

LOTTE CHEMICAL

SUSTAINABILITY REPORT
2019



About This Report

Through the 13th Sustainability Report by LOTTE Chemical, we aim to communicate transparently with our stakeholders about our performance and goals related to the economy, society and environment. This year's report highlights our business performance, including the social values we fulfill through our eco-friendly businesses and our new businesses, and as a sustainable company, we disclose our efforts to achieve the UN Sustainable Development Goals. Through the publication of Sustainability Report every year, LOTTE Chemical will continue to grow and advance, reflecting the views of our internal and external stakeholders.

Report Overview

This report includes our sustainability management performance from January 1 to December 31, 2019. In the case of key data that may impact stakeholder decision-making and judgment, such as the acquisition of LOTTE Advanced Materials, the report includes performance through the first half of 2020. To provide an understanding of trends, quantitative data is included from the most recent three years. Year-on-year data is based on December 31 of the fiscal year, and where the data period requires special attention, this is noted in the report.

Reporting Principles

We have prepared this report in accordance with the Core Option of the guidelines of the Global Reporting Initiative (GRI) Standards. The financial data are reported on a consolidated basis according to the Korean International Financial Reporting Standards (K-IFRS).

Reporting Scope

The financial data in this report cover the performance of LOTTE Chemical and its subsidiaries. The non-financial data, such as environmental and social data, are based on LOTTE Chemical's headquarters, the Daejeon R&D Center, and the plants in Yeosu, Daesan and Ulsan, which generate 99% of our revenue. Information on certain issues is also included from our subsidiaries and overseas plants.

Assurance


The reliability of the content and data in this report has been verified by a third-party assurance provider. The assurance results are stated on page 92.


Inquiries and Access

All of the sustainability reports published by LOTTE Chemical can be viewed and downloaded on our homepage (<http://www.lottechem.com>). Please direct any inquiries about our reports or suggestions for improvement to the contact information below. With your feedback, we aim to become a better company.

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LOTTE
CHEMICAL
SUSTAINABILITY
REPORT 2019

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BUSINESS HIGHLIGHT

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CEO's Letter

Dear Stakeholders,

It is a great honor to publish LOTTE Chemical's 13th Sustainability Report since our first publication of the Report in 2007. We sincerely thank you for your interest and support.

2019 was a difficult year for LOTTE Chemical due to a decline in sales and operating profit, caused by a decrease in global supply increase and demand. Nevertheless, LOTTE Chemical became the first Korean petrochemical company to successfully complete a shale gas plant in the US. We actively responded to changes in the market environment by promoting diversification of raw materials and expanding existing production facilities through joint ventures with refineries. In addition, we prepared a foundation for maximizing synergy through completing preparations for integration with LOTTE Advanced Materials.

Maximizing synergies with LOTTE Advanced Materials

This year marks the first year where LOTTE Chemical and LOTTE Advanced Materials operate as a merged entity. The integrated LOTTE Chemical will reorganize its operations and expand a balanced portfolio to achieve our 2030 goal of becoming a global top 7 chemical company. We will strive to maximize synergy by focusing on our core competencies according to the characteristics of our customers and business, while at the same time striving for change and stability.

Creating a safer workplace

LOTTE Chemical is aware that safety in our workplace and environment are imperative to achieving sustainable growth. We are making great efforts to establish and internalize a system that places safety and environment at the forefront of our business operation. By developing a safety slogan called "Live in Safety," all executives and employees are practicing the management policy of "Let's enjoy a safe life together in a culture that puts safety first." We will continue to expand our efforts to strengthen our competitiveness by preparing the highest level of business procedures and processes in the petrochemical industry and applying them to domestic and overseas subsidiaries.

Proactively responding to changes in the social environment

The current external business environment, such as mobility evolution, digitalization, eco-friendliness, and corporate social responsibility, requires companies to boldly break away from existing success formulas and pursue radical innovation. LOTTE Chemical will closely monitor market trends and prepare to proactively respond to rapid changes.

Furthermore, LOTTE Chemical has a mission to fulfill its social responsibility as a petrochemical manufacturer and aim to solve the disposable plastic waste problem. We strive to fulfill our environmental responsibilities in all stages of the value chain, from raw material production to packaging production and product production, distribution and sales, to establishing a virtuous cycle of plastics at all affiliates of LOTTE Chemical. We will bring a positive impact to society by creating a range of social initiatives.

LOTTE Chemical aims to become the world's best chemical company through endless innovation and changes based on trust and respect of its stakeholders. We aim to strengthen our competitiveness on the global stage while at the same time find new growth engines. We ask for continued interest and encouragement from our stakeholders as LOTTE Chemical works towards building a new future.

Thank you.

