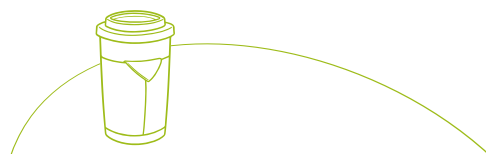
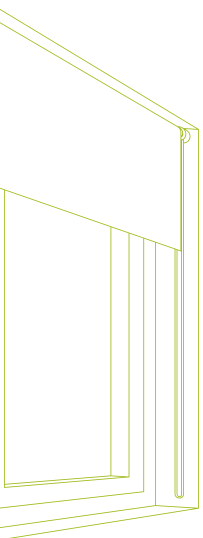




# LOTTE CHEMICAL SUSTAINABILITY REPORT 2018



# LOTTE CHEMICAL SUSTAINABILITY REPORT 2018

## ABOUT THIS REPORT

Lotte Chemical's 12<sup>th</sup> Sustainability Report reflects the company's dedication to addressing related to the economy, society, and the environment. We publish the sustainability report to transparently communicate with our stakeholders on our activities and achievements in sustainable management over the past year. We will reveal our sustainability management performance and continue to communicate with our internal and external stakeholders through the publication of the sustainability report.

**Overview of the Report** | This report covers the sustainable development activities and performance of Lotte Chemical from January 1 to December 31, 2018. For key information that may influence our stakeholders' decisions and judgment, this report also incorporates performance up to the first half of 2019. To ensure a better understanding of changing trends, this report provides quantitative data for the past three years. Year-on-year data is based on December 31 of each fiscal year and some data with a period gap is reported with additional statements.

**Reporting Principle** | This report is developed in accordance with the Core Option of GRI (Global Reporting Initiative) Standards. Financial data in this report were prepared based on consolidated financial statements in accordance with the Korean International Financial Reporting Standards (K-IFRS).

**Reporting Scope** | The financial data used in this report cover the performance of Lotte Chemical and our subsidiaries. Non-financial data such as environmental and social data in the report were prepared based on Lotte Chemical's head office, Daejeon R&D Center, Yeosu Plant, Daesan Plant and Ulsan Plant, collectively, from which 99% of sales are generated. Information related to our subsidiaries and overseas plants is also provided with respect to certain issues.

**Assurance** | A Third Party Assurance institution verified the credibility of the contents of this report. The results are stated on pages 109.

**Inquiry and Access** | All of the sustainability reports published by Lotte Chemical can be accessed and downloaded on the website of Lotte Chemical (<http://www.lottechem.com>). For any inquiries or additional information, please refer to the following contact information. We always welcome your feedback, as it helps us to become a better company.

## Lotte Chemical CSV TFT

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## OVERVIEW

- 04 CEO's Letter
- 06 Company Overview
- 08 Business Overview
- 12 Product Overview

## BUSINESS HIGHLIGHT

- 28 New Business Highlights
- 32 R&D Highlights
- 37 Major Product Outputs

## STRATEGY & GOVERNANCE

- 40 Sustainable Management Initiatives
- 42 Corporate Governance
- 44 Compliance
- 46 Ethical Management
- 48 Risk Management
- 50 Stakeholder Engagement
- 52 Materiality Test

## MATERIAL ISSUES

- 56 ISSUE 01. Environmental Conservation
- 63 ISSUE 02. Safety and Health
- 69 ISSUE 03. Corporate Social Responsibility
- 80 ISSUE 04. Employees
- 89 ISSUE 05. Customer Value
- 97 ISSUE 06. Mutual Growth

## APPENDIX

- 102 GRI Standards Index
- 104 Consolidated Financial Statements
- 106 Sustainability Data
- 108 Lotte Chemical's Declaration of Human Rights
- 109 Third Party Assurance

With the betterment of human life as our motto, Lotte Chemical is committed to becoming a sustainable world-class company.

## 04

### CEO's Letter

We look forward to our stakeholders' continued support and interest in our future.



## 06

### Company Overview

Korea's leading chemical company, Lotte Chemical is committed to making people's lives healthier and more prosperous through constant challenges and innovation.



## 08

### Business Overview

Lotte Chemical consistently strives to achieve robust financial performance and fulfill its corporate social responsibilities and take a leap forward to become a top-seven global chemical company, beyond being a leader in Korea's chemical industry.



## 12

### Products

Lotte Chemical is closer to your daily life than you might think. Our products range from daily necessities to medical and cutting-edge aerospace materials, advancing everyday life.





# OVERVIEW

## CEO's Letter





### Dear Stakeholders,

I am pleased to announce the publication of Lotte Chemical's 12<sup>th</sup> Sustainability Report since our first publication of the Report in 2007. I sincerely thank you for your continued support of, and interest in, Lotte Chemical.

In 2018, we persisted in investing in a wide variety of new businesses to discover new economic growth engines for the future.

After completing the expansion of the Yeosu Ethylene Plant, we have successfully constructed the US Ethane Cracker and EG Plant. As a result, we were able to acquire the world's 7<sup>th</sup> largest ethylene production capacity. We also accomplished the expansion of our Titan PP plant with excellent results. In addition, we have newly started the Indonesian crackers business and a joint venture project with Hyundai Oilbank in oil naphta cracking facilities. Also we are carrying out PC expansion projects, as well as MEX and PIA projects to strengthen our business competitiveness. In an effort to reach out to the stakeholders and raise our brand value and stature, we started national TV advertising for the first time.

### **"We will strive to take the initiative in creating social value, and support our employees balance work and family life."**

Lotte Chemical is committed to creating social value beyond the fulfillment of corporate social responsibility. We completed the construction of a membrane water treatment plant in Daegu, successfully making inroads into the domain of eco-friendly businesses. In order to fulfill corporate social responsibilities, we are systematically promoting diverse activities on various themes, such as safety, the environment, and health. As work-life balance has come to the fore of discussions on employee wellbeing and been the focus of significant social interest, Lotte Chemical is taking the lead in creating a corporate culture that supports harmony between work and personal life. To this end, we introduced a computer shutdown program designed to prevent employees from working late, and flexible work arrangements. We will continue our efforts to make Lotte Chemical a workplace where employees are happy. We are also making investments into reducing risks related to employee safety and the environment, and consistently compliance-based ethics management in order to become a representative social model.

The tough business environment at home and abroad is likely to continue in 2019, but we will continue to advance, tapping into our experience of turning crisis into success. We will continue to strengthen our investment in safety, and the environment, and actively promote innovation through such as Digital Transformation in order to respond to the changing society. We will endeavor to grow with our customers, employees, local communities, and partners by listening to our stakeholders from all walks of life, striving to meet their needs, and fulfilling our social responsibilities. We look forward to receiving your continued support and interest.

Thank you!

June 2019

**Lim Byung-yun**, CEO of Lotte Chemical

# Company Overview

Total Assets (based on consolidated financial statements)

 **KRW 20.7991** trillion

No. of employees

 **7,308**

## ABOUT LOTTE CHEMICAL

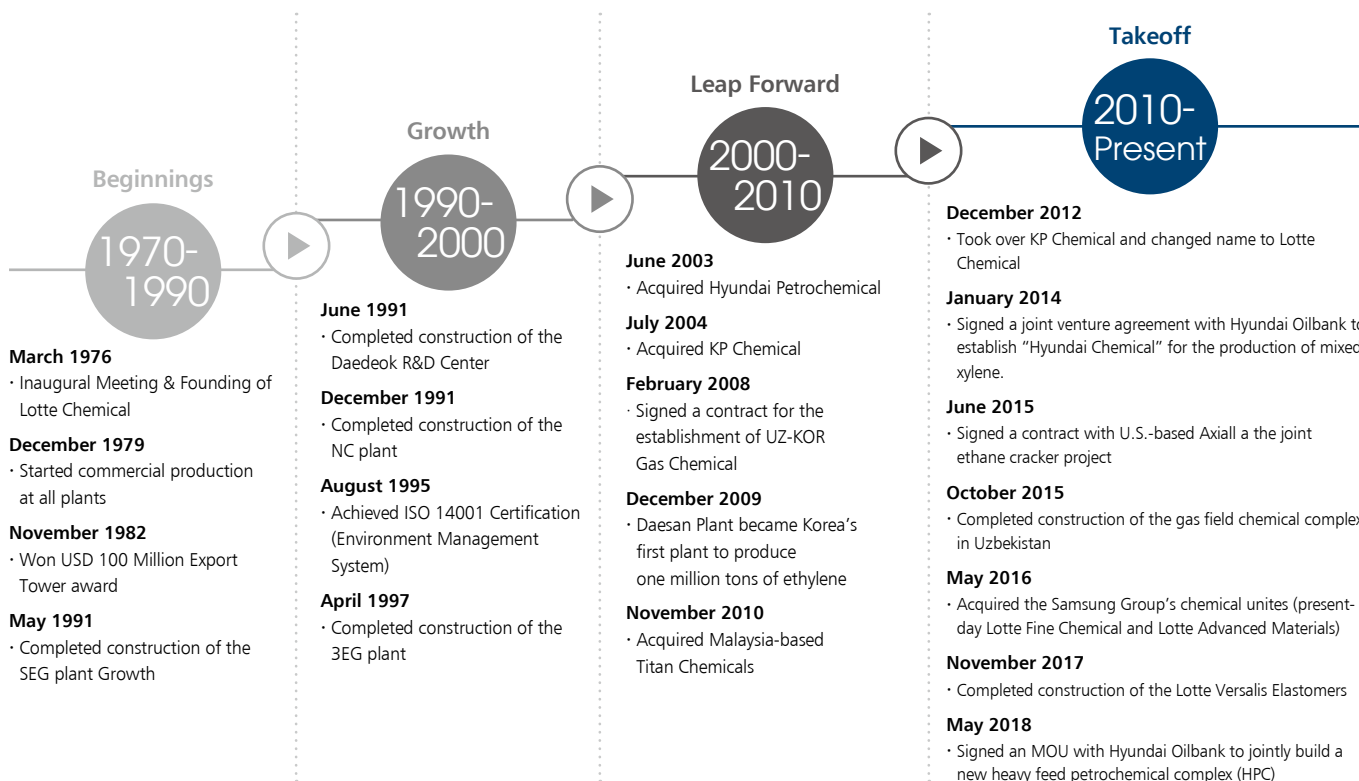
Korea's leading chemical company, Lotte Chemical is committed to making people's lives healthier and richer through constant challenges and innovations.

### General Information

Classification	
Company Name	Lotte Chemical Corporation
Date of Establishment	March 16, 1976
President & CEO	Lim Byung-yun, Shin Dong-bin, Kim Gyo-hyun
Head office	14-16F, Lotte World Tower, 300 Olympic-ro, Songpa-gu, Seoul, Korea
Industry	Petrochemical industry
Main Products	Polymer (PE, PP, PC, PET, EVA, etc.) Monomer (EG, EOA, MMA, PIA, PTA, etc.) Basic Chemicals (BZ, TL, XL, SM, BD, C5-Petrochemical product, etc.) Megatrend (UF membrane for water treatment)

## History of Lotte Chemical

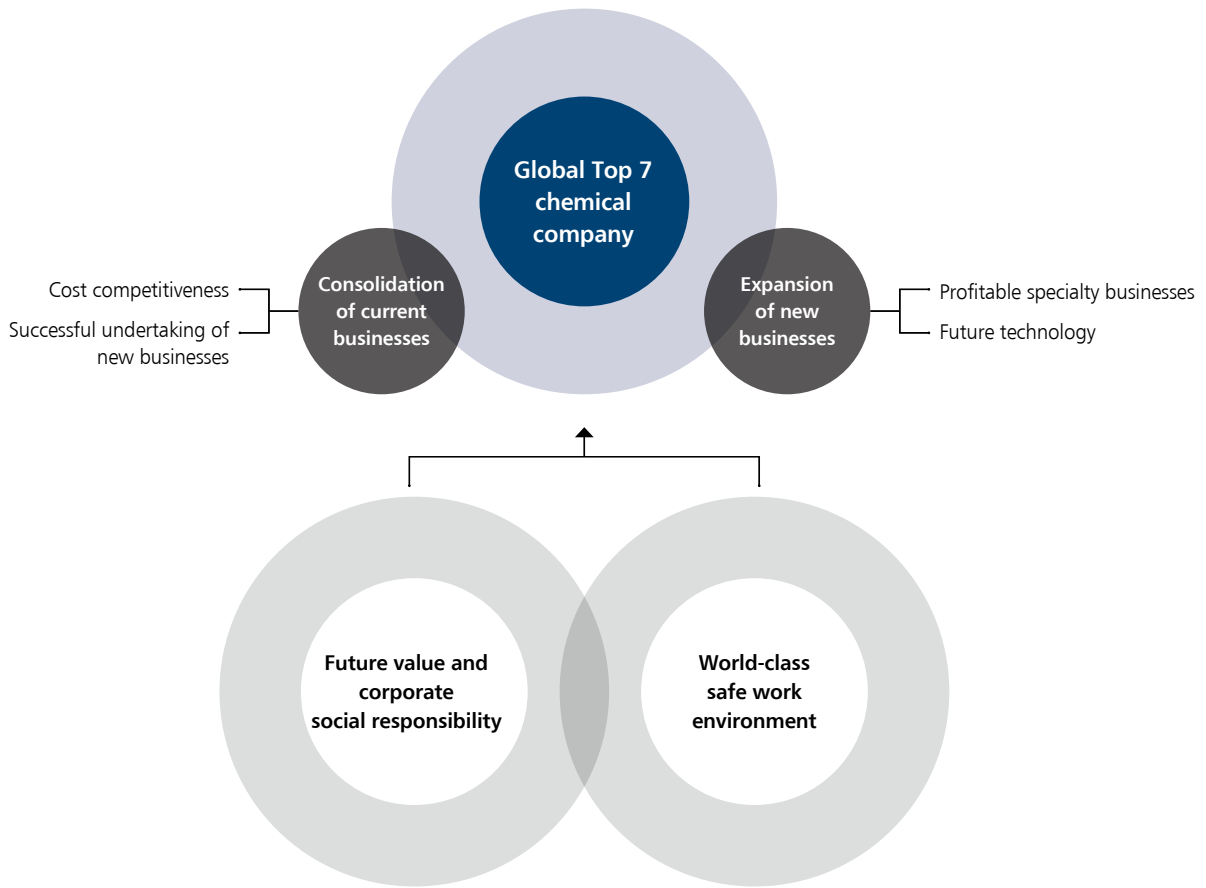
Since its foundation in 1976, Lotte Chemical has been evolving into a leader of the global petrochemical industry.





## VISION 2030

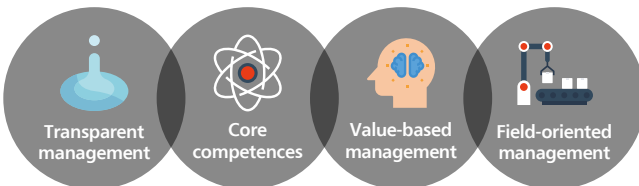
Lotte Chemical has drawn up the Vision 2030 Plan to enable the company promptly respond to changes in the business environment and prepare for another leap forward. In order to grow into a “Global Top 7 chemical company” by expanding our specialty business and securing future technologies, Lotte Chemical will strengthen existing businesses through cost competitiveness and successful implementation of new businesses.



### Core tasks for 2019



### Management principles



### Core values



# Business Overview

## Sales in 2018



## Business profits in 2018



## Lotte Chemical company overview

Founded in 1976, Lotte Chemical is Korea’s leading chemical company with world-class petrochemical complexes in Yeosu, Daesan, and Ulsan. We have generated stable profits through consistent investments in the expansion of production lines and new businesses, on the one hand, and sold quality products in over 120 nations around the world through overseas offices in China, Japan, Hong Kong, Russia, USA, Peru, and Turkey, and more. In 2018, our sales hit a record high as a result of excellent cost competitiveness, stable plant operation efficient business portfolio, and efforts to open new markets. We will continue to work hard to achieve stable financial performance and fulfill corporate social responsibility, ultimately securing a spot among the global top 7 chemical companies, beyond being a leader in Korea’s petrochemical industry.

## Main products

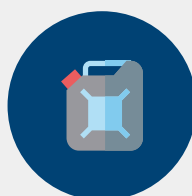
Lotte Chemical boasts a product portfolio that ranges from polymers and monomers to megatrends. Our products are applied extensively to household goods as well as cutting-edge materials for agricultural, engineering, medical, and auto industries, contributing to human enhancement.

### Polymer



- HDPE (High Density Polyethylene)
- LLDPE (Linear Low Density Polyethylene)
- LDPE (Low Density Polyethylene)
- EVA (Ethylene Vinyl Acetate)
- PP (Polypropylene)
- PC (Polycarbonate)
- PC Compound (Polycarbonate Compound)
- PET (Polyethylene Terephthalate)
- PM (Performance Materials)

### Monomer



- EO/EG (Ethylene Oxide/Ethylene Glycol)
- EOA (Ethylene Oxide Adduct)
- GE (Glycol Ether)
- MMA (Methyl Methacrylate)
- PIA (Purified Isophthalic Acid)
- PTA (Purified Terephthalic Acid)

### Basic chemicals, Chemical fiber, Megatrends



- BTX (Benzene, Toluene, Mixed Xylene)
- MeX/PX/OX (Meta-Xylene/Para-Xylene/Ortho-Xylene)
- C5-Petrochemical Product
- BD (Butadiene)
- SM (Styrene Monomer)
- UF Membrane for water treatment

## Domestic Plants and R&D Centers

Lotte Chemical operates world-class plants in Korea's top 3 petrochemical special district in Yeosu, Daesan, and Ulsan, and has established the R&D centers in Daedeok R&D Complex. We have optimized the production process at each plant to make the best of our strengths and secured production capacity by expanding the current production lines and building new plants. In addition, we have achieved a significant level of vertical integration.

We optimized the operation of each plant to maximize our advantages, and secured a stable production capacity by expanding our plants in Yeosu, Daesan and Ulsan, and by constructing new plants. Moreover, Lotte Chemical is enhancing its competitiveness in the global market by systemizing production from raw materials to finished products.

### Headquarter

The Lotte Chemical Headquarter in the Lotte World Tower, Songpa-gu, Seoul, is responsible for spearheading new business projects, marketing activities, sales and marketing activities at home and abroad, and overseeing various affairs related to management support to enable Lotte Chemical into a global player.

### Daesan Plant

Lotte Chemical came into possession of the Daesan Plant through the acquisition of Hyundai Petrochemical in 2003. After the takeover, we expanded the Naphtha Cracking Center (NCC), becoming the first Korean chemical company to achieve a production capacity of 100 million tons of naphtha. We strive to optimize energy consumption and ensure accident-free stable operation in each plant. We also continue expanding our business by expanding production lines and building new production facilities.

### Daejeon R&D Center

Located within the Daedeok Innopolis, the Daedeok R&D Center serves as an integrated R&D center for the chemical units of the Lotte Group since the merger of Honam Petrochemical, Lotte Daesan Petrochemical, and KP Chemical into one in 2005. The R&D center focuses on enhancing product competitiveness and securing original technologies that will ensure sustainable development and growth through research and development of polymers and polymer catalysts, engineering plastics, and new functional materials. We are also taking the lead in discovering sustainable growth engines for the future through technological support for overseas subsidiaries to develop new products and megatrend research.

### Ulsan Plant

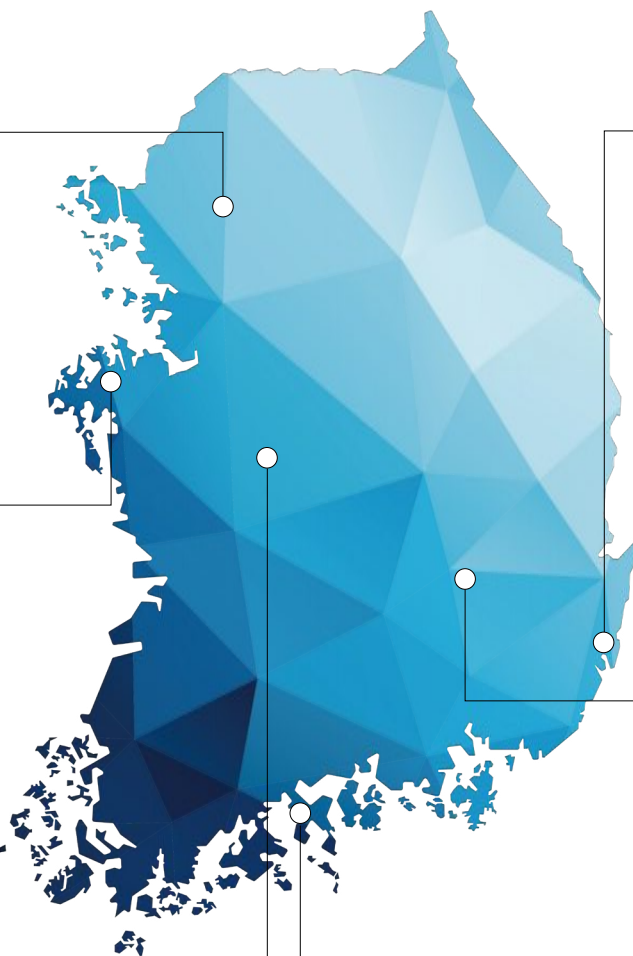
Since Lotte Chemical's merger with KP Chemical, the Ulsan Plant has produced Lotte Chemical's aromatic products. Ulsan Plant's manufacturing system boasts high efficiency through connection to one pipeline, which was established by our independent plant technology. The vertical manufacturing structure enables complete production from raw materials to finished products.

### Daegu Water treatment Plant

Lotte Chemical Daegu Plant located in Daegu National Water Industry Cluster produces water treatment membranes.

### Yeosu Plant

The history of Lotte Chemical began when the Yeosu Plant commenced commercial operations in 1979. Lotte Chemical has expanded business scope and scale by expanding and constructing plants. Based on this, Lotte Chemical has built a vertical integration system with international competitiveness. The Yeosu Plant manufactures polymer, monomer, basic chemicals and other products, and has been expanding to become a world-scale petrochemical production base through continuous expansion.



## Global Network

Lotte Chemical is actively advancing into overseas markets to expand its presence in the global petrochemical market. Starting with the takeover of Malaysia-based Titan Chemicals, we have continuously enhanced our global competitiveness through the successful completion of the Surgil project in Uzbekistan, undertaking of the ethane cracker project and ethylene glycol project in the United States, and the acquisition of the Samsung Group's chemical affiliates. We are also making investments in megatrends as a new growth engine for the future. Lotte Chemical is stepping up its efforts to become a global top 7 chemical company beyond Asia.

### Plants

Headquarter:	Seoul
R&D Center:	Daejeon
Production Plants:	Yeosu, Daesan, Ulsan
Sales Office:	Daejeon, Daegu, Busan

### Affiliates and Joint Enterprises

Lotte MRC:	Daesan, Chungcheongnam-do
Seetec:	Daesan, Chungcheongnam-do
KP ChemTech:	Ulsan
Sambark LFT:	Yesan, Chungcheongnam-do
DACC Aerospace:	Wanju, Jeollabuk-do
Lotte Mitsui Chemicals:	Yeosu, Jeollanam-do
Lotte Versalis Elastomers:	Yeosu, Jeollanam-do
Lotte Advanced Materials:	Yeosu, Jeollanam-do
Lotte Fine Chemical:	Ulsan

### Overseas Subsidiaries

LC Shanghai Trades:	Shanghai, China
LC Jiaxing:	Zhejiang, China
LC Jiaxing EP:	Zhejiang, China
LC Hefei EP:	Anhui, China
LC Shenyang EP:	Liaoning, China
LC Sanjiang:	Zhejiang, China
LC Titan:	Johor, Malaysia Jakarta, Indonesia
LC Alabama:	Alabama, USA
LC UK:	Wilton, UK
LC PL:	Karachi, Pakistan
LC Poland:	Warsaw, Poland
LC USR:	Malaysia
LC USA:	Delaware, USA
LACC:	Louisiana, USA
LCLA:	Louisiana, USA
LCNL:	Lagos, Nigeria

### Overseas Sales Offices

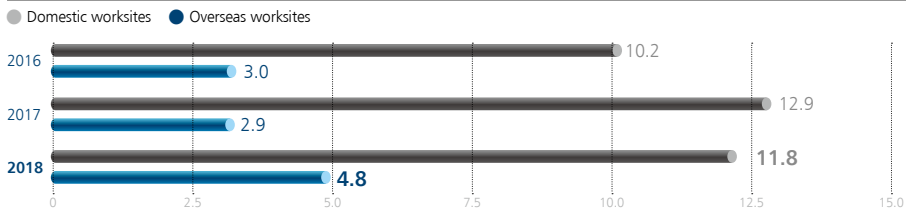
Japan:	Tokyo Office
USA:	Houston Office
Hong Kong:	Hong Kong Office
Russia:	Moscow Office
Turkey:	Istanbul Office
Vietnam:	Ho Chi Minh City Office
Peru:	Lima Office

- Headquarter, Plants, R&D Center
- Overseas Subsidiaries
- Overseas Branches



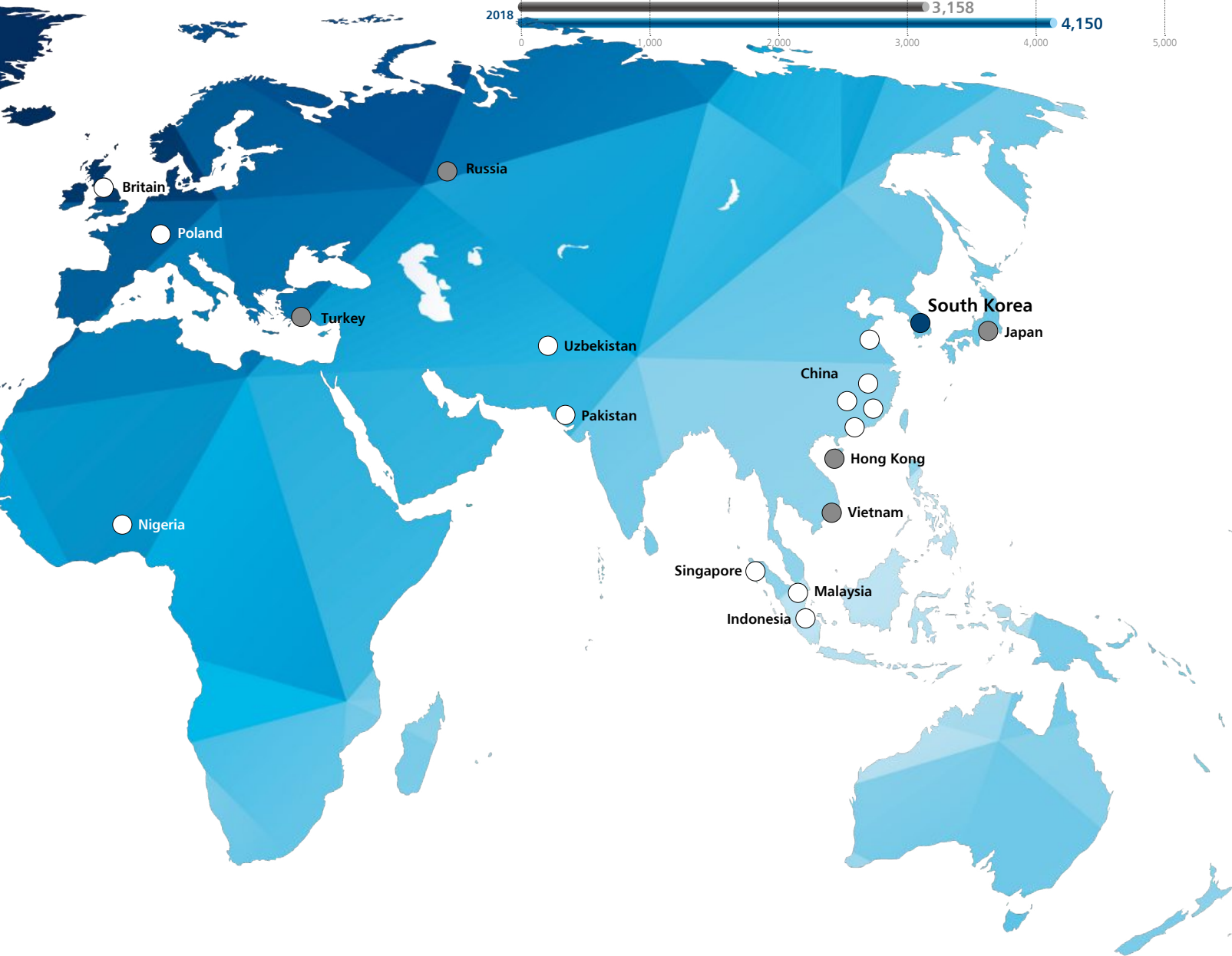
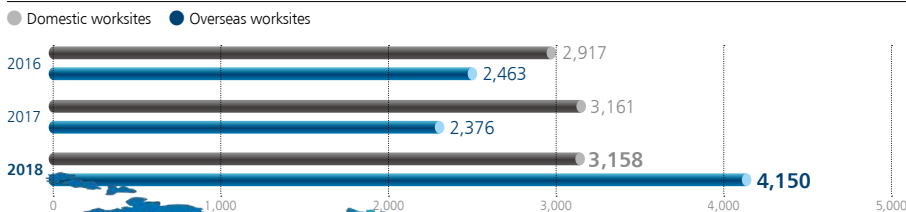
### Sales in Domestic & Overseas Sites

Unit: KRW trillion



### Employees in Domestic & Overseas Sites

Unit: persons



## Product Overview

Lotte Chemical is closer to your daily life than you might think. Our products range from daily necessities to medical and cutting-edge aerospace materials, advancing the quality of everyday life.





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# POLYMER





## PE

### Polyethylene

PE, the most widely used polymer with application in various fields, can be easily found in everyday life due to its excellent physical properties and processability. PE is applied to a wide range of products including pipes, automobile components, packaging materials, stationary and food containers.



#### HDPE (High-Density Polyethylene)

HDPE is a representative petrochemical product. It is strong against heat and cold, has high impact strength with excellent processability. Also it is used for general household goods, fishing net, rope, beverage cap, insulation cable, chemical medicine container, automobile fuel tank, various pipes, film (agricultural, industrial, packing) etc.

#### LDPE (Low-Density Polyethylene)

LDPE is a type of polyethylene resin that is another well-known petrochemical product along with HDPE. It is easily modifiable and flexible, thus enabling various designs according to the purpose of use. For this reason, LDPE is widely used for container lids and household goods. In addition, it is resistant to moisture and water and has excellent transparency. LDPE is also used in agricultural and packaging film, wire coating, and various lapping. The coating film on paper cups to prevent leakage is made with LDPE.

#### LLDPE (Linear Low-Density Polyethylene)

LLDPE is used for agricultural film, wrap, and more as its mechanical strength and transparency can be increased by modifying the distribution of the molecular weight. Having great processability, heat-resisting stability, and transparency, LLDPE is used for making water tanks, toys, and various containers and household products.

#### EVA (Ethylene-Vinyl Acetate)

EVA has the properties of both rubber and plastic in certain ways. EVA has excellent adhesiveness, and is used as the raw material for high-quality glue. EVA has drawn serious attention lately as a replacement for PVC because it can be designed to have various properties according to the customer's needs and can also be used for wire clothing. It is soft and can absorb shock well, and also has insulating properties that are suitable for the outer soles of shoes.

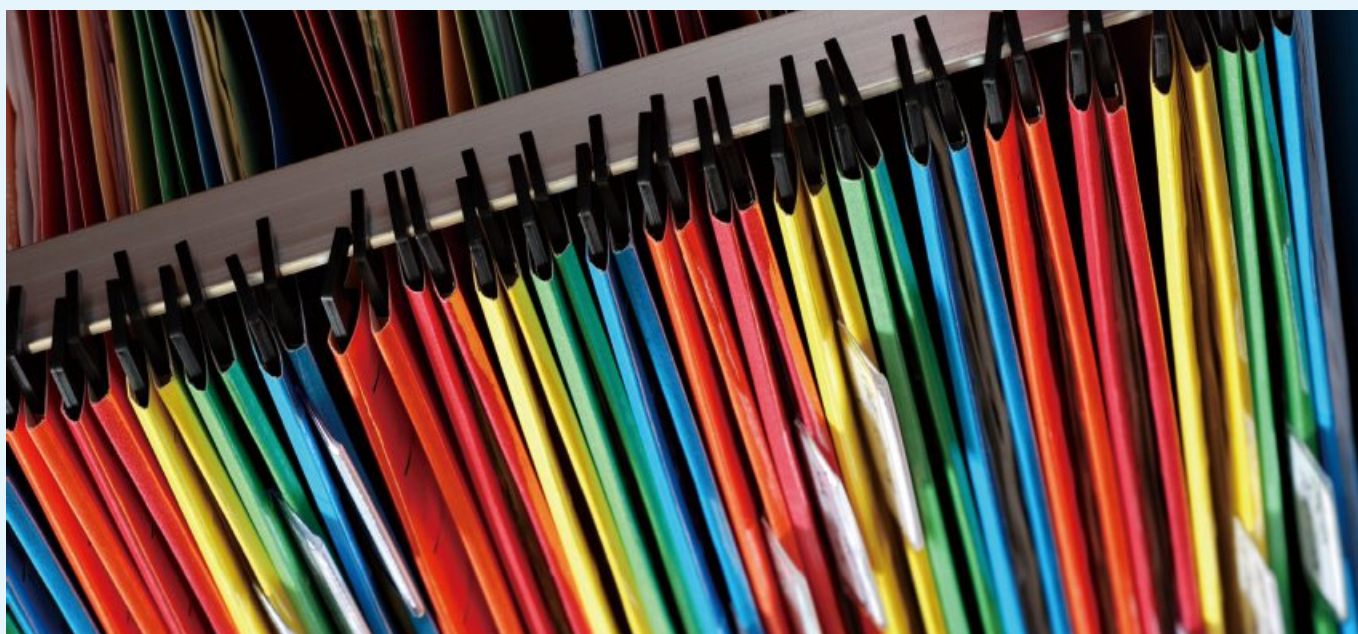
## Product Overview

Lotte Chemical is closer to your daily life than you might think. Our products range from daily necessities to medical and cutting-edge aerospace materials, advancing the quality of everyday life.

### PP

#### Polypropylene

Lotte Chemical strives to become the global leading chemical company by researching and developing high-tech products such as metallocene PP, HCPP, RTPO, TIPP, and Retort that overcome the limitation of conventional polypropylene.



#### Injection

The production process involves melting thermoplastic resin to turn the material into a fluid state and then injecting it into the mold to let it harden. Areas of application include various household products, containers, home appliances, toys, and many more.

#### Blow

Polypropylene for blow molding and sheets has excellent extrusion processability and physical properties. It can be used to make end products with a proper balance of rigidity and impact resistance. Its areas of application include vacuum formed trays, Danpla sheets, plane sheets, and various other types of blow containers. Of particular note, the ultra-high transparent random polypropylene recently developed has a transparency that is high enough to replace polycarbonate (PC).

#### Yarn / Fiber

Polypropylene for fibers is excellent for fiber molding with its

narrow molecular weight distribution. Its superb rigidity and elongation characteristics offer applications in woven bag, rope, fishing net, multi yarn, stable fibers, diapers, sanitary pads, and agricultural-industrial non woven fabrics.

#### Film

Lotte Chemical has accumulated know-how about product design technology and production. For various molding methods such as CPP, BOPP, IPP, Lamination, and Membrane for 40 years tailored to customer's needs and usage. It is advantageous for secondary processing because of its excellent thickness uniformity in film forming.

#### TIPP (Transparent-Impact resistance Polypropylene)

TIPP with high transparency and strength is manufactured with new polymerization process technology. It has transparency and impact resistance equivalent to conventional transparent RCP (Random PP) and superior blush resistance compared to general impact ICP (Impact PP).



## PC

### Polycarbonate

PC has superior mechanical properties and transparency compared to general purpose plastics. Lotte Chemical not only produces high-quality PCs that are raw materials for a wide range of products, but also produces PC compound that is acquired by adding functional additives and fillers to PC, and another PC/ABS compound with improved processability and chemical resistance, which is obtained by mixing PC and ABS.



#### PC (Polycarbonate)

PC, a polymer manufactured by eco-friendly non-phosgene process, has excellent impact resistance, heat resistance and transparency.

#### PC Compound (Polycarbonate Compound)

PC Compound is a polymer manufactured by mixing functional additives and fillers with PC. PC Compound adds various functionalities to PC and can be used as electrical and electronic products, OA housings, and automotive interior and exterior materials.

#### PC/ABS (Polycarbonate/Acrylonitrile-Butadiene-Styrene Resin)

PC/ABS is a polymer manufactured by mixing PC and ABS. PC/ABS has excellent extrusion and injection processability, as well as chemical resistance. It has excellent flame-retardant properties and can be used for electrical and electronic products, OA housings and automotive interior and exterior materials.

## PET

### Polyethylene Terephthalate

PET bottles made of Lotte Chemical's PET have many strengths such as non-toxicity, transparency, maintainability, chemical resistance, lightweight, processability, and excellent economical efficiency. Moreover, Lotte Chemical's PET can be molded at lower temperatures, leading to shorter cycle time and reduced utility costs.

## Product Overview

Lotte Chemical is closer to your daily life than you might think. Our products range from daily necessities to medical and cutting-edge aerospace materials, advancing the quality of everyday life.

