	₩ 13,767

The above-mentioned maturity analysis is based on undiscounted cash flow according to the contract, which is different from non-derivative liabilities in the separate statements of financial position. Apart from the above non-derivative liabilities, as at December 31, 2016, financial guarantee contract liabilities of the Company are explained in Note 30.

4.4 Capital risk

The Company performs capital risk management to maintain its ability to continuously provide profits to shareholders and parties in interest, and to maintain optimum capital structure to reduce capital expenses.

Consistent with others in the industry, the Company monitors capital on the basis of debt-to-equity ratio. Debt-to-equity ratio calculated as total liabilities divided by equity is used as an index to manage the Company's capital similar to overall industry practice.
Debt-to-equity ratios as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	**2016**	**2015**
Total liabilities	₩ 1,632,123	₩ 1,368,966
Total equity	2,112,550	2,109,256
Debt-to-equity ratio	77.26%	64.90%

5. Restricted Financial Assets

Details of restricted financial assets as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	**2016**	**2015**	**Description**
Long-term financial instruments	₩ 69	₩ 89	Bank transaction deposits, establish the right of pledge, and others

6. Short-term and long-term Investment Securities

Details of short-term and long-term investment securities as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)			2016	2015
Short-term investment securities	Available-for-sale financial assets	Beneficiary certificates	₩ 1,497	₩ 1,497
Long-term investment securities	Available-for-sale financial assets	Unmarketable equity securities	235	183
		Beneficiary certificates	454	116
		Equity investments	999	999
			₩ 1,688	₩ 1,298

Beneficiary certificates, unmarketable equity securities and equity investments are carried at cost because there is no quoted market price and their fair value cannot be measured.

There is no changes of gain (loss) on valuation of available-for-sale financial assets for the periods ended December 31, 2016 and 2015.

7. Trade and Other Receivables

Trade and other receivables as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016			2015		
	Gross amount	Provision for impairment	Book amount	Gross amount	Provision for impairment	Book amount
Current						
Trade receivables	₩ 300,487	₩ (23,182)	₩ 277,305	₩ 286,271	₩ (21,753)	₩ 264,518
Non-trade receivables	119,403	(1,054)	118,349	94,790	(1,084)	93,706
Accrued revenues	1,584	-	1,584	122	-	122
Short-term loans	913	(5)	908	1,109	(5)	1,104
	422,387	(24,241)	398,146	382,292	(22,842)	359,450
Non-current						
Trade receivables	181	(181)	-	181	(181)	-
Non-trade receivables	35	(35)	-	35	(35)	-
Long-term loans	55,318	-	55,318	4,353	-	4,353
	₩ 55,534	₩ (216)	₩ 55,318	₩ 4,569	₩ (216)	₩ 4,353

Movements in the provision for impairment for the year ended December 31, 2016, are as follows:

(in millions of Korean won)	Beginning balance	Provision for impaired receivables during the year (reversal)	Write-off	Ending balance
Trade receivables	₩ (21,753)	₩ (1,543)	₩ 114	₩ (23,182)
Non-trade receivables	(1,084)	23	7	(1,054)
Short-term loans	(5)	-	-	(5)
Long-term trade receivables	(181)	-	-	(181)
Long-term non-trade receivables	(35)	-	-	(35)
	₩ (23,058)	₩ (1,520)	₩ 121	₩ (24,457)

The creation of provision for impaired trade receivables has been included in 'selling and administrative expense' in the separate statement of profit or loss. And that of other receivables have been included in 'other operating expense'.

8. Inventories

Inventories as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016			2015		
	Acquisition cost	Valuation allowance	Book amount	Acquisition cost	Valuation allowance	Book amount
Merchandise	₩ 57,183	₩ (1,226)	₩ 55,957	₩ 13,691	₩ (1,933)	₩ 11,758
Finished goods	43,949	(2,533)	41,416	35,692	(2,676)	33,016
Work in progress	24,343	(79)	24,264	26,091	(64)	26,027
Raw materials	76,727	(3,460)	73,267	67,542	(2,769)	64,773
Materials in transit	15,449	-	15,449	13,685	-	13,685
Others	4,549	-	4,549	3,092	-	3,092
	₩ 222,200	₩ (7,298)	₩ 214,902	₩ 159,793	₩ (7,442)	₩ 152,351

During the year ended December 31, 2016, the Company reversed loss on ₩144 million of a previous inventory write-down (Loss on inventory valuation during 2015: ₩519 million).

9. Derivatives

Details of these derivatives and hedge accounting are as follows:

Derivative contracts	Purpose	Description
Currency forward exchange contracts	Cash flow hedge	Adjustment from foreign currency sales to Korean won to avoid cash flow risk arising from foreign currency forecast sales
	Held for trading	Recognized in profit (loss) for the period of valued amount of foreign currency forwards
Interest rate swap	Held for trading	Recognized in profit (loss) for the period of gap between floating-interest rate and fixed-interest rate

Details of valuation of derivative financial instruments as at December 31, 2016 and 2015, are as follows:

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

2016						
Buy		Sell			Gain (loss)	Accumulated other
Currency	Amount	Currency	Amount	Assets (liabilities)	on valuation of derivatives	comprehensive income[1]
Currency forward contracts:						
KRW	156,884	USD	133,000	₩ (3,682)	₩ -	₩ (3,682)
KRW	8,553	EUR	6,600	119	-	119
KRW	3,290	GBP	2,200	23	-	23
USD	8,500	KRW	9,673	260	260	-
Interest rate swap:						
KRW 5,000, 3.15%		KRW 5,000, MOR 3M+1.60%		(22)	(16)	-
KRW 30,000, 3.68%		KRW 30,000, MOR 3M+1.80%		(88)	(88)	-
				₩ (3,390)	₩ 156	₩ (3,540)

[1] Amounts before tax effect.

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

2015						
Buy		Sell			Gain (loss)	Accumulated other
Currency	Amount	Currency	Amount	Assets (liabilities)	on valuation of derivatives	comprehensive income[1]
Currency forward contracts:						
KRW	119,634	USD	101,000	₩ 1,010	₩ -	₩ 1,010
KRW	13,694	EUR	10,600	(5)	-	(5)
KRW	6,510	GBP	3,600	237	-	237
Interest rate swap:						
KRW 5,000, 3.15%		KRW 5,000, MOR 3M+1.60%		(19)	(21)	-
				₩ 1,223	₩ (21)	₩ 1,242

[1] Amounts before tax effect.

10. Financial Instruments by Category

Categorizations of financial assets and liabilities as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016					
	Financial assets at fair value through profit or loss	Loans and receivables	Available-for-sale financial assets	Derivative for hedging	Book amount	Fair value
Cash and cash equivalents	₩ -	₩ 155,824	₩ -	₩ -	₩ 155,824	₩ 155,824
Long and short-term financial instruments	-	69	-	-	69	69
Long-term and short-term investment securities	-	-	3,185	-	3,185	3,185
Trade and other receivables	-	453,464	-	-	453,464	453,464
Derivative assets	260	-	-	142	402	402
Deposits provided	-	41,257	-	-	41,257	41,257
	₩ 260	₩ 650,614	₩ 3,185	₩ 142	₩ 654,201	₩ 654,201

(in millions of Korean won)	2016					
	Financial liabilities at fair value through profit or loss	Financial liabilities at amortized cost	Derivative for hedging	Financial guarantee contracts	Book amount	Fair value
Trade and other payables	₩ -	₩ 384,337	₩ -	₩ 1,141	₩ 385,478	₩ 385,478
Borrowings, bonds and securitized debts	-	1,083,429	-	-	1,083,429	1,083,429
Derivative liabilities	110	-	3,682	-	3,792	3,792
	₩ 110	₩ 1,467,766	₩ 3,682	₩ 1,141	₩ 1,472,699	₩ 1,472,699

(in millions of Korean won)	2015					
	Financial assets at fair value through profit or loss	Loans and receivables	Available-for-sale financial assets	Derivative for hedging	Book amount	Fair value
Cash and cash equivalents	₩ -	₩ 166,196	₩ -	₩ -	₩ 166,196	₩ 166,196
Long and short-term financial instruments	-	89	-	-	89	89
Long-term and short-term investment securities	-	-	2,795	-	2,795	2,795
Trade and other receivables	-	363,803	-	-	363,803	363,803
Derivative assets	-	-	-	1,369	1,369	1,369
Deposits provided	-	18,521	-	-	18,521	18,521
	₩ -	₩ 548,609	₩ 2,795	₩ 1,369	₩ 552,773	₩ 552,773

(in millions of Korean won)	2015					
	Financial liabilities at fair value through profit or loss	Financial liabilities at amortized cost	Derivative for hedging	Financial guarantee contracts	Book amount	Fair value
Trade and other payables	₩ -	₩ 263,593	₩ -	₩ 1,983	₩ 265,576	₩ 265,576
Borrowings, bonds and securitized debts	-	888,862	-	-	888,862	888,862
Derivative liabilities	19	-	127	-	146	146
	₩ 19	₩ 1,152,455	₩ 127	₩ 1,983	₩ 1,154,584	₩ 1,154,584

Fair value hierarchy classifications of the financial instruments as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016			
	Level 1	**Level 2**	**Level 3**	**Total**
Financial assets:				
Financial assets at fair value through profit or loss	₩ -	₩ 260	₩ -	₩ 260
Derivatives for hedging	-	142	-	142
	-	402	-	402
Financial liabilities:				
Financial liabilities at fair value through profit or loss	-	(110)	-	(110)
Derivatives for hedging	-	(3,682)	-	(3,682)
	-	(3,792)	-	(3,792)
	₩ -	₩ (3,390)	₩ -	₩ (3,390)

(in millions of Korean won)	2015			
	Level 1	**Level 2**	**Level 3**	**Total**
Financial assets:				
Financial assets at fair value through profit or loss	₩ -	₩ -	₩ -	₩ -
Derivative for hedging	-	1,369	-	1,369
	-	1,369	-	1,369
Financial liabilities:				
Financial liabilities at fair value through profit or loss	-	(19)	-	(19)
Derivative for hedging	-	(127)	-	(127)
	-	(146)	-	(146)
	₩ -	₩ 1,223	₩ -	₩ 1,223

The above table does not include information on financial assets and liabilities, which are not measured at fair value because there are no material differences between the fair values and the book amounts.