June 2020

Kim Gyo-hyun, CEO of LOTTE Chemical

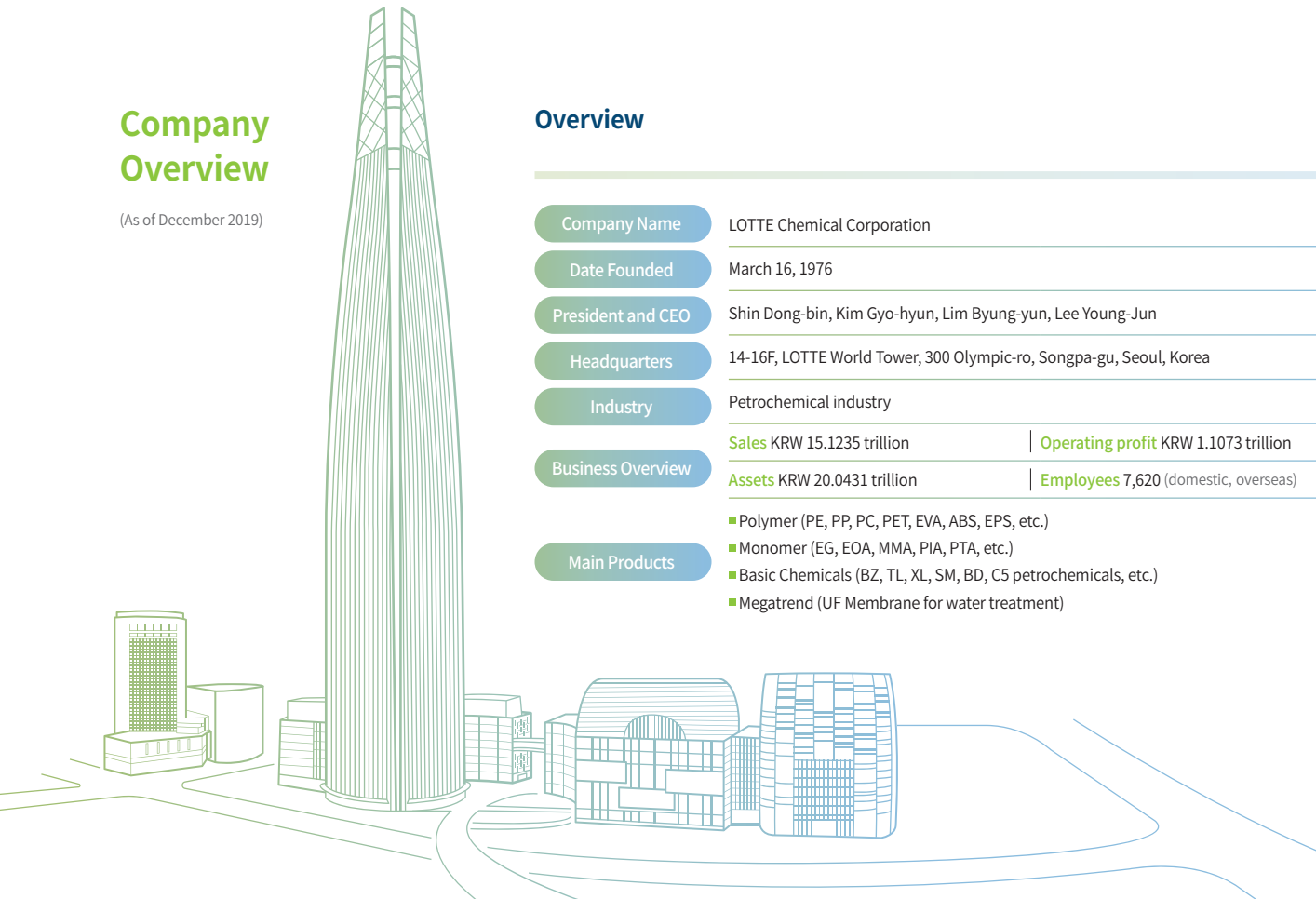


Company Overview

(As of December 2019)

Overview

Company Name	LOTTE Chemical Corporation	
Date Founded	March 16, 1976	
President and CEO	Shin Dong-bin, Kim Gyo-hyun, Lim Byung-yun, Lee Young-Jun	
Headquarters	14-16F, LOTTE World Tower, 300 Olympic-ro, Songpa-gu, Seoul, Korea	
Industry	Petrochemical industry	
Business Overview	Sales KRW 15.1235 trillion	Operating profit KRW 1.1073 trillion
	Assets KRW 20.0431 trillion	Employees 7,620 (domestic, overseas)
Main Products	■ Polymer (PE, PP, PC, PET, EVA, ABS, EPS, etc.)	
	■ Monomer (EG, EOA, MMA, PIA, PTA, etc.)	
	■ Basic Chemicals (BZ, TL, XL, SM, BD, C5 petrochemicals, etc.)	
	■ Megatrend (UF Membrane for water treatment)	