## Performance Materials

Lotte Chemical has developed and is selling a wide range of products based on 30 years of accumulated R&D experience and technology, including stable and competitive sourcing of raw materials, ownership and expansion of global production bases, and development of functional polymer products for an eco-friendly future society.



### LOTTMER

LOTTEMER made by Lotte Chemical Self-Technology is a thermoplastic elastomer (TPE), possessing both the elasticity of thermoset rubber and the moldability of thermoplastic. The product is lightweight and reusable, and the simple production process reduces overall costs. The eco-friendly material contains no harmful substances such as environmental hormones and heavy metals, and can replace flexible PVC and TPEE, as well as conventional thermoset rubber.

### ADPOLY

ADPOLY made by Lotte Chemical's own technology is an adhesive resin developed with Lotte Chemical's own technology. Heat reaction makes it adhere to polyolefin, gas barrier resin, or metal, allowing for co-extrusion with various structures. It is widely used with various molding methods to make bottles, sheets, films, and pipes. ADPOLY is also often used as a compatibilizer in the compound sector.

### TPO (Thermoplastic Olefin)

TPO has excellent heat resisting steel, impact resistance, and processability with upgraded functions of polypropylene. With excellent performance, it is used for car interior and exterior materials, electric products, industrial building materials, etc. Especially, it is widely used in various fields such as vehicle interior and exterior materials, electrical and electronic products, and

industrial building materials. In particular, Lotte Chemical has developed the first plastic bumper and thin-wall bumper in Korea and is recognized for its technology in the field of composite resin. We are introducing various functional products to the market through continuous R&D.

### LFT (Long-Fiber reinforced Thermoplastics)

LFT a high-stiffness thermoplastic long-fiber composite resin developed by Lotte Chemical's own technology, is the first developed and applied LFT that can be applied to both injection molding and extrusion molding. With excellent mechanical properties compared to existing short-fiber products, it can be applied to a wide range of areas such as automotive interior/exterior materials and industrial materials. Also, it can be applied to various field such as car interior and exterior, and industrial materials.

### EPP (Expanded Polypropylene)

EPP is developed by Lotte Chemical subsidiary Sambark LFT's own PP foaming thechnology HOWPOL®. It is a non-toxic, recyclable EPP product manufactured by an eco-friendly CO<sub>2</sub> process of foaming non-crosslinked plastic. The material can be produced into molded products of various shapes and colors. Its excellent mechanical properties and lightweight property make it suitable for automobile parts, electronic product packaging materials, and special purpose products.



# MONOMER

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## EO/EG

Ethylene Oxide/Ethylene Glycol

EG, a colorless liquid, is manufactured by reacting water and EO, which is created by the oxidation reaction of ethylene. EG is used as surfactants, antifreeze, and polyester, the most common synthetic fiber.

## Product Overview

Lotte Chemical is closer to your daily life than you might think. Our products range from daily necessities to medical and cutting-edge aerospace materials, advancing the quality of everyday life.

### EOA

#### Ethylene Oxide Adduct (EOA)

Lotte Chemical produces EOA with excellent color and uniform purity. We are continuously striving to provide a stable supply to the market through vertical integration of raw materials and products. We continually make efforts to develop new product that meet users' needs.



#### MPEG (Methoxy Polyethylene Glycol)

MPEG is the leading raw material for third-generation admixtures as the raw material for high-performance concrete admixture. Admixtures using MPEG can reduce water usage by more than 30% and greatly enhance concrete strength. Lotte Chemical's MPEG is a product with outstanding purity.

#### VPEG (Alkylallylether Polyethylene Glycol)

VPEG is a leading raw material for third-generation admixtures along with MPEG, and has very high growth potential. Using Lotte Chemical's high-purity, high-quality VPEG can simplify the manufacturing process of admixtures.

#### PEG (Polyethylene Glycol)

PEG, an inert and water-soluble liquid or solid substance, can be obtained through water and ethylene oxide. It is widely used as organic reaction intermediate, solvent, binder, raw materials for resin, polyol for urethane, dispersant, and emulsifier. Lotte Chemical is expanding its PEG product with various molecular weights.



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## GE

Glycol Ether

GE, an eco-friendly solvent that does not easily evaporate due to its low volatile organic compounds (VOCs) content, can be obtained by the distillation of reactants of alcohol with ethylene oxide or propylene oxide.

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## MMA

Methyl Methacrylate

MMA offers excellent strength and transparency and is used as raw material for optical disk, lighting, automobile lamp, and artificial marble. Lotte Chemical produces MMA through an eco-friendly process that generates less waste than conventional methods.

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## PIA

Purified Isophthalic Acid

PIA is manufactured by Lotte Chemical with its in-house technology. The high value-added technology-intensive product is produced only by 7 companies in 6 countries in the world. It is designated as a "world-class product" by the Korean Ministry of Trade, Industry and Energy and is renowned for its quality and technology.

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## PTA

Purified Terephthalic Acid

PTA, a material widely used in polyester fibers, industrial yarns, PET bottles, and industrial films, has excellent mechanical strength, heat resistance, water resistance, and insulation. Lotte Chemical possesses a large-scale PTA production capacity, which enables stable supply and PIA-linked sales.



## Product Overview

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# BASIC PETROCHEMICALS





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## BTX

### Benzene, Toluene, Mixed Xylene

#### BZ (Benzene)

BZ is a volatile, colorless or pale yellowish liquid with a unique sweet smell. It is used as an important solvent in chemical processes and is the leading aromatic base product used as raw material for various products.

#### TL (Toluene)

TL is a colorless liquid with high flammability and uniquely sweet smell. It is produced by the BTX process with a methyl substituent of benzene.

The term refers to Benzene, Toluene, and Mixed Xylene, which are produced with pyrolysis gasoline, a by-product of the ethylene plant, as the raw material. The high-value-added product is used as the raw material for construction, home appliances, and textile industries. Lotte Chemical has an efficient production structure that vertically integrates all processes from raw materials to finished products.

#### MX (Mixed xylene)

MX is available in two types of Isomer Grade and Solvent Grade. Lotte Chemical produces and sells solvent grade, and purchases Isomer Grade from outside to use it as a raw material for producing PX (Para-Xylene), OX (Ortho-Xylene), and MeX (Meta-Xylene).

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## SM

### Styrene Monomer

SM is produced by reacting ethylbenzene, which is obtained from the synthesis of benzene and ethylene. The colorless liquid with a unique odor is used as raw material for PS, EPS, ABS, SB latex, synthetic resin coating, ion exchange resin, etc.

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## BD

### Butadiene

BD is manufactured by extracting 1,3-Butadiene from Mixed C4 produced in ethylene plants. The colorless gas with a unique odor is mainly used as raw material of synthetic rubber (BR, SBR, SBL, etc) and synthetic resin (ABS, etc).

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## MeX/PX/OX

### Meta-Xylene/Para-Xylene/Ortho-Xylene

#### MeX (Meta-Xylene)

MeX accounts for 40 to 45% of MX and is the most abundant isomer of Xylene (XL). It is produced through the absorption/desorption process, and is used for the production of Purified Isophthalic Acid (PIA).

#### PX (Para-Xylene)

PX, a material separated from MX through the absorption/desorption process, is a volatile liquid that is colorless, transparent,

MeX, PX and OX (Ortho-Xylene) produced from MX (Mixed-Xylene), are distinguished by their differences in boiling points. OX with a high boiling point is separated first from PX and MeX with low boiling points through the separation process, and PX and MeX are separated in the absorption/desorption process.

and has an aromatic odor. The high value-added product is used for the production of terephthalic acid, which is the raw material for polyester fiber, PET bottles, film, etc.

#### OX (Ortho-Xylene)

OX, a xylene isomer with a high boiling point, is a material separated from MX through the distillation process. It is mostly used in phthalic anhydride, which is the raw material for plasticizer, maleic anhydride, and solvent.

## Product Overview

Lotte Chemical is closer to your daily life than you might think. Our products range from daily necessities to medical and cutting-edge aerospace materials, advancing the quality of everyday life.

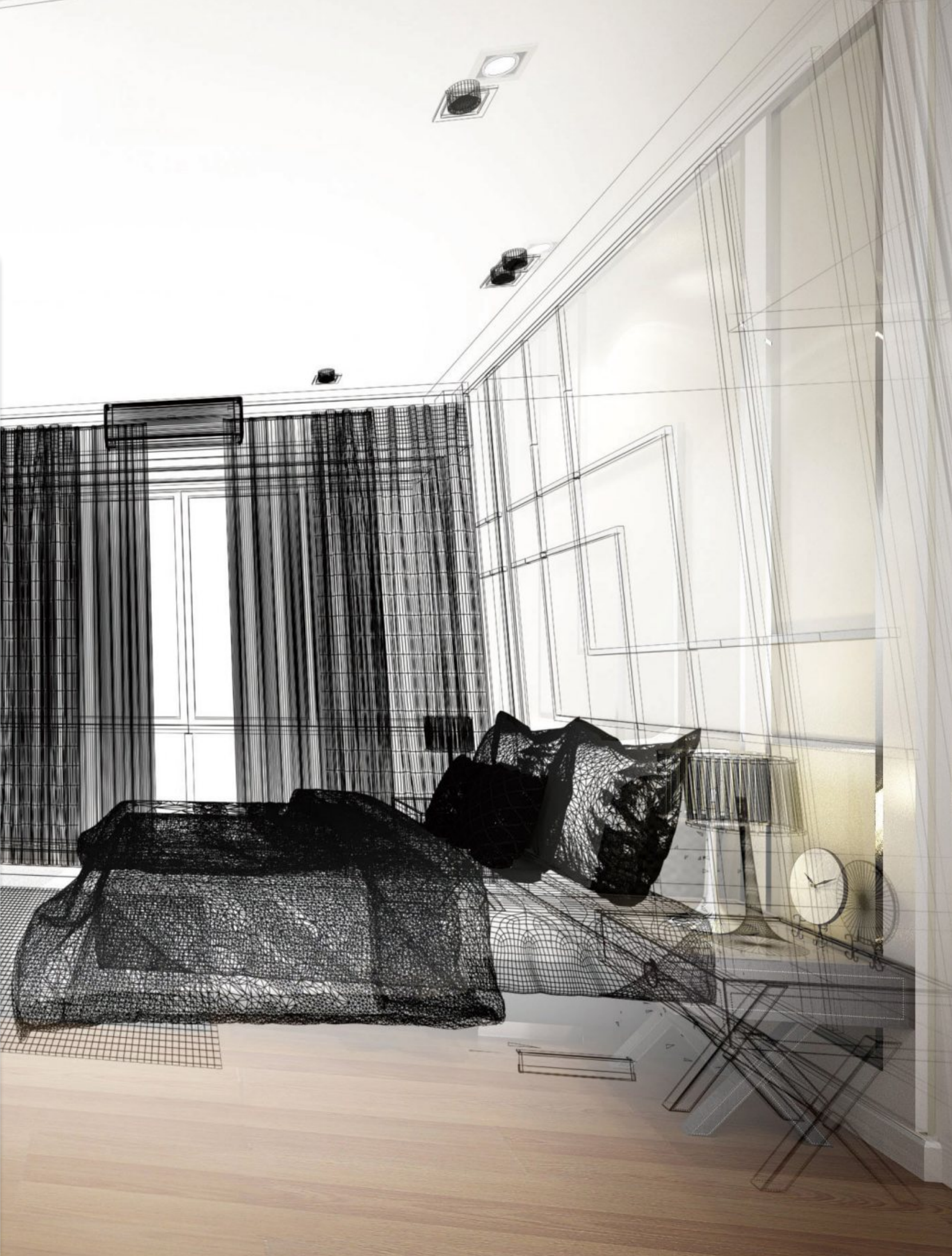


# MEGATREND

\*Megatrends: Lotte Chemical's mid- and long-term core business area

## Water Treatment Membrane

In 2011, Lotte Chemical selected water treatment technology as a next-generation growth engine and started to develop technologies. We have acquired world-class water treatment membrane technology through continuous development of wastewater treatment and water reuse. Lotte Chemical strives to become a global chemical company that seeks to improve quality of life and harmony with the environment.



**Lotte Chemical is evolving into a global chemical company. With excellent products and technology, we will stand proudly as Korea's representative company that leads the global market.**

## 28

### New Business Highlights

Having successfully completed the ethane cracker and ethylene glycol project in 2018, Lotte Chemical continues to develop new businesses.



## 32

### R&D Highlights

The Lotte Chemical R&D Center strives to secure technology for continuous growth and to pioneer new markets.



## 37

### Major product outputs

Lotte Chemical has a diverse range of products ranging from polymer and monomer to megatrend products.





# BUSINESS HIGHLIGHT



## New Business Highlights

### Overseas

#### Ethane Cracker and Ethylene Glycol Joint Venture in Louisiana, USA

In February 2014, Lotte Chemical signed a framework agreement on a joint venture for ethane cracker with USA-based Axiall Corporation, and in June 2015, formed an agreement on the terms of establishing a joint venture, including the share ratio and details of the ethylene business, and finalized the business investment in December 2015. The key of this project is to decompose refined ethane from shale gas to produce ethylene, the basic raw material for petrochemicals. We plan to produce one million tons of ethylene per year and supply it to Lotte Chemical and Axiall. With the secured amount of ethylene, we plan to simultaneously produce EG (Ethylene Glycol) with an annual capacity of 700,000 tons at the same site. Through the groundbreaking ceremony of the ethane cracker and ethylene glycol plant in June 2016, Lotte Chemical officially proclaimed its status as the first chemical company in Korea to venture into the shale gas ethane cracker business in North America and successfully achieved mechanical completion at the end of 2018. Commercial production is expected to start during the first half of 2019.



Ethane cracker and ethylene glycol plants under construction in Louisiana, USA



Petrochemical Complex Building Site



Malaysia Titan PP Expansion

### Construction of a Petrochemical Complex in Indonesia

This project for the construction of a large petrochemical complex in Banten Province, Indonesia, began with Lotte Chemical's acquisition of a site from state-run Krakatau Steel in 2016. After the groundbreaking ceremony in December 2018, sitework is now under way. We expect that mechanical completion will be achieved in 2023. This is a large-scale project that requires an investment of KRW 4 trillion and, when completed, has a production capacity of 91 million tons of ethylene, 520,000 tons of propylene, 130,000 tons of butadiene, and 400,000 tons of polypropylene. When the construction of the petrochemical complex is completed, Lotte Chemical seeks to increase the profitability of its 450,000 tons PE plant in Indonesia by ensuring self-sufficiency of the PE materials to gain a head start in the huge market, Indonesia. We also expect that our production base in Indonesia, followed by Malaysia, Uzbekistan, and the United States will contribute to further expansion of our global presence.

### Malaysia TITAN PP-Expansion Project

Lotte Chemical took over the Malaysia Titan in 2010 and completed the third PP (Polypropylene) plant expansion project in June 2018. This project is especially meaningful to Lotte Chemical because its progress utilizes the company's proprietary technology. Through the NC expansion of Titan, the propylene produced here will be used as raw material. This will strengthen our PP business competitiveness in the Southeast Asian market, which is the net import area of PP products, and will contribute to boosting LC Titan's sales and profits.



## Domestic

### NCC (Naphtha Cracking Center) Project in Partnership with Oil Refinery

Lotte Chemical signed an MOU with Hyundai Oilbank in May 2018 to jointly set up a NCC (Naphtha Cracking Center). The NCC uses byproducts made by refining crude oil, such as desulfurized heavy crude oil, byproduct gas, and LPG, which are cheaper than naphtha, as feedstocks to produce 750,000 tons of ethylene and 400,000 tons of propylene. Lotte Chemical seeks to diversify petrochemical feedstocks to improve cost competitiveness and, at the same time, make the best use of its experience for the successful completion of the project. The two parties expect that, as they had the experience of successfully completing the joint mixed xylene construction project in 2016, this project will make the best use of each other's strengths and significantly contribute to sharpening each other's competitive edge.

### Expansion of Ethylene Plant in Yeosu

Lotte Chemical has now begun commercial production in 2019, after the completion of its Yeosu plant expansion of 200,000 tons of ethylene in November, 2018. Slated for completion by the end of 2018, the expansion project is expected to increase Lotte Chemical's annual ethylene production capacity to 2.3 million tons, including that of the Daesan Plant. When combined with the capacity of the ethylene plant in Uzbekistan, which was completed in May 2016, the Lotte Chemical Titan Plant in Malaysia, with its expanded capacity realized at the end of 2017, and the ethane cracker plant in the USA, which is scheduled to be completed during the second half of 2018, we expect to have a total production capacity of 4.5 million tons of ethylene. This will make us the No. 1 ethylene producer in Korea and the 7<sup>th</sup> largest producer of ethylene in the world. In addition, we expect to secure cost competitiveness by diversifying raw materials, by using C3 LPG (Propane Gas) instead of the traditional raw material of petrochemistry, naphtha along with ethane produced from natural gas of Uzbekistan, and shale gas of the USA.

### Expansion of Yeosu PC (Polycarbonate) Plant

Following Lotte Chemical's decision to add a 100,000 tons PC (Polycarbonate) production line to the Yeosu Plant, construction has begun with the goal of completion in the second half of 2019. A high value-added product with strong heat-resistance and impact-resistance, PC is a representative engineering plastic widely used as a core material for lightweight automotive parts and durable daily necessities. This investment in our facility will garner us an annual production capacity of 210,000 tons of PC products. Combined with the PC production at the affiliate Lotte Advanced Materials (240,000 tons yearly), our annual production capacity is expected to total 450,000 tons altogether. Therefore, Lotte Chemical expects to become the world's third largest PC maker by 2020.



Site Reserved for the Joint Naphtha Cracking Center Project



Expansion of Ethylene Plant in Yeosu



Yeosu PC Plant Expansion





Ulsan PIA Production Facility Expansion



Ulsan Meta-Xylene Plant Expansion



Construction of Daegu Water Treatment Membrane Plant

### Ulsan PIA Production Line Expansion

Lotte Chemical is now carrying out the Ulsan PIA (Purified Isophthalic Acid) expansion project to sharpen its business competitiveness and optimize profitability. When the project is completed, the production capacity of the plant is expected to increase from 460,000 tons up to 840,000 tons annually. PIA is a high value-added project that is used to make PET, paints, and unsaturated resin and produced by only seven manufacturers around the world. This project aims to co-produce PTA (Purified Terephthalic Acid) at the Ulsan plant, which is expected to improve profitability through the production of the relatively more cost-competitive product when it is completed at the second half of 2019.

### Expansion of Ulsan Meta-Xylene Plant

Lotte Chemical is constructing another MeX (Meta-Xylene) production line of 200,000 tons at the Ulsan Plant to in order to stabilize the supply of raw materials and consequently enhance the competitiveness of the PIA (Purified Isophthalic Acid) business. The expansion is slated to be completed by the second half of 2019. MeX is a raw material for PIA, a high-margin product. Lotte Chemical is the world's largest PIA producer, but maintains an operation rate of about 70% due to a shortage of raw materials. Therefore, we decided to expand the facility to ensure a stable supply of raw materials and strengthen our competitiveness in the PIA market. We expect this facility investment to increase our PIA production volume by more than 30%, further bolstering our position as the world's No. 1 PIA supplier. In the second half of 2019, when this expansion project is completed, Lotte Chemical expects to see MeX production volume rising to 360,000 tons a year, further strengthening our competitiveness as the world's No. 1 manufacturer.

### Construction of Daegu Water Treatment Membrane Plant

The water industry is increasingly moving into the spotlight due to severe water shortages and water pollution caused by population growth, urbanization, variability of precipitation, and climate change. As the water industry emerges as the 'Blue Gold' industry of the 21<sup>st</sup> century (a term used to liken water to oil, as oil was previously called 'black gold'), Lotte Chemical completed the membrane project in the Daegu National Industrial Complex Water Industry Cluster to sell "MEMBRIO" in 2018. Lotte Chemical's membrane is a microfiltration capable of removing over 99.99 percent of particulate matter including bacteria in diameter of 0.1  $\mu\text{m}$  or larger in water. The installation of the membrane in water purification and and sewage treatment systems can contribute to keeping the environment clean and promoting human health. As Korea's leading chemical company, Lotte Chemical will actively make environmental commitments to give top priority to creating shared value for mutual prosperity between businesses and society.



## R&D Highlights

### Lotte Chemical R&D Center

Lotte Chemical emphasizes its objective of promoting R&D projects that go hand in hand with customers and the future. Since establishing an integrated chemical R&D Center within Lotte Group in 2005, Lotte Chemical strives to expand its business and secure source technology for sustained growth. The R&D Center also takes the lead in pioneering new markets through R&D in polymer products and their catalysts, functional new materials, and basic chemicals and megatrends. Lotte Chemical has grown to become a global R&D hub by expanding product development and technology support to overseas subsidiaries, including LC Jiaxing EP (China), LC Titan (Malaysia and Indonesia), and LC Alabama (USA). Lotte Chemical is stepping up its efforts to become a global top 7 chemical company beyond Asia by expanding its research capability and through product development.

#### Establishment Date

 1986

#### No. of employees

 342

#### Location

 Daejeon, Seoul

#### Percentage of female researchers (%)

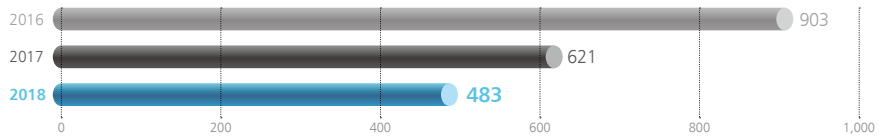
 30%

**R&D Status**

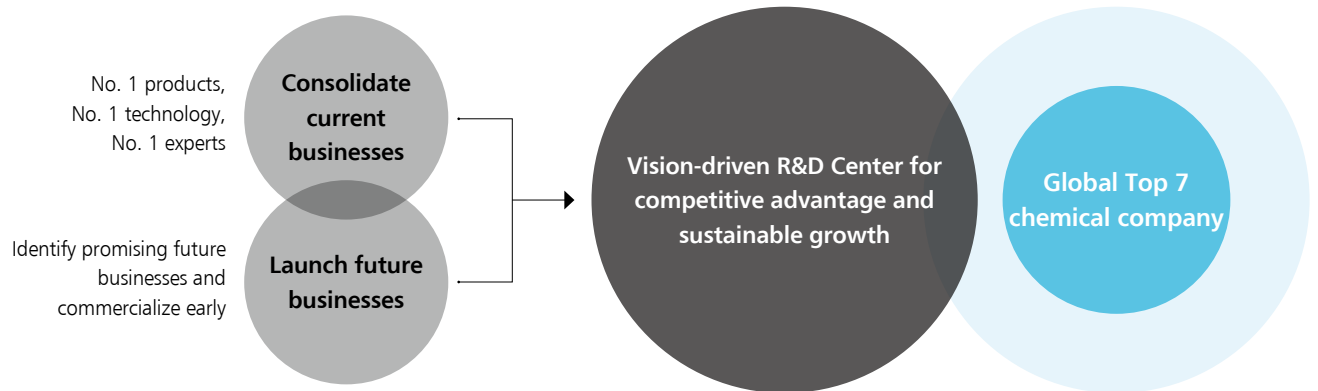
Classification	Research Investment (KRW million)	Research Staff Members (persons)
2016	63,602	391
2017	91,748	400
2018	63,741	342

**New product launches**

Unit: products



**Vision of R&D Center**



## Awards Won in 2018

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### Sept. 11, 2018

Excellence in Laboratory Safety Certification  
(Achieved Excellence in Laboratory Safety  
Certification in accordance with the Act on the  
Establishment of Safe Laboratory Environment;  
three parts in the R&D Center)

Ministry of Science and ICT

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### Nov. 1, 2018

Intellectual Property Business of the Year  
in recognition of Lotte Chemical's achievement in  
terms of patents and other intellectual property  
related work, our R&D division was honored as  
Intellectual Property and industrial development.

Korea Intellectual Property Office

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## Bringing Convenience to Everyday Life

Lotte Chemical is closely related to our everyday lives. Ranging from our household goods to cars, medical devices, and electronic goods, the products Lotte Chemical makes are near us anywhere and anytime. The Lotte Chemical R&D Center is developing a variety of products to contribute to future society.

## Boosting Industrial Infrastructure

Based on over 40 years of process and production controlling technology, Lotte Chemical was the first company in Korea to develop high molecular materials that are used to make hot water and heating pipes and automotive fuel tanks. Our polypropylene resin for extrusion coating, which demonstrates outstanding adhesive properties and processability, was selected as a World-Class Korean Product and contributed greatly to increasing exports. Lotte Chemical is also active in developing adhesive resin which adds functionality to commodity plastics and in developing composites that are highly intensive and lightweight to adapt to automobile components and electronic appliances.

## Developing High Value-Added Product Portfolio

Within the polymer business, which is one of Lotte Chemical's core businesses, we pursue overseas exports based on our proprietary source technologies that include catalytic process technology. We are consistently supplying the products that meet customer needs through technological support. Moreover, we are expanding the engineering plastics business to the portfolio of high value-added products by continuously applying our proprietary technologies to this field. In the monomer business, Lotte Chemical is enhancing its cost-competitiveness through energy efficiency, which results from improving the existing processes and catalysts, and developing high-value chemicals such as raw materials for high-rise concrete compounds.

## Commercializing Eco-friendly Technologies

Lotte Chemical is committed to expanding its environment and energy businesses by focusing on the water treatment business and research on eco-friendly materials. We have consistently invested in R&D to develop water industry technology and succeeded in single-handedly developing highly durable, high permeable hollow fiber membrane. In 2018, we completed the plant in the Korea Water Cluster in Daegu for mass production. Lotte Chemical will continue to boost its efforts to become a global player in the water industry through its top-notch R&D technology.

## Research Areas

### Polymer

**Polymer** | HDPE, LDPE, LLDPE, EVA, PP

Polyolefin-based resin is a typical plastic polymer resin that is widely used in automobiles, home appliances, film, packing materials, household goods and various items found in our everyday lives. Grounded in four decades of process and production control technology, Lotte Chemical develops and sells a variety of polymer products. We are currently preparing to make another leap toward becoming a global chemical company with 4.5 million tons of ethylene production volume in 2018.

### Megatrends

**Megatrends** | Water treatment business, New market exploration

This division is responsible for new and advanced technology research that can further strengthen the company's fundamental business and provide opportunities to discover new business opportunities. Currently, areas of research include water treatment.

### Catalyst and Process

**Catalyst and process** | Metallocene-Ziegler-Natta Catalyst

Catalyst research is carried out on various polyolefin catalysts such as PE, PP, metallocene catalysts, and catalysts for EP materials. For process research, we are conducting research on process efficiency improvements through process simulation and development of new and advanced process.

### Engineering Plastics

**Engineering plastics** | PET, PC, PC Compounds

Engineering plastics are characterized by high heat resistance and rigidity, thereby allowing substitution for metals, and include PET, PC and PMMA. We undertake research on the process and commercialization by individual products and its connection with the T/S activities of end customers.

### Functional Materials

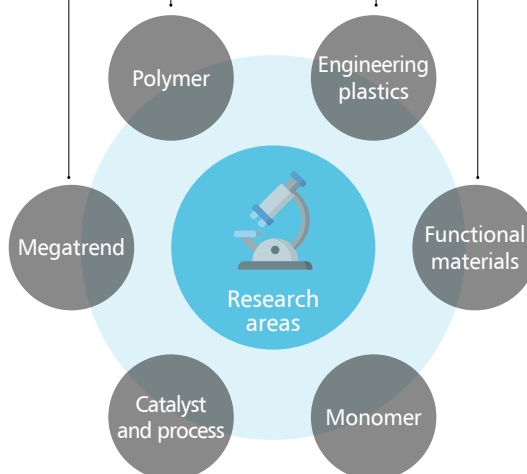
**Performance materials** | BR, EPDM, LFT, TPO, Automotive composites, LOTTMER (Functional TPV), EPP

Functional materials, which are based on reactive extrusion process technology, polymer composite manufacturing technology, and foam technology, have given new functionality to general-purpose polymers. This is where we will create a new market based on differentiated properties. Major products developed based on environment-friendly concepts include thermoplastic elastomers, adhesive resins, polyolefin functional foam material, and metal-alternative high-strength lightweight composites. In addition to the continuous development of nanocomposites, we lead the development of new and advanced materials for the future through research activities in product design, structural analysis and chemical finishing processing optimization based on CAE.

### Monomer

**Monomer** | Monomer, EO/EOA, New process

The focus of monomer research is primarily on developing new products and new processes in the fields of olefins, aromatics, and EO derivatives, and on developing related chemical catalysts. Notably, we develop high value-added derivatives that can secure the competitiveness of existing businesses, develop new and advanced technologies such as improving eco-friendly processes for reducing energy and CO<sub>2</sub> consumption, research high-value added properties of feedstock, and develop raw materials using unconventional oil and gas.



## 2018 R&D Performance Portfolio

Lotte Chemical has been recognized for its excellence in the global market with its advanced technologies and quality, and, in this spirit, we will continue to explore new growth businesses. We succeeded in developing high value-added products and lightweight products for automobiles, and have seen tangible achievements such as certification and awards from external organizations through the development of eco-friendly products of new and advanced materials.



TIPP (Transparent Impact-resistance PP)

### TIPP (Transparent Impact-resistance PP)

PP (Polypropylene) is a universal material widely used in everyday life. As the leading PP producing company in Korea, Lotte Chemical is manufacturing customized products by developing various new technologies. PP is highly favored as a material for food storage containers. The requirements for a food storage container include high strength to keep the product from breaking even when dropped and transparency to make it easy to check the contents inside, but impact resistance and transparency tend to be inversely proportional to each other. Lotte Chemical successfully overcame these limitations and developed TIPP that improves on the deficiencies of other existing products by providing both strength and transparency simultaneously. TIPP is in mass production for various uses such as detergent containers, transparent sheets, and medical equipment befitting its characteristics, and we plan to continue expanding its production as a main high value-added PP product.



### LFT (Long-Fiber reinforced Thermoplastics) Injection Molded Back-Beams for Automobiles

Demand for lightweight materials is constantly rising as government regulations for automobile fuel economy around the world are increasingly strengthened, while the demand for quality improvement is growing. As the leader in the automotive lightweight technology, Lotte Chemical continues to create a raft of lightweight components for automobiles. For example, LFT (Long Fiber Thermoplastic), a product developed by Lotte Chemical's proprietary eco-friendly technology, is 20 to 30% lighter in weight than metal, thereby reducing costs by 20%. It is becoming increasingly popular as a reinforced plastic material to effectively substitute for metals. Drawing upon the production technology that we have with LFT, we also succeeded in developing a back beam that can be manufactured through injection molding. The LFT injection-molded back beam is 45% lighter in weight compared to the conventional back beam, and this achievement then enabled us to drastically improve productivity by integrating the parts. In this regard, Lotte Chemical continues to develop eco-friendly lightweight materials through LOTTMER (Functional TRV), EPP (Expanded polypropylene), and other lightweight technologies.

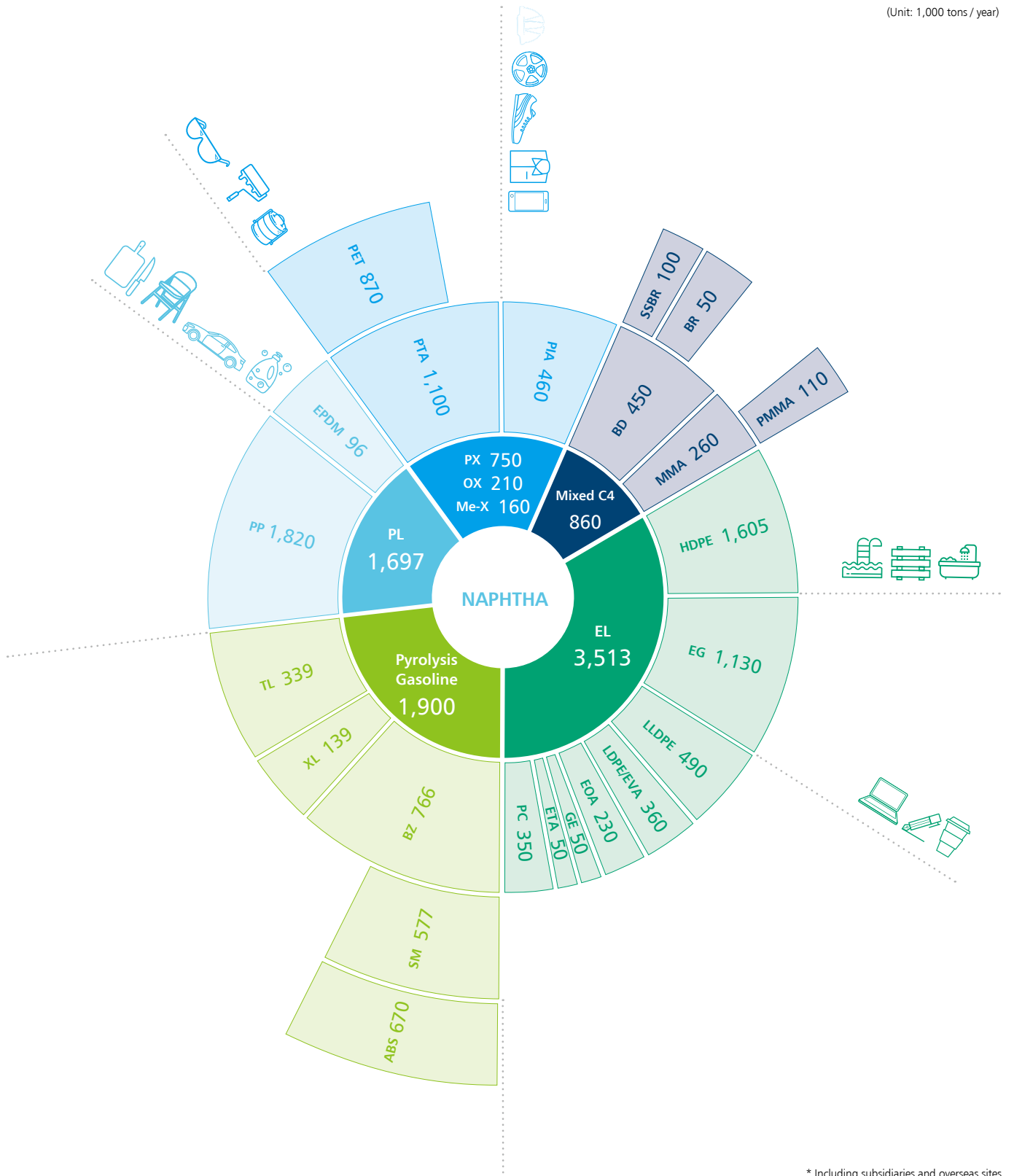
### Water-Treatment Business

In order to enter the water industry, which is under the spotlight in the 21 century, Lotte Chemical succeeded in developing highly durable, highly permeable hollow fiber membrane as a result of consistent investments in R&D of the technology. Our hollow fiber membrane is highly durable, thanks to the reinforcing material and, at the same time, chemical resistant and stain resistant due to the polyvinylidene fluoride (PVD) material, enabling it to be used stably for a long time. In 2018, Lotte Chemical completed a plant in the Korea Water Cluster in Daegu for mass production. We plan to expand our water business further to become a global player equipped with our world-class membrane technology.



# Major Product Outputs

Lotte Chemical has an extensive product portfolio, ranging from polymers to monomers to megatrend products. We will continue to grow as a global chemical player through the efficient use of our world-class production complexes and generation of stable profits.



\* Including subsidiaries and overseas sites

Lotte Chemical values the opinions of all stakeholders as part of our corporate management. We will pursue sustainable growth together with our stakeholders.

## 40

### Sustainable Management Initiatives

Lotte Chemical fulfills its economic, social and environmental responsibilities based on systematic sustainability management strategies and vision.



## 42

### Corporate Governance

Lotte Chemical aims to make decisions that take various stakeholders' interests into account through its advanced management system of the Board of Directors.



## 44

### Compliance

Lotte Chemical is building compliance into its business operations in order to reinforce its corporate social responsibilities and realize its core values through the settlement of compliance culture.



## 46

### Ethical Management

Lotte Chemical is building a transparent and clean corporate culture required of global leaders.



## 48

### Risk Management

It is essential for a business to identify various risk factors that may occur in a rapidly changing business environment and respond properly on a proactive basis in order to be sustainable.



## 50

### Stakeholder Engagement

Lotte Chemical is acutely aware of the importance of open communication with stakeholders when doing business and is proactively exchanging information through diverse channels.



## 52

### Materiality Test

Lotte Chemical identified potential issues related to our sustainability based on global standards, benchmarking of practices adopted by leading companies, media research and stakeholder surveys. The material issues related to our sustainability management activities were finally selected for intensive disclosure.







**STRATEGY &  
GOVERNANCE**



# Sustainable Management Initiatives

Lotte Chemical fulfills its economic, social and environmental responsibilities based on systematic sustainability management strategies and vision. We pursue long-term and sustainable growth and development, thus realizing a future society of prosperity for humanity.