Definitions for each fair value hierarchy levels of the above financial instruments, are as follows:

Level 1: Unadjusted quoted prices in active markets for identical assets or liabilities
Level 2: Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly
Level 3: Inputs that are not based on observable market data (unobservable inputs)

The fair value of financial instruments traded in active markets is based on quoted market prices at the dates of the seperate statements of financial position. These instruments are included in level 1. Instruments included in level 1 comprise primarily listed equity investments classified as trading securities or available-for-sale securities.

The fair value of financial instruments that are not traded in an active market (for example, over-the-counter derivatives) is determined by using valuation techniques. These valuation techniques maximize the use of observable market data where it is available and rely as little as possible on entity-specific estimates. If all significant inputs required for fair value of an instrument are observable, the instrument is included in level 2.

If one or more of the significant inputs is not based on observable market data, the instrument is included in level 3.

Valuation techniques and the inputs used in fair value measurements of derivative (level 2), are as follows:

Valuation technique	Observable inputs	Explanation of input parameters
Discounted cash flow method	Forward exchange rate	It is based on forward exchange rate, disclosed on the market that remaining period is the same until maturity of forward contracts. If the forward exchange rate is not disclosed on the market, it is calculated by using interpolation method.
	Discount rate	It is determined by using yield curve that is disclosed at the end of the reporting period.

Comprehensive income on each category of financial instruments for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016						
	Profit (loss) for the period						
	Interest	Dividends	Financial guarantee	Impairment and reversal	Disposal	Foreign exchange	Other comprehensive income [1]
Financial assets:							
Loans and receivables	₩ 6,692	₩ -	₩ -	₩ (1,520)	₩ (2,819)	₩ (257)	₩ -
Available-for-sale financial assets	-	25	-	-	-	-	-
	₩ 6,692	₩ 25	₩ -	₩ (1,520)	₩ (2,819)	₩ (257)	₩ -
Financial liabilities:							
Financial liabilities at amortized cost	₩ (38,164)	₩ -	₩ 1,588	₩ -	₩ -	₩ (6,331)	₩ -

[1] Amounts before tax effect.

(in millions of Korean won)	2015						
	Profit (loss) for the period						
	Interest	Dividends	Financial guarantee	Impairment and reversal	Disposal	Foreign exchange	Other comprehensive income [1]
Financial assets:							
Loans and receivables	₩ 3,357	₩ -	₩ -	₩ (80)	₩ (1,678)	₩ 9,106	₩ -
Available-for-sale financial assets	144	26	-	-	1,393	-	-
	₩ 3,501	₩ 26	₩ -	₩ (80)	₩ (285)	₩ 9,106	₩ -
Financial liabilities:							
Financial liabilities at amortized cost	₩ (38,209)	₩ -	₩1,418	₩ -	₩ 351	₩ (9,055)	₩ -

[1] Amounts before tax effect.

Apart from the above financial instruments, comprehensive income on derivative financial instruments for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016			2015		
	Profit (loss) for the period		Other comprehensive income[1]	Profit (loss) for the period		Other comprehensive income[1]
	Valuation	Disposal		Valuation	Disposal	
Derivative financial instruments for trading	₩ 156	₩ (9)	₩ -	₩ (21)	₩ -	₩ -
Derivative financial instruments for hedging	-	-	(4,781)	-	(144)	5,079
	₩ 156	₩ (9)	₩ (4,781)	₩ (21)	₩ (144)	₩ 5,079

[1] Amounts before tax effect.

Financial assets and financial liabilities subject to an enforceable master netting arrangement or similar agreement as at December 31, 2016 and 2015 are as follows:

(in millions of Korean won)	2016			2015		
	Gross recognized financial instruments	Gross financial instruments set off	Net amounts presented in the statement of financial position	Gross recognized financial instruments	Gross financial instruments set off	Net amounts presented in the statement of financial position
Financial assets:						
Trade receivables	₩ 9,386	₩ (4,422)	₩ 4,964	₩ 12,567	₩ (4,653)	₩ 7,914
Other receivables	144	(14)	130	360	(23)	337
	₩ 9,530	₩ (4,436)	₩ 5,094	₩ 12,927	₩ (4,676)	₩ 8,251
Financial liabilities:						
Trade payables	₩ 50,775	₩ (4,436)	₩ 46,339	₩ 27,071	₩ (4,676)	₩ 22,395

11. Investments in Subsidiaries, Associates and Joint Ventures

Details of investments in subsidiaries, associates and joint ventures as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	Location	Ownership interests (%)	2016	2015
Subsidiaries:				
Doosan Heavy Industries & Construction Co., Ltd. ("DHC")	Korea	36.82	₩ 1,232,946	₩ 1,232,946
Oricom Inc. ("Oricom")	Korea	63.41	23,168	23,168
Doosan Tower Co., Ltd.	Korea	100	231,550	231,550
Doosan Feed & Livestock Co., Ltd.	Korea	100	15,757	15,757
Doosan Hongkong Ltd.	China	100	-	-
Doosan Electro-Materials Singapore Pte Ltd.	Singapore	100	-	-
Doosan Shanghai Chemical Limited	China	100	-	-
Doosan Bears Inc.	Korea	100	11,138	11,138
DIP Holdings Co., Ltd. ("DIP")	Korea	100	164,169	164,169
DLI Corporation[1]	Korea	100	4,000	-
Doosan Information and Communications America LLC	USA	100	4,889	4,889
Doosan Information and Communications China Co., Ltd.	China	100	3,230	3,230
Doosan Information and Communications Europe Ltd.	UK	100	4,870	4,870
Doosan Mottrol (Jiangyin) Co., Ltd.	China	100	21,601	21,601
Doosan Electro-Materials (Changshu) Co., Ltd.	China	100	45,964	45,964
Doosan Electro-Materials America, LLC	USA	100	282	282
Doosan Electro-Materials Luxembourg Sarl	Luxembourg	100	28,111	28,111
Doosan Industrial Vehicle Europe N.A.	Belgium	100	16,934	16,934
Doosan Industrial Vehicle U.K. Ltd.	UK	100	1,909	1,909
Doosan Logistics Europe GmbH	Germany	100	1,909	1,909
Doosan Industrial Vehicle America Corp.	USA	100	27,016	27,016
Doosan Industrial Vehicle Yantai Co., Ltd.	China	100	10,617	10,617
Doosan Fuel Cell America, Inc.	USA	100	61,402	61,402
Treasury share trust[2]	Korea	100	30,000	60,000
			1,941,462	1,967,462
Associates:				
Doosan Cuvex Co.,Ltd [1]	Korea	23.93	33,217	-
Doosan Eco Biznet [3]	Korea	-	-	53
Guang Dong Xingpu Steel Center	China	21.05	2,076	3,854
Prestoliteasia	Korea	28.36	468	468
			35,761	4,375
Joint venture:				
Sichuan Kelun-Doosan Biotechnology Company Limited	China	50	2,526	2,526
			₩ 1,979,749	₩ 1,974,363

[1] During the year ended December 31, 2016, DLI Corporation was newly established and the Company acquired the shares of Doosan Cuvex Co., Ltd. from Doosan Engineering & Construction Co., Ltd.
[2] Investments in treasury share trust for the periods ended December 31, 2016 and 2015 (Note 32).
[3] During the year ended December 31, 2016, it was reclassified from investment to available for sale financial assets as the ownership interests decreased.