Company History



Take-off
2010-Present



Leap Forward
2000-2010



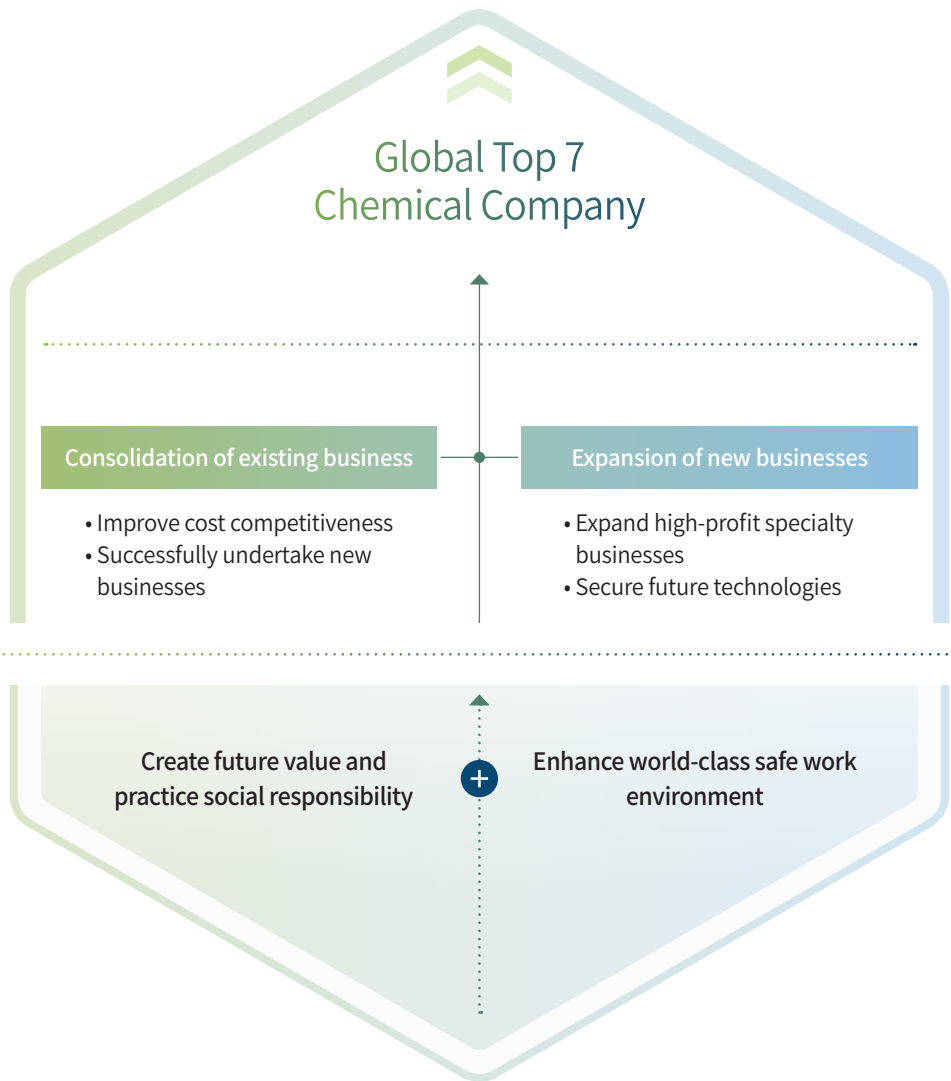
Growth
1990-2000



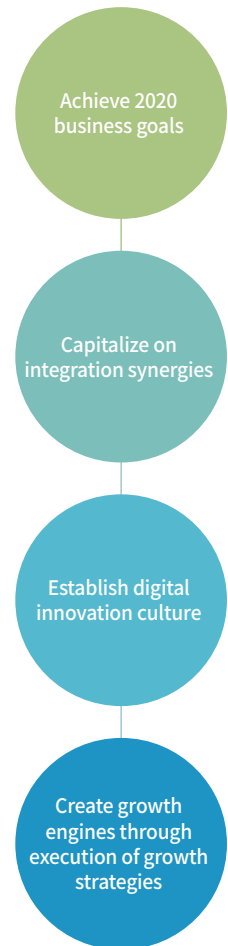
Beginnings
1970-1990

- August 2019** Began commercial production of U.S. ethane cracker
 - July 2019** Signed agreement with GS Energy on joint project to produce BPA and C4 petrochemical products
 - May 2018** Signed MOU with Hyundai Oilbank to jointly build new heavy feed petrochemical complex (HPC)
 - November 2017** Completed construction of LOTTE Versalis Elastomers
 - May 2016** Acquired Samsung Group chemical affiliates (LOTTE Fine Chemical, LOTTE Advanced Materials)
 - October 2015** Completed construction of gas field chemical project in Uzbekistan
 - June 2015** Signed agreement with U.S.-based Axiall for ethane cracker joint project
 - January 2014** Signed JV agreement with Hyundai Oilbank to establish 'Hyundai Chemical' for production of mixed xylene
 - December 2012** Merged with KP Chemical and renamed new entity to LOTTE Chemical
-
- November 2010** Acquired Malaysia-based TITAN Chemicals