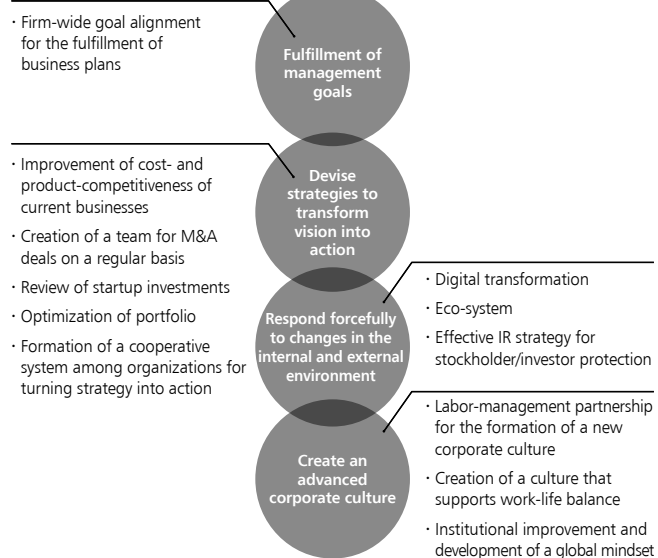
## Sustainability Management System

In order to achieve its vision of becoming a “Global Top 7 Chemical Company” Lotte Chemical declared the “Vision 2030” in 2018 and drew up key tasks and detailed strategies based on its sustainability management system.

### Vision



### Key tasks Detailed strategies



## Sustainability Management Implementation Organization

Lotte Chemical operates a Sustainability Management Working Group under the management and supervision of the CEO to promote company-wide sustainability management. The Sustainability Management Practice Council selects supervising organizations for the respective fields of environmental safety, governance, social contribution, and so forth, and establishes the implementation tasks by field to achieve systematic sustainability management.



## Achievements of Sustainability Management

Lotte Chemical was able to achieve positive outcomes both internally and externally in 2018 through the systematic implementation of sustainability management strategies. These accomplishments stem directly from the diligence and dedication invested by each and every employee at Lotte Chemical, as we strive to achieve financial growth, take corporate social

responsibility into account, and stick to transparent management. Lotte Chemical will continue to innovate and strive for sustainability management strategies to lay the cornerstone for becoming a global chemical company.

**Grand Prize at GSMA (Global Standard Management Awards) in the Green Management Category for Two Consecutive Years**

Lotte Chemical won the Grand Prize at the Global Standard Management Awards (GSMA) in the Green Management category for two consecutive years.

Organized by the Korean Management Registrar (KMR) and sponsored by the Ministry of Trade, Industry and Energy, the Small and Medium Business Administration, the Federation of Korean Industries, the Korea Chamber of Commerce and Industry, Korea International Trade Association, and Korea Federation of Small and Medium-sized Enterprises, the Green Management Award is given to businesses equipped with green management systems after a rigorous document and on-site screening. Receipt of the award testifies that Lotte Chemical gives top priority to green management.

This feat can be attributed to our consistent effort to reduce energy consumption, greenhouse gas emissions, and environmental pollution in workplaces. We will continue striving to make green management second nature as a sustainable global player.



**Platinum (Grand Prize) Winner in the Annual Report Category of LACP Spotlight Awards for Five Consecutive Years**

Lotte Chemical’s 2017 sustainability management report was awarded the Grand Prize in the Annual Report category of the Spotlight Awards Global Communications Competition, an international corporate public relations and report data evaluation event held by the League of American Communications Professionals LLC (LACP) for the fifth consecutive year. Moreover, we were ranked first in the Top 100 category again since 2016, which ranks all the participating companies’ publicity materials, including corporate reports and publications.

The ‘Spotlight Awards’ is an international public relations contest that evaluates the accuracy of information, transparency of management, and creativity in the publicity materials of

companies all around the world. This achievement results from Lotte Chemical’s commitment to faithfully reflecting the interests of our stakeholders and transparent disclosure of our management information. We will continue to publish quality sustainable management reports that will facilitate communication between Lotte Chemical and stakeholders while disseminating our efforts for sustainability management.



Lotte Chemical Ranked Platinum Winner of 2018 LACP in the Annual Report Report Category

**Charlotte Volunteer Group of Yeosu Plant Awarded Appreciation Plaque and Commendation Award as an Excellent Company for Co-Prosperity Projects in 2018**

The Lotte Chemical’s Volunteer Group in Yeosu Plant was selected as an Excellent Company for Co-Prosperity Projects by Yeosu Metropolitan City in 2018. It also received a commendation award for its contributions to improving welfare and human rights for people with disabilities. Lotte Chemical implements its CSR activities on a regular basis through the voluntary participation of its employees in CSR programs. Notably, the Charlotte Volunteer Group of the Yeosu Plant carried out voluntary activities such as regular environmental protection events and support for the underprivileged, serving as a corporate model of co-prosperity through cooperation with local communities.



Commendation Award granted by Yeosu Metropolitan City

# Corporate Governance

The formation and operation of sound and transparent corporate governance is one of the essential requirements for creating a solid company. Lotte Chemical aims to make decisions that take various stakeholders' interests into account through its advanced management system of the Board of Directors.

## Organization of the Board of Directors (BOD)

The Board of Directors of Lotte Chemical consists of nine experts representing nine fields. The Chairman of the BOD also serves as the Chairman and Representative Director. The outside directors, five in total, are responsible for balanced management decision-making.

As of March 27, 2019

Name (specialization)	Gender	Position	Initial Appointment Date	Title and Career
Shin Dong-bin	Male	Chairman & CEO	May. 28, 2004	Current) Chairman of Lotte Group
Kim Gyo-hyun	Male	President & CEO, Chairman of BOD	Mar. 24, 2017	Current) CEO of LC Titan
Lim Byung-yun	Male	Vice-President & CEO	Mar. 27, 2019	Current) Director of Value Management Division, Lotte Corporation
Yoon jong-min	Male	Non-executive Director	Mar. 27, 2019	Current) Director of Management Strategy Division, Lotte Corporation
Park Kyung-hee (Finance)	Female	external director, Audit Committee member	Mar. 20, 2015	Current) Professor of Business Administration, Ewha Womans University
Kim Yoon-ha (Finance)	Male	Outside director, Audit Committee member	Mar. 18, 2016.	Former) Director of General Bank Inspection Bureau, Financial Supervisory Service
Kim Cheol-soo (Tax)	Male	Outside director, Audit Committee member	Mar. 18, 2016.	Former) Deputy Head of Korea Customs Service
Park Yong-seok (Legal)	Male	Outside director	Mar. 18, 2016	Current) chief attorney, Lee & Ko Legal Firm
Jo Seok (Management)	Male	Outside director	Mar. 19, 2018	Current) President of Korea Hydro & Nuclear Power

\* On the date of appointment of CEO

## Diversity & Independence of the BOD

Board members are selected by internal rules based on applying relevant laws and ordinances such as the Commercial Act. Although in-house members are appointed at the general shareholders' meeting on the recommendation of the Board of Directors, outside directors are selected by the External Director Candidate Recommendation Committee through careful review of the candidates' expertise.

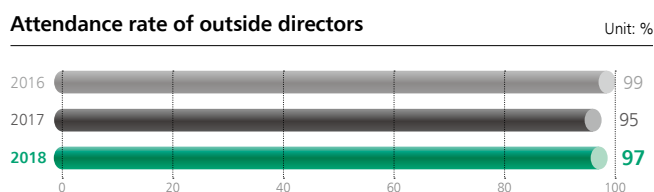
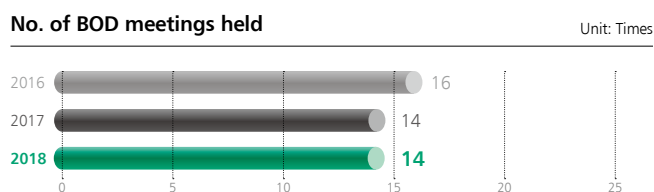
To implement a stable governance structure through checks

and balances among members, Lotte chemical subdivides management decision-making rights and business execution rights to the board and management through the regulations of the Board of Directors and the related regulations. Also the ratio of outside directors within the board is 50% or more (five out of nine directors) so that the board can practically exercise the check regarding management's executive powers, and outside directors do not have a specific background or represent specific interests. Under the "Diversity Principle" we recommend candidates for outside directors in a transparent and fair manner through the nomination committee for outside directors, which consists of two-thirds of the members.

The company's outside directors consist of experts including financial, accounting, legal and administrative. Based on their diverse backgrounds and expertise, we conduct in-house deliberations on the agendas of board members with effective monitoring of management's performance. In addition, to diversity, one of the current outside directors is appointed as a woman to reflect opinions on diversity policies and other matters. In addition, we provides detailed information on the agenda by conducting prior reports before the board meeting through its dedicated and related departments so that directors can make the best management decisions.

## Operation of the BOD

In 2018, board meetings were held 14 times. The board members go over various agenda items and issues related to sustainability management, including important business issues such as global business forays and investment decisions based on rational and professional processes. The Board operated three subcommittees, including the Audit Committee, to carefully review current issues in detail.



## Professionalism of the BOD

In order to improve the professionalism of the directors, Lotte Chemical provides materials on the agenda before the Board of Directors and the committee meetings, and holds briefing sessions if necessary. In addition, we regularly visit our business sites in Korea and overseas to share our company's management status through internal education. Also, we report on major issues that may affect our sustainability in terms of the economy, society, and the environment. The BOD operates three subcommittees, including the External Director Candidate Recommendation Committee, the Internal Transaction Committee, and the Audit Committee, to strengthen the BOD's expertise in making decisions and to support efficient operations.

As of March 27, 2019

Subcommittee	Member	Name	Purpose and Authorities
External Director Candidate Recommendation Committee	Inside director	Lim Byung-yun	Recommendation of outside director candidates
	Outside director	Jo Seok	
	Outside director	Park Yong-Seok	
Internal Transaction Committee	Outside director	Park Kyung-hee	Deliberations and requests for correction of internal transactions and private contracts over a certain scale
	Outside director	Kim Chul-soo	
	Outside director	Kim Yoon-ha	
Audit Committee	Outside director	Park Kyung-hee	Audit of accounting and works
	Outside director	Kim Chul-soo	
	Outside director	Kim Yoon-ha	

## Audit Committee

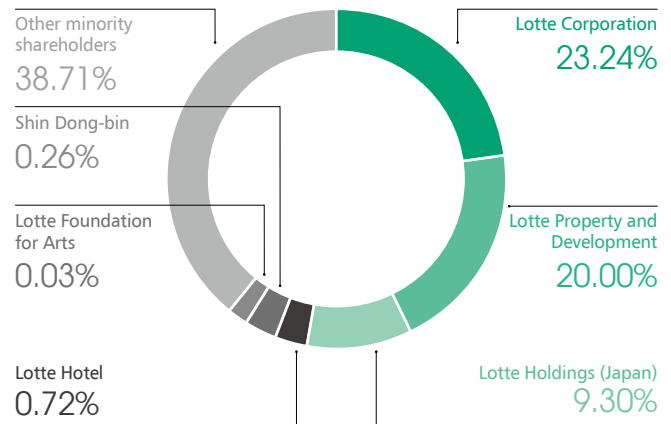
All members of the Audit Committee consist of external directors elected at shareholders' meetings. The tenure of the members of the Audit Committee is designated according to the Articles of Incorporation and guarantees independence, and is held at least once every three months. The committee contributes to establishing sound corporate governance by focusing on preventive and preemptive audits from the decision-making stage to post-audit strategic execution in order to fundamentally avert conflicts of interest.

## Performance Evaluation and Compensation

Evaluation and compensation for directors are conducted in accordance with fair and transparent rules and procedures. We comprehensively evaluate their overall business performance across the company as well as their individual activities. Also, we review them in advance to ensure reasonable compensation within the remuneration limits of the directors. The remuneration limit is fully reviewed and confirmed at the shareholders' meetings. Details are disclosed in the business report each year.

## Shareholder Composition

Lotte Chemical strives to maximize shareholder value by listening to the opinions of major shareholders and other minority shareholders. All shareholders exercise various rights in accordance with the scope of the laws and regulations. The major shareholders are Lotte Corporation and Lotte Property and Development.




Shareholder	No. of shares owned	Share (%)
Lotte Corporation	7,965,201	23.24
Lotte Property and Development	6,855,084	20.00
Lotte Holdings (Japan)	3,186,000	9.30
Lotte Hotel	245,351	0.72
Shin Dong-bin	90,705	0.26
Lotte Foundation for Arts	11,495	0.03
Others	15,921,583	46.45

## Providing Transparent Business Information

Lotte Chemical recognizes the importance of active and transparent communication with investors and markets, and provides accurate and sufficient information about the future economic value of our companies. As a result, we share information with investors through activities such as briefings and conferences, as well as activities related to corporate disclosure. For 2018, a total of 41 disclosures were submitted to effectively communicate with investors and stakeholders. In addition, we constantly monitor laws and regulations for their establishment and amendment in order to comply with disclosure regulations, and continue to disclose information effectively through continuous training on disclosure rules. Based on these efforts, Lotte Chemical was selected as the Best Public Corporation in 2017 by the Korea Stock Exchange.

## Issuer Credit Ratings and Date of Final Rating

	<b>Regular Rating</b>	National Information & Credit Evaluation (NICE)	AA+
	Corporate Bonds	June 15, 2018	
		Korea Investors Service (KIS)	AA+
		June 19, 2018	
		Korea Ratings	AA+
		June 21, 2018	
	<b>Initial Rating</b>	Korea Investors Service (KIS)	AA+
	Corporate Bonds	Aug. 22, 2018	
		Korea Investors Service (KIS)	AA+
		Aug. 22, 2018	

# Compliance

Lotte Chemical is engaging in compliance management activities with the aim of reinforcing corporate social responsibilities and realizing core values through the establishment of a culture compliance management. We also are operating a compliance system that meets global standards in an effort to take the lead in fulfilling corporate social responsibilities. All employees at Lotte Chemical are striving to comply with the laws and regulations for compliance management based on a robust corporate philosophy. Lotte Chemical is also operating the programs designed to prevent compliance risks in overall business activities, such as those related to fair trade, anti-corruption, safe, and the environment.

## Compliance Management

### Compliance Management Charter

Every employee of Lotte Chemical Corporation aims to grow the company into one that is appreciated by the public and fulfills its social responsibilities under the mission of “We enrich people’s lives by providing superior products and services that our customers appreciate and depend on” and complies with the following compliance management charter.

### Formation and Operation of a Compliance System

Lotte Chemical is managing overall compliance risks, protecting the core values of the group and the company, specifying the need for compliance and ethical management to members through the establishment of a compliance system that meets global standards, and ensuring its effective operation, firmly establishing it as the company culture. Our compliance system is composed of the compliance management charter and compliance management regulations, regulations on anti-corruption, fair trade, and other internal affairs, creation of a relevant department, online and offline training and other education and counseling on a regular basis, and internal accounting control and internal whistleblower hotlines through the operation of a valid internal accounting management system, audit and IT monitoring for risk detection and recurrence prevention for effective and efficient operation. Based on such efforts, we aim to run a business that meet legal and social requirements beyond simply complying with the law, build a corporation based on doing what is right for the company at all times, and ensure our corporate culture is sustainable.

### Improvement of Compliance-related Programs

In 2018, we formed a compliance team under the direct supervision of the CEO within the Compliance Management Division, monitored the compliance with the compliance control standards, and reported the results to the BOD twice. The monitoring checklist included the following: 1. Compliance risk review and consulting in areas related to fair trade, anti-corruption, and other business activities; 2. IT monitoring on internal electronic documents; 3. Violation of the Subcontracting Act and standard subcontract agreement and other subcontract transactions; 4. Process review in relation to internal transaction, procurement, subcontract, and private information protection, and; 5. Handling of whistle-blowing and grievances. Where necessary, we eliminated all factors with potential risks of illegal work processes to reflect the relevant legal standards.

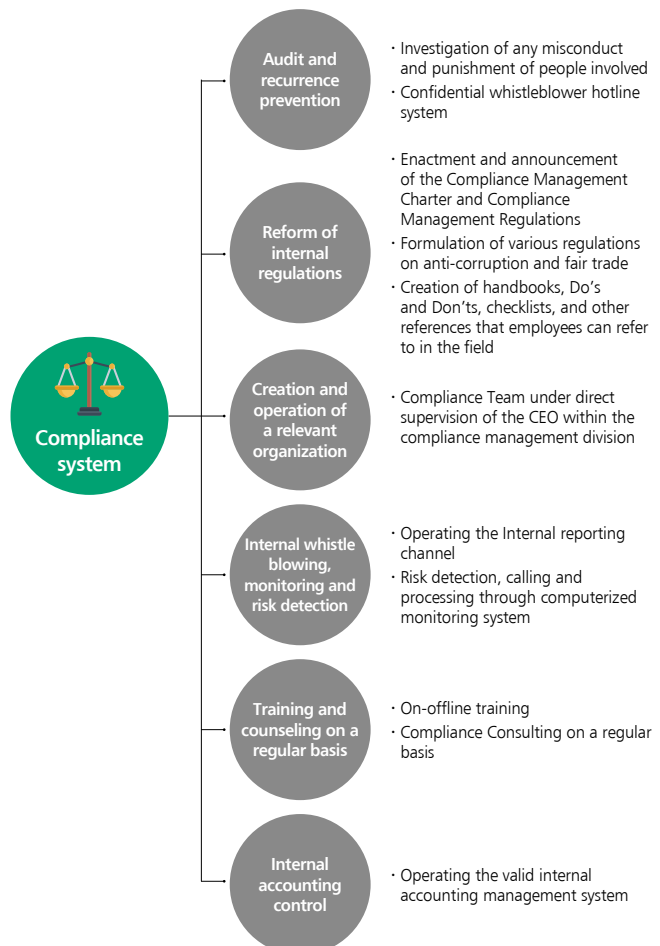
#### LOTTE Chemical’s Compliance Management Charter

Every employee of Lotte Chemical Corporation (Hereinafter referred to as “the Company”) aims to grow into a company that is appreciated by the public and fulfills its social responsibilities under the mission of “We enrich people’s lives by providing superior products and services that our customers appreciate and depend on.” and complies with the following compliance management charter.

Article 1 (Course of Action by Employees)

- ① We perform our job responsibly with honest and sincere attitude and establish a corporate culture of mutual respect and trust.
- ② We will do our best to increase the value of the company by transparent and efficient management and maximize the rightful profit of the stockholders.
- ③ With customer satisfaction as the top priority, we provide the best quality products and services that our customers want.
- ④ We establish a fair and transparent trade with partner companies and pursue mutual growth by strengthening the partnership.
- ⑤ We respect competitors, comply with relevant laws and regulations, and pursue fair and free competition.
- ⑥ As an eco-friendly enterprise, we will strive for continuous development and contribute to the preservation of the earth and the prosperity of humankind.
- ⑦ We fulfill corporate social responsibility by complying with the law and contributing to the public interest of the country and communities.
- ⑧ We respect human rights and strive for the protection of the vulnerable by taking affection and respect for people as core values.

Lotte Chemical’s Compliance Management Charter



### Compliance Mid- and Long-term Vision

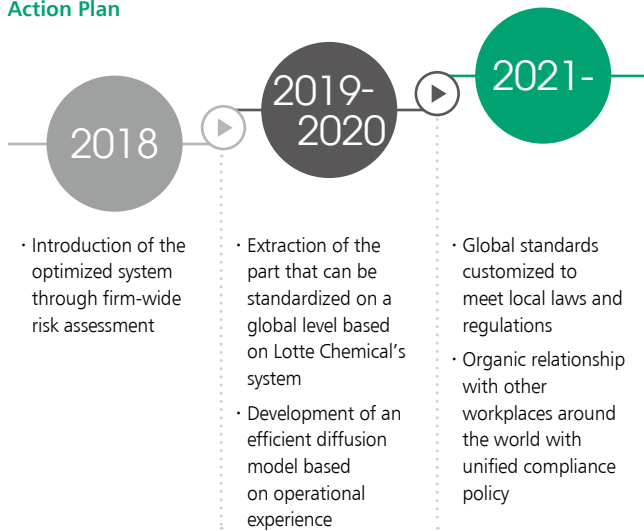
Lotte Chemical has formulated its mid- to long-term master plan in order to develop it as a world-class compliance system by utilizing its experience on creation and operation of a compliance system that meets global standards. We are carrying out our action plan with the aim of establishing a culture of compliance management that allows us, including our affiliates, to earn the trust of our employees, customers, and partners; and contributing to sustainability management by developing and spreading a standard model for the spread of a compliance system and a culture of compliance management to our affiliates. To that end, we plan to achieve the international certification of anti-bribery managementsystems (ISO 37001) next year and start developing a global fitting standard model through a comparative analysis of global standards and the compliance management of each workplace overseas.

### Compliance Mid- to Long-term Vision

#### Development into a world-class compliance system



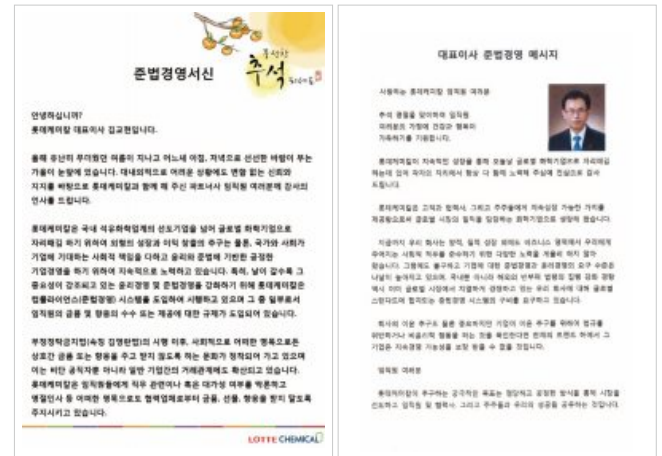
### Action Plan



### Improve Supply chain Compliance

Lotte Chemical established a Code of Conduct for the Integrity of Suppliers in 2015 and has been undertaking it ever since. We continuously reinforce our supply chain compliance by requiring the use of standard contracts and expanding the ECS (Electronic Chart Systems) for transparent and fair transactions with our partners. In 2018, especially, and in 2017, in particular, we completed the anti-corruption management system to comply with anti-graft laws including the Anti-Corruption and Bribery Prohibition Act both at home and abroad, with a plan to acquire the relevant international certificate. Next year, we will further strengthen our supply chain compliance by adding reciprocal obligations to comply with anti-bribery and other relevant laws and regulations in the contracts, while expanding compliance training to create a transparent and fair trading culture for our suppliers' employees.

**A Letter of Compliance Management |** Lotte chemical is sending a letter of compliance management from the CEO to all employees and partners in order to publicly announce its determination to abide by compliance management and compliance with rules. We make sure that all employees should engage in fair and transparent trade with partners and not to receive any form of bribery, including money and entertainment, from partners or stakeholders, while requiring partners not to offer anything illegal. We also encourage them to report unfair treatment or misconduct committed by our employees. We continue to do our best to make a fair and transparent corporate culture second nature to us by spreading our determination to practice compliance management and compliance with rules.



Letter of Compliance Management

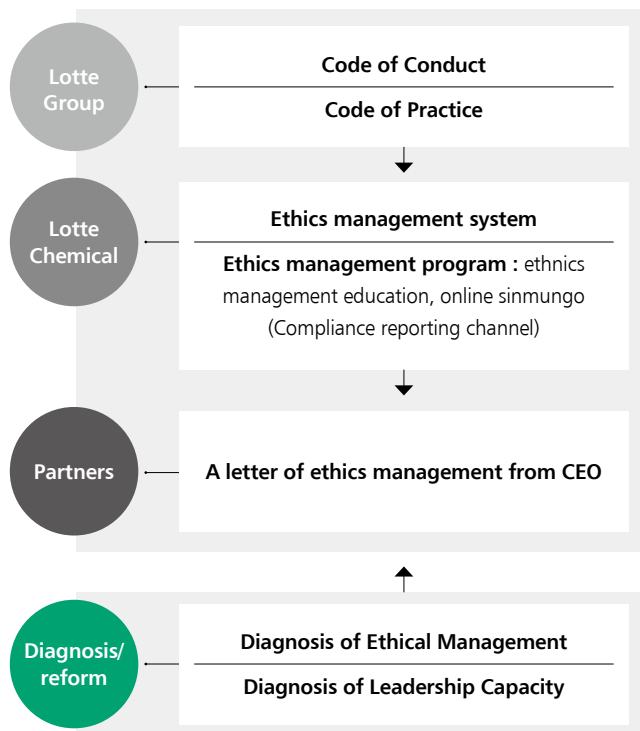
# Ethical Management

Lotte Chemical is building a transparent and clean corporate culture. Based on the ethical management system, including the Ethics Committee and the Ethics Office, we implement various ethical management activities to ensure that all employees understand their work ethics and conduct their work fairly and rationally. Based on our faith and trust, we will fulfill our corporate social responsibility and contribute to social and economic development and the enrichment of human life.

## Ethics Management System

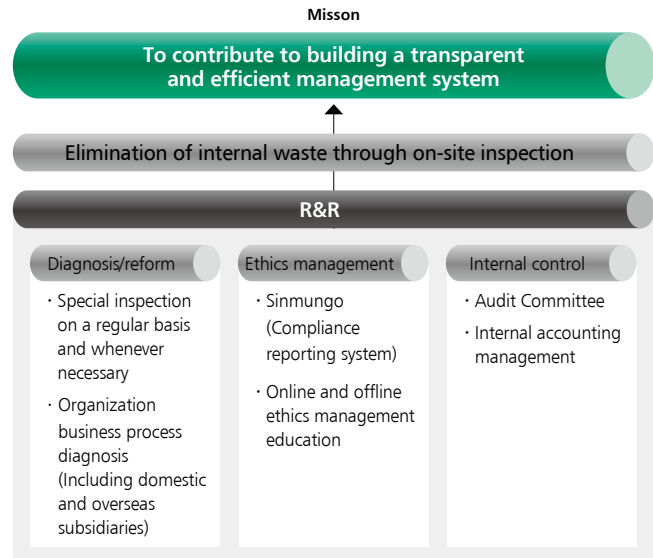
Lotte Chemical operates the Ethics Management Team under the direct management of the CEO. Through ethical management practice guidelines, we declared our ethical management intent internally and externally, while providing support for the overall operation of ethical management and the execution of detailed ethical management activities that include the establishment and operation of ethical regulations and the ethical management system. In addition, we are striving to establish a company-wide ethical management culture for employees through education and campaigns.

### Ethics Management System



### Ethical Management System

We established an organized ethical management system to enable all employees to share and monitor for an ethical management culture. We operate the ethics management website (<http://ethics.lottechem.com>) to share our ethics code internally and externally for all employees to observe the ethics pledge as well as engage in ethics management training and activities. In the meantime, we are establishing a reporting system for internal and external stakeholders to report unethical activities.



### Diagnosis and Reform of Ethics Management

Lotte Group has established the Code of Conduct in order to clarify the direction of ethical management within our organization. In 2016, the Code of Practice has provided clear guidelines on ethical issues. In addition, through diagnosis, reform, internal control, and other monitoring activities, we have consistently managed ethics. We are also able to measure the level of ethical management and support accurate status monitoring through the "Ethical Management Diagnosis" a preventive management system.

### Code of Conduct

Theme	20 Practices
Trust from Employees	<ul style="list-style-type: none"> <li>· Fair corporate culture</li> <li>· Organizational culture based on mutual respect</li> <li>· Safe working environment</li> <li>· Transparent financial statements</li> <li>· Asset protection and prevention of abuse</li> <li>· Protection of intellectual rights</li> <li>· Compliance with information protection regulations</li> <li>· Prohibition of bribery</li> <li>· Prohibition of internal trade</li> <li>· Prohibition of unfair political affairs</li> </ul>
Trust from Customers	<ul style="list-style-type: none"> <li>· Top-notch products &amp; services</li> <li>· Honest marketing</li> <li>· Protection of customer information</li> </ul>
Trust from Partners	<ul style="list-style-type: none"> <li>· Fair trade</li> <li>· Respect for partnership</li> <li>· Fair competition</li> <li>· Legitimate collection of information of competitors</li> </ul>
Trust from Society	<ul style="list-style-type: none"> <li>· Environmental protection</li> <li>· Corporate social responsibility</li> <li>· Respect for local culture/ compliance of local laws &amp; regulations</li> </ul>



## Ethics Management Program

Lotte Chemical implements a variety of ethical management programs including ethics management letters, ethical management education, campaigns, and quizzes. Based on these efforts, we internalize ethical management company-wide and bolster our ethical management system.

### Ethics Management Training

Lotte Chemicals is committed to active ethical management that goes beyond the level of passive ethical management to prevent unethical behavior and corruption, aiming for ethical relationships that strive for long-term cooperation and respect among employees. We have repeatedly conducted ethical management education through various methods such as online and collective education to internalize the ethical minds of our employees in business ethics.



Ethics Management Online Training

### Ethics Management Training

Classification	Unit	2016	2017	2018
No. of education courses	courses	6	6	5
Hours	hours	1	1	1
Number of employees who completed training	people	89	805	394

### 2018 Ethics Training

Classification	Course	Date	Target	Description
Collective training	New employee orientation	Feb. 13, 2018	Employees recruited during the first half of 2018	Introduction of ethics Management and roles of new employees
		Aug. 6 and 13, 2018	Employees recruited during the second half of 2018	
	Electronic approval	Jan. 13 ~ Feb. 27, 2018	All employees at the head office and all workplaces	
	Procurement/ bidding process reform	Mar. 12 ~ Mar. 22, 2018	All employees relevant to procurement	Increase of ethical Awareness, prevention of recurrence and Business reform through audit cases
	Criteria for arbitrary administrative decisions on loan lock cancellation	Apr. 11, 2018	Sales-related departments	
Export process reform	Sept. 18, 2018	Sales-related departments		
Online training	Ethics e-learning course	52 weeks	All employees	Video training for making ethnics management part of the organizational culture

\* Collective training held six times and online training held one time

### Online Shinmungo (Compliance-reporting System)

Lotte Chemical accepts reports of violations committed by internal/ external stakeholders through the "Online Shinmungo" on our Ethical Management website. The identity of an informant will be kept strictly confidential to prevent any possible disadvantages and unfair treatment for reporting. The feedback and handling process for the violation report is disclosed to the informant through a wired method and e-mail. Additionally, we provide various online and offline reporting channels such as postal mail, wired line, and e-mail, so that feedback and improvement suggestions for ethical management can be submitted anytime and anywhere.

### Online Sinmungo

Unit: cases

Classification	2016	2017	2018
Bidding and contract	3	1	3
Sales and receivables	1	-	-
Grievances of business partners	8	1	6
Complaints on work process	3	4	5
Total	15	6	14
Follow-up and prevention of recurrence	15	6	14



# Risk Management

The sustainability of a business lies in, among many aspects, its awareness of a variety of risks it may face in the rapidly changing global business environment and preemptive and proper risk management and responses. Driven by the management's interest in risk management and determination to fight risks, Lotte Chemical is committed to creating an efficient business environment by identifying causes of economic as well as social and environmental risks, managing risks on a regular basis, and efficient response systems.

## Operation of an Integrated Risk Management System

Lotte Chemical has established a systematic integrated risk management system and maintained sustainability. We have identified all potential risks in economic, social, and environmental areas and laid the foundation to respond promptly to the risks company-wide by identifying potential internal and external risk issues before they become crises. Moreover, in the event of a risk, we have an established management process for all members to undertake the most efficient and prompt response actions.

### Building Risk Management Governance

Lotte Chemical operates Enterprise Risk Management (ERM) to identify risk factors that may affect the company in the entire process of undertaking business activities and formulate risk management and response strategies to share how risks are being managed and reform risk management policies to reflect the company's management policy. Also, we have company-wide risk management governance through proper allocation of duties between the risk management department and relevant departments.

### Internal Control System

Lotte Chemical operates an internal control system for the management and relevant organization to analyze the risks that may have a significant impact on the businesses process and make decisions on the necessity of internal control. We reformed the internal accounting management system in accordance with the Act on External audit of Stock Companies, etc., which was revised in 2018. To that end, the relevant organization executes a thorough analysis of the business processes related to risk, such as regulatory and legal issues that may have a significant impact on our business operations, and reports the result to the Audit Committee and the Board of Directors. We further have the results reviewed and certified by external auditors and the Audit Committee.

## Creation of a Risk Portfolio

We established a risk portfolio in the four areas of operations, finance, compliance, and strategy, to evaluate newly identified risk factors on a company-wide basis. Crisis factors are selected and under continuous management based on the evaluation results.

### Operational risks

**Safety and Environmental Risks** | Safety and environmental risks at production sites are proportional to the expansion of business sites and facilities secured pursuant to the growth of the

company, and thus require intensive management. In this regard, we have implemented a safety and environmental inspection system at all times. Also, we, from 2017 in particular, provided consultations for the establishment of a new safety culture as led by our commitment to internalizing an awareness of safety and environmental management among our members. Moreover, we work on building the systems and structures that comply with international standards as a global company.

### Financial Risk

**Tax Risk Management** | As a faithful taxpayer and investor, Lotte Chemical dutifully abides by all relevant laws, principles, and regulations of all countries in which we operate our business. We faithfully perform our obligations to pay taxes, comply with all tax return and payment deadlines, and disclose related matters in an audit report and electronic disclosure system in a transparent manner. As a corporate citizen, we will faithfully fulfill our tax obligations and prevent all tax risks that may occur in opening new businesses and perform business transactions by carefully yet precisely responding to them.

### Compliance Audit Risk

**Compliance risk management** | Lotte Chemical operates a compliance management system in accordance with the growing global regulations on compliance management, tighter monitoring of the business environment by stakeholders, and the quantitative growth of the company. We ensure preliminary management through manuals and monitoring by identifying the specific risk areas. We completed the compliance management system project, which started at the end of 2016, to systematically support the overall areas of anti-corruption, antitrust, fair trade, environmental safety and health, human resources, tax accounting, and trade secret protection.

### Strategy Risk

**Industry Growth Risk** | As oil prices plummeted in the second half of 2014, traditional petrochemical companies based on NCC were able to secure stable flows of profitability due to boosted price competitiveness stemming from low-priced raw materials. Since then, however, oil prices have gradually risen and global competition is intensifying in line with large-scale expansion plans in the global arena. In order to minimize the risks caused by the growth of the entire petrochemical industry, we diversify our feedstock, develop specialty products, and venture into new businesses.

**Competition Risk** | As competition in the global market becomes fiercer, it is increasingly necessary to respond to production technology and quality control through the establishment of a high value-added product portfolio, as well as

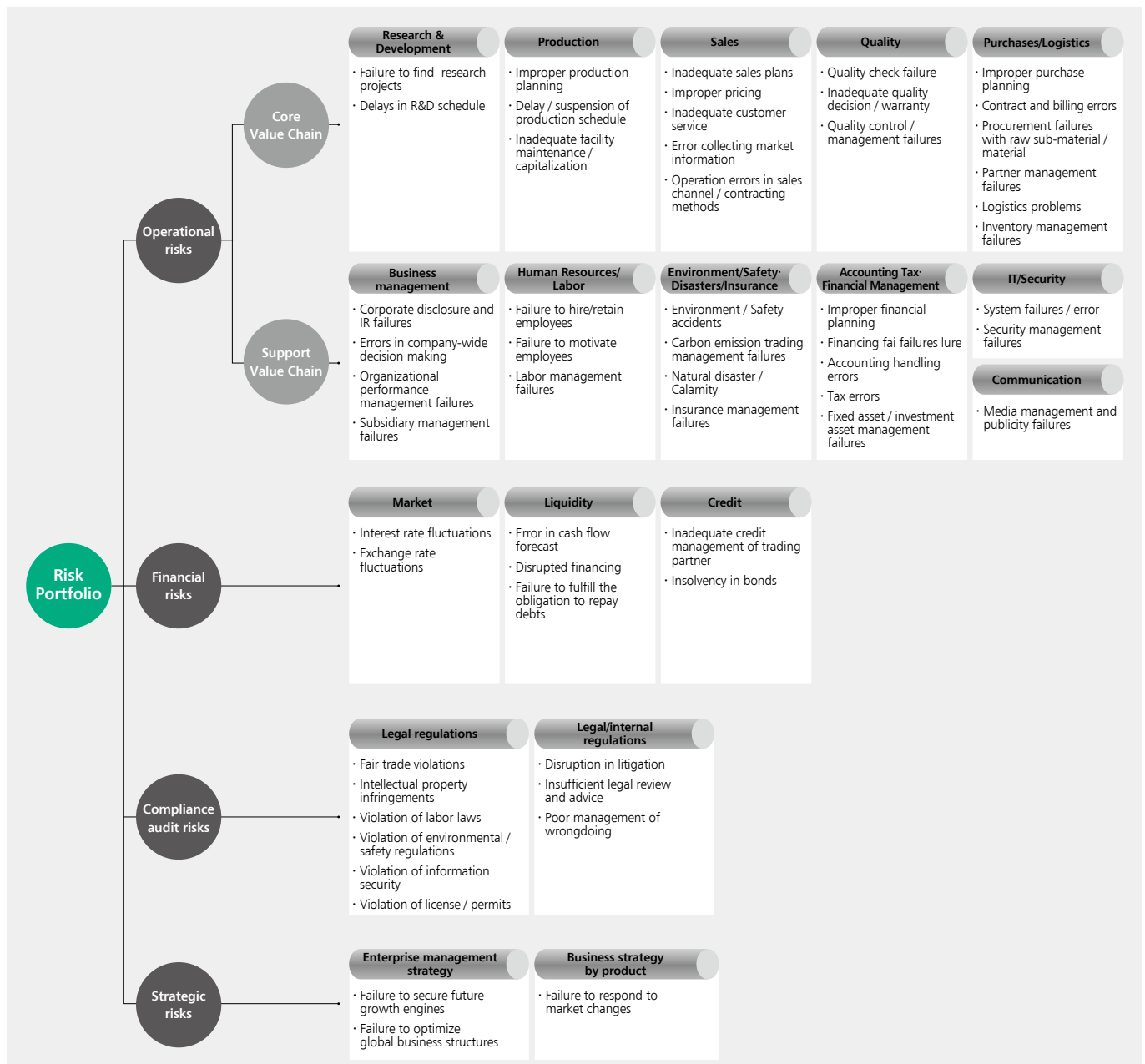
securing profits through stable sales in general-purpose products. In this regard, Lotte Chemical will keep up with market changes swiftly by continuously developing 'end-users' and understanding customer needs and will make devoted efforts in R&D activities and production optimization.