Details of quoted price in an active market for the investments in subsidiaries, associates and joint ventures as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016		2015	
	Book amount	**Fair value**	**Book amount**	**Fair value**
Subsidiaries:				
DHC	₩1,232,946	₩1,195,328	₩ 1,232,946	₩ 905,285
Oricom	23,168	43,674	23,168	69,266

12. Property, Plant and Equipment

Changes in property, plant and equipment for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016					
	Land	**Buildings and structures**	**Machinery**	**Others**	**Construction in progress**	**Total**
Opening net book amount	₩ 197,189	₩ 71,556	₩ 96,200	₩ 40,998	₩ 15,000	₩ 420,943
Acquisition / capital expenditures	18,144	16,258	15,837	33,680	85,609	169,528
Reclassification	5,151	9,240	22,518	6,421	(55,601)	(12,271)
Disposal	-	(3,952)	(1,479)	(1,558)	-	(6,989)
Depreciation	(43)	(5,055)	(16,877)	(20,223)	-	(42,198)
Impairments	-	(272)	(10,888)	(224)	-	(11,384)
Closing net book amount	₩ 220,441	₩ 87,775	₩ 105,311	₩ 59,094	₩ 45,008	₩ 517,629
Acquisition cost	₩ 184,341	₩ 136,456	₩ 356,968	₩ 177,530	₩ 45,008	₩ 900,303
Accumulated depreciation (accumulated impairment losses are included)	-	(48,681)	(250,739)	(118,404)	-	(417,824)
Government grants	-	-	(918)	(32)	-	(950)
Accumulated revaluation surplus	36,100	-	-	-	-	36,100

(in millions of Korean won)	2015					
	Land	**Buildings and structures**	**Machinery**	**Others**	**Construction in progress**	**Total**
Opening net book amount	₩ 183,546	₩ 68,826	₩ 109,825	₩ 44,023	₩ 4,621	₩ 410,841
Acquisition / capital expenditures	9,117	4,142	3,672	16,304	21,870	55,105
Government grants	-	-	(13)	(17)	-	(30)
Reclassification	-	3,327	4,620	785	(10,051)	(1,319)
Disposal	-	(306)	(548)	(188)	(1,439)	(2,481)
Depreciation	(43)	(4,434)	(21,356)	(19,909)	-	(45,742)
Net increase (decrease) in revaluation	4,569	-	-	-	-	4,569
Closing net book amount	₩ 197,189	₩ 71,555	₩ 96,200	₩ 40,998	₩ 15,001	₩ 420,943
Acquisition cost	₩ 161,089	₩ 118,529	₩ 331,014	₩ 147,412	₩ 15,001	₩ 773,045
Accumulated depreciation (accumulated impairment losses are included)	-	(46,974)	(233,647)	(106,358)	-	(386,979)
Government grants	-	-	(1,167)	(56)	-	(1,223)
Accumulated revaluation surplus	36,100	-	-	-	-	36,100

The Company recognized the land subsequently measured at revaluation amount; and if the land were stated at cost, the land would amount to ₩184,341 million and ₩161,098 million as at December 31, 2016 and 2015, respectively.

As at December 31, 2016, a certain portion of the Company's land and buildings are pledged as collaterals for loans from KDB and others (Note 31).

Details of revaluation model, which the Company applies to measurement of the land are as follows:

For the year ended December 31, 2016, the Company measured all land assets using revaluation model. As at December 31, 2016, the fair value of land assets was determined from the appraisal that was undertaken by independently qualified valuators, the First Appraisal & Consulting Co., Ltd ("FACC") and Mirae & Saehan Appraisal Co., Ltd., on October 31, 2015.

FACC and Mirae & Saehan Appraisal Co., Ltd. are members of Korea Association of Property Appraisers and comprise of certified professionals that have a significant amount of industry experience.
Fair value hierarchy classifications of the land as at December 31, 2016 and 2015, are as

follows:

(in millions of Korean won)	2016 Level 1	2016 Level 2	2016 Level 3	2015 Level 1	2015 Level 2	2015 Level 3
Land	₩ -	₩ -	₩ 220,441	₩ -	₩ -	₩ 197,189

Valuation techniques and inputs used for fair value measurement of land (level 3) are as follows:

Valuation technique	Significant and unobservable inputs	Correlation between unobservable inputs and fair value arguments
Official Assessed Reference Land Price ("OARLP"): OARLP of similar parcels nearby the subject land and reflating corrections necessary for differences between the subject and the comparable	Fluctuation rate of land price and others	Fair value increases (decreases) if rate of land price increases (decreases).
	Parcel conditions and others	Fair value increases (decreases) if correction of parcel conditions and others increases (decreases).
	Land conditions affecting the sales price and others	Fair value increases (decreases) if correction of land conditions affecting the sales price increases (decreases).

There are no significant differences between the fair value of land in 2016 and revalued amount in 2015.

Changes in revaluation model, for which the Company applies to measure the land during the year ended December 31, 2016, are as follows:

(in millions of Korean won)

Beginning balance	Acquisition	Revaluation: Other comprehensive income	Revaluation: Profit for the period	Others[1]	Ending balance
₩ 197,189	₩ 23,295	₩ -	₩ -	₩ (43)	₩ 220,441

[1] Depreciation related to provision for restoration of land.

- Finance lease assets

Finance lease assets in machinery and supplies as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	**2016**	**2015**
Acquisition cost	₩ 58,742	₩ 54,865
Accumulated depreciation	(46,716)	(42,892)
Book amount	₩ 12,026	₩ 11,973

Details of present value and minimum lease payments of finance leases liabilities as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	**2016**		**2015**	
	Minimum lease payments	**Present value**	**Minimum lease payments**	**Present value**
Within one year	₩ 8,263	₩ 7,775	₩ 10,074	₩ 9,487
Later than one year and not later than five years	8,157	7,811	8,746	8,442
	₩ 16,420	₩ 15,586	₩ 18,820	₩ 17,929
Present value adjustment	(834)		(891)	
Present value of finance leases liabilities	15,586		17,929	

Classification of depreciation expenses for the periods ended December 31, 2016 and 2015, is as follows:

(in millions of Korean won)	**2016**	**2015**
Cost of sales	₩ 33,713	₩ 38,344
Selling and administrative expenses	7,032	5,805
Research and development cost and others	1,453	1,593
	₩ 42,198	₩ 45,742

13. Intangible Assets

Changes in intangible assets for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016				
	Goodwill	Industrial rights	Development costs	Other intangible assets	Total
Opening net book amount	₩ 138,361	₩ 1,318	₩ 3,661	₩ 35,228	₩ 178,568
Acquisition / capital expenditures	-	389	6,889	11,503	18,781
Government grants	-	-	(1,898)	-	(1,898)
Reclassification	-	-	706	11,565	12,271
Disposal	-	(12)	-	(207)	(219)
Amortization	-	(402)	(1,232)	(11,758)	(13,392)
Closing net book amount	₩ 138,361	₩ 1,293	₩ 8,126	₩ 46,331	₩ 194,111
Acquisition cost	₩ 138,361	₩ 3,386	₩ 23,653	₩ 98,091	₩ 263,491
Accumulated amortization (accumulated impairment losses are included)	-	(2,093)	(10,066)	(51,760)	(63,919)
Government grants	-	-	(5,461)	-	(5,461)

(in millions of Korean won)	2015				
	Goodwill	Industrial rights	Development costs	Other intangible assets	Total
Opening net book amount	₩ 138,361	₩ 1,257	₩ 3,402	₩ 39,853	₩ 182,873
Acquisition / capital expenditures	-	615	1,687	3,818	6,120
Government grants	-	-	(371)	-	(371)
Reclassification	-	-	-	1,319	1,319
Disposal	-	(33)	-	-	(33)
Amortization	-	(515)	(1,057)	(9,762)	(11,334)
Impairments	-	(6)	-	-	(6)
Closing net book amount	₩ 138,361	₩ 1,318	₩ 3,661	₩ 35,228	₩ 178,568
Acquisition cost	₩ 138,361	₩ 3,428	₩ 32,682	₩ 77,841	₩ 252,312
Accumulated amortization (accumulated impairment losses are included)	-	(2,110)	(24,769)	(42,613)	(69,492)
Government grants	-	-	(4,252)	-	(4,252)

The book amount of membership with indefinite useful lives in other intangible assets item is ₩14,425 million and ₩14,616 million as at December 31, 2016 and 2015, respectively.

Meanwhile, expenditure on research and development, which was recognized as an expense, amounted to ₩29,282 million and ₩28,059 million for the periods ended December 31, 2016 and 2015, respectively.

Details of impairment test of goodwill, are as follows:

Goodwill allocated to the CGU as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)

CGUs	2016	2015	Description
Mottrol BG	₩ 84,562	₩ 84,562	Manufacturing and sale of hydraulic components
Information and communications BU	2,015	2,015	Operation and development of software
FM BU	6,420	6,420	Building maintenance service
Industrial vehicles BG	15,076	15,076	Manufacturing and sale of forklifts
Fuel Cell BG	30,288	30,288	Manufacturing and sale of fuel cell
	₩138,361	₩138,361	

The recoverable amount of a CGU is determined based on a value-in-use calculation and a discount rate used as follows:

	Mottrol BG	Information and communications BU	FM BU	Industrial vehicles BG	Fuel Cell BU
Discount rate	9.8%	9.3%	13.6%	7.6%	11.9%
Long-term sustainable growth rate	1.0%	0%	0%	0%	1.0%

The Company uses cash flow projections based on financial budgets approved by the directors covering five-year periods for a value-in-use calculation. The financial budgets are determined based on historical result and expectation of market growth. Cashflows beyond that five-year periods have been estimated using expected growth rate, and the growth rate does not exceed long-term average growth rate of market. The discount rates used reflect relevant risks specific to the CGUs.