 - December 2009** Daesan Plant becomes first in Korea to produce 1 million tons of ethylene
 - February 2008** Signed contract to establish UZ-KOR Gas Chemical
 - July 2004** Acquired KP Chemical
 - June 2003** Acquired Hyundai Petrochemical
-
- April 1997** Completed construction of 3EG plant
 - August 1995** Achieved ISO 14001 Certification (Environmental Management System)
 - December 1991** Completed construction of NC plant
 - June 1991** Completed construction of Daedeok R&D Center
-
- May 1991** Completed construction of SEG plant
 - November 1982** Achieved 'US\$ 100 Million Export Tower' Award
 - December 1979** Began commercial production at all plants
 - March 1976** Inaugural meeting and company founding

VISION 2030

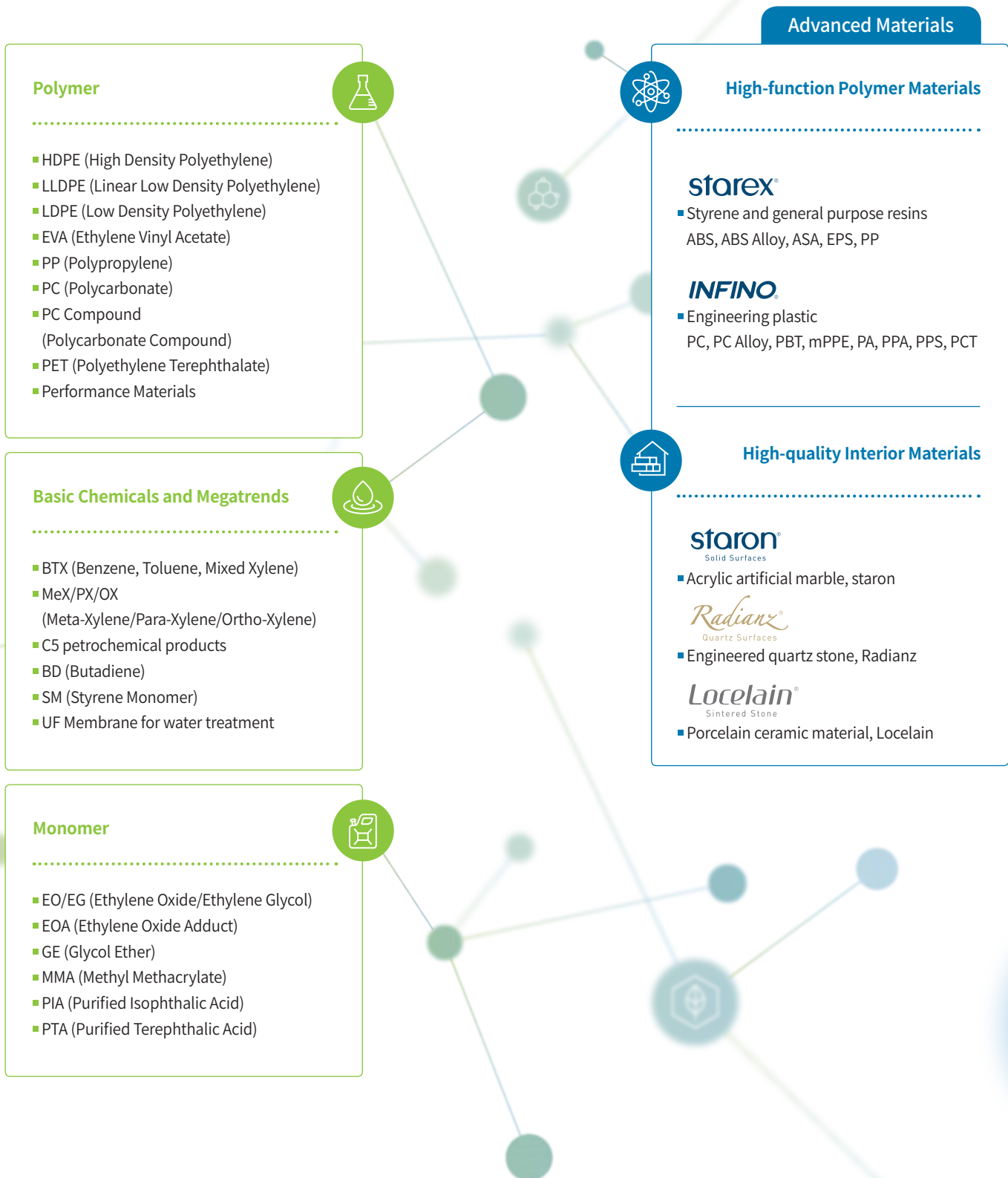


Core Tasks for 2020



Business Overview

Main Products



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)
- Performance Materials

Basic Chemicals and Megatrends

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

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)