**Economic Fluctuation Risk** | The petrochemical industry in 2018 faced an increase of demand for virgin plastics in accordance with the prohibition of import of waste plastics from China and decrease of supply due to instable operation of petrochemical plants worldwide. The U.S.-China trade dispute and the continued U.S. sanctions against Iran resulted in volatile oil prices in the second half of the year. Furthermore, the profitability of petrochemical businesses weakened due to America's circulation of ECC-based PE products. The petrochemical market in 2019 is expected to see global oversupply due to the full-swing operation

of the American ethane cracker and new downstream facilities and the completion of the export terminal. An increase of demand for petrochemical products is likely to be stable and oil refining businesses at home and abroad will enter the petrochemical market, causing fiercer competition.

**Resource Procurement Risk** | Lotte Chemical strengthens the monitoring of the market environment to forecast the pricing direction of raw materials and products, striving to secure profitability by establishing strategies accordingly. In this regard, we undertook the Uzbek gas field project and the shale gas business in the state of Louisiana in the USA to diversify the supply and demand of raw materials, thereby eliminating procurement risks. Moreover, we also established a proactive response system for changes in the market environment through organic cooperation among departments in production, research, and sales.

**Risk Portfolio**



# Stakeholder Engagement

Lotte Chemical is acutely aware of the importance of open communication with stakeholders as part of our business activity, and proactively exchanges information through diverse channels. The feedback we receive from our stakeholders, which include the government, employees, business partners, shareholders and investors, local communities, and customers, are reflected as areas of improvement, so that the economic value generated from our business activities is shared with our stakeholders.

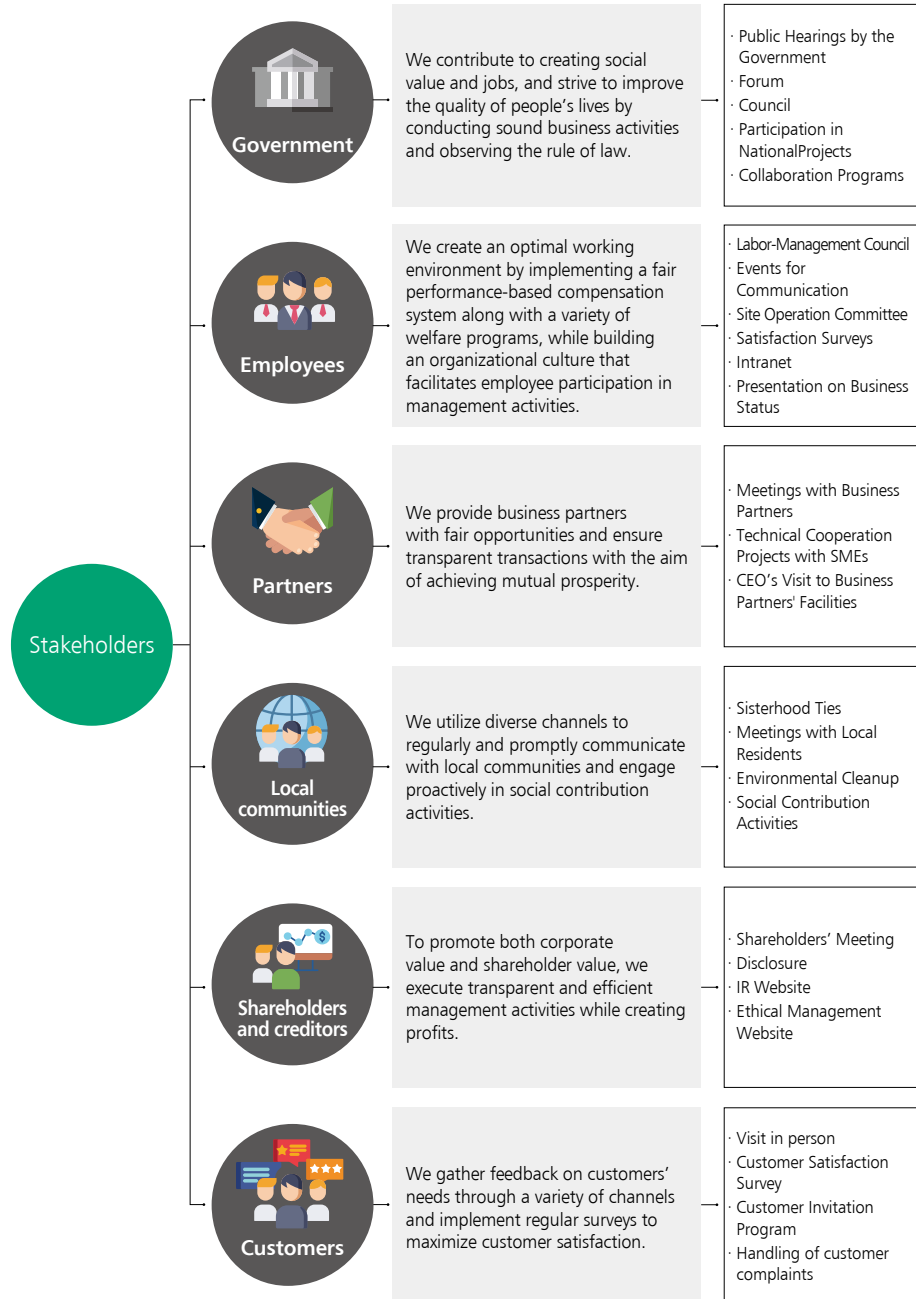
## Economic Value Allocation for Stakeholders



As of yearend 2018, Unit: KRW 100 million

## Vitalization of Stakeholder Engagement

Lotte Chemical maintains various communication channels to achieve co-prosperity with stakeholders and welcomes stakeholder opinions on sustainability management and management in general. From mid to long-term perspectives, we establish business directives and management policies that take stakeholders' interests into account and actively seek to communicate with our stakeholders.



## Interviews with Stakeholders

### Shareholders and Investors

Lotte Chemical is striving to diversify markets in order to respond to economic fluctuations at home and abroad. Our entry into the high value-added product market through the expansion of the U.S.-based ethylene plant and the Malaysia-based Titan plant, and acquisition of the Turkey-based engineered stone is highly positive and will pay off in the future. Lotte Chemical is now expanding its presence as a global chemical company through aggressive investment. However, we are also faced with the need to take measures to address the slowdown of the petrochemical industry. To that end, it is imperative for Lotte Chemical to respond to the external environment through constant communication with stakeholders, and boldly move forward to become a chemical player that represents Korea.

Kim Ji-yeong,  
Deputy Head of Department with WooriBank



### Relevant institutions

Lotte Chemical and Korea Petrochemical Industry Association (KPIA) draw up policies and put them into action for the robust development of Korea's petrochemical industry. Given the fall of international oil prices and oil refining companies' entry into the petrochemical industry, the petrochemical industry is likely to see fluctuations in the business environment. Under these circumstances, Lotte Chemical needs to be well prepared and make vigorous efforts to diversify its business and open new markets on the global stage for sustainable growth in order to become an industry leader. I hope that Lotte Chemical will grow into a global player by enhancing communication with its stakeholders through TV advertising, into which the company ventured for the first time in 2018, reaching out to local communities, and fulfilling its corporate social responsibilities.

Kim Jae-hun,  
Deputy Section Chief with KPIA



### Customers

Lotte Chemical has forged a strategic partnership with SH Energy & Chemical to supply quality products and services and achieve co-prosperity. Lotte Chemical is assisting its partner to address difficulties such as the aggravating insulator market and fiercer competition. Based on As Lotte Chemical is practicing ethics management, actively communications with its customers, and commitment to achieving co-prosperity with its partners, I hope that the company will grow into a world-class leader in the chemical industry.

Song Chi-heon,  
Section Chief with SH Energy & Chemical



### Employees

Lotte Chemical is doing its best to ensure employees' happiness at the work place and beyond. Especially, to supports employees' work-life balance, the company runs various programs, such as maternity leave based on the maternity protection policy, compulsory parental leave, and in-house childcare center, among many family-friendly programs. Thanks to these programs, I could create lasting memories with my child and learn to better understand and communicate with my wife. When I returned to work, I was able to focus on my work thanks to the programs that helped me adjust back in the workplace after a hiatus. I hope that Lotte Chemical remains a company that fulfills its corporate social responsibilities and makes its employees feel proud by expanding and diversifying its corporate social responsibility programs.

Kwon Guk-gyeong,  
Chief of the Safety and Culture TFT



### Partners

Lotte Chemical is committed to achieving co-prosperity with its small-and medium-sized businesses by helping them solve problems. For example, Lotte Chemical supported Insulation Korea by purchasing furnace facilities and offered on-the-job training programs, which helped Insulation Korea concentrate on sales activities and human resources development. I hope that Lotte Chemical continues implementing its co-prosperity system, fulfilling corporate social responsibility, and creating shared value.

Park Seong-ho,  
Nambu branch chief with  
Insulation Korea



### Local Communities

Lotte Chemical pays special attention to the underprivileged in the local community and strives to improve the quality of life by running the "Pleasure Box" program twice a year since 2018, donating 800 boxes of everyday necessities to people living just above the poverty line in Songpa-gu, Seoul, home to Lotte Chemical. The Pleasure Box shows Lotte Chemical's sincere care for needy people not as a business but as a member of the community. I hope that Lotte Chemical will continue to show interest in underprivileged people and contribute to developing a caring society.

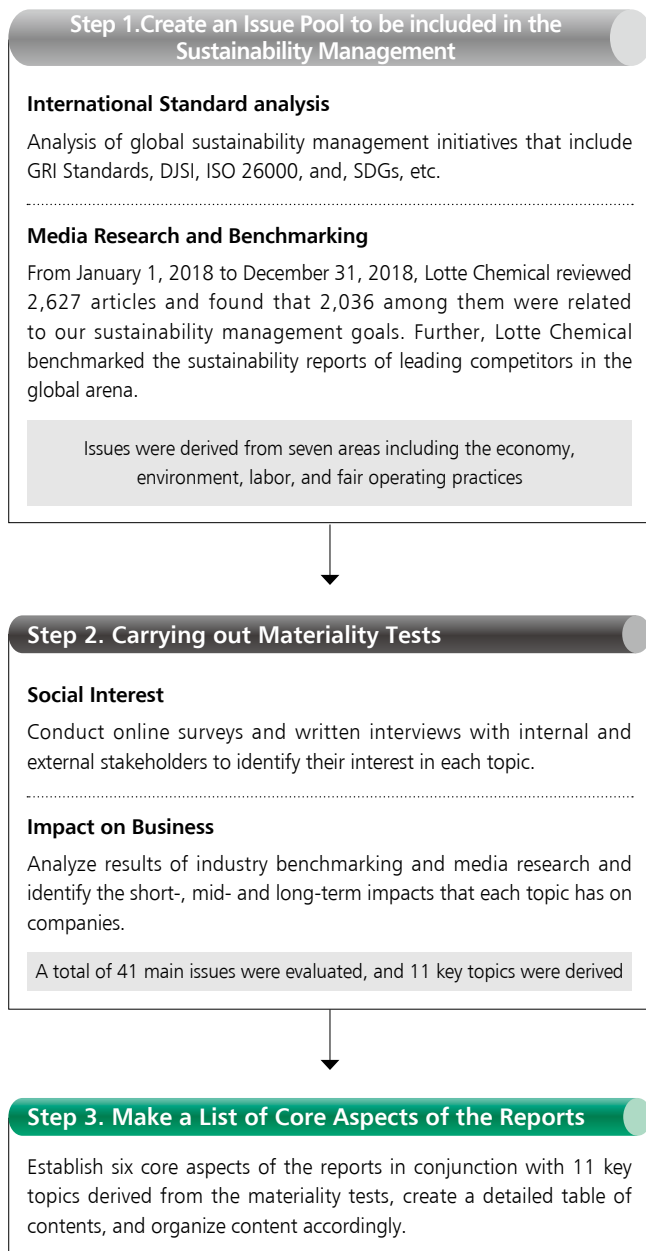
Kim Wi-yeong,  
Official with Songpa-gu Office



# Materiality Test

Lotte Chemical conducted a materiality test that reflects GRI's report decision process in order to identify key topics to be included in our Sustainability Management Plan. Our goals, achievements, and future plans for each key topic are highlighted in the report.

## Materiality Test Process

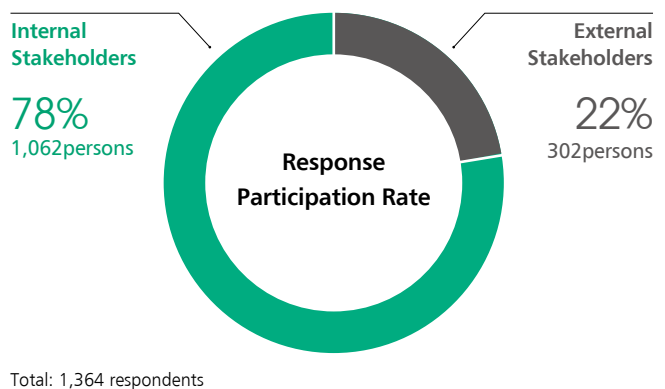


## Survey of Internal and External Stakeholders

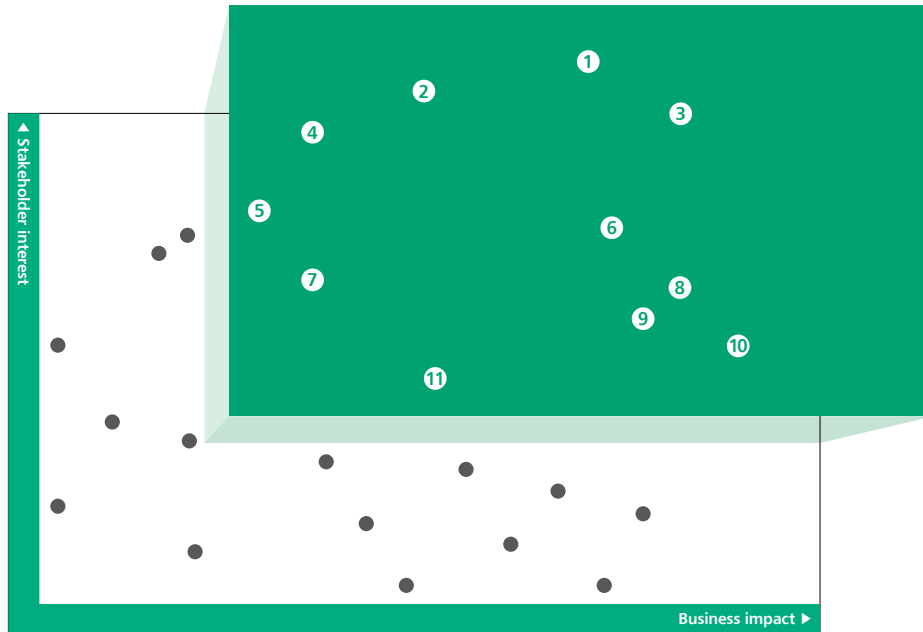
Lotte Chemical gathered the opinions of internal stakeholders (Executives and employees) as well as external stakeholders (Customers, partners, local communities, investors, governments, related organizations, etc.) that influence our business and identified high-level topics on which we should particularly focus.

Unit: %

Internal Stakeholders	
Entry into the global markets and business expansion	71.10
Improvement of employee welfare benefits	76.80
Strengthening of co-prosperity policy and activity	53.40
Increase of economic profits	37.70
Corporate social activity	52.20
Improvement of workplace safety and accident prevention	48.20
Development of eco-friendly products and services	59.30
External Stakeholders	
Strengthening of co-prosperity policy and activity	62.30
Entry into the global markets and business expansion	52.20
Corporate social activity	38.70
Increase of R&D activities	26.80
Improvement of employee welfare benefits	33.70
Promotion of job creation and employment stability	69.00
Fair selection of partners	64.90



### Results of Materiality Test



No.	Key Topics
1	Strengthening of co-prosperity policy and activity
2	Entry into the global markets and business expansion
3	Increase of economic profits
4	Vitalization of corporate social activity and the local economy Improvement of employee welfare benefits
5	Reinforcement of ethics management and monitoring system
6	Strengthening of employee capacity
7	Promotion of job creation and employment stability
8	Development of eco-friendly products and services
9	Improvement of employee welfare benefits
10	Responses to climate change
11	Strengthen communication to enhance customer satisfaction

### Core Aspects of the Report

We identified 11 key topics derived from the materiality test and categorized them into six core aspects, namely, the environmental conservation, social contribution, employee wellbeing, customer value, mutual growth, and contributions to the local community. We chose the six core aspects by taking into consideration their impact on Lotte Chemical's business and stakeholders' interest.

Classification	Core topics	Core Aspects of the Report	Page(s)
Economy	Entry into the global markets and business expansion	BUSINESS HIGHLIGHT	28~37
	Increase of economic profits	BUSINESS HIGHLIGHT	28~37
Environment	Development of eco-friendly products and services	ISSUE 01. Environmental Conservation	56~62
	Responses to climate change	ISSUE 01. Environmental Conservation	56~62
Society	Reinforcement of ethics management and monitoring system	Ethics management	46~47
	Vitalization of corporate social activity and the local economy	ISSUE 03. Corporate social responsibility	69~79
	Strengthening of employee capacity	ISSUE 04. Employees	80~88
	Promotion of job creation and employment stability	ISSUE 04. Employees	80~88
	Improvement of employee welfare benefits	ISSUE 04. Employees	80~88
	Strengthen communication to enhance customer satisfaction	ISSUE 05. Customer value	89~96
	Strengthening of co-prosperity policy and activity	ISSUE 06. Mutual growth	97~100

**Lotte Chemical values the opinions of all stakeholders and strives to integrate stakeholder feedback into its corporate management. We will thus pursue sustainable growth together with our stakeholders.**

**56**

**ISSUE 01. Environmental Conservation**

There is a growing interest in environmental issues such as the recent problems related to fine dust, environmental pollution, and global warming, necessitating tougher supervision of businesses.



**63**

**ISSUE 02. Safety and Health**

In the petrochemical industry, safety and hygiene at the workplace are more important than anything else to earn trust from stakeholders.



**69**

**ISSUE 03. Corporate Social Responsibility**

As a member of the local community, a business is required to create social value for the profit and benefit of the local community, as well as consumers and employees, beyond the mere pursuit of economic profits.



**80**

**ISSUE 04. Employees**

Lotte Chemical places high value on what it will become in the future rather than what it is now.



**89**

**ISSUE 05. Customer Value**

As customers are the end-users of the products, successful business performance is inseparable from winning customer trust.



**97**

**ISSUE 06. Mutual Growth**

As competition in the global market grows fiercer, the realm of the supply chain businesses we are required to manage is continually.







# MATERIAL ISSUES



## ISSUE 01

# Environmental Conservation

With the recent issues related to fine dust, environmental pollution, and global warming, there is a growing interest in environmental issues and demand for environmental conservation worldwide. Accordingly, world-class businesses are striving to streamline their business processes so as to minimize the impact of their business processes on the environment adopt eco-friendly practices and report their activities transparently, demonstrating their interest in environmental protection. In response to these demands, Lotte Chemical has formulated preemptive strategies for environmental management and developed action plans to meet social demands and reach out to its customers. As a global petrochemical producer, we are committed to faithfully fulfilling environment-related compliance requirements based on the Act on Integrated Control of Environmental Pollution-generating Facilities (Integrated Act) and Act on the Integrated Control of Pollutant-discharging Facilities (Act on Evaluation of Chemicals). To this end, we have installed eco-friendly facilities to rigidly manage and meet compliance mandates beyond basic duties. In addition, we are actively promoting our eco-friendly business philosophy through channels of communication with stakeholders to fulfill our duties as a corporate citizen.

## Lotte Chemical's Response

### Performance in 2018

Classification	Key issues	2018 Goal	Achievement Index	Deadline	Performance	Achievement
Responses to climate change	Enactment of the 2 <sup>nd</sup> -phase Emission Trading Scheme (2018-2020)	- Reduce voluntary emissions at worksites to secure more emission rights	- Goal-setting for voluntary reduction of GHG emissions	2018	- Goal-setting completed and GHG- reduction efforts are underway	●
Environmental Management	Enactment of the Act on Integrated Control of Environmental Pollution-generating Facilities (Integrated Act)	- Establish integrated licensing for Yeosu Plant 2 and roadmap for the establishment of an integrated license system	- Preparation of an integrated environmental plan for Yeosu Plant 2 - Establishment of a follow-up management system for integrated environmental management	2018	- Plan for the integrated environmental management of Yeosu Plant 2 completed - Establishment of management system for integrated environmental management	●
	Reinforcement of the Act on the Registration and Evaluation, etc. of Chemicals (Chemical Evaluation Act)	- Reduce risks by fulfilling compliance principles	- Completion of registration for phase-in chemical substance subject to registration - Preparation for advance notification of the secondary-registration substances according to the Chemical Evaluation Act (Over 1 ton of production per year)	2019	- Fifteen substances including benzene registered within the deadline - Advance notification for the secondary-registration substances scheduled (~June 30, 2019)	◐
Sustainable Management	Advancement of Environment, Quality and Safety (EQS) management system	- Establish management system and internalize implementation system in accordance with international standards	- Revision of ISO management system - Compliance with EQS standards, global standardization	2018	- Revision of the ISO management system - Compliance with EQS standards, global standardization	●

### Goals for 2019

Classification	Key Issue	2019 Goal	Deadline	Achievement Index
Responses to climate change	Forceful responses to regulations on emissions trading	- Cover emissions trading shortage	2019	- Creation of diverse emissions trading channels
Environmental Management	Implementation of the Special Act on the Reduction and Management of Fine Dust		2019	- Report on active participation in emergency measures and action taken to reduce pollution and action taken - Process reform and facility investment for reduction of NOx emissions concentration on a regular basis
	Implementation of the Act on the Integrated Control of Pollutant-discharging Facilities (Integrated Act)	- Reduce risks through the fulfillment of compliance principles	2022	- Review firm-wide integrated environmental management submission and develop implementation plans
	Act on Registration, Evaluation, etc. of Chemicals (Act on Evaluation of Chemicals)		2021	- Advance report on over 1 tons/yr. of produced and imported substances (~June 30, 2019) - Registration of over 1 tons/yr. of produced and imported substances (~Dec. 31, 2021)
Sustainable Management	Establishment of the revised standards of Environment, Quality, Safety (EQS)	- Internalize the standards	2019	- Formulation of plans for fulfillment and monitoring of action taken

## Environmental Management

### Environmental Vision and Goals

Lotte Chemical has established a global mid- to long-term vision in pursuit of becoming the safest eco-friendly company, while achieving environmental goals and strengthening PR activities to instill our employees with a sense of pride in working for this environmentally friendly company.



### Environmental Strategy

Lotte Chemical makes consistent efforts to preserve the global environment and protect its customers' health and their lives through strategic environmental management. We are implementing environmental pollution prevention activities through monitoring system. The company continuously practices activities to reduce energy usage and invests in emission reduction facilities for greenhouse gas throughout the company. Furthermore, Lotte Chemical is enhancing the eco-friendliness of its products and services through innovation in R&D.



- ① Activities for prevention of environmental pollution
- ② Reduction through the environmental pollution monitoring system
- ③ Reduction of GHG emissions and energy consumption
- ④ Development of Eco-friendly products and services

### Exclusive Organization for Environment & Safety Management

Lotte Chemical operates an Environmental Safety Management Team in order to oversee the safety and environmental impacts on the company and maintains business channels. We analyze the eco-friendly business implementation periods and impact, following reviews of eco-friendly trends and laws and regulations and determination of how to apply such analysis, expanding green management company-wide.

### Response to Environmental Management Standards

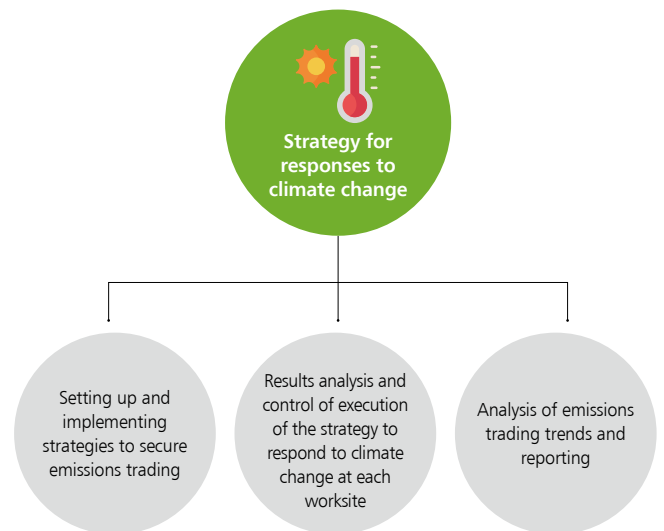
Lotte Chemical actively participates in various external certification and review processes related to environmental impact, thus securing objective bases for promoting eco-friendly management of global standards.

#### Establishing an Environmental Management System

Lotte Chemical has established an environmental management system through revision of standards. We use and apply the same standards for work efficiency among businesses, and implement a system for the international community.

### Formulation of Strategies to Respond to Climate Change

In line with the international community's efforts to address climate change, Lotte Chemical has included responses to climate change as a major issue of our management activities. We are engaging in diverse activities to fight climate change by training our employees to raise awareness and seek action measures.



#### GHG Emissions Management

Lotte Chemical has strived to secure additional emissions rights by improving productivity technology and the low-carbon process, on the one hand, and actively participating in domestic emission transactions, on the other, thereby contributing to enhancing management efficiency.

As the 2<sup>nd</sup> phase emissions trading scheme begins in 2018, we need to formulate measures to secure GHG emissions (Reduction activity, purchase emissions allowance, etc.). We plan to draw strategic plans to strengthen our emission compliance and take aggressive action.

**Greenhouse gas emissions**

Unit: tCO<sub>2</sub>e

Classification		2016	2017	2018
Direct emissions	Yeosu Plant	1,854,512	1,933,056	1,773,519
	Daesan Plant	1,742,409	1,712,806	1,706,839
	Ulsan Plant	611,071	743,481	696,107
	Head office and other worksites	1,407	1,218	1,468
	Total	4,209,399	4,390,561	4,177,933
Indirect emissions	Yeosu Plant	510,122	531,583	635,442
	Daesan Plant	646,846	665,943	717,547
	Ulsan Plant	319,825	351,370	345,409
	Head office and other worksites	4,744	4,967	4,935
	Total	1,481,537	1,553,863	1,703,333
Total emissions	Yeosu Plant	2,364,634	2,464,639	2,408,961
	Daesan Plant	2,389,255	2,378,749	2,424,386
	Ulsan Plant	930,896	1,094,851	1,041,516
	Head office and other worksites	6,151	6,185	6,403
	Total	5,690,936	5,944,424	5,881,266
Greenhouse gas (GHG) emissions intensity (tCO <sub>2</sub> e/MT)	Yeosu Plant	0.586	0.546	0.594
	Daesan Plant	0.526	0.529	0.525
	Ulsan Plant	0.494	0.463	0.457
	Total	2.797	2.060	2.124

1. Head office and other worksites: Head office (Seoul), R&D Center (Daejeon and Seoul), International Building (Busan), Water Treatment Membrane Plant (Daegu), R&D Center (Seoul) and Water Treatment Membrane Plant (Daegu) were completed in 2018.
2. The figures for the previous year are identical to those revised and reported to the government and may differ from those presented in last year's report.
3. The total emissions from the Daesan Plant (Emission factors changed) and the Head Office (Moved) increased slightly in 2018.

**Energy-Reduction Campaign in Each Worksite**

Lotte Chemical strategically manages energy consumption in each worksite under the supervision of the Safety, Environment & Technology Division. We set annual energy-saving targets for each worksite and take measures suitable to each worksite to actively cope with the energy issues. In addition, we held the 'Energy Greenhouse Gas Workshop' to improve energy reduction efficiency and listen to employees opinions in the worksites, raising their awareness of energy conservation and spreading it company-wide. These efforts reflect our commitment to reducing greenhouse gas emissions and energy consumption in each plant.

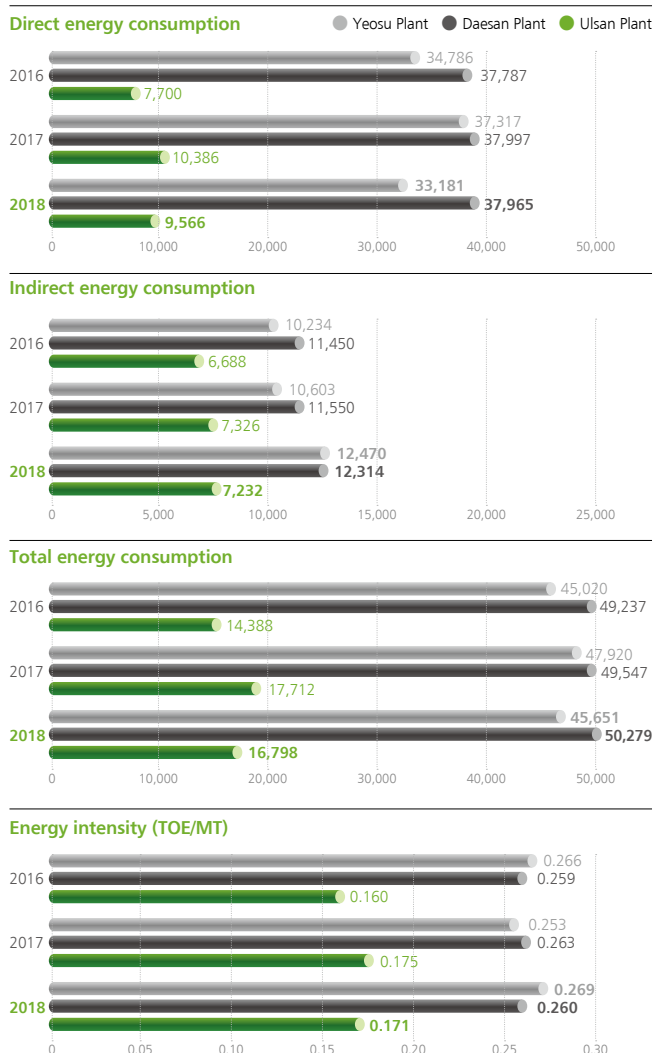
**Enterprise-wide Efforts to Save Energy**

In order to reduce unnecessary energy consumption at the Head Office and other worksites, we are replacing old office equipment with new eco-friendly office equipment. In addition to minimizing standby power by replacing old lamps with new power-saving lamps and making the switches detachable, we give awards to energy-saving households of employees in company housing as part of our policy to habitualize an energy saving policy.



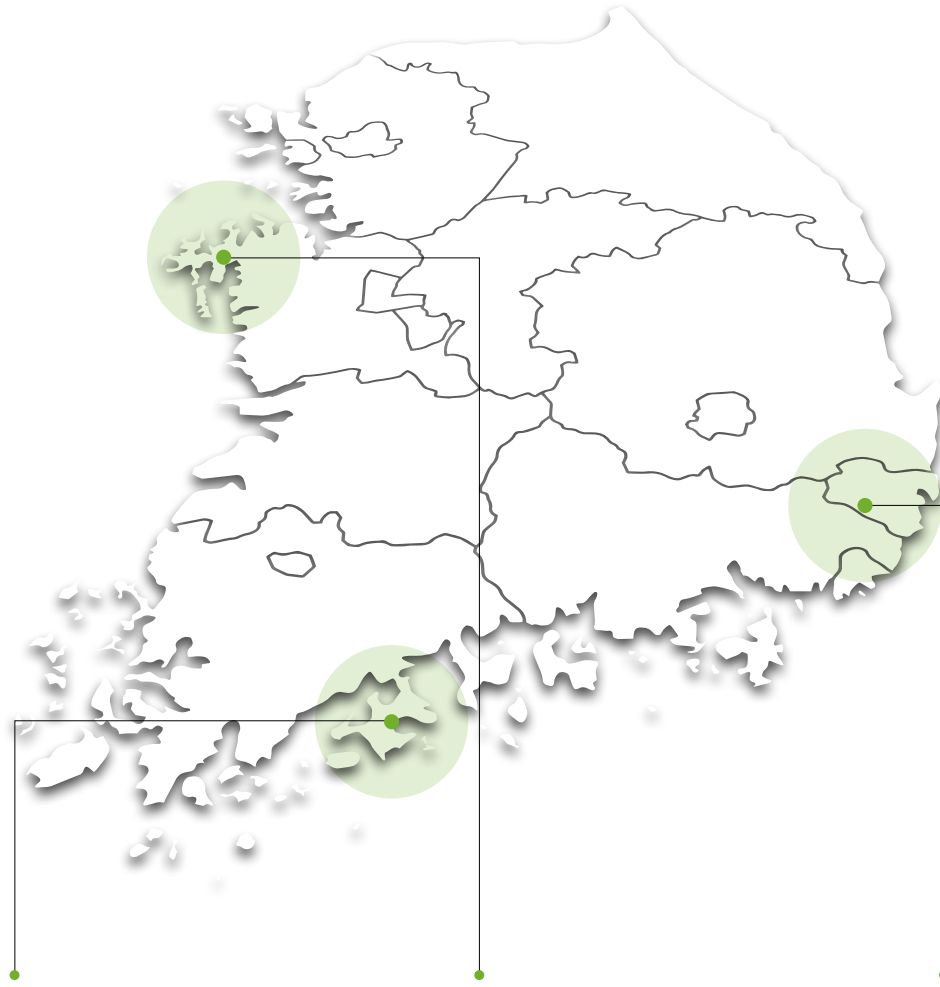
**Energy consumption**

Unit: TJ



\* The calculation of energy intensity is deducted from product outputs.

Reduction of GHG Emissions and Energy Consumption by Each Plant



**Yeosu Plant**

No. of reduction activities

**23** activities

CO<sub>2</sub> reduction

**13,631** tCO<sub>2</sub>e

Energy conservation

**261** TJ

Classification	Unit	2016	2017
No. of reduction activities	activities	27	31
CO <sub>2</sub> reduction	tCO <sub>2</sub> e	17,170	22,281
Energy conservation	TJ	312	424

**Best practices**

**Yeosu Plant**

- Reduction of steam through operational improvement of the reaction tower at the polycarbonate plant

**Daesan Plant**

No. of reduction activities

**24** activities

CO<sub>2</sub> reduction

**21,171** tCO<sub>2</sub>e

Energy conservation

**368** TJ

Classification	Unit	2016	2017
No. of reduction activities	activities	28	26
CO <sub>2</sub> reduction	tCO <sub>2</sub> e	69,070	10,543
Energy conservation	TJ	1,054	146

**Daesan Plant**

- Reduction of steam through recovery of wasted heat in the BTX plants and its utilization as the heat source of the naphtha cracking center

**Ulsan Plant**

No. of reduction activities

**7** activities

CO<sub>2</sub> reduction

**4,184** tCO<sub>2</sub>e

Energy conservation

**84** TJ

Classification	Unit	2016	2017
No. of reduction activities	activities	7	3
CO <sub>2</sub> reduction	tCO <sub>2</sub> e	5,801	3,954
Energy conservation	TJ	53	79

**Ulsan Plant**

- Reduction of electricity consumption through the installation of rotating machinery inverters
- Reduction of energy loss through the replacement of heater refractories

## Review of Integrated Environmental Impact

Lotte Chemical continues to respond to environmental regulations. To this end, Lotte Chemical has established a monitoring system to prevent environmental pollution such as air, water, and waste. We are continuously striving to find areas where investment is required.

**Environmental Investment Expenditure** Unit: KRW 100 million

Classification		2016	2017	2018
Environmental management expenses	Yeosu Plant	194.0	216.7	<b>234.3</b>
	Daesan Plant	158.7	209.2	<b>265.2</b>
	Ulsan Plant	193.6	222.6	<b>233.9</b>
Environmental investments	Yeosu Plant	124.1	161.0	<b>113.0</b>
	Daesan Plant	127.1	433.5	<b>63.5</b>
	Ulsan Plant	11.6	26.5	<b>48.0</b>
Total	Yeosu Plant	318.1	377.7	<b>347.3</b>
	Daesan Plant	285.8	642.7	<b>328.7</b>
	Ulsan Plant	205.2	249.1	<b>281.9</b>

\* In the case of the Ulsan Plant, the figures for the previous year have changed based on correction of errors in the environmental management expenses. (plant-wide power cost → power cost for the management and operation of the water environment)

### Fostering of Environmental Professionals

Lotte Chemical continues to produce environmental experts for systematic environmental management by assisting employees to join legal environmental training sessions and sharpen their environmental expertise. We are making every effort to assist our employees to take the lead in abiding by environment-related regulations and using their environmental expertise to prevent environmental pollution.