The carrying value of cash generating units does not exceed the recoverable amount of the CGU calculated based on value in use. Therefore, no impairment loss is recognized related to goodwill for the year ended December 31, 2016.

A reasonably possible change in a key assumption would cause the change of recoverable amount. So, management has observed related sales and industrial trend subsequently. Meanwhile, if discount rate changes by 50 basis points, no additional impairment losses will be incurred.

Classification of amortization expense for the periods ended December 31, 2016 and 2015, is as follows:

(in millions of Korea won)	2016	2015
Cost of sales	₩ 3,056	₩ 3,046
Selling and administrative expenses	10,155	8,113
Research and development cost and others	180	175
	₩ 13,391	₩ 11,334

14. Investment Properties

Changes in investment properties for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korea won)	2016			2015		
	Land	Building	Total	Land	Building	Total
Beginning balance	₩ 163,851	₩ 2,703	₩ 166,554	₩ 261,312	₩ 4,186	₩ 265,498
Disposal	(26,571)	(1,410)	(27,981)	(109,625)	(1,412)	(111,037)
Fair value gain (loss)	(1,333)	(61)	(1,394)	7,664	(71)	7,593
Others	-	-	-	4,500	-	4,500
Ending balance	₩ 135,947	₩ 1,232	₩ 137,179	₩ 163,851	₩ 2,703	₩ 166,554

Certain of the Company's land and buildings included in the above investment properties are pledged as collaterals for borrowings from Woori Bank and others (Note 31).

Details of fair value model that the Company applies to measurement of investment properties are as follows:

For the year ended December 31, 2016, the Company measured all investment properties using revaluation model. As at December 31, 2016, the fair value of investment properties was determined from the appraisal that was undertaken by independently qualified valuators, the First Appraisal & Consulting Co., Ltd ("FACC") and Mirae & Saehan Appraisal Co., Ltd., on November 30, 2016.

FACC and Mirae & Saehan Appraisal Co., Ltd. are members of Korea Association of Property Appraisers and comprise of certified professionals who have a significant amount of industry experience.

Fair value hierarchy classifications of investment properties as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016			2015		
	Level 1	**Level 2**	**Level 3**	**Level 1**	**Level 2**	**Level 3**
Land	₩ -	₩ -	₩ 135,947	₩ -	₩ -	₩ 163,851
Buildings	-	-	1,232	-	-	2,703

Valuation techniques and inputs used for fair value measurement of land assets (level 3) are as follows:

Valuation technique	**Significant and unobservable inputs**	**Correlation between unobservable inputs and fair value arguments**
OARLP approach : OARLP of similar parcels nearby the subject land and reflating corrections are necessary for differences between the subject and the comparable.	Fluctuation rate of land price and others	Fair value increases (decreases) if rate of land price increases (decreases).
	Parcel conditions and others	Fair value increases (decreases) if correction of parcel conditions and others increases (decreases).
	Land conditions affecting the sales price and others	Fair value increases (decreases) if correction of land conditions affecting the sales price increases (decreases).
Estimated cost price approach: Fair value is based on depreciation and replacement costs considered with structure, building materials, construction condition, building equipment, end use, present condition and management condition.	Replacement cost	Fair value decreases (increase) if replacement cost increases (decreases).

Changes in revaluation model, which the Company applies to investment properties for the year ended December 31, 2016, are as follows:

(in millions of Korean won)

		Revaluation		
Beginning balance	**Acquisition (disposal)**	**Other comprehensive income**	**Loss for the period**	**Ending balance**
₩ 163,851	₩ (26,571)	₩ -	₩ (1,333)	₩ 135,947

15. Bonds and Borrowings

Details of bonds and borrowings as at December 31, 2016 and 2015, are as follows:

(a) Bonds

(in millions of Korean won)	Annual interest rate (%)	2016	2015
The 281-2nd	-	₩ -	₩ 80,000
The 282-2nd	-	-	80,000
The 283-1st	3.84	20,000	20,000
The 283-2nd	4.27	80,000	80,000
The 284	4.33	100,000	100,000
The 285	3.95	60,000	-
The 286	4.42	75,000	-
		335,000	360,000
Discount on bonds payable		(982)	(683)
		334,018	359,317
Transfer of current portion of long-term bonds		(19,986)	(159,847)
- Principal amount of bonds		20,000	160,000
- Discount on bonds payable		(14)	(153)
		₩ 314,032	₩ 199,470

(b) Short-term borrowings

(in millions of Korean won)	Creditor	Annual interest rate (%)	2016	2015
Usance and D/A, D/P	Woori Bank and others	1.36-2.39	₩ 4,306	₩ 2,276
General borrowings	Shinhan Bank and others	2.54-3.84	449,273	184,000
			₩ 453,579	₩ 186,276

Financial liabilities related to transferred trade receivables, which did not meet the derecognition criteria, amounted to ₩4,306 million and ₩2,276 million as at December 31, 2016 and 2015, respectively. The trade receivables were pledged as collaterals for these liabilities (Note 30).

(c) Long-term borrowings

(in millions of Korean won)

Creditor	Annual interest rate (%)	2016	2015
Borrowings in Korean won:			
KDB	2.89-3.25	₩ 60,000	₩ 85,000
Woori Bank	3.63	50,000	50,000
Shinhan Bank	3.42	40,000	40,000
Kookmin Bank	2.30-2.92	5,088	5,135
Nonghyup Bank	3.02	30,000	30,000
KEB Hana Bank	3.52	25,000	50,000
Borrowings in foreign currency:			
KDB	2.99	30,213	29,300
Korea Exim Bank and others	2.83	55,591	53,912
		295,892	343,347
Present value discounts		(59)	(78)
		295,833	343,269
Transfer of current portion of long-term borrowings		(85,301)	(120,059)
		₩ 210,532	₩ 223,210

16. Net Defined Benefit Liabilities

The Company operates a defined benefit plan for employees, and the actuarial valuation of plan assets and the defined benefit obligations is performed by a reputable actuary using the projected unit credit method.

Details of net defined benefit liabilities as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016	2015
Present value of defined benefit obligations	₩ 160,432	₩ 146,339
Fair value of plan assets	(122,898)	(102,504)
Net defined benefit liabilities	₩ 37,534	₩ 43,835

Post-employment benefits recognized in the separate statements of profit or loss for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016	2015
Current service cost	₩ 20,674	₩ 20,496
Net interest cost	1,516	1,678
	₩ 22,190	₩ 22,174

Details of post-employment benefits recognized in the separate statements of profit or loss for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)		2016		2015
Cost of sales	₩	13,250	₩	13,398
Selling and administrative expenses		8,718		8,702
Others		222		74
	₩	22,190	₩	22,174

Movements in the net defined benefit liabilities for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)		2016				
		Defined benefit obligations		**Plan assets**		**Net defined benefit liabilities**
Beginning balance	₩	146,339	₩	(102,504)	₩	43,835
Current service cost		20,674		-		20,674
Interest expense (income)		4,075		(2,559)		1,516
		24,749		(2,559)		22,190
Remeasurements:						
Return on plan assets (excluding amounts included in interest income)		-		1,349		1,349
Actuarial loss from change in demographic assumptions		(977)		-		(977)
Actuarial gain from change in financial assumptions		815		-		815
Others		(949)		-		(949)
		(1,111)		1,349		238
Transfer in		3,173		(1,396)		1,777
Transfer out		(3,058)		1,919		(1,139)
Contributions by employer directly to plan assets		-		(25,360)		(25,360)
Benefit payments		(9,660)		5,653		(4,007)
Ending balance	₩	160,432	₩	(122,898)	₩	37,534

(in millions of Korean won)	2015		
	Defined benefit obligations	**Plan assets**	**Net defined benefit liabilities**
Beginning balance	₩ 126,146	₩ (81,793)	₩ 44,353
Current service cost	20,496	-	20,496
Interest expense (income)	4,121	(2,443)	1,678
	24,617	(2,443)	22,174
Remeasurements:			
Return on plan assets (excluding amounts included in interest income)	-	792	792
Actuarial loss from change in demographic assumptions	(985)	-	(985)
Actuarial gain from change in financial assumptions	2,576	-	2,576
Others	557	-	557
	2,148	792	2,940
Transfer in	3,768	(1,337)	2,431
Transfer out	(1,830)	779	(1,051)
Contributions by employer directly to plan assets	-	(23,510)	(23,510)
Benefit payments	(8,510)	5,008	(3,502)
Ending balance	₩ 146,339	₩ (102,504)	₩ 43,835

The significant actuarial assumptions as at December 31, 2016 and 2015, are as follows:

	2016	**2015**
Discount rate	2.8%	2.9%
Salary growth rate	Employee 2.0~6.2%	Employee 2.6~6.0%
	Executive 3.2%	Executive 2.8%

Plan assets as at December 31, 2016 and 2015, consist of:

(in millions of Korean won)	**2016**	**2015**
Equity securities	₩ 799	₩ 797
Debt securities	2,352	2,534
Deposits and others	119,747	99,173
	₩ 122,898	₩ 102,504

Plan assets are mostly invested in assets that have a quoted market price in an active market.