Advanced Materials

High-function Polymer Materials

starex®

- Styrene and general purpose resins
ABS, ABS Alloy, ASA, EPS, PP

INFINO

- Engineering plastic
PC, PC Alloy, PBT, mPPE, PA, PPA, PPS, PCT

High-quality Interior Materials

staron® Solid Surfaces

- Acrylic artificial marble, staron

Radianz® Quartz Surfaces

- Engineered quartz stone, Radianz

Locelain® Sintered Stone

- Porcelain ceramic material, Locelain

Business Sites

(As of June 2020)



Global Network



■ Headquarter, Plants, R&D Center
■ Overseas Subsidiaries
■ Overseas Branches
■ Advanced Materials Business

Business Sites	Affiliates and Joint Ventures	Overseas Subsidiaries	Overseas Sales Offices
<ul style="list-style-type: none"> • Seoul Headquarters • Uiwang Office • Daejeon R&D Center • Seoul R&D Center • Production Plants : Yeosu, Daesan, Ulsan • Sales Offices : Daejeon, Daegu, Busan 	<ul style="list-style-type: none"> • 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 Fine Chemicals : Ulsan 	<ul style="list-style-type: none"> • 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 • LC Titan : Jakarta, Indonesia 	<ul style="list-style-type: none"> • LC Alabama : Alabama, USA • LC UK : Wilton, UK • LC PL Karachi, Pakistan • LC Poland : Warsaw, Poland • LC USSR : Malaysia • LC USA : Delaware, USA • LACC : Louisiana, USA • LCLA : Louisiana, USA • LCNL : Lagos, Nigeria
<ul style="list-style-type: none"> • 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 			



Advanced Materials Business

Business Sites	Sales Affiliates	Plants	Offices
<ul style="list-style-type: none"> • Uiwang Office 	<ul style="list-style-type: none"> • Frankfurt, Germany • Bangkok, Thailand • Shanghai, China • Tokyo, Japan • Los Angeles, USA 	<ul style="list-style-type: none"> • Tatabánya, Hungary • Dong Nai, Vietnam • Tianjin/Dongguan, China • Yeosu, Korea • Tijuana, Mexico • Manisa, Turkey 	<ul style="list-style-type: none"> • Dubai, UAE • Milan, Italy • Istanbul, Turkey • Chennai/Delhi, India • Hanoi, Vietnam • Jakarta, Indonesia • Shenzhen/Tianjin/Suzhou/Weihai/Qingdao, China • Gwangju/Busan/Gumi/Ulsan, Korea • Kuala Lumpur, Malaysia • Detroit/San Diego, USA

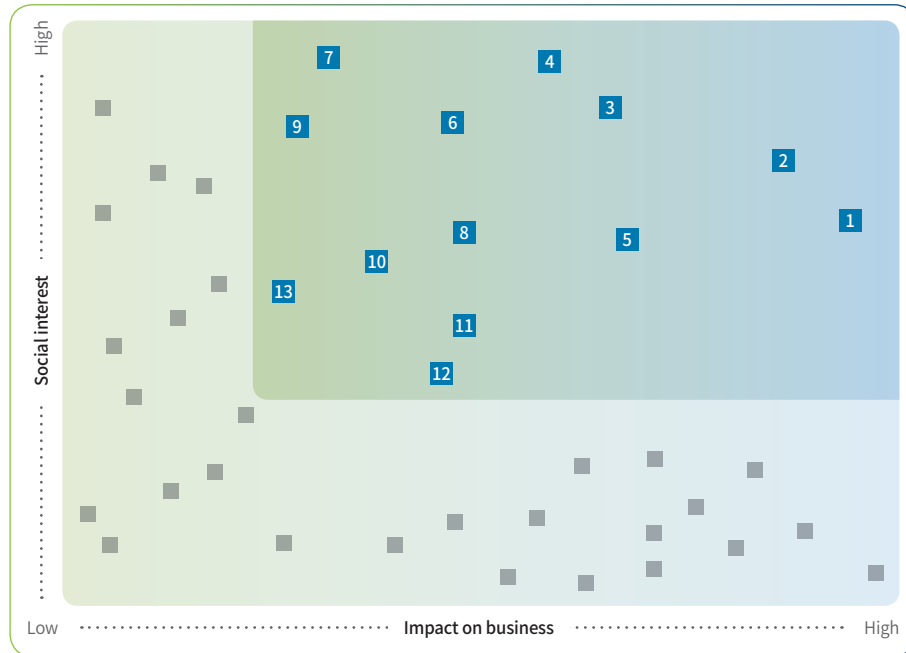
Materiality Assessment

To identify the core topics related to the sustainable management of LOTTE Chemical, we conducted a materiality assessment reflecting the GRI process in determining reporting content. The targets, performance and future plans for each key topic are highlighted in the report.