**No. of employees who have completed the environmental training** Unit: people

Classification	Yeosu	Daesan	Ulsan
2016	30	32	152
2017	41	34	321
<b>2018</b>	<b>31</b>	<b>45</b>	<b>324</b>

### Efficient Resource Management

Naphtha and mixed xylene are important raw materials that are used for Lotte Chemical's flagship products. Such raw materials are supplied by local refineries as well as international companies. Also, we strive to optimize energy use in the logistics process by reviewing the optimal transportation process considering the regional characteristics of Yeosu, Daesan and Ulsan.

**Use of raw materials** Unit: tons

Classification	Yeosu	Daesan	Ulsan
2016	2,804,013	3,279,027	725,204
2017	2,950,232	3,313,481	1,190,286
<b>2018</b>	<b>2,565,070</b>	<b>3,161,967</b>	<b>1,108,518</b>

### Water and Waste Water Management

Water supply for plant is provided with water by reviewing water inlet routes from nearby sources of water supply in real time for stable supply of the water necessary for production. The Yeosu Plant secures water from JuamDam and Sueo Dam, while the Daesan Plant procures water from Daehoho Lake and Asanho Lake and the Ulsan Plant from Daeam Dam and Nakdonggang River. Wastewater is installed and operated by wastewater treatment plant, where wastewater is treated and turned into eco-friendly water clean enough for fish to live when discharged.

**Water use** Unit: 1,000 tons

Classification	Yeosu	Daesan	Ulsan
2016	16,621	13,534	10,516
2017	17,931	13,416	11,434
<b>2018</b>	<b>18,823</b>	<b>13,810</b>	<b>11,321</b>

**Wastewater discharge** Unit: 1,000 tons

Classification	Yeosu	Daesan	Ulsan
2016	3,208	2,307	6,204
2017	3,461	2,367	7,122
<b>2018</b>	<b>4,161</b>	<b>2,419</b>	<b>6,729</b>

※ In 2018, regular repair at the Yeosu plant increased the amount of waste water.

### Air Pollutant Emissions Management

We established TMS (Tele Monitoring System) for permanent surveillance of the atmospheric environment. In addition, we installed and operate a regenerative oxidizer to minimize the generation of pollutants and odors. Regular self measurements are conducted to prevent possible contaminant spills. Furthermore, we introduced a closed system to recover and incinerate the volatile organic compounds (VOCs) generated in storage tanks, wastewater treatment plants, and sampling devices.

**Air Pollutant Emissions** Unit: tons

Classification		2016	2017	2018
SOx	Yeosu Plant	15	21	<b>9</b>
	Daesan Plant	1	1	-
	Ulsan Plant	46	48	<b>45</b>
NOx	Yeosu Plant	360	425	<b>468</b>
	Daesan Plant	4	5	<b>7</b>
	Ulsan Plant	392	633	<b>568</b>

\* There can be a difference in the total amount due to round-off.  
 \* Differences in figures of each plant result from the existence of their own boilers.  
 ※ No internal boiler system at the Daesan Plant (low emission of pollutants)

## Prevention of Water Pollutant Emissions

Lotte Chemical operates in-house wastewater treatment plants at worksites in order to manage water pollutants. Wastewater is discharged through our own wastewater treatment facility and the integrated wastewater treatment facilities at the industrial complex. Constant monitoring for wastewater through Water TMS minimizes the environmental impact of wastewater.

### Water quality

Classification		2016	2017	2018
BOD	Yeosu Plant	19	15	18
	Daesan Plant	3	3	2
	Ulsan Plant	2	1	1
COD	Yeosu Plant	37	38	45
	Daesan Plant	17	20	23
	Ulsan Plant	11	8	19
SS	Yeosu Plant	33	41	38
	Daesan Plant	3	3	6
	Ulsan Plant	10	8	19

Unit: ppm

\* Differences in wastewater density are attributable to treatment methods such as the integrated wastewater treatment facilities at the industrial complex (Yeosu Plant and Ulsan Plant 1,2) and the independent wastewater treatment facilities at each site (Daesan Plant). Wastewater density at each plant is below legal standards.

## Management of the Spills of Chemical Substances

To prevent the possibility of leakage, a leak detector and shutdown equipment are installed. In addition, we systematically organized the Leak Detection and Repair (LDAR) system to conduct a safety inspection on a regular basis and provide relevant employees with compulsory training programs to ensure zero possibility of harmful chemical substances leaking out.

### Chemical substance emissions

(PRTR: Pollutant Release and Transfer Register)

Unit: tons

Classification		2016	2017	2018
Ethylene	Yeosu Plant	12	12	14
	Daesan Plant	13	12	7
	Ulsan Plant	-	-	-
Propylene	Yeosu Plant	8	10	12
	Daesan Plant	17	16	2
	Ulsan Plant	-	-	-
Xylene	Yeosu Plant	-	-	-
	Daesan Plant	-	-	-
	Ulsan Plant	6	7	3
Acetic acid	Yeosu Plant	-	-	-
	Daesan Plant	-	-	-
	Ulsan Plant	9	10	9
Others	Yeosu Plant	72	70	65
	Daesan Plant	54	57	47
	Ulsan Plant	23	19	11

## Soil Pollution

We have prepared guidelines for preventing soil contamination from chemical substances generated in the production processes and transportation. The company paved floors of administered facilities with impervious concrete, so that pollutants do not permeate into the soil. Some areas of the plants need additional rounds of review for thorough preventive measures. Furthermore, we conduct periodic soil contamination tests to figure out the impact on the soil around the site.

## Increased Recycling of By-products

Among the by-products generated after the production of steam, hydrogen, gas and other products, we collect the resources that can be recycled and sell them to outside companies or re-use them as raw materials and fuel energy sources.

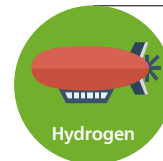
### By-product Management

Unit: tons

Classification		2016	2017	2018
By-product generation	Yeosu Plant	2,950,579	2,804,455	2,432,273
	Daesan Plant	3,103,951	2,971,388	2,910,006
	Ulsan Plant	44,882	56,196	51,769
By-product recycling	Yeosu Plant	2,950,579	2,804,455	2,432,273
	Daesan Plant	3,103,951	2,971,388	2,910,006
	Ulsan Plant	44,882	56,196	51,769
Rate of recycling by-products (%)	Yeosu Plant	100	100	100
	Daesan Plant	100	100	100
	Ulsan Plant	100	100	100

\* The figures for the previous year at the Yeosu Plant differ from those in the previous report due to the omission of EC by-products

### Examples of recycling by-products



#### Source

Generated during production at NC and SM plants

**Yeosu Plant** | uses this hydrogen as a raw material or fuel at BTX, PE PP plants

**Daesan Plant** | uses hydrogen as a raw material or fuel at BTX, PE, PP plants, surplus hydrogen is sold to nearby businesses

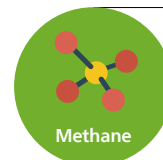


#### Steam

#### Source

Generated during waste heat recovery of PC MVR, EO reactors, and NC heaters

**Yeosu Plant and Daesan Plant** | All steam produced as a by-product is consumed in the plants



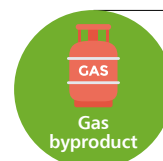
#### Methane

#### Source

Generated during product production at NC plant

**Yeosu Plant** | consumed as a raw material or fuel in the plant and surplus is sold to nearby businesses

**Daesan Plant** | All consumed as fuel in the plant



#### Gas byproduct

#### Source

Released as a by-product during production or during wastewater treatment in the wastewater treatment plant

**Ulsan Plant** | Total self-consumption by fuel in the site

## Minimization of Waste Generation

Lotte Chemical focuses on sources of waste-generation by minimizing the amount of waste generated and pursues green management measures such as systematic separation of generated waste and optimizing of recycling. The waste real-name system has been introduced to raise employee awareness of responsibility for waste discharge and separate collection. The waste is monitored by tracking the amount of waste generated by discharge source for any abnormalities, and this collected data is analyzed to reduce the amount of waste and to establish improvement plans. Going further, we will seek to minimize the amount of waste generated through additional process-improvement activities, investment in eco-friendly facilities, and increase in the rate of resource recycling.

**Impact Assessment of Waste**

Lotte Chemical conducts periodic waste analysis to assess the effects of the waste generated during production processes on the surrounding environment. We also comprehensively supervise the waste storage area to minimize the environmental impact from waste.

**Management methods for general waste**

Unit: tons

Classification		2016	2017	2018
Incineration	Yeosu Plant	3,850	3,220	<b>3,400</b>
	Daesan Plant	485	310	<b>274</b>
	Ulsan Plant	308	235	<b>176</b>
Landfill	Yeosu Plant	3,002	2,995	<b>3,328</b>
	Daesan Plant	399	902	<b>1,524</b>
	Ulsan Plant	17,668	19,633	<b>9,974</b>
Recycling	Yeosu Plant	6,781	6,104	<b>6,566</b>
	Daesan Plant	3,757	4,390	<b>3,298</b>
	Ulsan Plant	8,889	9,184	<b>15,945</b>
Total	Yeosu Plant	13,632	12,319	<b>13,293</b>
	Daesan Plant	4,640	5,602	<b>5,096</b>
	Ulsan Plant	26,865	29,052	<b>26,095</b>

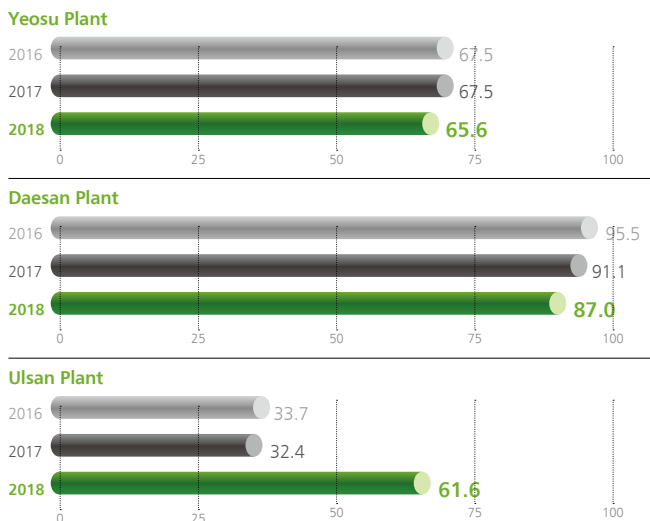
**Management of Designated Waste**

Unit: tons

Classification		2016	2017	2018
Incineration	Yeosu Plant	1,544	1,338	<b>3,076</b>
	Daesan Plant	144	207	<b>171</b>
	Ulsan Plant	49	28	<b>531</b>
Landfill	Yeosu Plant	41	8	<b>92</b>
	Daesan Plant	-	-	<b>1</b>
	Ulsan Plant	9	11	<b>19</b>
Recycling	Yeosu Plant	10,766	9,617	<b>12,265</b>
	Daesan Plant	18,128	10,082	<b>9,886</b>
	Ulsan Plant	280	348	<b>1,191</b>
Total	Yeosu Plant	12,351	10,964	<b>15,433</b>
	Daesan Plant	18,272	10,289	<b>10,057</b>
	Ulsan Plant	338	387	<b>1,741</b>

※ In 2018, T/A(Turn Around) at the Yeosu plant increased the amount of waste.

**Integrated Recycling Rate of General and Designated Waste** Units: %



\*There can be differences in the total amount due to round-off.

- \* Reason for the increase of recycling at the Ulsan Plant
  - In 2018, organic sludge (Waste sludge) treated by a sponsored recycling business that utilized the recyclable properties of organic sludge
  - Recycled items used as raw materials of landfill mold and cement sand

**Eco-friendly Products & Expansion of Investment in Technology**

Lotte Chemical is continuously expanding investments in eco-friendly products and technologies. Through these efforts, we succeeded in developing and commercializing bio PET, thermoplastic elastomers, PLA, and eco-friendly resins, etc., to raise environmental value.

**Eco-friendly Products**

**Ti-PET**

PET containers, which are used in people’s everyday lives, have gained enormous popularity globally and quickly replaced glass and other food and beverage containers. Lotte Chemical, Korea’s No. 1 PET resin producer, developed Ti-PET as an eco-friendly titanium catalyst to secure the competitiveness of high-quality. We stepped up titanium catalyst-based PET R&D activities to produce green PET containers starting 2016 and succeeded in pilot production. Currently, we are preparing for mass production. Compared to existing product, “Green Ti-PET” is expected to be a future-oriented PET material as this recyclable and reusable material makes it possible to save energy during the process of manufacturing PET bottles and has excellent gas barrier properties and heat stability.







## ISSUE 02

# Safety and Health

In the chemical industry, first and foremost is the need to win the trust of stakeholders through thorough and safe workplace management and health activities. This is because fires, explosions, and leakages, etc., can lead to serious safety accidents, which can pose a great danger to local communities. Therefore, prevention and inspection activities based on a high level of awareness of safety and health concerns are critical. In this spirit, Lotte Chemical is establishing a global safety and health system at its head office and whole organizations. We are fully committed to preventing volatile organic compounds spills and safety accidents, such as fires and explosions, and to continuously strengthening our prompt response system to such accidents. We also implement various programs for the health management of workers. Various stakeholders, such as the government and local communities, demand the comprehensive prevention of safety and health accidents and the minimization of damage in the event of accidents. Particularly for the chemical industry, the occurrence of safety accidents can have a direct impact on many people. thus, preventive-centered, more proactive and preliminary safety and health management efforts are required.

### Lotte Chemical's Responses

#### Performance in 2018

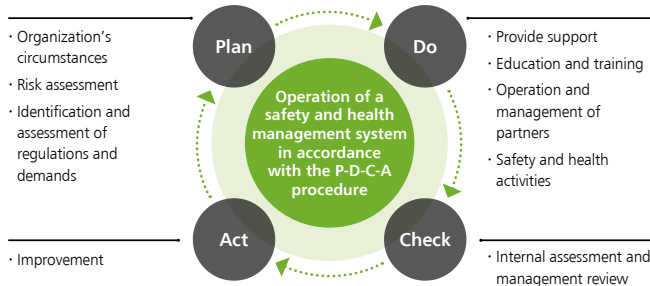
Classification	Key issues	2018 Goal	Achievement Index	Deadline	Performance	Achievement
Safety culture	Increase of awareness of safety, systems	- Raise the standards of safety culture	- Awareness of safety, safe behaviors	2018	- Increased awareness of safety by 4.2% (2018, 7.2pt./a perfect score of 10), Increase safe behaviors by 44% (2018, 7.2pt. /a perfect score of 10)	●
Integrated standardization of company-wide safety and health standards	Integrated standardization	- Complete implementation of the globalized standard system	- Completion	2018	- Globalized safety standards in relation to PSM and ISO45001	●

#### Goal for 2019

Classification	Key Issue	2019 Goal	Deadline	Achievement Index
Internalization of a safety culture	Raising the standards of safety culture	- Promote safe practices and surveillance activities among employees and production of in-house experts in safety culture - Improve the safety and Health education system	2019	- Execution rate
Improve safety management	Establish safety management system	- Permission of safety work, Observation of safety behavior, Establishment of safety report	2019	- Establish safety management system

## Safety and Health Management System

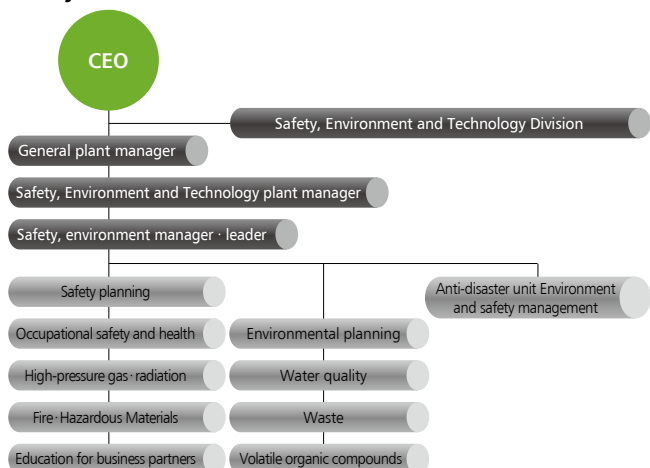
Lotte Chemical operates a systematic safety and health management system with strategic tasks and goals based on the OHSAS 19001 safety and health system. In order to publicly proclaim our determination to make our workplaces safe and healthy, and present consistent goals of the safety and health policy, we have set a safety and health policy that serves as a basis for our business performance and by-laws for the company. As occupational health and safety management has become an international standard (ISO45001), we are revising our safety and health standards, including the CEO management principle and risk factor management, to meet the ISO45001 management system requirements. We are structure HLS (High Level Structure) to meet the requirements of ISO 45001 and improve to a health and safety standard system with PSM (Process Safety Management)



### Safety, Environment and Technology Division

Lotte Chemical operates an independent safety and environmental management organization. The Head Office runs the safety environment technology unit under the direct management of the CEO, to oversee safety environment management at all business sites and subsidiaries. Further, the Safety Environment Team is responsible for managing and supervising working-level safety environment duties by worksite, and provides relevant training and diagnosis. Meanwhile, we provide safety diagnoses and safety environment experts to our partner firms to disseminate a safety culture in the supply chain.

#### Safety and health structure



### Occupational Safety and Health Committee

Lotte Chemical operates the Occupational Safety and Health Committee in each worksite in compliance with the Occupational Safety and Health Act. The Occupational Safety and Health Committee deliberates and makes decision on important issues on safety and health for the prevention of industrial disasters. The committee consists of the same number of employees on both, and includes representatives from workers and site.

### Safety Management of Business Partners

Industrial accidents caused by negligence may be directly related to the survival of the related project. Lotte Chemical pays special attention to the safety management of its business partners as well in order to reinforce safety environment management. Each of the partners' worksites operates a committee to hold a monthly meeting on a regular basis and inspect the field to address hazards. In particular, we rewarded our exemplary partners based on the assessment of the safety management of our partners. The award ceremony, a platform to show our appreciation for our exemplary partners, was attended by the CEOs of the 11 winners. We will continue working closely with our partners, honor outstanding partners to promote a safety culture, and thereby take the initiative in making safety at the workplace second nature for the Lotte community.



Award ceremony to honor outstanding partners

Furthermore, the Yeosu Plant formally held a resolution ceremony to publicly announce its determination to achieve zero-disaster in preparation for the periodic maintenance for 2018. At the ceremony, we vowed to achieve zero accidents caused by negligence and raise awareness of safety through more rigorous self-imposed safety management programs. With unwavering confidence that accidents can be prevented, we worked hard and successfully completed the maintenance.



Zero-disaster resolution ceremony in preparation for periodic maintenance

## Employee Wellness and Health Promotion Activity

Lotte Chemical operates a fitness center in company housing to help workers keep in shape after work. The company also provides general health checkups to workers every six months; comprehensive health examinations every two years to workers aged 35 and older as well as to their spouses; and comprehensive health examinations every year to workers aged 40 and older as well as to their spouses. In addition, we implement an employee health promotion program twice a year and motivate workers to quit smoking and/or lose weight by presenting gift vouchers to those who succeed in their efforts. Furthermore, the Yeosu Plant received applications for a period of seven months from employees aiming to quit smoking, in order to reduce the smoking rate at the plant. On this note, the plant fully supports and encourages applicants in success through smoking cessation training and counseling by tobacco cessation counselors, measurements of CO in the body, nicotine dependence tests, and support in providing smoking cessation products. As a result, approximately 15% of the applicants successfully quit smoking in 2018. We also implemented an annual challenge program based on five health checklists for those suffering from metabolic syndromes to fully participate in healthcare activities to prevent cardiovascular diseases. This program, which has now been available for two years, lasts six months for those diagnosed with metabolic syndrome. The relevant checklist includes five health indicators of waistline, blood pressure, fasting blood sugar, triglyceride, and high-density fat. Moreover, counseling on exercise, weight-loss, and lifestyle management is provided and the participants who achieve a normal level of health indicators are awarded. Clearly, we strive to build a healthy work environment.



Fitness Center

The Ulsan Plant teamed up with the local health center to open the Health Awareness Center for employees from May 31 to June 1, 2018. During the event, workers examined their biological age by taking various tests, such as a taste threshold test, body composition test, and stress test, and received counseling services on how to stay healthy, raising health awareness.



Health Awareness Center

## Emergency Response Training System

Lotte Chemical operates an emergency response system in order to tackle various unexpected hazards, such as fire and explosion, toxic gas leak, and natural disasters. When an emergency occurs, a prompt reporting system is required and the person in charge makes a decision based on the report to handle the situation and prevent the secondary accidents. We also strive to minimize human and material losses by identifying root causes, and take measures to prevent recurrence and hold training sessions at least four times per year to hone emergency response skills.



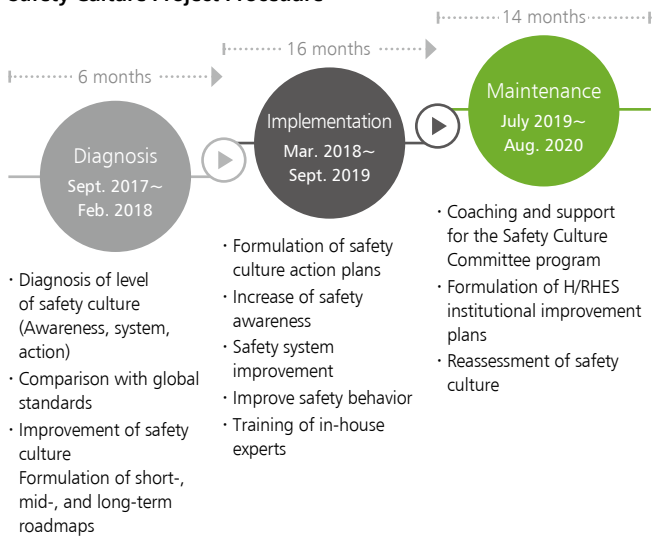
Emergency-response training

## Improvement of Safety Culture

### Action plan for the Improvement of Safety Culture

In order to improve safety culture on a global level for sustainable growth, we are undertaking a company-wide safety culture improvement project, which consists of three steps, namely, diagnosis of the level of safety culture, implementation of action plans, and maintenance.

#### Safety Culture Project Procedure



In 2017, Lotte Chemical conducted a company-wide diagnosis of the level of safety culture to identify tasks to be fulfilled for the increase of safety awareness and improvement of safety behaviors and safety systems. In 2018, the year to take action, Lotte Chemical’s management including the CEO publicly vowed to practice safety in the workplace and stressed the importance of individual roles and responsibilities for the improvement of safety culture during the safety leadership training session. In particular, the R&D Center is staging the commuting safety campaign “Safety Everyday” on the last Friday of every month. As part of the R&D Center’s safety culture building campaign “Clean for Safety,” the commuting safety campaign aims to create a safe R&D environment for work efficiency and establish an R&D safety culture. For the improvement of safety behaviors, we held the safety behavior management for supervisors and workers’ coaching capacity and on-site practice training sessions. In accordance with the “PBS (People Based Safety)” practice procedure, we chose major behaviors for improvement so that the supervisor of each department and relevant staff members are overseen on a regular basis. For the improvement of the safety system, we are striving to identify problems to be solved and implement and revise in-house standards for the improvement of safety and culture. For the final step, maintenance, in 2019, we plan to run the in-house experts (In safety behavior observation, safety and health management system, and PSM (Process Safety Management) training program for the reorganization of the safety and health training system and improvement of expertise in safety. In addition, we are undertaking a project to improve the communication change management system and safety behavior motivation system.





Workplace tour special safety training by CEO



Safety observation behavior fieldwork for supervisors



Safety leadership training for executives and supervisors

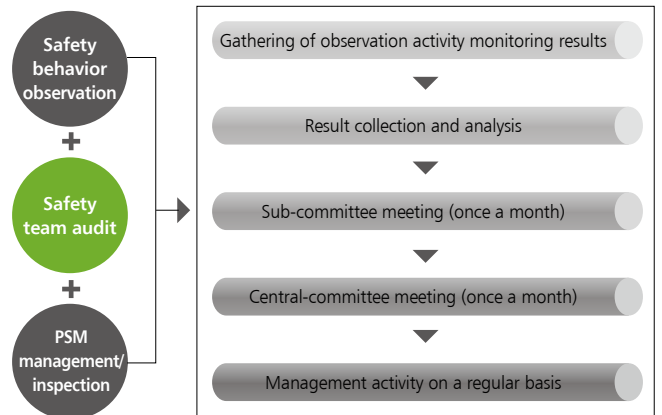


"Safety Everyday" safety campaign

## Structure and Operation of the Safety Culture Committee

Lotte Chemical organized the Safety Culture Committee in order to undertake safety culture-related programs. We have a sub-committee meeting and general committee meeting once per month, respectively, to deliberate the agendas proposed through safety behavior observation and PSM activities and address the issues that hinder safety activities. The sub-committee has a meeting led by the team leader to discuss various safety-related issues with supervisors and PSM teams. Led by the plant managers of the worksites, the central committee discusses various safety issues with management and team leaders.

### Safety Culture Committee Activity Procedure



## Enhancing the Management of Chemical Substances

We have been working hard to enhance the management of chemical substances and prevent chemical accidents since 2015 in accordance with the Act on Registration, Evaluation, etc., of Chemicals, and the Act on Chemicals Control. In order to respond to the Act on Registration, Evaluation, etc., of Chemicals, we have established a consortium with leading petrochemical companies. Moreover, we are thoroughly managing chemicals to prevent any related accidents and violations by constructing and operating a chemicals-controlling system.

### Establishing a Strict System to Manage Chemical Substances

In order to respond to increasingly stringent global regulations on chemical substances, we have constructed and been implementing a global-level system to control chemical substances. Through the system, we are monitoring the inflows and outflows of some 20,000 raw and subsidiary materials and products and the status of their use on a real-time basis, and are minimizing risks in regulating harmful chemicals. We do this by strictly controlling the purchasing and selling of harmful chemicals subject to regulations. In addition, we are informing our global employees and customers of harmful risks, emergency measures and handling methods for relevant substances in detail by drawing and disseminating MSDS (Material-Safety Data Sheet) in multi-languages.

## Strengthening Facilities for Controlling Chemical Substances

In order to prevent the leakage of toxic chemicals within our workplaces, we are striving to strengthen chemicals-controlling facilities. Protective walls have been set up around facilities for storing harmful chemicals, and impervious materials have been used for such facilities. When chemical substances are leaked out, the whole quantity is transferred to and handled in a waste water disposal facility. In addition, we are preventing and immediately responding to any accidents by having extinguishers, gas masks, protective gloves, clothes, boots and glasses shields, etc., in the right places and at all times.



Sulfuric Acid Tank's Leak Detector in the Daesan Facility



Speed Bump for Tank Lorries Entering and Exiting

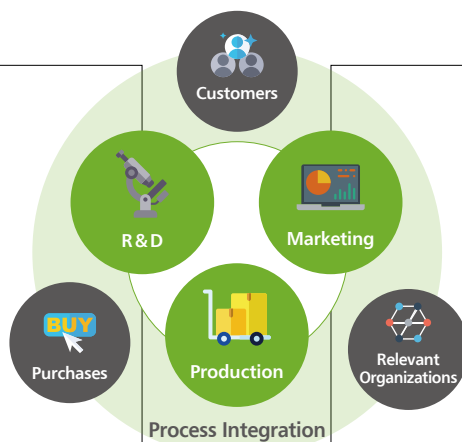
### Chemicals-Controlling System

#### Managing Information on Chemicals

Directly utilizing knowledge of regulatory information and risk-management provided by the chemicals-controlling system at the design and development stage

#### Managing Supply Network

Being connected to suppliers and providing necessary information in time by utilizing e-Procurement functions



Integrating functions regarding regulation compliance and safety management into main business processes including purchase, production, delivery, quality management, and so forth.

#### Managing Customers

Providing proper documents needed for customers to comply with regulations

#### Managing Compliance with Regulations

Developing a process to comply with regulations, thoroughly inspect data on safety, detect and eliminate risks in advance



### ISSUE 03

## Corporate Social Responsibility (CSR)

As corporate members of the community, businesses are required to create social value that goes beyond the financial value of pursuing profits and to pursue the interests and benefits of consumers and employees as well as the local community. In particular, as the direction of CSR activities has shifted away from one-off charitable donations toward the resolution of mid- to long-term social issues, we strive to foster differentiated social contribution strategies by considering the characteristics of our companies and their businesses. Businesses should be committed to promoting co-prosperity with local communities and sharing the profits generated from economic activities with society for mutual growth. They are also responsible for engaging in consistent, long-term CSR activities by incorporating corporate strategies. As a corporate citizen, Lotte Chemical strives to fulfill its CSRs and to coexist with local communities. We plan to run a consistent, long-term CSR program on four themes — namely, safety, the environment, health, and the local community. Based on core values that put people first and invest in people first, we aim for the joint development of community and value, rather than pursuing only immediate profits. Based on this, we will build our corporate image as a socially responsible company.

### Lotte Chemical's Response

#### Performance in 2018

Classification	Key issues	2018 Goal	Achievement Index	Deadline	Performance	Achievement
Participation in local community development	Strategic CSR	- Launch More than Safety (Safety project for sharing and co-prosperity)	- Donation made by four worksites (Yeosu, Daesan, Ulsan, Daejeon)	2018	- Fire extinguishers donated to safety-suboptimal people from a safety perspective in Ulsan - donation to firefighters - 35 stress diagnosis kits donated (Fire stations in the Chungcheongnam-do and Jeollanam-do areas) - 200 concert tickets donated	●
	Programs for the improvement of the housing environment for the underprivileged	- Identification of people living in suboptimal home environment and providing home renovation	- Undertake the home improvement project	2018	- Yeosu: "Hope Houses (3)," home repair (1), improvement of housing environment (7) - Daesan: home repair for underprivileged 4 times a year - Ulsan: home repair for underprivileged 10 times a year - Head office: hot/cold weather survival kits for 1,600 households living in suboptimal home environment	●
	Sharing for the green environment	- Development of green projects in all worksites	- Undertake green projects	2018	- Participation in the "Adopt a River" project - Cleaning of the village near the worksite	●

#### Goals for 2019

Classification	Key issue	2019 Goal	Deadline	Achievement Index
Participation in local community development	Safety-related theme	- Formulate and undertake the More than Safety program	2019	- CSR activities and development of programs on safety
	Environment-related theme	- Formulate and undertake The More than Environment program	2019	- CSR activities and development of programs on the environment
	Health-related theme	- Formulate and undertake The More than Health program	2019	- CSR activities and development of programs on health
	Local community-related theme	- Formulate and undertake local community-related program	2019	- CSR activities and development of programs customized to local communities

## CSR

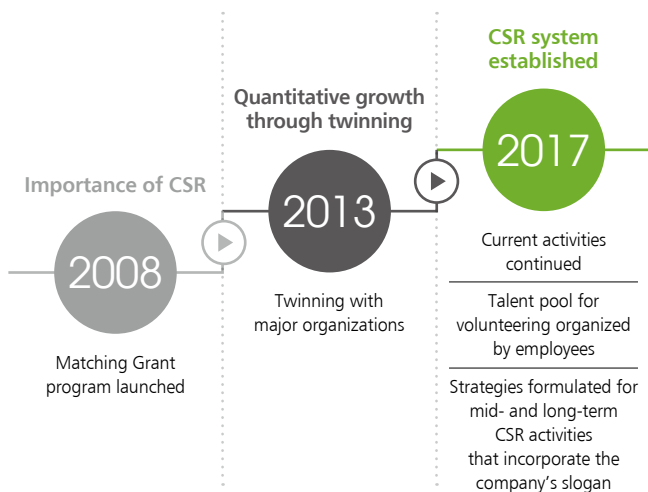
Lotte Chemical establishes a strategic social contribution system to promote company-wide activities to achieve growth and development jointly with the local community. We forge organic relationships with local communities through active social contribution activities by the Head Office and by business sites at home and abroad.

### Matching Grant Program

We have operated a Matching Grant scheme since 2008 to raise charitable funds each year and the company's contribution to the fund matches the entire amount raised voluntarily by employees. The fund set up by this program is used for social contribution activities at each worksite, as well as regular donations to institutes with sisterhood ties, including Korea Children's Foundation and community centers for persons with disabilities.

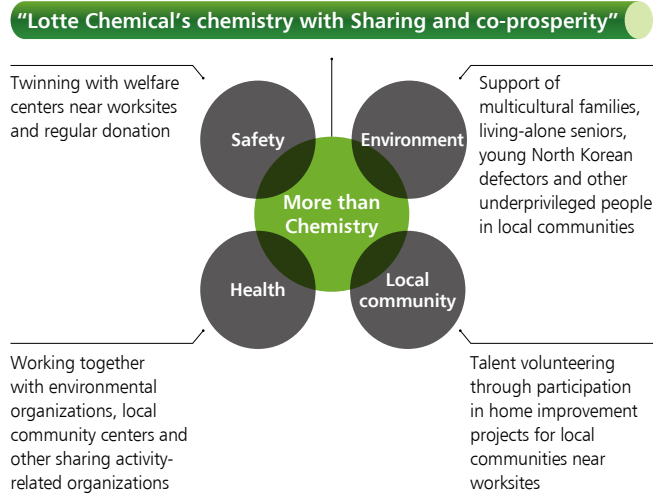


### Social Contribution Activity Roadmap



## CSR Program

With "Lotte Chemical's chemistry with sharing and co-prosperity" as our slogan, we are actively engaging in CSR activities. With safety, environment, health, and local community as the themes, we are undertaking long-term, practical CSR activities that make a significant difference to the community and the environment.



### Charlotte Volunteer Group

In 2015, the volunteer groups that were operated independently by business sites were integrated into the "Charlotte Volunteer Group" to motivate employees to participate voluntarily. As a warm companion of the local community, they actively promote social contribution activities, and also they use this as a channel to establish an innovative labor-management culture and engage in various activities together.



Charlotte Volunteer Group's CSR Activities

#### Charlotte Volunteer Group's CSR Activities

Classification	Unit	2016	2017	2018
No. of participants	persons	1,893	2,248	2,330
No. of participation hours	hours	12,500	14,800	15,476
Ave. participation hours/person	hours	6.6	6.58	6.64

\* including duplicate persons



## CSR Activities by Theme

### Safety

As Lotte Chemical is a chemical company, we give utmost priority to safety and safety management. Accordingly, we plan various safety-related CSR activities for suboptimal people from a safety perspective, such as firefighters.

#### People Vulnerable to Safety Risks

Lotte Chemical signed an agreement with the Ulsan Nambu Fire Station to donate fire extinguishers and smoke detectors for people living in an environment with a high fire threat. We have donated fire extinguishers and smoke detectors to 1,000 underprivileged households with the aim of preventing fire and minimize fire damage.

#### Firefighters

Firefighters take responsibility for the safety of Lotte Chemical employees in each worksite and, furthermore, work day and night for the safety of citizens. In sincere appreciation for their dedication to safety, we have carried out various CSR activities for the improvement of their working conditions.

The majority of firefighters are prone to experience shocking accidents, such as injuries and fatalities and suffer from PTSD (Posttraumatic Stress Disorder), but they are not getting the medical care they deserve. In order to help them, Lotte Chemical donated stress test kits to 18 fire stations in Chungcheongnam-do and 17 fire stations in Jeollanam-do for firefighters' mental health. Firefighters are known to have many difficulties in maintaining work-life balance as well as overcoming PTSD. Due to the shifting nature of work, they seldom find time for their families and consequently have difficulty building strong family relationships. In order to offer them an opportunity to have some quality time with their families, Lotte Chemical donated 200 tickets for the Hans Zimmer vs. John Williams concert to them.



An agreement ceremony for installation of fire safety equipment for vulnerable people from a safety perspective



CSR activity for the improvement of firefighters' working conditions

**NEW CONCERT**

**한스 짐머 vs 존 윌리엄스**  
Hans Zimmer vs John Williams

2018. 12. 2일 / 롯데콘서트홀

2018. 12. 2일 오후 7시

**한스 짐머 vs 존 윌리엄스**

두 영화음악의 거장이 한 무대에  
한스 짐머의 배트맨 vs 존 윌리엄스의 슈퍼맨  
영국 바버칸 센터 로열 알버트홀 공연 기록  
모두가 기대하는 국제 첫 공연

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티켓가 12/9/7/4천원  
출연 지휘 맨사나 잉글라스  
연주 고려아름오케스트라  
프로그램 한스 짐머 배트맨 라이온 킹 글래디에이터  
존 윌리엄스 슈퍼맨 헌들라워스트 스테이브 외

Support for firefighters with PTSD to enjoy culture with their families



"A Cool Summer" Story of Lotte Chemical and Songpa-gu



Home improvement activity for the underprivileged



"Adopt a River" campaign



Environmental cleanup activity

## Environment

As a chemical company, Lotte Chemical is acutely aware of the impact on the environment. In an effort to solve the problem, we are undertaking various CSR activities under the theme, "environment", helping people living in suboptimal housing environment and raising public awareness of the environmental issues.