The sensitivity analysis of the defined benefit obligation as at December 31, 2016 and 2015, is as follows:

(in millions of Korean won)	2016				2015			
	Discount rate		Salary growth rate		Discount rate		Salary growth rate	
	1% increase	1% decrease	1% increase	1% decrease	1% increase	1% decrease	1% increase	1% decrease
Amount	₩ (10,325)	₩ 11,716	₩ 11,044	₩ (9,957)	₩ (8,848)	₩ 10,177	₩ 9,843	₩ (8,737)
Ratio	(-)6.44%	7.31%	6.89%	(-)6.21%	(-)6.05%	6.96%	6.73%	(-)5.98%

The expected maturity analysis of defined benefit obligations as at December 31, 2016, is as follows:

(in millions of Korean won)	Less than 1 year	Between 1-2 years	Between 2-5 years	Between 5-10 years	Total
Expected contribution	₩ 11,877	₩ 30,603	₩ 48,595	₩ 91,635	₩ 182,710

The Company expects to contribute ₩ 24,224 million for the defined benefit plans in 2017.

17. Provisions

Changes in provisions for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016					
	Beginning balance	**Addition (Reversal)**	**Used**	**Ending balance**	**Current**	**Non-current**
Provision for product warranties	₩ 5,692	₩ (442)	₩ (1,020)	₩ 4,230	₩ 4,230	₩ -
Provision for restoration	795	54	-	849	-	849
Other provisions	140	-	(103)	37	37	-
	₩ 6,627	₩ (388)	₩ (1,123)	₩ 5,116	₩ 4,267	₩ 849

(in millions of Korean won)	2015					
	Beginning balance	**Addition (Reversal)**	**Used**	**Ending balance**	**Current**	**Non-current**
Provision for product warranties	₩ 6,430	₩ 870	₩ (1,608)	₩ 5,692	₩ 5,692	₩ -
Provision for restoration	743	52	-	795	-	795
Other provisions	119	60	(39)	140	140	-
	₩ 7,292	₩ 982	₩ (1,647)	₩ 6,627	₩ 5,832	₩ 795

The Company estimates expenditure required to settle the Company's obligations from product warranty, refund, related after service and others based on warranty period, and historical claim rate and recognizes provisions based on the estimated expenditure.

18. Share Capital and Share Premium

Changes in share capital and share premium for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won and in shares)	Number of shares		Share capital			
	Ordinary shares	Preferred shares	Ordinary shares	Preferred shares	Total	Share premium
Balance at January 1, 2015	21,270,888	5,396,759	₩107,854	₩26,984	₩134,838	₩355,736
Balance at December 31, 2015	21,270,888	5,396,759	₩107,854	₩26,984	₩134,838	₩355,736
Balance at January 1, 2016	21,270,888	5,396,759	₩107,854	₩26,984	₩134,838	₩355,736
Retirement of shares	(1,064,000)	-	-	-	-	-
Balance at December 31, 2016	20,206,888	5,396,759	₩107,854	₩26,984	₩134,838	₩355,736

The Company's total number of authorized to issue shares is 400,000,000 shares with a par value of ₩5,000 per share. There is a difference arising from retirement of shares through retained earnings during 2016 and before 2015, and share capital is not the same as total par value of shares issued.

The number of ordinary shares that have limitation on voting right under commercial law is 5,276,455 shares and 5,977,528 shares as at December 31, 2016 and 2015, respectively. Preferred shares does not have voting right.

19. Capital Surplus

Details of capital surplus as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won):	2016	2015
Share premium	₩ 355,736	₩ 355,736
Gain from merger	1,390	1,390
Other reserves	43,565	33,414
Revaluation reserve	277,542	277,542
	₩ 678,233	₩ 668,082

20. Other Components of Equity

Other components of equity as at December 31, 2016 and 2015, consist of:

(in millions of Korean won)		2016		2015
Treasury shares	₩	(296,831)	₩	(300,920)
Loss on sale of treasury shares		(16,738)		(16,738)
Stock option		12,296		18,426
Loss on capital reduction		(127,319)		(127,319)
	₩	(428,592)	₩	(426,551)

- *Treasury shares*

The Company held treasury shares for the purpose of stabilizing the share price and changes in treasury shares for the year ended December 31, 2016, are as follows:

(in millions of Korean won and in shares)	Number of treasury shares			Book amount of treasury shares		
	Ordinary share	Preferred share	Total	Ordinary share	Preferred share	Total
Beginning balance	5,426,298	673,054	6,099,352	₩(285,867)	₩(15,053)	₩(300,920)
Acquisition	563,830	-	563,830	(59,457)	-	(59,457)
Disposal (retirement of shares)	(1,064,000)	-	(1,064,000)	63,546	-	63,546
Ending balance	4,926,128	673,054	5,599,182	₩(281,778)	₩(15,053)	₩(296,831)

- *Share-based payment*

The Company has granted stock options to its directors several times. Stock options are settled based on the Board of Directors' decision by issuance of new share, treasury share or cash settlement. Vesting condition offers two-year service after the resolution at the shareholders' meeting.

Details of stock options as at December 31, 2016, are as follows:

(in Korean won and in shares)

	Date of grant	Number of granted options	Exercise period	Exercise price	Expected fair value at the date of grant
8th	2007.3.16	800	2010.3.16 - 2017.3.15	₩ 59,600	₩ 28,930
9th	2008.3.21	11,900	2011.3.21 - 2018.3.20	165,100	68,846
10th	2009.3.27	2,250	2012.3.27 - 2019.3.26	106,500	53,382
12th	2010.3.26	40,810	2013.3.26 - 2020.3.26	116,500	56,460
13th	2011.3.25	16,300	2014.3.25 - 2021.3.25	137,500	68,045
14th	2012.3.30	25,000	2015.3.30 - 2022.3.30	156,200	63,647
15th	2013.3.29	53,000	2016.3.29 - 2023.3.28	128,100	43,353
16th	2014.3.28	101,900	2017.3.28 - 2024.3.27	134,300	39,558

The Company measured the stock options by fair value approach. The related assumptions to measure the cost of the stock options granted are as follows:

	Risk-free interest rate	Expected option life	Expected price volatility	Expected dividend yield ratio
8th	4.79%	3.00	46.73%	0%
9th	5.18%	3.00	58.89%	0%
10th	3.71%	3.53	69.82%	22%
12th	3.82%	3.27	71.67%	35%
13th	3.66%	3.29	73.42%	40%
14th	3.57%	3.41	62.76%	43%
15th	2.45%	3.42	49.22%	46%
16th	2.88%	3.60	40.90%	48%

Risk-free interest rate is based on a three-year treasury bond yield rate.

Changes in stock options for the year ended December 31, 2016, are as follows:

(in shares)	Number of ordinary shares to be issued				
	Beginning	**Granted**	**Exercised**	**Forfeited**	**Ending**
8th	800	-	-	-	800
9th	21,600	-	-	(9,700)	11,900
10th	2,450	-	-	(200)	2,250
12th	68,260	-	-	(27,450)	40,810
13th	31,300	-	-	(15,000)	16,300
14th	46,200	-	-	(21,200)	25,000
15th	92,400	-	-	(39,400)	53,000
16th	110,600	-	-	(8,700)	101,900
	373,610	-	-	(121,650)	251,960

(in millions of Korean won)	Valuation amount				
	Beginning balance	**Granted**	**Exercised**	**Forfeited**	**Ending balance**
8th	₩ 23	₩ -	₩ -	₩ -	₩ 23
9th	1,487	-	-	(668)	819
10th	131	-	-	(11)	120
12th	3,854	-	-	(1,550)	2,304
13th	2,130	-	-	(1,021)	1,109
14th	2,940	-	-	(1,349)	1,591
15th	4,006	-	-	(1,708)	2,298
16th	3,854	177	-	-	4,031
	₩ 18,425	₩ 177	₩ -	₩ (6,307)	₩12,295

The weighted-average remaining contractual period of stock options is 5.62 years.

21. Accumulated Other Comprehensive Income

Accumulated other comprehensive income as at December 31, 2016 and 2015, consist of:

(in millions of Korean won)		2016		2015
Cash flow hedge	₩	(2,684)	₩	941
Revaluation of land		42,022		42,022
	₩	39,338	₩	42,963

22. Retained Earnings

Retained earnings as at December 31, 2016 and 2015, consist of:

(in millions of Korean won)		2016		2015
Legal reserves	₩	52,863	₩	43,737
Discretionary reserves		51,666		74,999
Retained earnings before appropriation		1,584,204		1,571,189
	₩	1,688,733	₩	1,689,925

The Commercial Code of the Republic of Korea requires the Company to appropriate for each financial period, as a legal reserve, an amount equal to a minimum of 10% of cash dividends paid until such reserve equals 50% of its issued share capital.

Changes in retained earnings for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)		2016		2015
Beginning balance	₩	1,689,925	₩	1,641,097
Profit for the period		153,802		123,324
Actuarial loss on retained earnings		(181)		(2,229)
Dividends payments		(91,267)		(72,267)
Retirement of shares		(63,546)		-
Ending balance	₩	1,688,733	₩	1,689,925

The appropriation of retained earnings for the periods ended December 31, 2016 and 2015, is as follows:

The appropriation of retained earnings for the year ended December 31, 2016, is expected to be appropriated at the shareholders' meeting on March 31, 2017. The appropriation date for the year ended December 31, 2015, was March 25, 2016.