Materiality Assessment Process







Materiality Assessment Results



No.	핵심 토픽
1	Generating increased economic profits
2	Entering global markets and business expansion
3	Responding to climate change
4	Strategic social contribution activities
5	Contributing to local communities and revitalizing regional economies
6	Reducing GHG emissions and responding to Emissions Trading Scheme
7	Strengthening workplace safety and preventing accidents
8	Developing eco-friendly products and services
9	Expanding employment and providing employment stability
10	Transparency in Board of Directors composition and operations
11	Strengthening mutual growth policies and activities
12	Minimizing emissions of hazardous chemicals
13	Strengthening monitoring of GHG emissions

Core Aspects of the Report

Category	Core Topics	Core Aspects of the Report	Page(s)
 Environment	Responding to climate change	Environment : Responding to Climate Change	20-25
	Reducing GHG emissions and responding to Emissions Trading Scheme	Environment : Responding to Climate Change	
	Developing eco-friendly products and services	Environment : Responding to Climate Change	
	Strengthening monitoring of GHG emissions	Environment : Responding to Climate Change	
 Safety	Strengthening workplace safety and preventing accidents	Health and Safety	26-29
	Minimizing emissions of hazardous chemicals	Health and Safety	
 Society	Expanding employment and providing employment stability	Employees	30-35
	Strategic social contribution activities	Social Contributions	40-43
	Contributing to local communities and revitalizing regional economies	Social Contributions	
	Strengthening mutual growth policies and activities	Mutual Growth	44-47
 Economy	Transparency in Board of Directors composition and operations	Governance	58-59
	Generating increased economic profits	New Business Highlights	
	Entering global markets and business expansion	New Business Highlights	48-51





SUSTAINABILITY HIGHLIGHT

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Sustainability Management Vision