### Support for People in Suboptimal Housing Environment

In Songpa-gu, home to the head office of Lotte Chemical, roughly 8,000 households are classified as part of the near poverty group. The "near poverty" group refers to the low-income people who are not as economically poor as the recipients of basic livelihood security benefits but are viewed as potentially poor. As they live close to the poverty line but are falling through the cracks in the welfare system, Lotte Chemical has decided to lend a hand to them by improving their housing environment as part of our CSR activities. Since they live in poor surroundings and are exposed to heatwaves and cold spells, we have donated a "cold box" which is filled with a cooling mat, moisture absorbers, and mosquito repellants, and a "hot box" which is packed with winter gear, including a blanket, neck warmer and socks to 800 households. In recognition of the deed, we received the "Hope Ondol Project" Award Certificate from Songpa-gu Office. In addition, Lotte Chemical workers in each worksite, including the Daesan Plant, visit living-alone seniors and people with brain disorders living near the poverty line and help them live in a more pleasant and clean environment by volunteering their time and effort to change wallpapers and floors and repair the roof and furniture.

### Environmental Cleanup

Lotte Chemical is committed to keeping the environment clean by engaging in environmental cleanup activities in each worksite. The Yeosu Plant, for instance, cleaned the Deokyangcheon Stream four times a year and the Daesan Plant helped clean the Myeongji Reservoir, Samgilpo Port, and Mangilsa Buddhist Temple nine times per year.

### Environmental Exhibition

Lotte Chemical sponsored the Kenny Scharp exhibition, which was held at the Lotte Museum to raise public awareness of the environment. Kenny Scharp is a U.S.-born pop artist who translated the fear of environmental destruction into art. We sponsored the show to demonstrate our commitment to environmental sustainability.

## Health

We care about the health of our employees and members of the local community. We pay special attention to the mental health of underprivileged people who slip through the cracks in the welfare system. For instance, we hold the “Healing Camp” program for single parent families and provide children with rare diseases with music therapy services.

### Healing Time for Single Parent Families

Lotte Chemical sponsors 100 single parent family members recommended by the Seoul City Single Parent Family Support Center to provide them with the support to attend camping and music concerts. The “Healing Camp” for single parent families was held in Lotte Resort in Buyeo and consisted of a variety of programs, including parent education for elementary school children, children’s interactive activities, Buyeo Seo-dong Lotus Flower Festival, and Water Park outing. The camp event was prepared to help participants strengthen family bonds with members of their families. Also, Lotte Chemical invited them to music concerts “Organ Odyssey” and “Kids Concerts” to introduce classical music to children and allow participants to enjoy music with their families.

### Musical Games for Relaxation at Bobath Children’s Hospital (Rehabilitation)

Lotte Chemical sponsored 111 children with rare diseases to help them regain physical and mental strength through music therapy. With “Musical Games for Relaxation Sponsored by Lotte Chemical” as the title, the music therapy activity was designed to improve the quality of life in children with rare diseases as well as their parents by helping them dealing with both physical and emotional stress.

During the three-month program, children with disabilities showed improvement in concentration and persistence, while their parents demonstrated the decrease of depression symptoms through psychological stability. As the program proved effective, we will continue to offer the music therapy programs to more children for longer periods for the betterment of the lives of members of the local community.



Healing Time Camp for the relaxation of single parent families

### L.CONCERT

<p>9.30 / 12.2 (금) 오전 11:30</p> <p><b>오르간 오딧세이</b></p> <p>5천여 개의 파이프로 이루어진 롯데콘서트홀의 지붕 파이프오르간과 대니는 특별한 여정</p> <p>티켓가 2 / 1만 원 출연 오르간 및 해설 류아라 콘서트마스터 나영준 프로그램 &lt;오르간 나날&gt; 9.30 &lt;크리스마스 스페셜&gt; 12.2</p>	<p>10.7 (일) 오전 11:30</p> <p><b>키즈 콘서트</b></p> <p>우리아이 첫 번째 클래식 콘서트 재미있는 애니메이션으로 어린이와 어른 모두를 위한 즐거운 클래식 공연</p> <p>티켓가 5 / 3 / 2 만 원 출연 지유 크리스토퍼 리아(첼로) 연우 디토 오케스트라 프로그램 그레고리 스키스 오케스트라 기념 프로젝트 '파트' 일레 모음곡 '산타클로스'</p>
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Healing Time Concert for the relaxation of single parent families



Musical Games for Relaxation at Bobath Children’s Hospital



Sharing Love through Kimchi Making by Daesan Plant



Celebration of longevity by Yeosu Plant



Donation of boxes of everyday necessities to recipients of basic livelihood benefits by Ulsan Plant



Donation of heating and cooling products for people with limited affordability to electricity by R&D Center

## Local Community

Lotte Chemical is carrying out a wide array of CSR activities geared toward co-prosperity with local communities. We are committed to reaching out to the underprivileged people and working together with local communities as well as other relevant organizations to create shared value.

### Support for Economic Self-reliance

The Charlotte Volunteer Group has been supporting local communities to achieve economic self-reliance. Our local worksites, including the Yeosu Plant, Daesan Plant, Ulsan Plant, and R&D Center, donated food trucks and side dishes to offer meals to needy people and provided living necessities to Seniors, North Korean defectors, and veterans' families. In addition, we provided financial support to cover heating expenses for multicultural families and low-income families with disabilities. We also donated prosthetic legs for people with disabilities under financial strain. We will continue to undertake CSR activities and donate our time and effort for community development.



Hope Sharing Scholarship by R&D Center

**Support for Self-Reliance of Local Facilities**

The Charlotte Volunteer Group engages in diverse CSR activities to help various facilities, including community welfare centers, nursing facilities and childcare centers, become self-sufficient. Our local worksites, including the Yeosu Plant, Daesan Plant, Ulsan Plant, and R&D Center, actively participated in CSR activities to tackle social problems and supported local facilities. We will continue to commit ourselves to volunteer works for local community development.

**Support for Rights to Education**

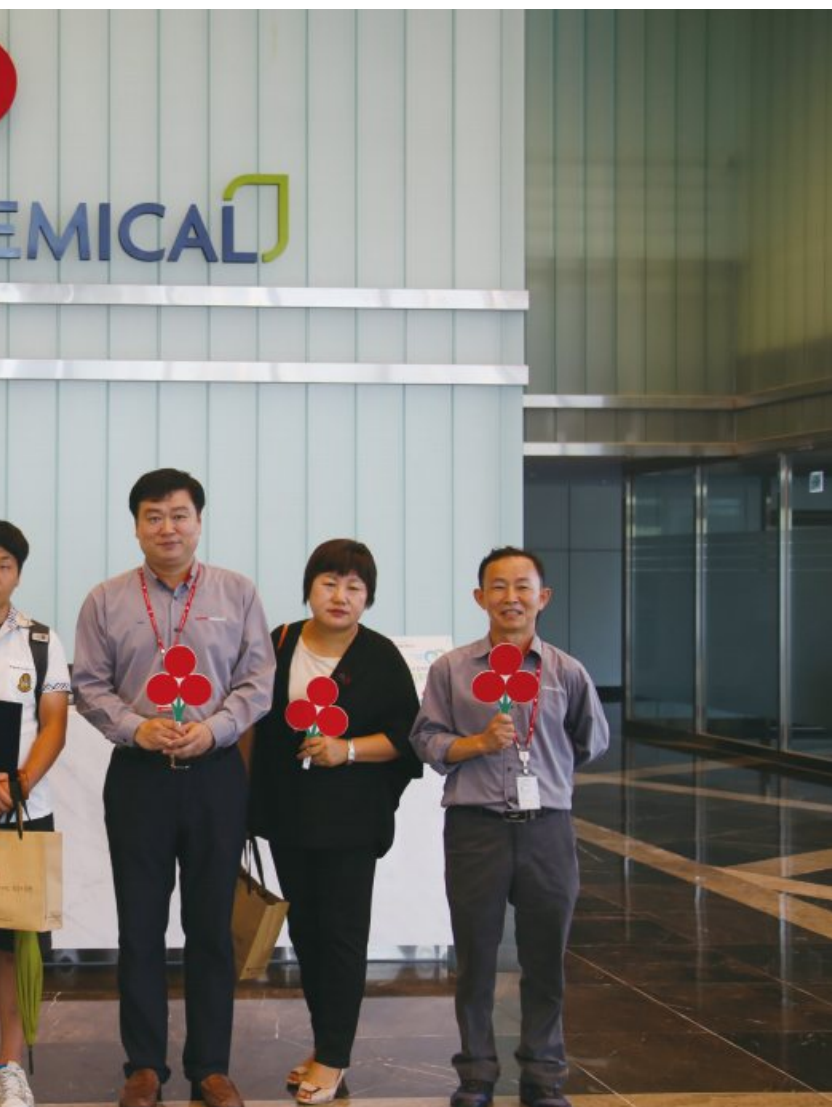
The Charlotte Volunteer Group is committed to helping children who cannot available or discontinue education owing to financial difficulties restore their rights to education through diverse CSR activities. The Yeosu, Daesan, and Ulsan Plants and the R&D Center as well as other worksites sponsor students who had to drop out of school due to financial problems and donate scholarships as well as books and school uniforms to facilitate their studies.



Food truck donation by Yeosu Plant



Donation by Daesan Plant to cover heating expenses for people with disabilities



Donation of humanities and science books by R&D Center



Donation of rice by Ulsan Plant to community center for people with disabilities



Supporting the Establishment of Playground for an Orphanage



Supporting the Construction of a Bus Station



Collecting E-Waste



Awarding Scholarships

## Making Contributions to the Global Community

In order to provide more practical assistance for the local communities where our overseas branches are stationed, we are developing locally specialized social contributions. We will endeavor to become a global chemical company, taking the lead in discharging our social responsibility.

### LC Titan

#### Embracing the Underprivileged

LC Titan is making various social contributions in order to support the underprivileged. We supported the repair and maintenance of an orphanage's playground and actively helped set up fences around a nursing home and arrange oxygen supplies there. In addition, we improved facilities and supported education programs for a special education school in order to provide opportunities for students to have good experiences.

#### Supporting Local Communities

LC Titan is taking the lead in improving public facilities for local communities. We have been installing bus-waiting rooms in one selected bus station per year. In addition, we built public restrooms and restored a mosque. As part of our activities to support local communities, we served Bubuk Lambuk (Food consumed after sunset during Ramadan) and delivered gifts of hope to cancer patients at local hospitals during Hari Raya (a festival to celebrate the completion of a month of fasting during Ramadan).

#### Activities to Improve the Environment

LC Titan planted 25,000 trees and made contribution to enhancing the environment of the local community and also took the lead in collecting electric/electronic waste. While carrying out the collection of e-waste, we installed e-waste recycling bins at three elementary and middle schools and reverted revenues generated out of the collected e-waste to the relevant schools.

#### Supporting Education

LC Titan is supporting scholarships to create an environment where students from the low-income bracket can concentrate on their studies and have the same educational opportunities. We covered school expenses for 109 students from two schools and awarded scholarships to 10 outstanding students from each and every one of the 20 elementary and middle schools. We could secure talented workers in advance by selecting nine students from two to three colleges to give scholarships and letting them work with LC Titan after their graduation. Thanks to our continuous activities, including the one-year internship apprentice program, LC Titan is establishing itself as a company that endeavors to enhance the local community's education.

## LC Pakistan

### Environment • Go Green Campaign

LC Pakistan has been implementing its Go Green Campaign by continuing to supply drinking water within a factory since its establishment in 1998 and expanding the drinking water supply to areas outside the factory since 2017. Additionally, we make direct purchase of seeding with the goal of growing 15,000 trees in the factory, we have delivered them to the nearby NH University, the Child Health Center and PQA's Environmental Department since 2018.

### Supporting the Local Community • Free Eye Medical Camp

In 2018, we launched the EYE CAMP in the PQA area, where the LC Pakistan workplace is located. We carried out volunteer medical services such as examining and treating eye diseases for locals lacking medical care. In 2018, volunteer medical services were conducted three times from March to September to December.

### Endowing Scholarship to The Citizen Foundation School (TFC)

In the area of Mosa Goth & Cattel Colony, where LC Pakistan workplace is located, we awarded scholarships worth 380,000 Rupee in total to 20 low-income students out of those from TFC (The Citizen Foundation School), a nonprofit organization, so as to motivate them to study well.

### LOTTE Scholarship Foundation

LC Pakistan started its scholarship project through the LOTTE Scholarship Foundation in 2017. We awarded scholarships worth \$5,300 each to 12 NED students in 2017, the 1<sup>st</sup> year of the project, and \$6,530 to 15 NED students in 2018, the 2<sup>nd</sup> year of the project.



Delivering Seedlings to NH University



Free Eye Medical Camp



Endowing Scholarship to TFC



LOTTE Scholarship Foundation's Scholarship Award Ceremony



LOTTE Scholarship Foundation's Scholarship Award Ceremony

# SDGs (Sustainable Development Goals)

## Sustainable Development Goals

The United Nations established its Sustainable Development Goals (SDGs) requiring the global community to jointly achieved by the global community from 2016 to 2030. The SDGs are directed toward sustainable development of all nations around the world. SDGs defines 17 goals, including responding to poverties and climate changes, addressing inequalities, developing economies and others, and 169 detailed objectives. Lotte Chemical is striving to find new growth engines and jointly address social issues as a corporate citizen by identifying and achieving SDGs that fall within the ambit of its vision and business strategy.



## Seventeen Goals of the UN SDGs



- Goal 1** End Poverty in All its Forms Everywhere
- Goal 2** End Hunger, Achieve Food Security and Improved nutrition, and Promote Sustainable Agriculture
- Goal 3** Ensure Healthy Lives and Promote Well-being for All at All Ages
- Goal 4** Ensure Inclusive and Equitable Quality Education, and Promote Lifelong Learning Opportunities for All
- Goal 5** Achieve Gender Equality and Empower All Women and Girls
- Goal 6** Ensure Availability and Sustainable Management of Water and Sanitation for All
- Goal 7** Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for All
- Goal 8** Promote Sustained, Inclusive and Sustainable Economic Growth, Full and Productive Employment and Decent Work for All
- Goal 9** Build Resilient Infrastructure, Promote Inclusive and Sustainable Industrialization, and Foster Innovation
- Goal 10** Reducing Inequality Within and Among Countries
- Goal 11** Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable
- Goal 12** Ensure Sustainable Consumption and Production Patterns
- Goal 13** Take Urgent Action to Combat Climate Change and Its Impacts
- Goal 14** Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development
- Goal 15** Protect, Restore and Promote Sustainable Use of Terrestrial Ecosystems, Sustainably Manage Forests, Combat Desertification, and Halt and Reverse Land Degradation and Halt Biodiversity Loss
- Goal 16** Promote Peaceful and Inclusive Societies for Sustainable Development, Provide Access to Justice for All and Build Effective, Accountable and Inclusive Institutions at All Levels
- Goal 17** Strengthen the Means of Implementation and Revitalize the Global Partnership for Sustainable Development





### Goal 1. Providing Equal Education Opportunities

LC Titan is granting scholarships to students from low-income families near workplaces in Malaysia and Indonesia to provide them with equal education opportunities. We have helped cover schooling expenses for students from poor families and provided scholarships for outstanding students with excellent records in connection with schools in local communities. In addition, we are providing students with such programs as field trips to our workplaces, technical training, apprentice program and so forth. LC Pakistan is awarding scholarships to low-income students living near its workplace to encourage them to continue their studies. In addition, we are granting scholarships to outstanding students of local colleges through Lotte Scholarship Foundation and placing some at our local workplaces.



### Goal 4. Project to Support Good Education

Lotte Chemical continues to be a reliable sponsor for beneficiaries by nurturing future talents in science and encouraging students who had to stop their studies due to their poor family surroundings to have dreams and hopes. The Hope-sharing Scholarship is a scholarship project to help those students who study hard, not giving up their dreams despite difficult environments, to stand on their feet. By joining the 'Fruit of Love (Community Chest of Korea in Daejeon)' and 'Office Worker's Sharing Campaign Project Agreement,' all employees of Lotte Chemical Research Center are donating a certain portion of their wages on a monthly basis to raise the 'Happiness-sharing Fund.' We are striving to nurture local talents by providing the Hope-sharing Scholarship twice per year.



### Goal 6. Program to Improve Residential Environment for the Underprivileged

We are carrying out a program to improve the residential environment for the underprivileged near Yeosu, Daesan and Ulsan areas where Lotte Chemical plants are located. We are actively renovating homes such as papering walls and floors, painting outer walls, doing electrical works and others for recipients of national basic livelihood guarantees, near poverty groups, senior citizens who live alone, families raised by grandparents, the extremely poor and other. By doing so, we continue to improve the quality of life for those residents and get rid of any dangerous factors that would threaten their safety.



### Goal 7. Re-using Electricity and Reducing Greenhouse Gas Emissions

Lotte Chemical has come up with a long-term strategy to reduce energy-use and enhance energy-efficiency for sustainable energy-use. Based on the long-term strategy, we could improve the efficiency of our facilities by introducing highly effective facilities and innovating working process, automate the operation of our plants by applying new IT system, and reduce energy use by optimizing plant-operating conditions. We are also working hard to prevent energy-loss and increase energy-efficiency by continuously discovering energy-saving items and reviewing new technologies.



### Goal 8. Supporting Partners that Pursue Sustainable Economic Growth Creating Decent Jobs for Advancement into Foreign Markets

Lotte chemical is actively supporting our partners with outstanding capabilities to advance into overseas markets. In particular, we helped our outstanding partners at home to expand their overseas supplies into LC Titan. We could thus help 31 local partners increase their supply performance worth 11.8 billion KRW at LC Titan (Malaysia) in 2018. LC Titan, as a top-tier chemical company based in Southeast Asia, is expected to help our partners to expand their supplies to various overseas markets based on their supply performances based on LC Titan. We are planning to actively back up excellent partners at home to move into a scheduled new Indonesian project.



### Goal 13. Greenhouse Gas & Energy Management System (GEMS) to Respond to Climate Change

Lotte Chemical is taking the lead in reducing greenhouse gases and responding to climate change. We were the first local chemical company to establish a greenhouse gas inventory system in 2008. Furthermore, we have adopted GEMS, a SAP-based greenhouse gas & energy management program, and are using it continuously since its implementation in 2010.

Lotte Chemical is managing greenhouse gas reduction targets assigned to each of our facilities. We have set a reduction goal for the planned period of the 2<sup>nd</sup> emissions trading system (2018~2020) twice as high as the performance made during the 1<sup>st</sup> planned period (2015~2017). We are reducing greenhouse gases by actively carrying out the development of and investment in new products. In addition, we are very active in using eco-friendly technologies. For instance, we have introduced a polycarbonate-manufacturing process that utilizes carbon dioxide, generated from facility processes, as a base material.



## ISSUE 04

# Employees

Lotte Chemical sets a higher value on the future-creating possibility, rather than what it is now. We believe 'talents' are the principal agents leading a company's sustainable growth.

Securing and nurturing global talents equipped with passion and responsibility for further growing our society while developing themselves is one of our core goals in achieving the corporate vision. Lotte Chemical has based its organizational culture on prioritizing the happiness of its employees in line with the chronological change that emphasizes work & life balance. As a global company, we are taking the initiative in pursuing the happiness of our employees and enhancing their productivity by actively implementing family-oriented programs and customized working system to satisfy personal life cycles.

Furthermore, we are helping our employees at the main office and overseas branches and external stakeholders to understand how our talents are recruited and nurtured to contribute to the company and the society by making public our company's sustainable direction in securing and nurturing talents. Our company is supplementing its policy on nurturing talents every year. We will continue to enhance the capability of our employees at home and abroad so that they can continue to play key roles in the global market and contribute to sustainable growth and development.

## Lotte Chemical's Response

### Performance in 2018

Classification	Key issues	2018 Goals	Achievement Index	Deadline	Performance	Achievement
HR	Managing/operating personnel	- Securing and retaining outstanding talents	- Recruitment channel diversification and promotion - HR system improvements - Attract excellent talent	2018	- Diverse recruitment channel and promotion to attract excellent talent - 2018 HR system improvements (Placement and improvement of new employees, family support for expatriates etc) - Decrease in excellent talent retirement rate	●
Nurturing talents	Advancing the nurturing of global talents	- Secure continuous upper hand in language proficiency of all employees - Implementing the 3 <sup>rd</sup> local expert program - Enhancing capabilities of expatriate employees	- Retained the number of employees capable to be sent to overseas markets at the same rate as the previous year (Around 80%) - Completing the course and sharing knowledge - Implemented and continuously Managed the education course for dispatch before and after	2018	- Achievement 88% Overseas Dispatchable Personnel - The average company-wide language score 827 to 836 (9-point rise) - Successfully completing the 3 <sup>rd</sup> local expert program (Indonesia, Turkey and Nigeria) and publishing new outputs and completing internal dissemination - Establishment the explicit knowledge for presiding expatriate and rehabilitation	●
	Fortifying education system for each grade and position	- Advancing education system for each grade/position and establishing a nurturing program - Expanding learning opportunities for all positions by operating the accreting system - Expanding the period and visiting foreign markets to improve work capabilities and global mindset of newly hired employees	- Reorganizing each education program and newly establishing a program	2018	- Fortified education by class and position level - Advanced training for new employees/experts/position managers and accounting authentication/chemical engineering academy - Expanded the association with external high-quality trainings (SNU EFRC, CMRI petrochemical conference and others) - Expanded and managing systemic learning through the accreting system - Shared the status of the accreting at each workplace on a monthly basis and encouraging those who didn't complete the accreting system - Strengthened training for new employees - Expanded the training period from one week to four weeks (The longest in the industry) - Initiated four-week programs such as common training for the main office positions, trainings on the factory process (Shift-work) and field-oriented trainings at outstanding overseas branches	●
Employee-friendly organizational culture	Disseminating a creative labor/management culture	- Declaring the 3 <sup>rd</sup> anniversary of creative labor/management culture	- Implementing various labor/management cooperation programs	2018	- Winning the creative master award regarding a creative labor/management culture	●
	Creating work-life balance culture	- Improving working culture and enhancing work productivity	- Introducing work innovation system and establishing various instruments	2018	- Introducing a system to reduce working hours (PC-OFF, flexible working hour system, judged working hour system and others) - Implementing family-oriented programs (Inviting employees' kids and parents, and others)	●
	Establishing employee-friendly organizational culture and vitalizing communications	- Vitalizing monthly special lectures (Reflecting the needs of employees by conducting surveys) - Implementing programs to vitalize the organization by customizing each group - Restructuring communication message programs	- Expanding each training/program and newly establishing trainings and programs	2018	- Vitalizing monthly special lectures - Operating various themes including humanities, communications, business trends, and others reflecting employees' needs - Organizational culture aligned with consensus formation and vision - Identifying the employees' needs through self-organizing culture diagnosis and HR system implementation - CEO special lecture and CEO letter distribution - Share key issues by department - Open Interdepartmental/Generation Communication Program - Chemi-Making Program: reverse mentoring between CEO/heads of main office and new generation - Crossed Talkivity: small activities between executives from other businesses and new generation - Vitalizing communication messages - Finding out communication issues through on-site surveys and distributing practical solutions - Diversifying messaging channels including mobile messaging and others	●
	Continuing to improve the corporate culture	- Continuing to operate the corporate culture TFT and diversifying programs	- Improving organizational efficiency index	2019	- Implementing ERRC campaign to enhance work productivity	●

### 2019 Goal

Classification	Key Issues	2019 Goals	Deadline	Achievement Index
Global	Setting global-level HR direction	- Establishing HR organization system to satisfy global standards - Establishing global HR governance/supporting system in accordance with the expansion of overseas businesses	2020	- Establishing HR organization system in accordance with global standards - Establishing global HR governance/supporting system in accordance with the expansion of overseas businesses
	Recruitment	- Securing outstanding/specialized talents - Securing external experts to actively respond to changes in business environment - Recruiting people with advanced foreign college degrees related with our core businesses	2019	- Securing outstanding talents to expand overseas new projects - Securing external experts to actively respond to changes in business environment - Recruiting people with advanced foreign college degrees related with our core businesses
HR Management	Implementing a system to nurture and retain talents	- Establishing a system to develop and compensate careers in order to enhance job-related satisfaction and productivity	2019	- Establishing a system to develop and compensate careers in order to enhance job-related satisfaction and productivity
Nurturing Talents	Nurturing global talents ahead of time in order to become the global top seven	- Systemizing trainings for global core talent pools - Nurturing local experts for future businesses ahead of time and developing strategic language capabilities	2019	- Training core talent pools and enhancing the leadership of executives - Systemically operating trainings for expected expatriate employees - Selecting and managing the 4 <sup>th</sup> local experts - Developing strategic language capabilities for future businesses
	Nurturing talents and preparing synergy by integrating petrochemical companies	- Expanding our own trainings to fortify core capabilities of petrochemical companies - Preparing the integration of chemical company HRD by running TFT ahead of time	2019	- Increasing our influence compared with training for talent pools - Strengthening the association with outstanding external job training institutes - Integrating and operating petrochemical companies as a prioritized course out of the ones for talents and newly hired employees
Respecting Human Rights	Spreading creative labor/management culture	- Stable labor/management culture	2021	- Achieving cooperative and rational labor/management relations
Employee friendly Organization culture	Creating work-life balance culture	- Endeavoring to enhance productivity in comparison with reduced working hours	2019	- Weekly working hours and level of work concentration
	Vitalizing rapidly-growing organization's communications	- Strengthening communications between CEO/executives and employees - Operating communication messages and campaigns for work concentration - Providing special lectures related with management policies	2019	- Supporting CEO's on-site communication-based management and interactive communications with executives - Diversifying communication channels and introducing video/knowledge services - Providing theme-specific lectures and project lectures related with management issues
	Continuing to improve corporate culture	- Continuing to operate corporate culture TFT and diversifying programs	2019	- Improving organizational efficiency index

## Creating a Culture of Work & Life Balance

As time goes by, people are placing more emphasis on work-life balance, and in recognition of such chronological changes, Lotte Chemical is taking the lead in creating a corporate culture where work and life are balanced.

### Corporate Culture with Work and Life Balance

After amending a law related to the reduction of working hours, we have introduced a PC-OFF system to improve the work culture and proposed various types of flexible working systems in order to help realize work & life balance. In addition, we have become the first to introduce a 'sabbatical month' to let those who are promoted to an executive level take a one month vacation so that they could concentrate on their work and enhance productivity after returning to work. We are planning to create an environment in which employees can concentrate on their work by improving productivity proportional to reduced working hours. We believe that we could improve productivity and job-related concentration and expect to create the harmony between work and life.

#### Sabbatical Month System

Lotte Chemical is strengthening its work-life balance culture by implementing a sabbatical month system. With the leading system being operated not only with Lotte Group but also in the industry, we are encouraging those who become managerial-level employees to take a sabbatical leave for a month. Through the sabbatical month system, they can have the opportunity to deeply consider their roles as managers and boost their energy-levels, so that they can fully utilize their capabilities when returning to work. And we are providing expenses for annual leave and sabbatical month vacations in order to create a virtuous cycle. We are playing a positive role in boosting their loyalty to, and pride in, their company.

#### PC-OFF System

Lotte Chemical introduced the PC-OFF system in July 2018 in order to reduce working hours in a practical way after considering the productivity. Based on this system, no employee is allowed to turn on their PC when they are automatically shut down after work. The ultimate goal of the system is not to simply reduce working hours but to create the maximum productivity for given hours at work so that employees can make it their habit to leave work on time. Through this system, Lotte Chemical is striving to enhance both job-related productivity and work-life balance.

### Flexible Working System

Lotte Chemical is implementing a flexible working system to help its employees take care of their kids, develop themselves, and commute from long distance by respecting their various lifestyles. Accordingly, we are allowing our employees to freely adjust when getting to work from 8 a.m. to 10 a.m. through staggered office hours, and we are providing a working environment in which employees can select to go to work at any time even after 10 a.m. on special days.

### Work & Family Balance Organization Culture

Lotte Chemical is striving to grow both the organization and families in harmony in order to create a work-family balance culture and a family-friendly management. Based on the the belief that the growth and happiness of our employees and families promote the growth of our company, we are practicing family-friendly management and operating a daycare center at each of our workplaces (Yeosu/Daesan/Research Center).

#### Mandating and Activating Paternity Leave

Our company, as a chemical company, is inevitably a male-dominant company. Considering this fact, we created an atmosphere for men to freely take leave by setting an institutional measure to mandate paternity leave in 2017. Furthermore, we are actively supporting childbirth by paying 100% of the ordinary wage for the first month of such a break in order to mitigate economic hardship arising from reduced wages while taking leave and encourage our employees to take parental leave. More than 60% of our male employees with newly born babies took paternity leave in 2018, showing that we are taking the lead in practicing family-friendly management.



A Poster of Paternity Leave

#### Extending the Period of Maternity Leave to Two Years

By extending the period of maternity leave by up to two years, we are helping our female employees not to stop their careers due to lack of time to foster their kids, which often forces them to retire from their jobs.

## CASE

## Expanding Family Participation Programs

Lotte Chemical carried out various programs through which families could participate, as part of its family-friendly management. Based on our own organizational culture centered on our company housing, we are practicing our family-friendly management in many ways including Lotte Family Day when the employee's children visit and tour the company, parents-inviting events for newly-hired employees, cultural lectures for spouses, experience activities during the children's vacation, hobby classes and others.



Children's Visit to Our Company

## Lotte Family Unity Event

The 3<sup>rd</sup> Lotte Family Unity Contest was hosted in November 2018 at Gocheok Sky Dome in Seoul. This event was held to strengthen communication among the subsidiaries and to build a healthy and vibrant workplace culture. Nearly 8,000 people, including executives and employees and their families from major subsidiaries, attended and enjoyed various programs, such as a baseball tournament, a giveaway prize contest, and a large-scale concert. Employees and their families raised their sense of pride as members of Lotte Group and enjoyed their time by participating in various programs.



Lotte Family Unity Event

## Recruitment of Talents

In 2013, Lotte Group declared a 'Diversity Charter' for the first time among all enterprises in Korea way of putting into action our respect for the diversity of our employees and eliminating discrimination against them. Based on our recruitment motto of 'Fairness,' we recognize diversity based on individual differences such as gender, academic background, disability status, and hometown. Through fair and transparent procedures, we hire excellent talents with passion and competence.

## Desired Qualities of Employees

## The young who do not fear failure

- The young who have the spirit to take risks for success and not to fear failure
- Active and adventurous spirit seeking success even out of failure rather than just enjoying a stable life without seeking challenges due to fear of failure.

## The young who make endless efforts for self-development

- The young who continue to enhance their knowledge and capabilities to achieve success out of their true strengths not out of their recklessness
- The young who know the value of patience and endeavor and who are able to learn the basics to advance.

## The young who know how to cooperate and coexist

- The young who are loyal to, cooperate with and assist their colleagues, seniors and juniors
- The young who can appreciate people and the community in which they live

## Securing Female Talents

Lotte Chemical continues to focus on hiring and retaining female workers. By hiring female workers to fill a certain proportion of the entirety of our human resources, we continue to endeavor to work with female talents. In addition to our existing female-friendly system, we established a program to encourage those who suffer from sub-fertility to take leave and to support their medical expenses in 2018. As such, we are implementing policies to help female workers balance work and life and to support such talented women on career breaks to continue with their careers.

## Securing Global Talents

Lotte Chemical strives to secure excellent talents both at home and abroad. In order to hire qualified researchers, a division dedicated to HR management was established within the R&D Center in 2015. In addition, we are focusing on securing customized R&D talents and fortifying the pool of researchers through recruitment in association with businesses and universities, the selection of outstanding students and the hiring of those with overseas doctorate degrees. Moreover, we strive to hire global talent thanks to our global recruitment, employment of foreign students in Korea and global talent recruitment standards.

## Expanding Capability Centered Talent Recruitment

Lotte Chemical respects the diversity of individuals and operates various recruitment channels to recruit the best talent, based on their special competencies. In addition to our open recruitment of newcomers, we hire talents through a large-scale audition event to identify those with vocational competencies; the disabled to provide opportunities the underprivileged and address our social responsibilities; female military officers; individuals who have made national contributions; and idea competition winners.



Spectacle Recruitment



Job Fair for Discharged Military Officers

## Creating Decent Jobs

Lotte Chemical decided to hire all workers dispatched to the company as of January 1, 2017. The decision was made to practice the innovation plan announced by Lotte Group in October 2016. Through this decision, we are planning to provide more secure jobs by transforming 10,000 irregular workers within Lotte Group into regular workers over the next three years. In the past, contractual workers sent to Lotte Chemical were subject to the internal evaluation at the end of their two-year contract period, and we directly hired some of them who qualified our employment standards. As of January 1, 2017, however, we eliminated the contract-based worker program and directly hired all 35 dispatched workers at headquarters, research centers, and plants in Yeosu, Daesan, and Ulsan. Thanks to this decision, we could provide them with stable jobs by eliminating their job-related uncertainty and applying our policies on wages and welfare.

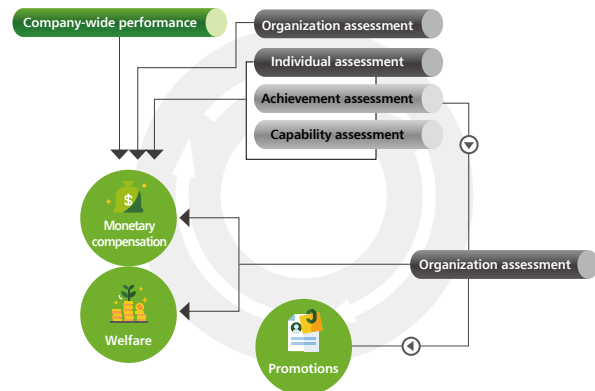
## Performance Management and Welfare System

The process of nurturing talents should be backed up by accurate evaluation of performance and fair compensation commensurate with the work. Lotte Chemical is thus implementing a performance -management system that is fair to all of our employees in order to motivate them and to provide support for them to improve themselves. By conducting performance evaluations and providing proper feedback, we are helping our employees to enhance their capabilities and manage their careers.

### Process of Evaluating Employees performance

Lotte Chemical’s HR assessment of its employees is comprehensive as it consists of Management by Objectives (MBO) and capability evaluation. Such a comprehensive assessment is conducted once a year to review careers and performances of our employees after setting Key Performance Indicator (KPI) in accordance with MBO criteria every year in order to achieve systemic evaluation results. As promotions and incentives are devised and paid based on the results of individual evaluations, a positive effect is generated on improving work performance. Furthermore, we are paying incentives to outstanding individuals and teams from each different position so as to motivate each and every employee to voluntarily boost their performances.

### Evaluation Frame



### Performance Feedback Process

Assessment result feedback shows that the personnel assessment not only produces relevant assessment results but also works as an essential process to expand communications between assessors and assessees and to enhance the acceptability regarding results. Lotte Chemical’s feedback system is a face-to-face feedback method through which heads of divisions directly hand over assessment result statements stating the result and the assessor’s general review to those related after completing the personnel assessment results. Thanks to the system, our employees are provided with a number of advices on their career development and work performances through objective reviews on their capability levels and produced performances.

**Employees Subjected to Periodic Performance Assessment and Career Development Evaluation**

Classification	Unit	2016	2017	2018
Rate of employees to be evaluated	%	41	39.6	<b>38.4</b>
No of employees to be evaluated	People	1,192	1,251	<b>1,212</b>

**Strengthening Welfare**

Lotte Chemical is striving to alleviate its employees difficulties and stresses by introducing and operating various welfare programs.

**Strengthening Lotte Chemical’s Welfare through ‘Esthetic GWP’**

Lotte Chemical is working hard to practically enhance its welfare system by implementing a concept known as ‘Esthetic GWP’ (Great Work Place) for its employees. We continue to strive to improve the morale of and esthetic GWP for our employees through such programs as delivering fruit baskets to hospitalized employees and their families to wish their recovery, providing welcome boxes for newcomers who are to live in the company house, supporting children of our employees for the national college entrance exam, offering ‘family month’ gifts, encouraging hardworking employees facing hot weather and others.

**Employee Health Management Program**

We are presenting regular, special, and external general medical check-ups on a periodic basis to manage the health of our employees. In addition, we’ve extended the scope of our support for the families (Spouse and parents) of our employees to get regular health check-ups. And, we continuously implement company-wide smoking cessation activities by introducing a smoking area licensing system across all business sites.

**Hobby Sharing and Cultural Life**

By establishing more than 20 clubs, our employees are enjoying their hobbies together after business hours. Through various activities including soccer, baseball, mountain climbing, musical watching, cultural experiences and others, we provided chances for our employees to respect individual values and philosophy of life and to grow each other.

**Nurturing Talents**




Lotte Chemical is working hard to strengthen the competitive edge of our human resources, which is the core of a corporate competitiveness, in order to jump up to be a ‘Global Top 7 Chemical Company’ of its VISION 2030.

**Advancing the System of Nurturing Employees**

Lotte Chemical has advanced our talent-nurturing roadmap and training system to achieve our new vision. We’ve systemized the talent-nurturing program into basic and advanced levels depending on their ranks and positions and also supported a language-learning program by designating 12 business-related strategic languages including English, Chinese and Japanese for our employees to play global roles.

In order to foster core global talents, we’ve newly launched a training program for our reserved expatriate employees and continued to carry out a local expert (Dispatching to overseas sites) program. In addition, we’ve operated various communication programs of sharing CEO messages and company issues and of enhancing organizational vitalities for our employees to further focus on their work.

**Talent-Nurturing Roadmap and Training System**

	Staff	Assistant manager	Manager	Senior	Executive
	Language education · Information education · Monthly special lecture · Core value education · New vision education · Communication program · Sexual harassment Prevention education · Compliance education (Anti-corruption, fair trade)				
	Introductory education	Grade essential education			Promoted executive course
		promotion qualification education	Team head qualification system		
	Chemical/Accounting Academy, Fairness education, salesperson Education				
	Job Qualification Certification System, Job School, Job expert curriculum				
	External Executive Master Course · EMBA Course · MBA · External MBA Course · External Doctorate Course · Overseas Exchange Work Program · Local Expert · Global School · Engineering/Public Information of Speech Graduate School				

**Strengthening Rank-Based Education**

In order to enhance capabilities related to each rank and position, we conducted various rank-based trainings.