(in Korean won)	**2016**	**2015**
Unappropriated retained earnings		
Unappropriated retained earnings carried over from prior year	₩ 1,494,128,278,455	₩ 1,450,094,702,354
Profit for the period	153,802,056,181	123,323,659,813
Remeasurements of defined benefit plan	(180,539,444)	(2,229,208,977)
Retirement of treasury shares	(63,545,813,297)	-
Transfers retained earnings		
Reversal of research and development reserves	25,000,000,000	23,333,000,000
Appropriation of retained earnings		
Earned profit reserves	10,042,561,690	9,126,715,885
Dividends	100,425,616,900	91,267,158,850
Unappropriated retained earnings to be carried forward	₩ 1,498,735,803,305	₩ 1,494,128,278,455

Details of dividends for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won and in shares)	**2016**			**2015**		
	Preferred shares (old)	**Preferred shares (new)**	**Ordinary shares**	**Preferred shares (old)**	**Preferred shares (new)**	**Ordinary shares**
Face value per share	₩ 5,000	₩ 5,000	₩ 5,000	₩ 5,000	₩ 5,000	₩ 5,000
Year-end dividends:						
Number of shares issued	4,411,074	985,685	20,206,888	4,411,074	985,685	21,270,888
Number of treasury shares	(620,812)	(52,242)	(5,276,455)	(620,812)	(52,242)	(5,977,528)
Shares eligible for dividends	3,790,262	933,443	14,930,433	3,790,262	933,443	15,293,360
Rate of dividend per face value	103%	102%	102%	92%	91%	91%
Dividend per share (in Korean won)	₩ 5,150	₩ 5,100	₩ 5,100	₩ 4,600	₩ 4,550	₩ 4,550
Dividend amount	19,520	4,761	76,145	17,435	4,247	69,585
Average closing price[1](in Korean won)	70,480	70,200	112,300	61,300	61,175	95,050
Dividend yield	7.31%	7.26%	4.54%	7.50%	7.44%	4.79%

[1] Average of prices in the stock market for one week preceding the two business days before the record date of the shareholders' list related to above dividends.

23. Revenues

Details of revenues for the periods ended December 31, 2016 and 2015, are as follows

(in millions of Korean won)		2016		2015
Sales of goods				
Manufactured products	₩	1,317,929	₩	1,342,711
Merchandise		327,226		152,556
		1,645,155		1,495,267
Others				
Dividend		179,334		114,334
Others		242,647		263,955
		421,981		378,289
	₩	2,067,136	₩	1,873,556

24. Breakdown of Expenses by Nature

Breakdown of expenses by nature for the periods ended December 31, 2016 and 2015, is as follows:

(in millions of Korean won)		2016		2015
Changes in inventories	₩	(62,552)	₩	35,278
Purchases of raw materials and goods		992,934		790,371
Employee benefits expenses		354,092		348,575
Depreciation and amortization		55,589		57,072
Others		501,701		428,859
Total cost of sales and administrative expenses	₩	1,841,764	₩	1,660,155

25. Selling and Administrative Expenses

Selling and administrative expenses for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)		**2016**		**2015**
Salaries	₩	105,157	₩	103,356
Post-employment benefits		7,881		7,810
Employee benefits		21,637		18,903
Travel expenses		8,983		7,254
Utility expenses		2,137		1,523
Sales commission		18,761		20,061
Taxes and dues		3,929		4,045
Rental expenses		24,171		14,976
Depreciation		7,032		5,805
Entertainment expenses		2,998		3,102
Advertising expenses		24,918		6,149
Packaging expenses		2,552		2,036
Research and development		29,282		28,059
Training expenses		5,685		7,328
Freight expenses		8,056		6,280
Commission expenses		52,989		21,462
Maintenance of office		3,216		2,878
Service contract expenses		15,345		5,008
Samples expenses		1,952		1,474
Impairment loss		1,543		77
Amortization		10,155		8,113
Others		6,545		7,380
	₩	364,924	₩	283,079

26. Finance Income and Costs

Details of finance income and costs for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)		**2016**		**2015**
Finance income				
Interest income	₩	6,692	₩	3,501
Dividend income		25		26
Gain on foreign currency transactions		17,900		16,736
Gain on foreign currency translations		12,211		3,433
Gain on derivatives transactions		-		57
Gain on valuation of derivatives		260		-
Gain on exemption of debt		-		351
Financial guarantee income		1,588		1,418
		38,676		25,522
Finance costs				
Interest expense		38,164		38,209
Loss on foreign currency transactions		19,612		13,097
Loss on foreign currency translations		17,087		7,021
Loss on derivatives transactions		9		201
Loss on valuation of derivatives		104		21
		74,976		58,549
Finance costs, net	₩	(36,300)	₩	(33,027)

27. Other Non-operating Income and Expenses

Details of other non-operating income and expenses for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016	2015
Non-operating income		
Gain on disposal of long-term investment securities	₩ -	₩ 1,393
Gain on disposal of property, plant and equipment	971	1,358
Gain on disposal of intangible assets	112	-
Gain on disposal of investment properties	235	401
Gain on valuation of investment properties	934	7,702
Others	1,751	7,966
	4,003	18,820
Non-operating expenses		
Loss on disposal of trade receivables	2,819	1,678
Impairment loss on investments in subsidiaries	-	11,986
Loss on disposal of property, plant and equipment	5,216	336
Impairment loss on property, plant and equipment	11,384	22
Loss on disposal of intangible assets	142	34
Impairment loss on intangible assets	-	6
Loss on disposal of investment properties	1,025	350
Loss on valuation of investment properties	2,327	109
Donations	7,162	16,674
Others	8,702	7,964
	38,777	39,159
Other non-operating expenses, net	₩ (34,774)	₩ (20,339)

28. Tax Expense and Deferred Tax

Income tax expense for the periods ended December 31, 2016 and 2015, consists of:

(in millions of Korean won)		2016		2015
Current tax on profits for the year	₩	4,019	₩	59,621
Deferred tax:				
Origination and reversal of temporary differences		(6,789)		(21,291)
Charged or credited directly to equity		1,215		(1,619)
Others		2,050		-
Income tax expenses	₩	495	₩	36,711

The movement in deferred tax assets and liabilities during the periods ended December 31, 2016 and 2015, is as follows:

(in millions of Korean won)	2016							
			Changes					
		Beginning balance		Profit or loss		Equity		Ending balance
Accrued revenues	₩	(13)	₩	7	₩	-	₩	(6)
Loss on valuation of inventories		1,801		(35)		-		1,766
Investment in securities		5,844		(4,972)		-		872
Property, plant and equipment		(24,988)		3,554		-		(21,434)
Investment properties		(15,162)		2,238		-		(12,924)
Accrued expenses		11,966		593		-		12,559
Post-employment benefit obligations		7,861		(1,102)		58		6,817
Reserve for research and human resource		(12,834)		6,381		-		(6,453)
Others		6,476		(1,090)		1,157		6,543
	₩	(19,049)	₩	5,574	₩	1,215	₩	(12,260)

(in millions of Korean won)	2015							
			Changes					
	Beginning balance		Profit or loss		Equity		Ending balance	
Accrued revenues	₩	(26)	₩	13	₩	-	₩	(13)
Loss on valuation of inventories		1,675		126		-		1,801
Investment in securities		6,678		(834)		-		5,844
Property, plant and equipment		(38,945)		15,059		(1,102)		(24,988)
Investment properties		(18,393)		3,231		-		(15,162)
Accrued expenses		11,147		819		-		11,966
Post-employment benefit obligations		7,797		(648)		712		7,861
Reserve for research and human resource		(18,811)		5,977		-		(12,834)
Others		8,538		(833)		(1,229)		6,476
	₩	(40,340)	₩	22,910	₩	(1,619)	₩	(19,049)

There are no temporary differences, net loss and tax credit carryforwards, which have not been recognized as deferred tax assets.

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

Details of unrecognized taxable temporary differences as deferred tax liabilities related to investments in subsidiaries, joint ventures and associates as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)	2016		2015		Remarks
Investments in subsidiaries	₩	931,409	₩	799,282	Able to control the reversal of the temporary difference

The aggregate deferred tax relating to items that are charged or credited directly to equity for the periods ended December 31, 2016 and 2015, is as follows:

(in millions of Korean won)	2016			2015		
	Before tax	**Tax effect**	**After tax**	**Before tax**	**Tax effect**	**After tax**
Gain (loss) on valuation of derivatives	₩ (3,540)	₩ 857	₩ (2,683)	₩ 1,241	₩ (300)	₩ 941
Revaluation surplus	55,437	(13,415)	42,022	55,437	(13,415)	42,022
Remeasurement of net defined benefit liabilities	(18,077)	4,375	(13,702)	(17,839)	4,317	(13,522)
	₩ 33,820	₩ (8,183)	₩ 25,637	₩ 38,839	₩ (9,398)	₩ 29,441

The tax on the Company's profit before tax differs from the theoretical amount that would arise using the weighted average tax rate applicable to profits as follows:

(in millions of Korean won)	2016	2015
Profit before income tax expense	₩ 154,297	₩ 160,035
Tax at domestic tax rates applicable to profits	36,878	38,266
Adjustments:		
Non-temporary difference	(33,357)	(7,125)
Temporary difference not recognized as deferred tax	487	(5,864)
Tax credits	(3,994)	(3,600)
Additional income tax paid(refunded) for prior periods	(512)	15,082
Others	993	(48)
Income tax expense	₩ 495	₩ 36,711
Effective tax rate (Income tax expense/Profit before income tax expense)	0.32%	22.94%

29. Earnings per Share

(a) Basic earnings per share

Basic earnings per share for the periods ended December 31, 2016 and 2015, are as follows:

(in Korean won)		2016		2015
Basic earnings per ordinary share	₩	7,800	₩	6,090
Basic earnings per old-type preferred share[1]		7,850		6,140

[1] The Company calculated earnings per share for old-type preferred share due to the nature of the share, which does not have preferred right on dividends and liquidation; therefore, the share is considered as ordinary share based on Korean IFRS 1033 ‘Earnings per share’.