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Topics
Nature

P. 30
Topics
People

P. 40
Topics
Society

P. 48
Topics
The Future

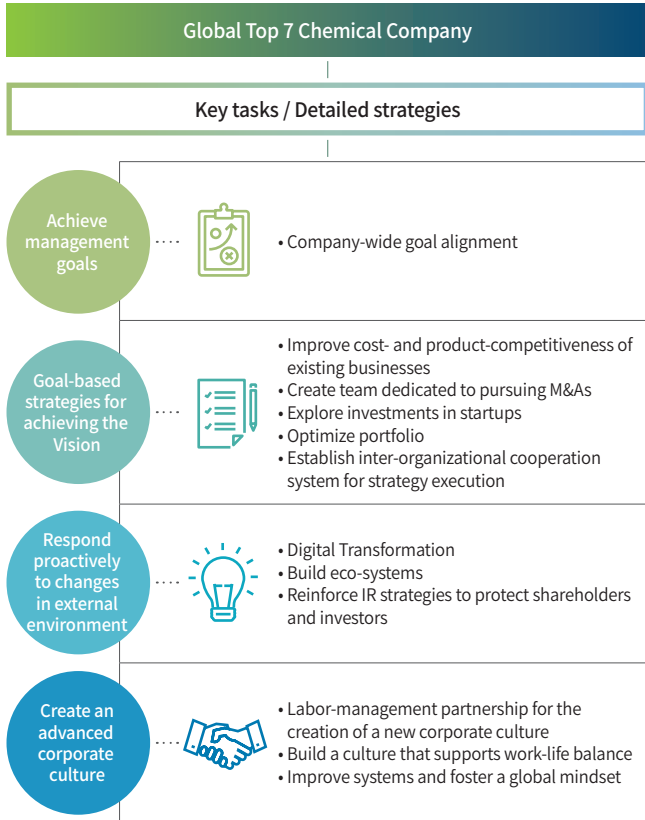
Sustainability Management Vision

Nature
People
Society
The Future

Sustainability Highlight

Sustainability Management Vision

Vision



Organization








UN SDGs goals

<p>Goal 1 NO POVERTY</p> <ul style="list-style-type: none"> • LC Titan scholarship • LC Pakistan scholarship • LOTTE Scholarship Foundation scholarship award 	<p>Goal 3 GOOD HEALTH AND WELL-BEING</p> <ul style="list-style-type: none"> • Recertified again as a family-friendly company 	<p>Goal 4 QUALITY EDUCATION</p> <ul style="list-style-type: none"> • 'Hope Sharing Scholarship' • 'Happiness Sharing Fund'
<p>Goal 5 GENDER EQUALITY</p> <ul style="list-style-type: none"> • Efforts to recruit more female employees • Recertified as a family-friendly company 	<p>Goal 7 AFFORDABLE AND CLEAN ENERGY</p> <ul style="list-style-type: none"> • Introducing highly efficient facilities • Continuing plant innovation activities to improve facility efficiency • Automating plant operations using new IT systems • Reducing energy consumption by optimizing plant operational conditions • Discovering new areas for continued energy saving 	<p>Goal 8 DECENT WORK AND ECONOMIC GROWTH</p> <ul style="list-style-type: none"> • Actively support overseas expansion of partner companies • Helping outstanding domestic partner companies with their overseas expansion (LC Titan) • Support for outstanding domestic partner companies to join new Indonesia project

Seventeen Goals of the UN SDGs

 <p>Goal 1 NO POVERTY End Poverty in All its Forms Everywhere</p>	 <p>Goal 10 REDUCED INEQUALITY Reducing Inequality Within and Among Countries</p>
 <p>Goal 2 ZERO HUNGER End Hunger, Achieve Food Security and Improved nutrition, and Promote Sustainable Agriculture</p>	 <p>Goal 11 SUSTAINABLE CITIES AND COMMUNITIES Make Cities and Human Settlements Inclusive, Safe, Resilient and Sustainable</p>
 <p>Goal 3 GOOD HEALTH AND WELL-BEING Ensure Healthy Lives and Promote Well-being for All at All Ages</p>	 <p>Goal 12 RESPONSIBLE CONSUMPTION AND PRODUCTION Ensure Sustainable Consumption and Production Patterns</p>
 <p>Goal 4 QUALITY EDUCATION Ensure Inclusive and Equitable Quality Education, and Promote Lifelong Learning Opportunities for All</p>	 <p>Goal 13 CLIMATE ACTION Take Urgent Action to Combat Climate Change and Its Impacts</p>
 <p>Goal 5 GENDER EQUALITY Achieve Gender Equality and Empower All Women and Girls</p>	 <p>Goal 14 LIFE BELOW WATER Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development</p>
 <p>Goal 6 CLEAN WATER AND SANITATION Ensure Availability and Sustainable Management of Water and Sanitation for All</p>	 <p>Goal 15 LIFE ON LAND Protect, Restore and Promote Sustainable Use of Terrestrial Ecosystems, Sustainably Manage Forests, Combat Desertification, and Halt and Reverse Land Degradation and Halt Biodiversity Loss</p>
 <p>Goal 7 AFFORDABLE AND CLEAN ENERGY Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for All</p>	 <p>Goal 16 PEACE AND JUSTICE STRONG INSTITUTIONS Promote Peaceful and Inclusive Societies for Sustainable Development, Provide Access to Justice for All and Build Effective, Accountable and Inclusive Institutions at All Levels</p>
 <p>Goal 8 DECENT WORK AND ECONOMIC GROWTH Promote Sustained, Inclusive and Sustainable Economic Growth, Full and Productive Employment and Decent Work for All</p>	 <p>Goal 17 PARTNERSHIPS TO ACHIEVE THE GOAL Strengthen the Means of Implementation and Revitalize the Global Partnership for Sustainable Development</p>
 <p>Goal 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE Build Resilient Infrastructure, Promote Inclusive and Sustainable Industrialization, and Foster Innovation</p>	

<p>Goal 11 SUSTAINABLE CITIES AND COMMUNITIES</p>  <ul style="list-style-type: none"> • Project LOOP 	<p>Goal 12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>  <ul style="list-style-type: none"> • Project LOOP 	<p>Goal 13 CLIMATE ACTION</p>  <ul style="list-style-type: none"> • Established greenhouse gas inventory in 2018 • Adopted SAP-based GHG/energy management program GEMS in 2010 • Set and managed GHG goals for each facility
<p>Goal 15 LIFE ON LAND</p>  <ul style="list-style-type: none"> • Reinforcing chemical control facilities 	<p>Goal 17 PARTNERSHIPS TO ACHIEVE THE GOAL</p>  <ul style="list-style-type: none"> • Project LOOP 	

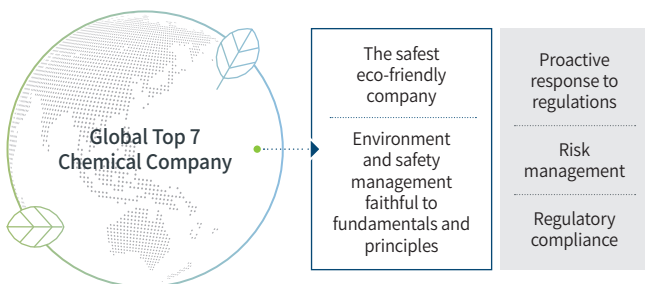
TOPIC 01

Environment Responding to Climate Change

Environmental Management

Environmental Vision and Strategies

LOTTE Chemical operates the Safety&Environment division, an executive organization under the direct management of the CEO, to oversee the safety and environmental impacts of our company, and institutes a company-wide environmental management by maintaining internal and external business channels with various stakeholders.