**Vitalizing a Program to Boost Capability of Newcomers at an Early Stage**

We conducted trainings for our newcomers by expanding the period from one week to four weeks, the longest ever in the industry. We restructured the job-related common education into a training to help out our newcomers’ soft-landing and improved the on-site adaptability of our newcomers by conducting an orientation education on the production process commonly applied to all positions. We also encouraged our newly-hired employees to cultivate their global mind by inviting them to our outstanding overseas branches to help them understand overseas branches and new projects there.



Orientation Education for Newcomers

**Strengthening Education for On-Site Factory Workers**

We've been operating a vocational training school since 2012 to enhance capabilities of our employees at an early stage before recruiting them for specialized jobs. In order to maximize job-related capability when sending employees for specialized jobs to our workplaces, we systemized the education curriculum for this year. The education period extended from three months to four months as the field placement expanded to enhance the on-job capability. Furthermore, we could secure outstanding human resources through a newly-established organizational attitude evaluation to review personal character and his/her ability to adapt to the organization other than their on-job capabilities. We built the labor & management trust by sharing the status as to how we operate the education for those promoted for specialized positions and carrying out special lectures for the management.

**Enhancing Leadership Training for Those in Charge**

By diagnosing the leadership of all of our position holders, we could recognize the level of our company's leadership capability and relevant education needs. We also newly launched a company-customized leadership training to enhance the leadership capability. We conducted CEO's special lecture not only for those position holders including our executives, team heads and leaders but also for managerial employees at all of our workplaces to disseminate CEO's message on the leadership mind.

**Strengthening Education on Each Job**

By conducting basic/advanced trainings on each job, we helped employees to understand the nature of each job and encouraged them to cultivate their job-related capabilities.



Chemical Engineering Academy

**On-Job Academy: Chemical Engineering, Sales, Accounting**

We are conducting special trainings on each job to increase our employees' job-related capabilities and to enhance their productivity. By carrying out a chemical engineering academy to introduce our company's products and production process, we are striving to help our employees to understand our businesses. We are also improving individual and organizational sales capabilities suitable for business features by having a sales academy. In addition, we are working hard to help our newcomers to form their business management mind by conducting an accounting training for all of our new recruits with no regard to their majors and jobs and requesting them to obtain the nationally-registered accounting certification.

**Support for Obtaining Special Degrees and Certificates**

Under the belief that the strengthening of employees' competitiveness leads to the growth of a company, we've prepared a number of programs to encourage our employees to obtain job-related certificates. We are not only supporting all education fees and material costs for master-mechanic's practical skill courses but also providing written · performance test costs and congratulatory rewards when passing tests. Furthermore, we are endeavoring to foster core researchers by supporting admission fees and tuition fees for those researchers in doctorate or post-doctorate courses.

**Expanding Association with Outstanding External Education Institutes**

We've expanded job-related training opportunities through associations with external education institutes. We've vitalized job trainings for on-site engineers by associating with an engineering development research center and chemical economy research institute of an external college. We are also running external supreme courses, including a best leader academic course at a college, in order to nurture our executives.

**Nurturing Global Talents**

We've implemented various global trainings to nurture talents suitable for a Global Top 7 chemical company.



Outstanding Local Managers' Visiting Education

**Program to Nurture Expatriate Employees**

In view of the ever-increasing importance of nurturing expatriate employees as part of expanding our company's overseas projects, we've secured a pool of reserved expatriate employees and developed programs to nurture them in the long term. For the reserved expatriate employees, we conducted trainings on how to recognize their roles as expatriate employees, manage diversity and risks and control mental health, carry out intensive language courses, distributed on-site settlement manuals/related books and provided safety education for them to adapt to the overseas sites and to cultivate global mind. In addition, we are conducting trainings to enhance their managerial capabilities and leadership skills before dispatching them. After their returning home, we are helping them to recognize and learn internal changes of the organization by conducting a home-adaptation program. We are also making a virtuous circle of sharing knowledge by distributing the accumulated know-how on the work and life in overseas branches from returnees and their families in writing to those reserved expatriate employees.





Core Value Training for Locals (Attaching LCTM Posters and Distributing Handbooks)

### Program to Nurture Local Experts

Base on our 'Glocalization' strategy, we are nurturing local experts equipped with global senses. We've learned languages and cultures of each of the business strategic regions and improved our insights on future business markets by dispatching our global core talents there. We've so far nurtured 10 local experts on eight countries for the last three terms.

### Language Learning Support System

We've conducted various language trainings by designating 12 business-related strategic languages including English, Chinese and Japanese for our employees to play global roles. We are encouraging our employees to learn English, Chinese, Japanese and others by conducting individual/group-based internal language programs for all employees, while supporting them to attend external language institutes and online language courses and to apply for certified language tests. In addition, we've granted self-development funds to those employees who improved their language scores in order to motivate others to learn languages. We have the best language capability unrivaled in the same industry thanks to such various learning support programs.

### Nurturing Natives at Overseas Branches

We are also conducting various trainings for natives working at our overseas branches. We've operated group mission/vision programs, core value trainings and other campaign activities for natives to cultivate their loyalty to our company. In addition, we are endeavoring to manage and nurture both domestic and native employees by carrying out trainings for newcomers, leadership education, job and safety trainings and other branch-specific local trainings.

### Future Direction in Developing Talents

We continue to review our policy on nurturing talents and improve shortcomings found last year by diagnosing employees' satisfaction, conducting surveys on needs, attending global HR conferences and others every year. We will continue to work hard to enhance capabilities of our employees home and abroad so that they could play key roles in the global market and contribute to sustainable management and development.

## Vitalizing Organizational Culture

Lotte Chemical has put a lot of efforts into activating communications among our employees and vitalizing organizational culture. As a result, we recorded an excellent engagement level in '2018 Lotte Engagement Diagnosis' conducted on all of our employees. The 'engagement' level is an indicator showing that employees are not only emotionally satisfied with the organization but also further attached to the company and their jobs to voluntarily achieve fruitful results. Our company received way higher scores on the general engagement compared with other Lotte Group's affiliates. And the sharp increase in the score from the previous year shows that our employees voluntarily strive to create organizational and individual performances.



Theme Special Lectures

### Improving Communications and Organizational Culture

#### Operating an Individual Consulting Program for Personal Career Development

Our company is running a face-to-face consulting program to help each of the employees to find their strong points and capabilities and to design their careers. Having the consulting program through which each of the employees could have advices on their career development, other difficulties related with their current jobs and personal hardships at any time, they could ask their team heads for such a program whenever necessary. We are continuously managing the CDP of our employees by sharing with HR managers relevant plans made out of the consulting program with team heads, providing related trainings and changing divisions and addressing difficulties arising from career development.

#### Program to Internalize Corporate Culture in line with the Organizational Expansion

In order to continue to grow the organization and to form the company-wide consensus, we've carried out an organizational culture program aligned with our vision. By providing CEO's special lectures, disseminating CEO letters across the company, and sharing internal issues, we've helped our employees to know and understand the organization's vision and the management status. By inviting external renowned lecturers, our executives have conducted theme special lectures on interesting subjects on a monthly basis. And we've published and distributed

'Communication Message', a consensus letter for all employees to share the basic job standards, values and the company's changing directions. By conducting trainings to prevent sexual harassment within the company and to improve the awareness of the disabled, we are putting every effort into creating sound and healthy organizational culture.

**Boundless Communications among Divisions and Generations**

In line with the aging of the organization and the increase in the number of millennial employees, we've implemented new communication programs. By dividing executives from each divisions and employees depending on their ranks and genders into groups, we've conducted a reverse mentoring program. We've also conducted a voluntary communication program through which employees directly designate executives from other divisions and carry out group-based culture experience activities. In addition, we implemented a mentoring program to help our newcomers to adapt to the organization.



Visiting an Art Gallery with CEO and Newcomers

**Respecting Diversity**

Our company has been operating an internal diversity committee on a regular basis since 2016. We are planning to continue to operate the committee to draw and systemize ideas that the company has failed to consider through its policy by communicating and discussing with various employees regardless of their ranks/genders/ages.

**Prohibiting child and forced labor**

Child and forced labors are strictly prohibited at the headquarters and all workplaces. By actually looking into each of the workplaces every year, we are inspecting if there is any of child and forced labors. The relevant result shows that we didn't have any of child and forced labor cases in 2018.

**Banning Discrimination and Protecting Human Rights of Employees**

In accordance with 'Lotte Group's Diversity Charter' established in 2013, Lotte Chemical respects the diversity of genders, culture, physical appearances, generations and others. Individual human rights and characters of our employees are all respected and any discriminative treatments against genders, religions, disabilities, races, academic abilities, hometowns, political leanings and others are strictly prohibited. In order to prevent any infringement of human rights that would unconsciously occur in advance and stop improper behaviors and remarks including sexual harassment, violence and assault, we are conducting trainings on sexual

harassment prevention and other trainings on human rights as well. In addition, we are also banning any unfair treatments and discriminations based on school, hometown, family and other connections.

**Win-Win Labor & Management Relations**

Our company is pursuing cooperative labor & management relations through a number of improvements in order to build desirable organizational culture. We respect the value of our employees through continuous communications with them. Furthermore, we are taking confidence-building measures to enhance their sense of belonging to and pride in the organization by creatively operating the organization.

**3<sup>rd</sup> Anniversary of Creative Labor & Management Culture**

2018 marked the 3<sup>rd</sup> anniversary of creative labor & management culture Lotte Group declared both internally and externally. Lotte Chemical received credit for its endeavors to establish a basis for creative labor & management culture through mutual trust between them when winning the award in Value Creation Master at the 3<sup>rd</sup> creative labor & management culture anniversary ceremony hosted by Lotte Group.



The 3<sup>rd</sup> Anniversary to Celebrate Creative Labor & Management Culture

**Activating Labor Union Communications**

We are operating sub-organizations such as a labor-management committee, a field-oriented operation committee and others for labor-management communications and cooperation. We are building labor-management trust through various channels including communication venues, labor-management workshops, on-site meetings and others. At the committees, a wide range of issues are discussed such as improvements as to the company housing and sharing of the management performance.

**Operating a Program to Address Difficulties of Employees**

Lotte Chemical is operating a program to address difficulties of its employees to find complaints and on-site hardships of its employees and to provide immediate and specific solutions. By having face-to-face consulting channels between team heads and members and meetings of each division in place at all times, we are striving to seek immediate solutions. If there are any difficulties that are hard to be solved, the labor-management committee is helping to handle such difficulties and is also working hard to tackle down overall issues including human rights, anti-corruption, and ban on discrimination, job improvements and others.



## ISSUE 05

# Customer Value

As a customer is the end user of a company's products, the successful business performance is connected with the trust of each customer. As such, Lotte Chemical acknowledges the importance of meeting customer satisfaction, listens to their voices and strives to provide best products to meet their needs. We are running various communication channels to collect opinions of our customers and to create values and are enhancing our technical capability to offer high-quality products. In addition, we continue to improve our products and services by prioritizing the safety and health of our customers and to thoroughly protect their information by arranging our information security system. Lotte Chemical is also implementing the customer-satisfying management for all of its customer companies home and abroad. Based on the improvement of our products, we are running various strategies and processes to further satisfy our customers.

### Lotte Chemical's Response

#### Performance in 2018

Classification	Key issues	2018 Goal	Achievement Index	Deadline	Goal achievements	Achievement
Communications with customers	Surveying customer satisfaction	- Regular monitoring of customer satisfaction	- Continuous implementation, feedback on quality improvement	2018	- Strengthening affinity with customers by continuously conducting surveys on customer satisfaction and providing feedback on quality improvement	●
	Inviting and awarding the most outstanding customers	- Regularly inviting and communicating with customers	- Continuous implementation	2018	- Realizing sustainable management by establishing trust-based relations	●
	Inviting local customers and holding green communication events	- Conducting activities to communicate with local customers	- Continuous implementation	2018	- Providing customized services for customers, collecting and reflecting customers' needs and improvements	●

#### Goals for 2019

Classification	Key issue	2019 Goal	Deadline	Achievement Index
Communications with customers	Surveying customer satisfaction	- Regularly monitoring customer satisfaction	2019	- Continuous implementation, quality improvement feedback
	Inviting and awarding the most outstanding customers	- Continuously inviting and communicating with customers	2019	- Continuous implementation
	Inviting local customers and holding green communication events	- Conducting activities to communicate with local customers	2019	- Continuous implementation

## Enhancing the Value of a Corporate Brand

Lotte Chemical has carried out various activities to promote its corporate image as part of its endeavors to enhance its reputation as a leading chemical company in Korea and its brand value. We've started TV and movie ads and printed ads for the first time since its foundation. Other advertisements were also conducted through Lotte Chemical's website renewal, sporting event sponsorship, airport ads and other various platforms. Lotte Chemical has a plan to continue to actively communicate with its stakeholders through various campaigns and promotional activities. Furthermore, we are going to contribute to the increase of our stakeholders' interests by improving our brand value.

### Lotte Chemical's TV Ads

Lotte Chemical's TV advertisement was created to efficiently show its status and identity as a global player in the real market to the people nationwide. To this end, Lotte Chemical Titan's Malaysian plant which is Lotte Chemical's representing global production base, the US-based ECC plant which is the first Korean chemical facility advanced into the North American market, and Yeosu facility from which Lotte Chemical was founded were selected for the background of the advertisement.

In addition, as the theme of the ads campaign, we've chosen 'Global Chemistory' coined with the word, 'Chemical' that is related with our main business of chemistry and the word, 'Story' of our business activities in the global market. We could vividly deliver our existence as a global chemical company equipped with innovative spirit and reliable technology through three versions of TV ads on our activities in Southeast Asia, US and Korea. Furthermore, we could let people know that Lotte Chemical, on behalf of Lotte Group, is playing a key role in the chemical industry as Korea's backbone industry and is conducting its role as a leading Korean chemical company in satisfying the public expectations.

### Movie Advertisement

Together with TV ads, we've implemented another advertisement utilizing digital and cinema media. The advertisement was produced in an animation form to target young people who mainly use such media and included Lotte Chemical's challenging spirit of 'there is no matter you cannot address' into the concept of 'No Matter'. Lotte Chemical's cute and friendly character is traveling across the world to intriguingly deliver the stories about new projects and eco-friendly new materials Lotte Chemical has successfully implemented and developed such as Sureugil project in Uzbekistan, the construction of the US ECC plant and others.

### Image Advertisement

Together with TV ads, we've conducted another advertisement utilizing newspapers and magazines. The advertisement was produced in a way of efficiently showing Lotte Chemical in line with the TV ads series targeting opinion readers.



Lotte Chemical TV Advertisement Edition 1 – Southeast Asia



Lotte Chemical TV Advertisement Edition 2 – The US



Lotte Chemical Movie Theater Advertisement "No Matter"

\* Lotte Chemical's advertisements are assessed through Youtube by searching "Lotte Chemical's Advertisements" or from the menu of Lotte Chemical's website [PR materials].

## Renewing Lotte Chemical's Website

Lotte Chemical has implemented the overall renewal process of its website to efficiently deliver its brand identity and to establish its promotion channel through which the convenience of its customers is enhanced. We've provided simple and easy explanations and various infographics for ordinary people to easily understand the features and production process of chemical products. Through the menu of [Lotte Chemical in Ordinary Life], we are using images related with the ordinary life to specifically show how products manufactured by Lotte Chemical are applied to our ordinary life. Meanwhile, the new website has adopted a responsive web design that automatically optimizes the screen size to meet different forms of users' displays. As a result, consistent services are assessed from various platforms including general PCs, smartphones and other tablet devices.

Lotte Chemical's new website won the special grand award for the improvement of users' convenience and excellent delivery of information in 2018 WEB AWARD KOREA\*. In the long run, Lotte Chemical is planning to use its website as a digital communication means to get closer to ordinary people by delivering information in consideration of the convenience of various stakeholders.



Lotte Chemical New web site

\* WEB AWARD KOREA is the most authorized domestic website assessment event hosted by Korea Internet Professionals Association to select the most innovative and outstanding website out of all wired and wireless websites newly launched for the year.

## Sports Marketing Sponsorship

Lotte Chemical is implementing sports marketing activities to enhance its brand image. We strive to increase our reputation and marketability and promote our brand by sponsoring Lotte Giants, the most popular sports club in Korea, LPGA Lotte Championship which is well known by golf fans in Korea, KLPGA Lotte Rent-a-Car Women's Open Tournament and other domestic and international professional golf tournaments and KOLON section marathon competition.



Lotte Giants Advertisement (Helmet)

## Airport Advertisement

We've launched a corporate image advertisement at each airport in Yeosu and Ulsan where our facilities are located. By adopting Lotte Chemical's slogan of 'More Than Chemistry' implying 'a global chemical company that creates value more than chemistry' and an ads design that emphasizes Lotte Chemical's CI, we are naturally delivering the company's business philosophy. In the long run, we are planning to continue to carry out promotional activities by utilizing various platforms to increase the awareness of Lotte Chemical and to enhance its positive image.



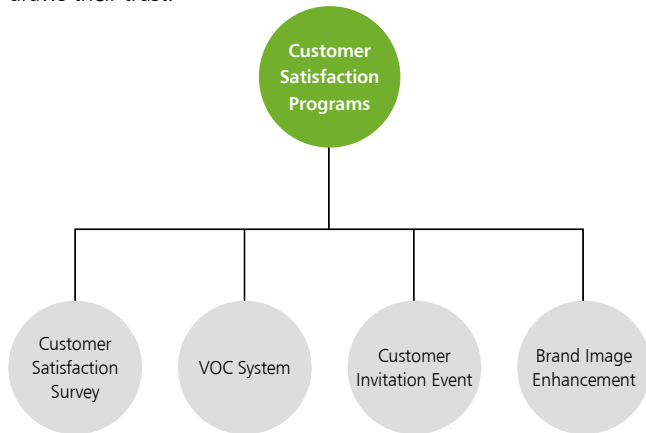
Image Advertisement in Yeosu Airport

## Customer-Satisfying Management

Lotte Chemical prioritizes the realization of its customer value, offers products and services that meet customers' needs and conducts activities to satisfy its customers.

### Activities to Satisfy Customers

Lotte Chemical is pursuing the realization of its customer value in various ways such as the conducting of activities to improve customer satisfaction, the enhancement of customer communication channels, the improvement of its brand image and others. Lotte Chemical will re-establish itself as a company that carefully listens to its customers' voices, creates value and draws their trust.

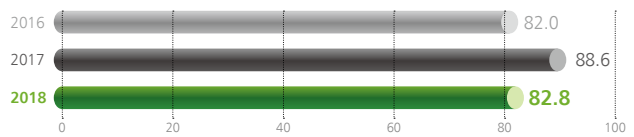


## Increasing Customer Satisfaction

Lotte Chemical conducts annual customer satisfaction survey on its domestic customer companies that purchase its products every year to collect specific opinions on the overall processes of its products including the quality of materials, packaging, delivery, A/S and others. The opinions collected from its customers are sent to relevant divisions to come up with necessary measures in actively improving the product quality in the future. The result score of the customer satisfaction survey stood at 82.8 in 2018.

Customer Satisfaction Survey Result Table

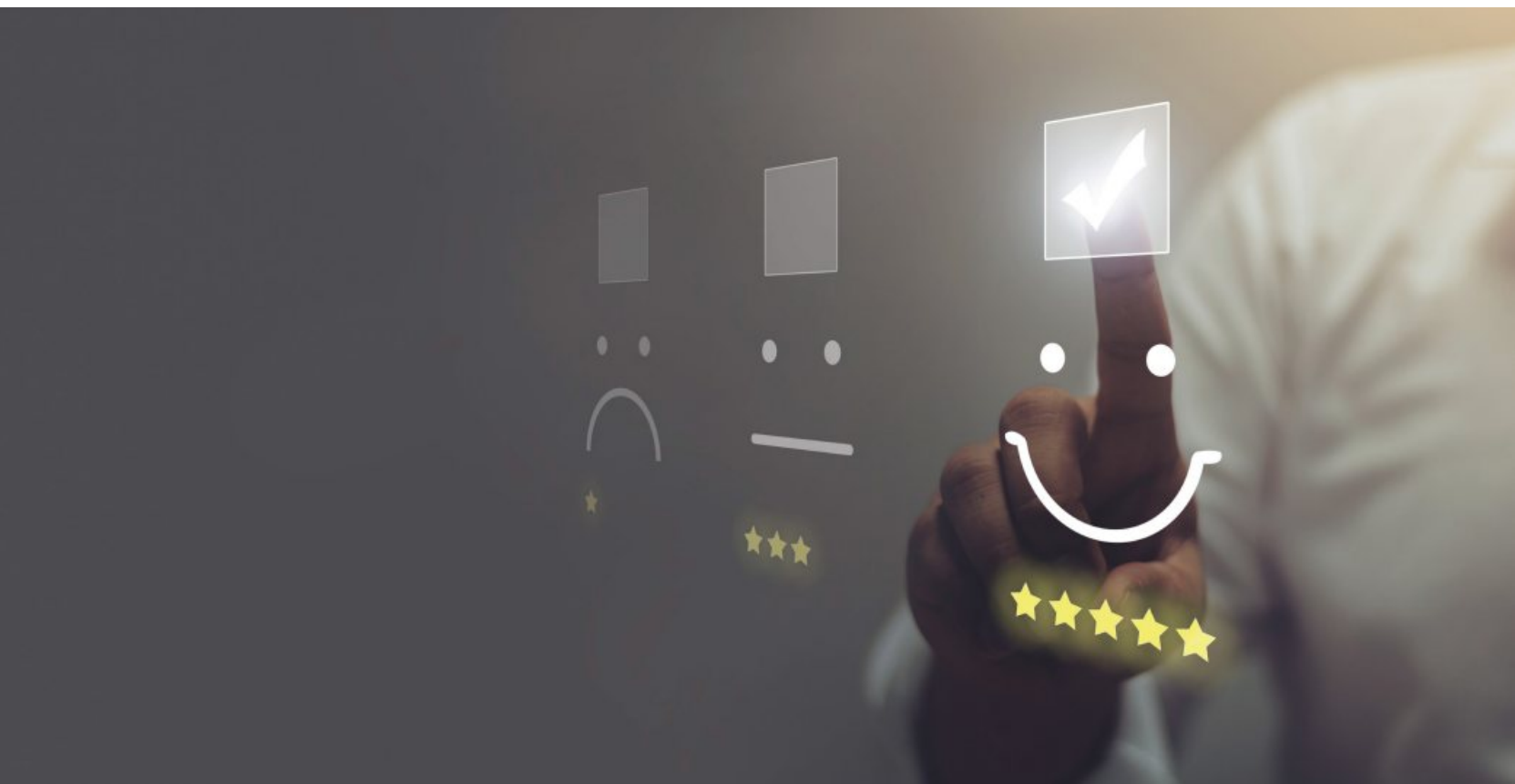
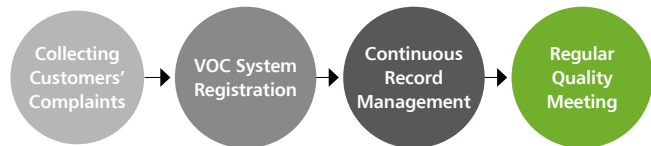
Unit: Score



### Operating VOC System

Lotte Chemical has established a systemic VOC-handling process through which all issues ranging from acknowledging customers' complaints to addressing them are recorded and managed by operating an organization solely responsible for supporting customers. The voiced complaints collected through the process are swiftly addressed by relevant divisions and preventive measures are come up with at a regular quality conference.

#### VOC-Handling Process



## Enhancing Communications with Customers

We are creating opportunities to communicate with our customers by holding an event of inviting customers, conducting activities to provide technical support for customers and others. We shared trends in the chemical industry and information on cutting-edge technology and enhanced the trust of our customers by holding an even of inviting outstanding customers and a seminar of inviting overseas customers in 2018 and by utilizing them as a channel to communicate with our customers.

### CEO-Level Events

- Holding an event of inviting six outstanding customers
- Holding a seminar of inviting 45 overseas customers (Vietnam)
- Strengthening responses to each of the organization levels by holding small-sized regional events

### Working-Level Events

- Forming and training a PE next generation leaders' gathering, supporting the gathering venue (15 companies participated in 2018)
- Carrying out the polymer school
- Conducting activities to provide technical support for customers



2018 Event to Extend Thanks to the Most Outstanding Customer



Polymer School Next Generation Leaders' Gathering



Event of Inviting Customers in Ho Chi Minh

## Providing Maintenance Skills for Customers

By utilizing environment safety technology Lotte Chemical holds, it has been implementing an on-going support program to provide safety inspection and maintenance technology for its customer companies since 2016. We are providing proper solutions for our customers to deal with their issues by transferring our know-how on inspecting and diagnosing facilities, replacing consumables, managing facilities and others. Through such endeavors, we could help our customers to improve their capacities to maintain their facilities on their own, contribute to the improvement of the safety of their facility environment and increase our customers' satisfaction. In the long run, we are planning to continue to conduct activities to help our customers to inspect and maintain their facilities and to exchange our technologies with them.

Classification	Providing maintenance technology support for customer companies
How support was provided	On-site support by inviting an official business team (3~5 people) to visit Yeosu/Daesan/Ulsan facilities
The range of support	Overall inspections and partial maintenance related with machines/relay facilities/environment/safety
Details of support	Customized support for customers in 2018 (Seyoung Chemistry)



Inspecting an repairing electricity and instruments/machinery

## Quality Management

Lotte Chemical is concentrating on its own capability in order to provide safe and high-quality products and services. We will carry out activities in preemptively managing and continuously innovating quality throughout the production processes so as to provide optimized products for our outstanding customers.

## Product Safety

We are striving to secure the safety for our customers before producing and delivering products. By enacting the product liability regulation, we are actively compensating damages arising from deficits of our products. We are also seeking to protect victims and to provide swift and stable post-actions by taking up product liability insurance. In addition, we are stating information on relevant laws and regulations of exporters for safe delivery and use of all products in a way of reducing risks when transporting and handling them.

### CASE

#### Cases of Improving Quality

##### Ultra-Transparent and Impact-Absorbing Plastic

PP (Polypropylene) is one of the materials widely used in our ordinary life and is used to make various daily supplies closely related with human life such as containers for food and other items. Among these, food containers need to be strong enough not to be broken when dropped and to be transparent to see contents inside. It is, however, very hard to simultaneously meet the two features as the shock-enduring nature is in contrast to the transparency. In order to overcome such restrictions, we've put a lot of efforts into R&D for many years, resulting in developing highly-transparent and impact-resilient plastic (TIPP) to improve the solidity and transparency at the same time compared with existing products. We could successfully manufacture such materials into various daily containers and medical items. And we are expanding the production of the materials as high value products.



Highly-Transparent and Impact-Absorbing Plastic (Daily Containers)

##### PET Based on New Catalysts

PET containers widely used in daily life have sharply grown as they made a big hit worldwide as alternatives to replace existing glass bottles and other food containers. Lotte Chemical, the number one producer of PET in Korea, has been developed 'Ti-PET' as a more environmentally eco-friendly titanium catalyst in order to secure high quality PET competitiveness. We started researching and developing PET based on titanium catalyst to enhance the eco-friendly features of the existing products since 2016 and succeeded in a test production in 2018. And, we are currently preparing for mass production. Compared to existing PET products, Ti-PET is in the limelight since it is recyclable and reusable thanks to its features of reducing energy use while producing PET bottles, blocking gases and stabilizing heat.



PET Based on New Catalysts



## Strengthening Information Protection

As the risk of information leakage is increasing, protecting customers' information has become the basis of gaining the trust of customers and the duty companies should perform. In accordance with domestic and international laws and regulations including Act on Information and Communications Network, Act on Personal Information Protection and others, Lotte Chemical has come up with an information protection system to safely protect personal information and assets of our employees and customers. Domestically, we've built a swift and systemic responsive system in accordance with information protection manuals by conducting mock drills on a regular basis. In addition, we continue to carry out activities to efficiently protect information assets by setting policies on information protection and managing intellectual assets on a yearly basis. Internationally, relevant regulations to protect personal information have been tightened. As such, we are trying to minimize any possible compliance risks by taking continuous and active response measures with other companies from each of the nations in order to safely undertake global business tasks.

## Enhancing the Level of Information Protection

Lotte Chemical has enhanced the level of information protection throughout all of its business areas by classifying information protection activities into technical, physical and administrative parts based on ISO27001. As for the technical part, Lotte Group has introduced APT attack-handling security equipment to respond to APT (Advanced Persistent Threat) attack that has recently become a hot issue. As a result, all employees are enjoying safer IT services. As for the physical part, we are deleting unnecessary items out of the existing information pool except for just minimum information needed for performing jobs by inspecting our workplaces without a prior notice and are also improving weak points by inspecting the security of our offices. As our employees' awareness of information protection is more important than technically controlling measures in protecting information, we are actively conducting company-wide trainings and campaigns on information protection every month.

In order to respond to EU GDPR implemented in May, 2018, we checked our headquarters and all branches in EU in terms of information process management and conducted risk influence assessments. And, we are planning to expand and systemize all possible technical and administrative protection measures.



## Four Chemical Subsidiaries of Lotte Group Participated in CHINAPLAS 2018, Asia's Largest Petrochemical and Rubber Exhibition

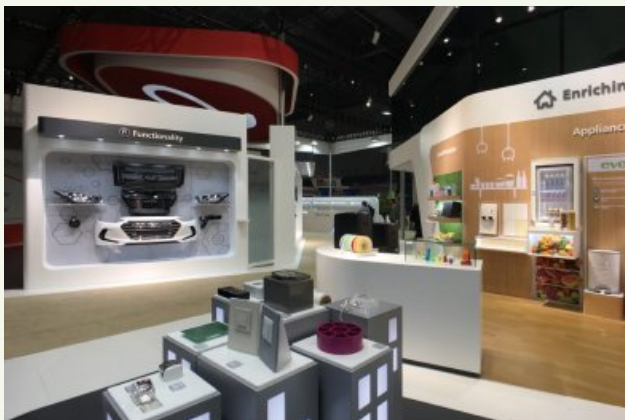
Lotte Chemical participated in CHINAPLAS 2018, Asia's largest petrochemical and rubber exhibition, held at the National Exhibition and Convention Center in Shanghai, China from April 24 to 27, 2018. CHINAPLAS is one of the largest chemical industry exhibitions in Asia, attracting global heavyweight petrochemical companies, including BASF, Dow, DuPont and others, and hundreds of thousands of industry stakeholders and customers each year. In 2018, about 3,900 companies from 40 countries attended.

As for the exhibition structure, 'Value Line', a mark symbolizing Lotte Group's slogan of 'Lifetime Value Creator', is placed on both sides and the ceiling of the booth to show the dynamic and inventive image of Lotte Group that shares every moment of human life. The booth consisted of four zones to focus primarily on specialized business fields and displaying the latest material solutions. It represented a great opportunity for the chemical division of Lotte Group to fully demonstrate its top-notch technological capacity to stand tall as a global chemical company.



1. The 'About Us' Zone represented the synergy and vision of the four chemical companies of Lotte Group. Our global network, business portfolios, and new businesses were covered, centered on the new vision of Lotte Group: "Lifetime Value Creator".

2. In the 'Driving Value' Zone, the synergy of four chemical companies of Lotte Group and technology and information of automobile products were dynamically represented by using a real white automobile and a video screen.



3. In the 'Enriching Value' Zone, we introduced each of our products widely used in daily life such as food containers, household appliances, packaging boxes and others as if visitors may feel that they were in a normal house to express the cozy image of Lotte Group: "Sharing Every Moment of Life".



4. In the 'Powering Value' Zone, a line of highly functional products optimized for various areas needed for sustainable living, such as architecture, medical care and energy, were exhibited.



## ISSUE 06

# Mutual Growth

As the competition gets fiercer in the global market, the scope of managing the supply network a company is required to have is being expanded. As such, companies are working hard to secure the sustainability by enhancing their competitiveness throughout all supply networks including the quality of raw materials, services after selling products and transportation. Lotte Chemical's systemic implementation of its win-win strategies and programs is not only affecting its partners, as the beneficiaries of the strategies and programs, but also its performance directly and indirectly. In addition, the creation of positive relations with our partners will contribute to the enhancement of our image shown to local communities and future talents home and abroad. Through Lotte Chemical's practical and systemic win-win programs, we will help our partners to stand on their feet and create a virtuous-circle environment for companies.

### Lotte Chemical's Response

#### Performance in 2018

Classification	Key issues	2018 Goal	Achievement Index	Deadline	Performance	Achievement
Mutual Growth	Providing support to increase sales	- Support partners athome and abroad to increase their sales	- Actual results of increasing delivery unit price Actual results of exports	2018	- Supporting exports: supported local partners to expand their exports (30 companies, about 11.8 billion KRW)	●
	Providing financial support	- Expand funds for mutual growth	- Expanding funds and actual results of using funds	2018	- As of December, 2018, 106 companies were provided with loans worth about 95.4 billion KRW	●
	Providing technical support	- Provide technical support and Expand joint research	- Selecting tasks and actual results of providing technical support - Assisting customers/partners by sharing tends in petrochemical industry	2018	- Provided technical support for partners (1,627 cases, about 900 million KRW)/ conducting a joint research and development with partners (3 cases)	●
	Providing other supports	- Expand supports related with business management for partners	- Actual results of providing direct and indirect supports related with business management for partners - Continuously providing 'Employment Stepping-Stone Programs' and conducting trainings on jobs and basic knowledge for employees of partners	2018	- Supported partners for innovation campaign by participating in the industry innovation campaign - Supported partners to attend overseas exhibitions · Chinaplas 2018 (Three partners) - Arranged a meeting with purchasing partners (Yeosu/Daesan/Ulsan facilities) · 111 people from 106 companies attended the meeting - CEO's visits to main partners: visited two partners - Holding next generation gatherings: 20 people from customer companies	●

#### Goals for 2019

Classification	Key issue	2019 Goal	Deadline	Achievement Index
Expanding Mutual Growth to the Global Market	Providing support to increase sales	- Providing support to partners at home and abroad to increase their sales	2019	- Actual results of increasing delivery unit price Actual results of exports
	Providing financial support	- Expanding funds for mutual growth	2019	- Expanding funds and actual results of using funds
	Providing technical support	- Providing technical support and expanding joint research	2019	- Selecting tasks and actual results of providing technical support - Supporting customers/partners by sharing tends in petrochemical industry
	Providing other supports	- Expanding supports related with business management for partners	2019	- Actual results of providing direct and indirect supports related with business management for partners

## Fair Trade

We are striving to expand fair trade culture so as to internalize the law-abiding spirit, the core basis for the sustainability of a company, when performing business transactions with our partners. As a large-sized company, we are enhancing our social responsibility by improving the practice of performing business transactions with subcontractors, strengthening programs to mutually cooperate with our partners and laying the groundwork for mutual growth.

### Fair Trade Compliance Program

Lotte Chemical, as a global company, is taking the lead in complying with fair competition rules in order to sustainably grow. Through a fair trade compliance program introduced in 2006, we are suggesting clear behavioral standards for our stakeholders to comply with the Fair Trade Act and are preliminarily preventing law-violating actions. By publishing and distributing handbooks on fair trade compliance, we are helping our employees to use them as the basis of performing their jobs and are updating amendments of relevant laws and regulations when necessary. Through internal standard operation procedures (Internal regulations, checklists, Dos & Don'ts, handbooks, guidelines and others) on fair trade in various circumstances, we are providing clear behavioral standards for our employees to comply with laws. We have also introduced a preliminary monitoring system to build and operate the compliance system.

#### Seven Core Factors of Fair Trade Compliance Program

01. CEO's will and declaration on compliance
02. Assign a compliance manager in charge of operating CP
03. Publish and distributing handbooks on compliance
04. Conduct continuous and systemic trainings on compliance
05. Establish the internal auditing system
06. Penalize employees for violating laws related with fair trade
07. Establish the system of managing documents

We continue to expand the scope of mandatorily using standard contract forms, to disseminate the fair trade compliance culture both internally and externally. We engage compliance lecturers conduct regular and frequent trainings on amended contents of related laws, decisions and precedents of the Fair Trade Commission, internal SOP (Standard Operation Procedures) and others for employees at all of our workplaces, we are preliminarily preventing law-breaking actions.

In particular, the Compliance Team newly established within the compliance management division directly under the CEO's office is backing up the compliance manager assigned in accordance with the fair trade compliance regulation and is taking care of jobs related with fair trade. We are reporting the results of the compliance team to the BOD on a regular basis and are making company-wide endeavors to carry out our business in compliance with relevant laws and regulations. Regarding internal transactions exceeding a certain level, preliminary deliberations are made by the internal transaction committee consisted of external directors. Considering the importance of preliminarily preventing violation of laws, we've made it mandatory to obtain the compliance team's review before implementing all tasks that are potentially

connected with such areas as fair trade and anti-corruption. Prior-diagnosis and post-inspection are conducted on our major businesses.

Furthermore, we are working hard to enhance the awareness of fair trade compliance by expanding the actual operation of fair trade compliance to our subsidiaries.