Profit attributable to ordinary shares is as follows:

(in Korean won)		2016		2015
Profit attributable to the ordinary equity holders of the Parent Company	₩	153,802,056,181	₩	123,323,659,813
(-)Expected dividends on new-type preferred shares		4,760,559,300		3,733,772,000
(-)Expected residual income attributable to new-type preferred shares		2,520,280,121		1,950,902,255
(-)Expected profit attributable to old-type preferred shares		29,753,491,819		23,272,234,606
Profit attributable to ordinary shares	₩	116,767,724,941	₩	94,366,750,952

The weighted-average number of ordinary shares and old-type preferred shares outstanding used in the earnings per share calculation is as follows:

(in shares)	2016		2015	
	Ordinary shares	Old-type preferred shares	Ordinary shares	Old-type preferred shares
Beginning outstanding shares	15,280,760	3,790,262	15,853,290	3,790,262
Change in treasury shares	(310,506)	-	(357,946)	-
Weighted-average number of ordinary shares outstanding	14,970,254	3,790,262	15,495,344	3,790,262

(b) Diluted earnings per share

Diluted earnings per share for the periods ended December 31, 2016 and 2015, are as follows:

(in Korean won)		2016		2015
Diluted earnings per share	₩	7,800	₩	6,090
Diluted earnings per old-type preferred share		7,850		6,140

Diluted profit attributable to ordinary shares is as follows:

(in Korean won)		2016		2015
Profit attributable to ordinary shares	₩	116,767,724,941	₩	94,366,750,952
Share-based expense (after tax)		-		-
Diluted profit attributable to ordinary shares	₩	116,767,724,941	₩	94,366,750,952

The weighted-average number of ordinary shares outstanding used in the earnings per share is calculated as follows:

(in shares)		2016		2015
Weighted-average number of ordinary shares outstanding	₩	14,970,254	₩	15,495,344
Effect of stock option exercise		314		434
Adjusted weighted-average number of ordinary shares outstanding	₩	14,970,568	₩	15,495,778

Diluted earnings per share for old-type preferred share equals the basic earnings per share since there is no potential ordinary share for old-type preferred share.

Conditions for preferred shares dividends are as follows:

(in Korean won, in shares)		Face value	Number of shares issued
Old-type preferred share [1]	₩	5,000	4,411,074
New-type preferred share [2]		5,000	985,685

[1] The Company should distribute cash dividend available to ordinary shares +1%.
[2] The Company should distribute 2% of face value of preferred share annually. In case the dividend rate of ordinary share exceeds that of preferred share, preferred share is participated in dividend for the exceeded dividend.

30. Contingencies and Commitments

(a) Notes, bills and checks offered in security

The Company pledged a blank note to Korea Defense Industry Association as collaterals for long-term borrowings and performance guarantee agreements.

(b) Loan ceiling

As at December 31, 2016, loan ceilings of the Company are as follows:

(in thousands of foreign currency, in millions of Korean won)	**Financial institutions**	**Limitation**	
Overdraft	Woori Bank and others	KRW	15,000
General loans	Shinhan Bank and others	KRW	592,272
Other loans	Korea Exim Bank and others	KRW	230,357
L/C payment guarantee	KDB and others	USD	67,700
		KRW	837,629
		USD	67,700

(c) Transferred trade receivables

Outstanding trade receivables sold with recourse by the Company are in the amount of ₩ 4,306 million and ₩ 2,276 million as at December 31, 2016 and 2015, respectively. Because the Company retains some level of risks and rewards relating to trade receivables, the Company has recognized its book amount of it and cash receipt from transfer as short-term borrowings in separate statements of financial position (Note 15).

(d) Litigation in progress

The Company is involved in pending lawsuits as a defendant with claims exposure of ₩ 16,923 million as at December 31, 2016. The ultimate outcome of such pending lawsuits cannot presently be determined.

(e) Technical contract

The Company has technical license agreements for the purpose of manufacturing specific products with Nabtesco, Horstman and others for the year ended December 31, 2016, and the Company paid ₩ 578 million as license fee.

(f) Payment guarantees

As at December 31, 2016, details of payment guarantees provided by the Company for third parties are as follows:

(in thousands of foreign currency, in millions of Korean won)

Provided to	Amount	Description
Subsidiaries:		
Doosan Mottrol (Jiangyin) Co., Ltd.	USD 7,000	An on-site certification of payment
	CNY 95,000	An on-site certification of payment
Doosan Electro Materials (Changshu) Co., Ltd.	USD 55,500	An on-site certification of payment
Doosan Electro-Materials Luxembourg Sarl	USD 30,000	An on-site certification of payment
Circuit Foil Luxembourg Sarl	EUR 14,500	An on-site certification of payment
Doosan Industrial Vehicle U.K	GBP 29,400	An on-site certification of payment
Doosan Industrial Vehicle Yantai Co., Ltd.	USD 10,000	An on-site certification of payment
Doosan Fuel Cell America, Inc.	USD 162,253	An on-site certification of payment
	KRW 2,285	An on-site certification of payment
Korea Tax Exemption Limit Institute Corp.	KRW 694	Performance guarantees
	USD 264,753	
	CNY 95,000	
	GBP 29,400	
	EUR 14,500	
	KRW 2,979	

As at December 31, 2016, details of payment guarantees received from third parties are as follows:

(in thousands of foreign currency, in millions of Korean won)

Provided from	Amount	Description
Seoul Guarantee Insurance	KRW 26,437	Performance guarantee
Korea Defense Industry Association and others	KRW 50,571	Performance guarantee
Machinery Financial Cooperative	KRW 29,333	Performance guarantee
Korea Software Financial Cooperative [1]	KRW 4,287	Performance guarantee
KDB and others	USD 20,752	L/C payment guarantee
	KRW 110,628	
	USD 20,752	

[1] Equity investments are pledged as collaterals.

(g) Ordinary wages

The Company may have to pay additional wages, if regular bonuses and other salaries fall under the category of ordinary wages. But, the Company sees the possibility of the likeliness of having to pay related amounts to be low, based on the Supreme Court decision.

31. Pledged Assets

The Company pledged certain assets as collaterals for its financial liabilities as at December 31, 2016, as follows:

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

Institution	Asset	Related account	Financial liabilities	Collateralized value
Kookmin Bank	Chang-won employee apartment	Property, plant and equipment and investment properties	KRW 89	KRW 605
KDB	Jeung-pyeong, Ik-san plant and Chang-won plant and others		KRW 110,000 USD 25,000	KRW 217,490 USD 29,761
Woori Bank	Shin-gal plant, Anmyeondo land and others		KRW 150,000	KRW 137,000
Shinhan Bank	Incheon plant		KRW 40,000	KRW 40,000

32. Related Party Transactions

The related parties of the Company and nature of their relationship with the Company as at December 31, 2016, are as follows:

	Company
Subsidiaries	DHC and subsidiaries
	Doosan Infracore Co., Ltd. ("DI") and its subsidiaries
	Doosan Engineering & Construction Co., Ltd. ("DEC") and its subsidiaries
	Doosan Engine Co., Ltd. ("DE") and its subsidiaries
	Oricom
	Hancomm
	Doosan Advertisement (China) Co., Ltd.
	Doosan Tower Co., Ltd.
	Doosan Feed & Livestock Co., Ltd.
	Doosan Hongkong Ltd.
	Doosan Electro-Materials(Shen Zhen) Limited
	Doosan Electro-Materials Singapore Pte Ltd.
	Doosan Shanghai Chemical Limited
	Doosan Bears Inc.
	DIP
	DRA
	Doosan Real Estate ABS (2nd)
	Doosan Information and Communications America, LLC
	Doosan Information and Communications China Co., Ltd.
	Doosan Information and Communications Europe Ltd.
	Doosan Mottrol (Jiangyin) Co., Ltd.
	Doosan Electro-Materials (Changshu) Co., Ltd.
	Doosan Electro-Materials America, LLC
	Doosan Electro-Materials Luxembourg Sarl
	Circuit Foil Luxembourg Sarl
	Doosan Industrial Vehicle Europe N.A.
	Doosan Industrial Vehicle U.K. Ltd.
	Doosan Logistics Europe GmbH
	Doosan Industrial Vehicle America Corp.
	Doosan Industrial Vehicle Yantai Co., Ltd.
	Doosan Fuel Cell America, Inc. and others
Associates	Guang Dong Xingpu Steel Center
	Presto Lite Asia Co.,Ltd. and others
Joint venture	Sichuan Kelun-Doosan Biotechnology Company Limited