### Expanding Compliance Support

Beyond merely conducting regular and frequent law-abiding trainings for all of our employees, we are also distributing Compliance Newsletter, containing compliance-related news articles, explanations on related laws and regulations and their amendments, important precedents and decisions and things to keep in mind when performing jobs, to our employees on a regular basis and are providing Compliance Guideline (Checklists, Dos & Don'ts, handbooks, standard contracts and others) on various job-related circumstances for our employees to prevent any law breaches in advance in order to help our employees to easily comprehend and follow laws and behavioral standards when doing their jobs.

### Integrity Commitment of Suppliers

After the OECD Anti-Bribery Convention took effect in 1999, global sanctions against corrupt companies and nations are gradually tightened. Being aware that the transparent and fair management of a company is a key to global competitiveness, Lotte Chemical set integrity standards for its suppliers to follow in April, 2015. Since then, we are regulating basic rules to be followed by all suppliers that hope to perform business transactions with Lotte Chemical. All suppliers could start their business transactions with our company only after suffixing their e-signatures on the agreement through e-procurement ([www.ebiz.lottechem.com](http://www.ebiz.lottechem.com)), the e-commerce system of Lotte Chemical. The agreement is mainly consisted of three provisions: provision on banning collusion to keep and/or fix the bidding price to win a contract; provision on the prohibition of giving monetary and entertainment bribery or unfair profits to our employees; and provision on protecting internal whistle blowers on bribery offerings and actions in collusion.

### Conducting Clean Holiday Campaigns

We've been conducting the 'No Gift' campaign under the name of the CEO for former employees and partners during every New Year's Day, Thanksgiving Day and other holidays since 2012. We sent a letter asking not to give and receive any gifts during national holidays to 1,688 representatives and responsible people of our customers and partners in 2018. And we notified our employees of standards on performing integritous jobs, methods of handling unwillingly-received gifts, principles on the prohibition of receiving gifts and money.

### Operating a Gift-Returning Center

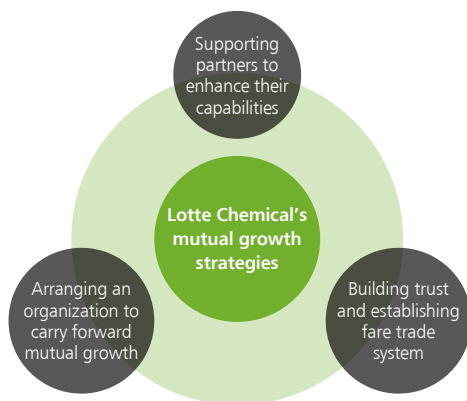
Lotte Chemical is running a gift-returning center to return gifts unfairly received from its stakeholders during national holidays and when promoted. In the event that a food gift has gone bad or the return is not possible due to the unknown return address, we are making donations to local communities to stop bribery and corruption risks in advance.

## Mutual Growth Policies and Programs

Lotte Chemical is conducting practical win-win programs to enhance mutual cooperation and continuous business transactions with its partners. We would like to grow together with our partners in the long run by creating sound corporate environment for our partners and providing programs to strengthen capabilities of our partners including financial support, technical cooperation, consulting and trainings, enhanced communications and others.

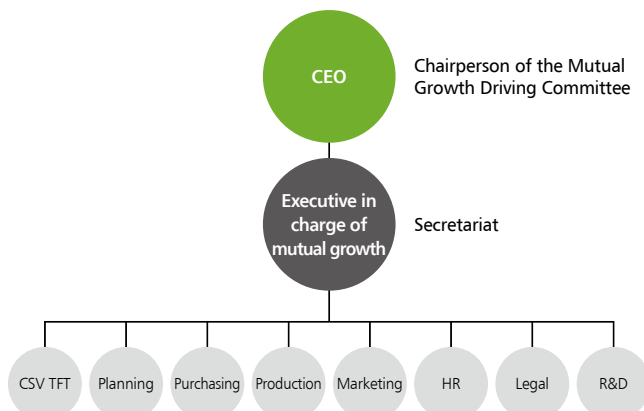
### System to Drive Mutual Growth

Lotte Chemical is reflecting its mutual growth KPI including achievement in driving mutual growth, fair trade compliance, communications with partners and others on the evaluation of its executives to encourage them to strive to make active and mutual cooperation with partners. In addition, we have been running an executive office for mutual growth since 2012 in order to carry forward systemic win-win strategies.



### Operating an Executive Office for Mutual Growth |




Having the CEO as the chairperson, the executive office for Mutual Growth is coming up with and carrying forward systemic strategies for Mutual Growth. To this end, it is closely cooperating with planning, purchasing, production, marketing, training, legal, research and other relevant divisions to monitor related core achievements and to make improvements at all times.



## Summary of Mutual Growth Activities

Lotte Chemical is helping its partners to stand on their feet by providing various supports related with financing, advancing into foreign markets, technology, education and others. In addition, we've established a number of interactive communication channels to enhance reliable relations and to crease mutually-cooperating culture.

### Achievements in Driving mutual growth Programs with Partners

- 
  - 67.5 billion KRW of mutual growth funds (135 billion KRW of raised funds in total)
  - 93 billion KRW of credit guarantee amount (Accumulated)
- 
  - Supporting partners to attend overseas exhibitions
  - Supporting 30 partners to advance into overseas markets in 2018
- 
  - Supporting industry innovation campaign and M/S for partners
  - Arranging meetings with purchasing partners

### Financial Support

By means of a mutual growth funds established in 2010, our company is financially helping its partners and providing loans for them at the annual interest rate of 1.2% lower than the commercial rate. As of the end of 2018, 106 companies received loans worth 135 billion KRW and more partners were provided with financial aids through mutual-growth funds compared with the previous year. In particular, we signed an agreement with the Credit Guarantee Fund to ensure mutual growth between large-sized and small-sized companies in 2017. We are active in supporting liquidity of small-sized companies and in practicing mutual cooperation between large-sized and small-sized companies by guaranteeing credits worth around 108 billion KRW contributed for five times since 2008.



### Carrying Forward Industry Innovation Campaigns

An industry innovation campaign is a Mutual Growth program through which large-sized companies provide supports related with overall management and production technology innovation for small-sized companies to innovate their productivity. Our company has been providing customized consulting services for its partners by actively participating in the industry innovation campaign conducted by the Korean Chamber of Commerce & Industry since 2013. In 2018, we helped SMG Co., Ltd. to manage its long-term inventory and to improve its process-balancing system, reducing the cost of around 100 million KRW and expecting to increase the sales by 30%.



Industry Innovation Campaign (SMG Co., Ltd.)

### CASE

#### Industry Innovation Campaign by Lotte Chemical + SMG

Lotte Chemical was selected as ‘an excellent case of the industry innovation campaign’ in 2018 and received credit for its endeavor for Mutual Growth with SMG. We supported SMG for establishing a system to enhance its productivity and introducing a heating system and a balancing facility and suggested alternatives to the company after precisely reviewing its difficult processes. Thanks to our support, SMG could reduce a three-year long inventory and lay the groundwork for its business management all of its employees could empathize with by improving its job performance evaluation system.

Tasks to Conduct	Details
Facility Part	<ul style="list-style-type: none"> <li>Reduce long-term inventory</li> <li>Enhance deviation of product weight by improving the balancing process</li> </ul>
Management Part	<ul style="list-style-type: none"> <li>Improve the job evaluation system</li> <li>Strengthen members' will to address issues and foster an innovative mindset</li> <li>Improve customer satisfaction by reducing the delivery time (Two days on average) thanks to improved process</li> </ul>
Financial Effect	<ul style="list-style-type: none"> <li>Reduce outsourcing costs by improving balancing process</li> <li>Reduce costs for keeping three-year long inventory</li> </ul>

### Managing the Safety Environment

We are supporting activities in improving safety environment for our partners to secure the job-related safety for their employees and to assume responsibilities for their health. By holding a monthly safety council for our partners, we are stressing the importance of managing the safety environment at all workplaces and are supporting our partners to prevent any possible accidents in advance. In 2018, we conducted safety inspection of and supported maintenance technology for 1,627 cases worth 900 million KRW.

### Support for Advancing into Overseas Markets

Lotte Chemical is actively helping its partners with outstanding capabilities to advance into foreign markets. In order for them to secure product competitiveness in overseas markets, we are providing them with chances to test their technology in overseas workplaces and are helping them to explore overseas markets by utilizing our network. In addition, we are practically supporting our outstanding partners by providing opportunities to participate in overseas tenders, guaranteeing long-term business transactions, handling export-related jobs and others in order for them to stably settle down in overseas markets.

### Arranging Meetings and CEO's Visit to Outstanding Partners

We are arranging meetings with our purchasing partners every year to address issues and to strengthen cooperative relations through communications with them. In 2018, we invited 111 people from our partners to a meeting and had a time to share their difficulties and to find ways of addressing issues. Furthermore, our CEO made visits to outstanding partners to extend our thanks to them and to listen to their needs, showing our endeavors to further enhance win-win partnership with them.



CEO's Visit to Outstanding Partners

The background features a hand interacting with a tablet displaying various data visualizations. There are several circular callouts with percentages: 3%, 7%, 19%, 24%, 20%, 8%, and 25%. A network diagram with nodes and lines is visible in the bottom left. Two large green curved brackets frame the word 'APPENDIX'.

# APPENDIX

102 GRI Standards Index

104 Consolidated Financial Statement

106 Sustainability Data

108 Lotte Chemical's Declaration of Human Rights

109 Third-party Verification

# GRI STANDARDS INDEX

Topic	Disclosure		Pages/ References
	No.	Title	
GRI 102 : Organizational Profile 2018	102-1	Name of the organization	6
	102-2	Activities, brands, products, and services	8~9, 12~25
	102-3	Location of headquarters	6
	102-4	Location of operations	9~10
	102-5	Ownership and legal form	10
	102-6	Markets served	8~11
	102-7	Scale of the organization	11
	102-8	Information on employees and other workers	11
	102-9	Supply chain	68
	102-10	Significant changes to the organization and its supply chain	98~99
	102-11	Precautionary Principle or approach	48~49
	102-12	External initiatives	78~79
	GRI 102 : Strategy 2018	101-13	Membership of associations
102-14		Statement from senior decision-maker	5
GRI 102 : Ethics and integrity 2018	102-15	Key impacts, risks, and opportunities	48~49
	102-16	Values, principles, standards, and norms of behavior	46
GRI 102 : Governance 2018	102-17	Mechanisms for advice and concerns about ethics	46~47, 88
	102-18	Governance structure	42~43
GRI 102 : Stakeholder Engagement 2018	102-40	List of stakeholder groups	50~51
	102-41	Collective bargaining agreements	71, 99
	102-42	Identifying and selecting stakeholders	50~51
	102-43	Approach to stakeholder engagement	50~51
	102-44	Key topics and concerns raised	50~52
GRI 102 : Reporting practice 2018	102-45	Entities included in the consolidated financial statements	Annual report
	102-46	Defining report content and topic Boundaries	52~53
	102-47	List of material topics	52~53
	102-48	Restatements of information	N/A
	102-49	Changes in reporting	About This Report
	102-50	Reporting period	
	102-51	Date of most recent report	
	102-52	Reporting cycle	
	102-53	Contact point for questions regarding the report	
	102-54	Claims of reporting in accordance with the GRI Standards	102~103
102-55	GRI content index		
102-56	External assurance		
GRI 103: Management Approach 2018	103-1	Explanation of the material topic and its Boundary	58,63,69,81,89,97
	103-2	The management approach and its components	58,63,69,81,89,97
	103-3	Evaluation of the management approach	58,63,69,81,89,97
GRI 201 : Economic Performance 2018	201-1	Direct economic value generated and distributed	50,106
	201-3	Defined benefit plan obligations and other retirement plans	106
GRI 203 : Indirect Economic Impacts 2018	203-1	Infrastructure investments and services supported	34
	203-2	Significant indirect economic impacts	34
GRI 205: Anti-corruption 2018	205-1	Operations assessed for risks related to corruption	44~45, 98
	205-2	Communication and training about anti-corruption policies and procedures	44~45, 98
	205-3	Confirmed incidents of corruption and actions taken	N/A
GRI 206 : Anti-competitive Behavior 2018	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	N/A



Topic	Disclosure		Pages/ References
	No.	Title	
GRI 301 : Materials 2018	301-3	Reclaimed products and their packaging materials	36
	302-1	Energy consumption within the organization	58
	302-2	Energy consumption outside of the organization	58
GRI 302 : Energy 2018	302-3	Energy intensity	58
	302-4	Reduction of energy consumption	58
	302-5	Reductions in energy requirements of products and services	58
GRI 303 : Water 2018	303-1	Interactions with water as a shared resource	58~59
	303-2	Management of water discharge-related impacts	58~59
	303-3	Water withdrawal	58~59
GRI 305 : Emissions 2018	305-1	Direct (Scope 1) GHG emissions	58~59
	305-2	Energy indirect (Scope 2) GHG emissions	58~59
	305-4	GHG emissions intensity	58~59
	305-5	Reduction of GHG emissions	58~59
	305-6	Emissions of ozone-depleting substances (ODS)	58~59
	305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	58~59
GRI 306 : Effluents and Waste 2018	306-1	Water discharge by quality and destination	60~62
	306-2	Waste by type and disposal method	62
	306-3	Significant spills	60~62
GRI 401 : Employment 2018	401-1	New employee hires and employee turnover	106
	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	N/A
	401-3	Parental leave	106
GRI 403 : Occupational Health and Safety 2018	403-1	Occupational health and safety management system	107
	403-2	Hazard identification, risk assessment, and incident investigation	107
	403-3	Occupational health services	107
	403-4	Worker participation, consultation, and communication on occupational health and safety	107
GRI 404 : Training and Education 2018	404-1	Average hours of training per year per employee	98~99, 107
	404-2	Programs for upgrading employee skills and transition assistance programs	80~88
GRI 408 : Child Labor 2018	408-1	Operations and suppliers at significant risk for incidents of child labor	88
GRI 409 : Forced or Compulsory Labor 2018	409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	88
GRI 412 : Human Rights Assessment 2018	412-2	Employee training on human rights policies or procedures	47, 107
GRI 416 : Customer Health and Safety 2018	416-1	Assessment of the health and safety impacts of product and service categories	95
	416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	N/A
GRI 417 : Marketing and Labeling 2018	417-1	Requirements for product and service information and labeling	12~25

# Consolidated Financial Statement

## Consolidated Financial Statement

Account Title	Unit	2016	2017	2018
<b>Assets</b>				
I. Current assets	KRW	5,851,675,895,722	8,225,469,338,408	8,143,917,538,954
1. Cash and cash equivalents	KRW	2,202,944,465,224	1,685,211,989,030	1,329,974,466,103
2. Short-term financial instruments	KRW	425,756,558,256	3,086,656,512,787	3,306,356,089,721
3. Available-for-sale financial assets	KRW	20,588,275,000	100,046,195,000	-
4. Financial assets at fair value through profit or loss	KRW	6,685,073,198	2,434,730,122	61,228,839,825
5. Financial assets at fair value through other comprehensive income	KRW	-	-	4,544,530,000
6. Accounts receivables and other receivables	KRW	1,551,920,459,156	1,667,550,760,928	1,536,464,504,902
7. Inventories	KRW	1,477,157,254,043	1,535,989,483,699	1,777,344,107,136
8. Financial lease receivables	KRW	138,598,084	138,598,084	138,598,084
9. Current income tax assets	KRW	16,403,225,181	15,381,900,865	23,703,051,222
10. Other current financial assets	KRW	13,242,873,191	19,507,537,143	31,091,183,088
11. Other current assets	KRW	136,839,114,389	112,551,630,750	73,072,168,873
II. Non-current Assets	KRW	10,015,158,274,179	11,325,501,762,242	12,655,231,294,150
1. Long-term financial instruments	KRW	67,515,500,000	67,512,500,000	67,512,500,000
2. Available-for-sale financial assets	KRW	304,235,250,235	255,241,155,482	-
3. Financial assets at fair value through profit or loss	KRW	-	-	10,477,026,362
4. Financial assets at fair value through other comprehensive income	KRW	-	-	105,494,703,734
5. Financial lease receivables	KRW	3,014,310,692	2,888,357,916	2,761,874,442
6. Investments in Associates	KRW	1,288,114,096,686	1,438,963,136,291	1,610,446,273,728
7. Investments in a joint venture	KRW	848,082,771,318	945,616,486,554	990,502,713,594
8. Tangible assets	KRW	5,546,663,157,027	6,716,184,181,432	8,036,093,695,375
9. Investments in real estate	KRW	99,471,563,871	114,606,808,510	112,015,364,493
10. Goodwill	KRW	723,796,856,918	723,796,856,918	723,796,856,918
11. Other intangible assets	KRW	1,068,600,007,244	986,777,410,423	929,231,047,968
12. Other financial assets	KRW	20,898,712,615	20,253,421,140	21,961,882,770
13. Other non-current assets	KRW	5,552,909,940	15,230,234,510	12,351,445,832
14. Deferred income tax assets	KRW	39,213,137,633	38,431,213,066	32,575,908,934
Total Assets	KRW	15,866,834,169,901	19,550,971,100,650	20,799,138,833,104
<b>Liabilities</b>				
I. Current liabilities	KRW	3,448,810,302,356	3,790,891,299,787	3,961,420,261,244
1. Purchase payables and other payables	KRW	1,126,697,903,644	1,420,006,265,123	1,102,408,993,149
2. Financial liabilities at fair value through profit or loss	KRW	-	133,610,266	223,020,520
3. Loans payable and corporate bonds	KRW	1,745,873,962,485	1,498,617,635,176	2,185,774,111,188
4. Current income tax liabilities	KRW	365,609,755,774	516,405,147,316	369,321,658,376
5. Other financial liabilities	KRW	99,934,087,464	181,182,416,161	126,034,288,844
6. Other current liabilities	KRW	91,154,064,043	161,173,576,770	168,474,654,674
7. Provisions	KRW	19,540,528,946	13,372,648,975	9,183,534,493
II. Non-current liabilities	KRW	3,017,206,697,113	3,505,312,739,432	3,293,391,331,347
1. Financial liabilities at fair value through profit or loss	KRW	-	25,238,394,790	43,310,577,157
2. Loans payable and corporate bonds	KRW	2,439,574,476,416	2,703,800,471,060	2,600,624,849,061
3. Net defined benefit liabilities	KRW	23,195,912,697	26,509,772,488	34,038,128,999
4. Deferred income tax liabilities	KRW	524,809,517,144	587,754,527,688	512,169,390,749
5. Other financial liabilities	KRW	14,558,572,798	43,060,201,548	13,765,745,922
6. Other non-current liabilities	KRW	7,735,920,277	10,557,221,128	14,162,651,831
7. Provisions	KRW	7,332,297,781	108,392,150,730	75,319,987,628
Total Liabilities	KRW	6,466,016,999,469	7,296,204,039,219	7,254,811,592,591
<b>Equity</b>				
I. Equity attributable to the owner of the parent	KRW	9,363,112,350,552	11,489,628,164,151	12,734,717,751,049
1. Capital share	KRW	171,377,095,000	171,377,095,000	171,377,095,000
2. Other paid-in capital	KRW	478,576,150,133	880,743,872,602	880,861,285,570
3. Retained earnings	KRW	8,486,992,508,654	10,582,113,942,798	11,784,662,256,446
4. Other components of equity	KRW	226,166,596,765	-144,606,746,249	-102,182,885,967
II. Non-controlling interests	KRW	37,704,819,880	765,138,897,280	809,609,489,464
Total Equity	KRW	9,400,817,170,432	12,254,767,061,431	13,544,327,240,513
Total Equity and Liabilities	KRW	15,866,834,169,901	19,550,971,100,650	20,799,138,833,104

## Consolidated Statement of Comprehensive Income

Account Title	Unit	2016	2017	2018
I.Sales	KRW	13,223,540,873,785	15,874,510,689,910	16,545,013,876,662
II.Cost of sales	KRW	9,956,835,878,305	12,081,876,222,814	13,792,192,144,448
III.Gross profit	KRW	3,266,704,995,480	3,792,634,467,096	2,752,821,732,214
Selling and administrative expenses	KRW	722,451,059,395	862,913,509,269	785,422,322,768
IV.Operating income	KRW	2,544,253,936,085	2,929,720,957,827	1,967,399,409,446
Financial income	KRW	156,147,422,909	253,053,655,691	184,904,701,505
Financial cost	KRW	241,023,186,030	273,186,322,842	194,589,278,042
Valuation losses and gains using equity method	KRW	71,447,129,465	284,443,693,668	202,316,945,067
Other non-operating income	KRW	232,893,826,207	213,268,096,980	317,101,520,810
Other non-operating expense	KRW	276,346,028,679	322,614,040,202	224,481,202,464
V.Net income before income tax	KRW	2,487,373,099,957	3,084,686,041,122	2,252,652,096,322
Income tax expense	KRW	650,188,180,879	800,109,102,761	610,717,958,486
VI.Profit for the year	KRW	1,837,184,919,078	2,284,576,938,361	1,641,934,137,836
VII.Other comprehensive income (loss)	KRW	85,909,192,018	-428,342,968,836	107,719,724,682
1.Items that will not be reclassified subsequent to income (loss)	KRW	-3,949,772,132	-57,569,625,822	-12,142,722,394
Re-measurements of defined benefit plans	KRW	-5,608,108,254	-19,208,894,765	-20,424,474,469
Other comprehensive income (loss)-valuation loss (gain) of financial asset at fair value	KRW	-	-	758,177,215
Retained earnings using the equity method	KRW	1,658,336,122	642,665,098	-20,863,647,286
Overseas business translation gain / loss	KRW	1,200,128,716	-43,476,747,966	27,939,229,487
Changes in capital variation using the equity method	KRW	-2,207,049,932	-29,013,393,026	-14,712,032,490
Tax effects	KRW	-	4,473,351,811	15,160,025,149
2.Items that will be reclassified subsequent to income (loss)	KRW	89,858,964,150	-370,773,343,014	119,862,447,076
Valuation loss (gain) of available-for-sale financial assets	KRW	-6,609,388,327	18,235,014,796	-
Valuation loss (gain) of derivatives	KRW	591,062,562	1,252,661,761	-129,744,253
Overseas business transaction exchange difference	KRW	98,084,339,847	-355,338,412,119	105,640,140,601
Changes in capital variation of equity method	KRW	-2,207,049,932	-29,013,393,026	14,316,371,058
Tax effects	KRW	-	-5,909,214,426	35,679,670
VIII.Total comprehensive income	KRW	1,923,094,111,096	1,856,233,969,525	1,749,653,862,518
Net income (loss) attributable to:				
Current income (loss) attributable to the owner of the parent	KRW	1,835,812,632,200	2,243,875,142,823	1,579,194,571,925
Current income (loss) attributable to non-controlling interest	KRW	1,372,286,878	40,701,795,538	62,739,565,911
Comprehensive income (loss) attributable to:				
Comprehensive income (loss) attributable to the owner of the parent	KRW	1,920,537,275,695	1,859,116,215,130	1,658,916,975,700
Comprehensive income (loss) attributable to non-controlling interest	KRW	2,556,835,401	-2,882,245,605	90,736,886,818
IX.Earnings per share				
Basic earnings (loss) per share	KRW	54,488	65,625	46,074
Diluted earnings (loss) per share	KRW	54,488	65,625	46,074

## Status of Main Business Sales

Sector	Items	Unit	Sales
Olefin	Ethylene, propylene, benzene, toluene, para xylene, ortho xylene, etc	Million KRW	2,513,089
Monomer	Styrene monomer, butadiene, ethylene oxide adduct, ethylene oxide glycol, purified isophthalic acid, purified terephthalic acid, and methyl methacrylate monomer, etc.	Million KRW	4,453,819
Polymer	High density polyethylene, polypropylene, low density polyethylene, polyethylene terephthalate, linear low density polyethylene, polycarbonate, LFT, and EPP, etc	Million KRW	10,477,921
Others	Byproducts and others	Million KRW	153,762
Elimination of internal transactions		Million KRW	-1,053,577
Total Sales		Million KRW	16,545,014

# Sustainability Data

## Economy

### Sales of domestic and overseas workplaces

Classification	Unit	2016	2017	2018
Sales of domestic workplaces	Trillion KRW	10.2	12.9	<b>11.8</b>
Sales of overseas workplaces	Trillion KRW	3	2.9	<b>4.8</b>
Total	Trillion KRW	13.2	15.9	<b>16.5</b>

### Financial Assistance Received from the Government

Classification	Unit	2016	2017	2018
government grant	Million KRW	3,315	1,880	<b>1,230</b>

### Economic Value Allocation as of the End of 2018

Classification	Unit	2018	Remarks
Government	100 million KRW	<b>5,014</b>	Corporate tax
Employees	100 million KRW	<b>3,307</b>	Salary (labor cost), welfare benefits
Partners	100 million KRW	<b>59,961</b>	Raw materials costs, service costs, other expenses
Local communities	100 million KRW	<b>79</b>	Donations
Shareholder and creditors	100 million KRW	<b>4,206</b>	Financial expenses
Surplus economical value	100 million KRW	<b>28,770</b>	-

## Society

### Number of Domestic Employees

Classification	Unit	2016	2017	2018
Type of employment	Regular	Person	2,774	2,958
	Irregular	Person	83	203
Gender	Male	Person	2,571	2,762
	Female	Person	346	399
Age	Below 30	Person	465	543
	30~50	Person	1,746	1,853
	Above 50	Person	706	765
Total number of domestic employees	Person	2,917	3,161	<b>3,158</b>

### Number of Employees Overseas in 2018

Classification	Unit	2018
Type of employment	Regular	Person
	Irregular	Person
Gender	Male	Person
	Female	Person
Age	Below 30	Person
	30~50	Person
	Above 50	Person
Total number of employees overseas	Person	<b>137</b>

1) Based on those who work in Korea

### Number of Employees by Business Site

Classification	Unit	2016	2017	2018
Number of domestic workplaces	Facility	11	11	<b>11</b>
Number of domestic employees	Person	2,917	3,161	<b>3,158</b>
Number of overseas workplaces	Facility	18	18	<b>20</b>
Number of employees overseas	Person	2,463	2,376	<b>4,150</b>

\*including local workforce

### Turnover Rate

Classification	Unit	2016	2017	2018
Turnover rate	%	2.1	2.0	<b>2.0</b>

### Employees Subject to Periodical Performance Evaluation and Career Development Review

Classification	Unit	2016	2017	2018
Percentage of employees subject to review	%	41	39.6	<b>38.4</b>
Number of employees subject to review	Person	1,192	1,251	<b>1,212</b>

### Retirement Pension Subscription Rate

Classification	Unit	2016	2017	2018
Subscription rate	%	95.8	84	<b>78</b>
Number of employees	Person	2,794	2,655	<b>2,429</b>

\*As of the end of December of the corresponding year

### Childcare Leave Status

Classification	Unit	2016	2017	2018
Number of employees on parental leave	Person	40	92	<b>110</b>
Number of employees who returned to work after parental leave	Person	20	57	<b>95</b>
Number of employees who have worked for 12 months or more after their return	Person	29	50	<b>75</b>

### Satisfaction Level of Employees

Classification	Unit	2016	2017	2018
Satisfaction level of employees	Point	79	75	<b>85</b>

### Number of Employees Subject to Collective Bargaining

Classification	Unit	2016	2017	2018
Number of employees subject to collective bargaining	Person	1,377	1,421	<b>1,422</b>
Total number of employees	Person	2,917	3,161	<b>3,258</b>
Percentage of employees subject to collective bargaining	%	47	45	<b>44</b>

### Employees Represented by the Labor-Management Joint Safety and Health Committee

Classification	Unit	2016	2017	2018
Number of employees	Person	1,918	2,070	<b>2,093</b>

\*Yeosu-Daesan-Ulsan

### Disaster Rate

Classification	Unit	2016	2017	2018
Total disaster rate	%	0.03	0.21	<b>0</b>
Total number of disasters	Case	1	2	<b>0</b>

### Training Hours per Employee

Classification	Unit	2016	2017	2018
Total training hours	Hour	377,181	388,382	<b>398,292</b>
Total number of employees	Person	2,732	2,770	<b>3,067</b>
Training hours per person	Hour	138	140	<b>130</b>

### 2018 Training on Prevention of Sexual Harassment

Classification	Unit	2018
Attendance	Person	<b>2,936</b>
Training cost	1,000 KRW	<b>5,450</b>

\* Domestic Criteria

### Other Trainings on Human Rights

Classification	Unit	2016	2017	2018
Number of training sessions	Times	5	5	<b>7</b>
Trainee candidates	Person	184	190	<b>194</b>
Those who completed trainings	Person	182	190	<b>191</b>

\* Other Trainings on Human Rights: Grade education containing the respect for diversity and WoW forum to ensure human rights of female workers and others

### Ethical Management Training Status

Classification	Unit	2016	2017	2018
Number of training courses	Course	6	6	<b>5</b>
Training hours per course	Hour	6	8	<b>4</b>
Number of those who completed the courses	Person	89	805	<b>394</b>

### Online Ombudsman Status

Classification	Unit	2016	2017	2018
Tender and contract	Case	3	1	<b>3</b>
Sales and bonds	Case	1	-	-
Grievances by partners	Case	8	1	<b>6</b>
Job-related complaints	Case	3	4	<b>5</b>
Total	Case	15	6	<b>14</b>
Preliminary-measures and post-measures to prevent recurrence	Case	15	6	<b>14</b>

### Achievements in Supporting Mutual Growth with Partners

Classification	Unit	2016	2017	2018
Mutual growth fund	100 million KRW	1,350	1,350	<b>1,350</b>
Number of companies joined for mutual growth	Company	350	350	<b>350</b>
Programs to support partners	Program(case)	20	16	<b>12</b>
Financial supports	Program(case)	5	4	<b>3</b>
Technical supports	Program(case)	9	6	<b>6</b>
Training supports	Program(case)	2	2	<b>0</b>
Management supports	Program(case)	4	4	<b>3</b>
Number of training courses held for partners	Times	2	2	<b>0</b>
Number of trainees from partners who completed the training courses	Person	53	157	<b>0</b>
Number of companies supported for overseas market forays	Company	20	61	<b>30</b>

### Related Organization Dues

Classification	Unit	2016	2017	2018
Membership fees of related groups	Million KRW	183.5	197	<b>180.8</b>

\* Expenses paid to the Korea Petrochemical Industry Association

### Social Contribution Investment

Classification	Unit	2016	2017	2018	Remarks
Investments in social welfare	Million KRW	1,294	2,087	<b>1,672</b>	Improvement of residential environment, investments in social welfare facilities and others
Investments in education and scholarships	Million KRW	57	64	<b>215</b>	Investments in childcare centers and others
Investments in environment and culture	Million KRW	36	18	<b>30</b>	Cleaning the nature and others
Others	Million KRW	8,618	14,163	<b>6,034</b>	

## Lotte Chemical's Declaration of Human Rights

Lotte Chemical, as a global chemical company that opens healthy and prosperous future for humans, is taking social responsibility and is seeking for sustainable growth based on the trust of all of its stakeholders.

Lotte Chemical advocates international principles suggested by 'UN Universal Declaration of Human Right' and 'UN Guiding Principles on Business and Human Right; Ruggie Framework' and declares to take relevant responsibilities. Lotte Chemical will do its best to prevent the infringement of human rights that could take place in the process of managing businesses and publically announces to respect and protect human rights and free will of all stakeholders including customers, members, local communities, partners and others as stated in detail below.

### Human Rights for Employees

- Preventing discriminations against genders, races, religions, disabilities, origins and others
- Fundamentally preventing wrongful labor practices such as forced and child labors
- Complying with all labor principles including safety, health, working hours and others recommended by ILO and ratified by the nation

### Human Rights for Customers

- Requesting, recording and storing minimum personal information only to comply with laws
- Establishing sufficient security system including encryption in order to prevent information leakage
- Responsibly using personal information limited to providing services and conducting marketing activities

### Human Rights for Local Communities

- Acknowledging the responsibility for developing local communities and actively participating in social contribution activities
- Measuring and managing the effect of activities that could cause local communities' environmental and social issues

### Human Rights for Partners

- Establishing fair and equal trade relations with partners for mutual growth
- Banning discriminations against internal member of partners and preventing forced and child labors

Lotte Chemical, as a responsible corporate citizen in the global business environment, will do its best to ensure such human rights policies are followed by its subsidiaries and partners and take the initiative in spreading the human-right-based business management.

Thank you



June, 2019

CEO and President of Lotte Chemical, **Lim Byung-yun**

# Third-Party Assurance Statement

## To the Readers of LOTTE CHEMICAL Sustainability Report 2018:

### Foreword

Korea Management Registrar Inc. (hereinafter "KMR") has been requested by of LOTTE CHEMICAL Sustainability Report 2018 to verify the contents of its 2018 Sustainability Report (hereinafter "the Report"). LOTTE CHEMICAL is responsible for the collection and presentation of information included in the Report. KMR's responsibility is to carry out assurance engagement on specific data and information in the assurance scope stipulated below.

### Scope and standard of Verification

LOTTE CHEMICAL describes its efforts and achievements of the corporate social responsibility activities in the Report. KMR performed a type2, moderate level of assurance using AA1000AS (2008) and SRV1000 from KMR Global Sustainability Committee as assurance standards. KMR's assurance team(hereinafter "the team") evaluated the adherence to Principles of Inclusivity, Materiality and Responsiveness, and the reliability of the selected GRI Standards indices as below, where professional judgment of the team was exercised as materiality criteria.

The team checked whether the Report has been prepared in accordance with the 'Core Option' of GRI Standards which covers the followings.

- GRI Reporting Principles
- Universal Standards
- Topic Specific Standards
  - Management approach of Topic Specific Standards
  - Economic Performance: 201-1, 201-3
  - Indirect Economic Impacts: 203-1, 203-2
  - Anti-Corruption: 205-1, 205-2, 205-3
  - Anti-Competitive Behavior: 206-1
  - Materials: 301-3
  - Energy: 302-1, 302-2, 302-3, 302-4, 302-5
  - Water: 303-1, 303-2, 303-3
  - Emissions: 305-1, 305-2, 305-4, 305-5, 305-6, 305-7
  - Effluents and Waste: 306-1, 306-2, 306-3
  - Employment: 401-1, 401-2, 401-3
  - Occupational Health and Safety: 403-1, 403-2, 403-3, 403-4
  - Training and Education: 404-1, 404-2
  - Child Labor: 408-1
  - Forced or Compulsory Labor: 409-1
  - Human Rights Assessment: 412-2
  - Customer Health and Safety: 416-1, 416-2
  - Marketing and Labeling: 417-1

This Report excludes a data and information of joint corporate, contractor etc. which is outside of the organization, i.e. LOTTE CHEMICAL, among report boundaries.

### Our approach

In order to verify the contents of the Report within an agreed scope of assurance in accordance with the assurance standard, the team has carried out an assurance engagement as follows:

- Reviewed overall report
- Reviewed materiality test process and methodology
- Reviewed sustainability management strategies and targets
- Reviewed stakeholder engagement activities
- Interviewed people in charge of preparing the Report

**Our conclusion**

Based on the results we have obtained from material reviews and interviews, we had several discussions with LOTTE CHEMICAL on the revision of the Report. We reviewed the Report’s final version in order to confirm that our recommendations for improvement and our revisions have been reflected. When reviewing the results of the assurance, the assurance team could not find any inappropriate contents in the Report to the compliance with the principles stipulated below. Nothing has come to our attention that causes us to believe that the data included in the verification scope are not presented appropriately.

- Inclusivity  
 Inclusivity is the participation of stakeholders in developing and achieving an accountable and strategic response to sustainability  
 - LOTTE CHEMICAL is developing and maintaining stakeholder communication channels in various forms and levels in order to make a commitment to be responsible for the stakeholders. The assurance team could not find any critical stakeholder LOTTE CHEMICAL left out during this procedure.
- Materiality  
 Materiality is determining the relevance and significance of an issue to an organization and its stakeholders. A material issue is an issue that will influence the decisions, actions, and performance of an organization or its stakeholders.  
 - LOTTE CHEMICAL is determining the materiality of issues found out through stakeholder communication channels through its own materiality evaluation process, and the assurance team could not find any critical issues left out in this process.
- Responsiveness  
 Responsiveness is an organization’s response to stakeholder issues that affect its sustainability performance and is realized through decisions, actions, and performance, as well as communication with stakeholders.  
 - The assurance team could not find any evidence that LOTTE CHEMICAL’s counter measures to critical stakeholder issues were inappropriately recorded in the Report.

We could not find any evidence the Report was not prepared in accordance with the ‘Core Option’ of GRI standards.

**Recommendation for improvement**

We hope the Report is actively used as a communication tool with stakeholders and we recommend the following for continuous improvements.

- LOTTE CHEMICAL identified key topics based on the due materiality assessment process and faithfully included them in the report. Also, its effort to provide goals and performances in detail using quantifiable data is highly valued. The company is advised to firmly establish the culture of sustainability by expanding key performance indicators related to sustainability.

**Our independence**

With the exception of providing third party assurance services, KMR is not involved in any other LOTTE CHEMICAL’s business operations that are aimed at making profit in order to avoid any conflicts of interest and to maintain independence.

*E. J Hwang*

June, 5<sup>th</sup>, 2019  
 CEO **Eun Ju Hwang**





**LOTTE**  
**CHEMICAL**  
SUSTAINABILITY  
REPORT  
2018



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