	Company
Other related parties [1]	Doosan Credit Union
	Yeongang Foundation
	Chung-Ang University
	Neo Trans
	Doosan Infracore Xinjiang Machinery Co., Ltd. and others

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

Sales and purchases with related parties for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)

		2016					
Type	**Name of entity**	**Sales**	**Other income**	**Others (Disposal of assets and others)**	**Purchases**	**Other expenses**	**Others (Purchase of assets and others)**
Subsidiaries	DHC and its subsidiaries	₩ 117,653	₩ 2,240	₩ 21,290	₩ -	₩ 182	₩ -
	DI and its subsidiaries	124,713	821	-	47,634	4,616	23,618
	DEC and its subsidiaries	18,498	518	-	-	170	43,447
	DE and its subsidiaries	10,593	-	-	-	2,708	-
	DIV	171,928	510	-	29,351	383	-
	DIP	110,991	-	-	-	3	-
	Others	191,579	3,087	53,100	21,111	124,783	12,292
		745,955	7,176	74,390	98,096	132,845	79,357
Associates		12,909	-	-	5,322	725	-
Joint venture		1,056	-	-	-	-	-
Other related parties		2,094	-	-	-	9,533	35
		₩ 762,014	₩ 7,176	₩ 74,390	₩ 103,418	₩ 143,103	₩ 79,392

(in millions of Korean won)

		2015					
Type	Name of entity	Sales	Other income	Others (Disposal of assets and others)	Purchases	Other expenses	Others (Purchase of assets and others)
Subsidiaries	DHC and its subsidiaries	₩ 117,672	₩ 1,344	₩ 78,015	₩ -	₩ 785	₩ -
	DI and its subsidiaries	163,208	513	29,763	29,894	5,811	-
	DEC and its subsidiaries	25,167	331	4,961	-	7,872	16,566
	DE and its subsidiaries	11,406	-	-	-	2,921	-
	DIV	171,886	476	-	29,895	486	-
	DIP	27,241	-	-	-	8	-
	Others	203,452	1,185	-	13,175	12,749	-
		720,032	3,849	112,739	72,964	30,632	16,566
Associates		374	-	-	3,399	74	-
Joint venture		988	-	-	-	-	-
Other related parties		11,274	-	-	39	17,591	-
		₩ 732,668	₩ 3,849	₩ 112,739	₩ 76,402	₩ 48,297	₩ 16,566

Outstanding balances arising from sales/purchases of goods and services as at December 31, 2016 and 2015, are as follows:

(in millions of Korean won)

		2016			
Type	**Name of entity**	**Trade receivables**	**Other receivables**	**Trade payables**	**Other payables**
Subsidiaries	DHC and its subsidiaries	₩ 11,595	₩ 74,466	₩ 23	₩ 987
	DI and its subsidiaries	18,981	21,388	4,225	581
	DEC and its subsidiaries	5,611	6,719	273	3,147
	DE and its subsidiaries	2,043	1,601	-	-
	DIV	56,469	980	9,452	797
	DIP	76	-	-	-
	Others	67,761	86,391	27,658	15,175
		162,536	191,545	41,631	20,687
Associates		942	4,855	265	10
Joint venture		-	582	-	-
Other related parties		174	1,797	15	598
		₩ 163,652	₩ 198,779	₩ 41,911	₩ 21,295

(in millions of Korean won)

		2015			
Type	**Name of entity**	**Trade receivables**	**Other receivables**	**Trade payables**	**Other payables**
Subsidiaries	DHC and its subsidiaries	₩ 14,977	₩ 54,372	₩ 56	₩ 166
	DI and its subsidiaries	18,484	22,109	3,538	641
	DEC and its subsidiaries	20,418	11,629	899	2,216
	DE and its subsidiaries	896	1,690	-	-
	DIV	58,074	305	6,723	284
	DIP	3,191	149	-	5,789
	Others	62,316	5,251	11,159	1,997
		178,356	95,505	22,375	11,093
Associates		-	-	181	-
Joint venture		-	586	-	-

(in millions of Korean won)

		2015							
Type	**Name of entity**		**Trade receivables**		**Other receivables**		**Trade payables**		**Other payables**
Other related parties			1,081		1,862		-		614
		₩	179,437	₩	97,953	₩	22,556	₩	11,707

Fund and equity transactions with related parties for the periods ended December 31, 2016 and 2015, are as follows:

(in millions of Korean won)

Type	**Name of entity**	**Transactions**		**2016**		**2015**
Associates	DLI Corporation	Investment in capital as at establishment	₩	4,000	₩	-
	DEC	Acquisition of equity of Doosan Cuvex Co.,Ltd.		33,217		-
	Doosan Fuel Cell America, Inc.	Loans		48,917		-
	Treasury share trust	Investment		30,000		60,000
	Treasury share trust	Recovery		(60,000)		(60,000)

As at December 31, 2016, the Company has provided payment guarantees and others for related parties (Note 30).

The Company defines key management personnel as registered officer and non-registered officer (including outside director) who have the authority and responsibility for planning, operation and control and are in charge of business or division unit. Compensation to key management personnel of the Company for the periods ended December 31, 2016 and 2015, is as follows:

(in millions of Korean won)		**2016**		**2015**
Short-term employee benefits	₩	29,682	₩	38,456
Post-employment benefits		2,068		2,369
Share-based payments		177		2,549
	₩	31,927	₩	43,374

33. Cash Generated from (Used in) Operations

(a) Cash generated from (used in) operations

(in millions of Korean won)		2016		2015
Adjustments for:				
Interest expense	₩	38,164	₩	38,209
Income tax expenses		495		36,711
Loss on foreign currency translations		17,087		7,021
Loss on valuation of derivatives		104		21
Loss on disposal of trade receivables		2,819		1,678
Impairment loss on investments in subsidiaries		-		11,986
Depreciation		42,198		45,742
Amortization		13,392		11,334
Loss on disposal of property, plant and equipment		5,216		336
Impairment loss on property, plant and equipment		11,384		22
Loss on disposal of intangible assets		142		34
Impairment loss on intangible assets		-		6
Loss on disposal of investment properties		1,025		350
Loss on valuation of investment properties		2,327		109
Post-employment benefits		21,968		22,174
Impairment loss		1,543		77
Other impairment loss (reversal)		(23)		4
Provisions (reversal)		(1,461)		929
Loss on valuation of inventories (cost of sales)		(146)		519
Share-based payments		177		2,549
Interest income		(6,692)		(3,501)
Dividend income		(179,359)		(114,360)
Gain on foreign currency translations		(12,211)		(3,433)
Gain on exemption of debt		-		(351)
Gain on valuation of derivatives		(260)		-
Gain on disposal of long-term investment securities		-		(1,393)
Gain on disposal of property, plant and equipment		(971)		(1,358)
Gain on revaluation of property, plant and equipment		-		(37)
Gain on disposal of intangible assets		(112)		-
Gain on disposal of investment properties		(235)		(401)
Gain on valuation of investment properties		(934)		(7,702)
Financial guarantee income		(1,588)		(1,418)
Other income		-		(4,501)
	₩	(45,951)	₩	41,356

(in millions of Korean won)		**2016**		**2015**
Change in operating assets and liabilities:				
Decrease (increase) in trade receivables	₩	(12,190)	₩	26,450
Decrease (increase) in other receivables		(5,950)		2,177
Decrease (increase) in inventories		(62,408)		34,760
Increase in derivative assets		(13)		-
Decrease (increase) in other current assets		4,083		(3,600)
Increase in long-term other receivables		(22,736)		-
Decrease in other non-current assets		-		488
Increase in long-term non-current assets		(7,036)		-
Increase (decrease) in trade payables		84,694		(25,955)
Increase (decrease) in other payables		7,894		(10,814)
Increase in provisions		(103)		(1,647)
Decrease in other current liabilities		(9,724)		(609)
Increase in long-term other payables		2,345		4,439
Benefit payments		(4,009)		(3,502)
Post-employment benefits transferred from affiliated companies		638		1,379
Increase in plan assets		(25,360)		(23,510)
	₩	(49,875)	₩	56

(b) Non-cash transactions

(in thousands of Korean won)		**2016**		**2015**
Reclassification of investments in subsidiaries to treasury share	₩	59,457	₩	59,961
Non-trade receivables for disposal of investment properties		18,787		77,018
Non-trade payables related to acquisition of property, plant and equipment		21,999		-
Reclassification of advance payments related to acquisition of intangible assets		2,700		-
Reclassification of construction in progress to property, plant and equipment and others		(55,601)		10,052
Reclassification of bonds		20,000		160,000
Reclassification of long-term debts		85,301		92,683
Retirement of treasury share		63,546		-

34. Events After the Reporting Period

The Company entered into a contract to dispose Doosan Feed & Livestock Co., Ltd., a subsidiary, to Dongwon F&B Co., Ltd. at ₩ 35.3 billion, on March 10, 2017.