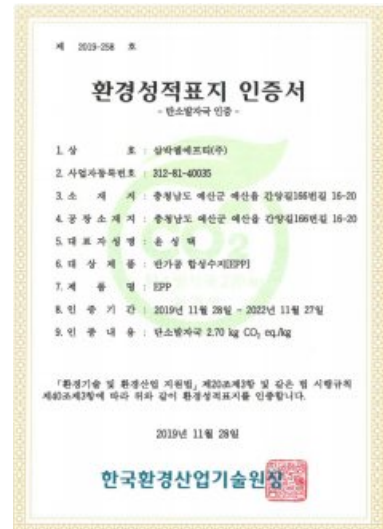
- 1 Efforts to prevent environmental pollution
- 2 Reinforce reduction efforts through the environmental pollution monitoring system
- 3 Reduce GHG emissions and energy consumption
- 4 Improve eco-friendliness in life-cycle of products and services
- 5 Waste plastic reduction (recycling) activity

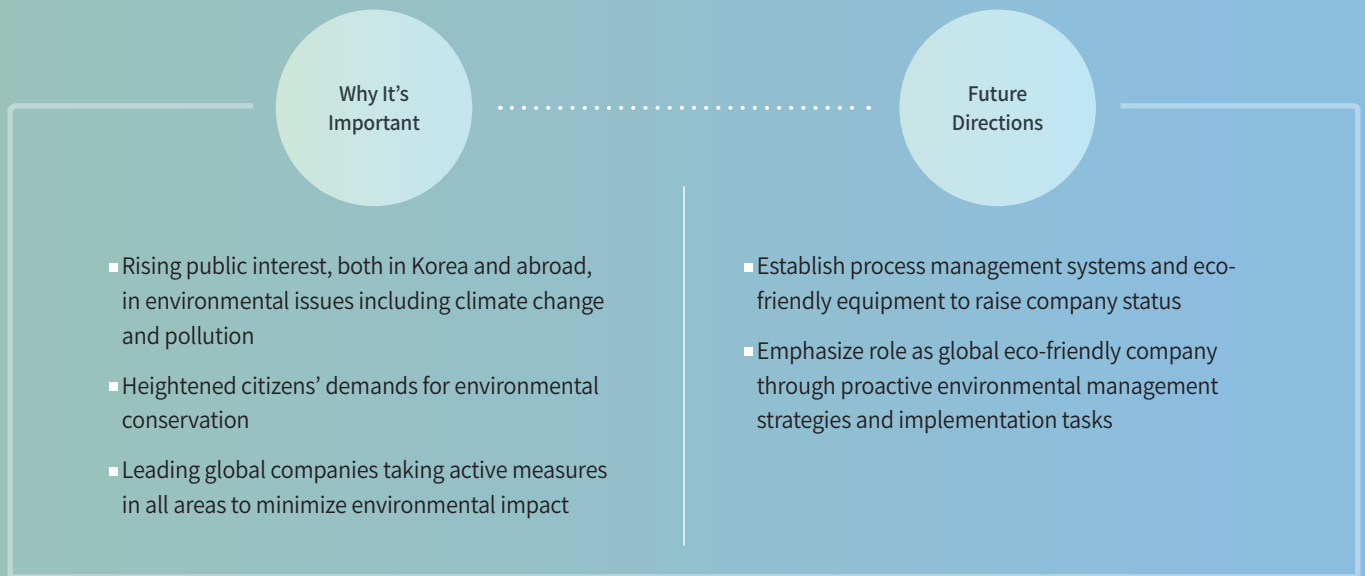
Establishing an Environmental Management System

Since adopting the 2015 version of ISO 14001 (Environmental Management System) in 2018, LOTTE Chemical has been working to implement a management system that are aligned with global standards. Also, with the establishment of an operational system integrated with safety/quality management, we have created synergy in many different areas.

Instituting and Operating Life-cycle Assessment (LCA)

- Established system for product life-cycle assessments in 2019 with 100% subsidiary Sambark LFT
- Obtained an Environmental Product Declaration (carbon footprint) issued by the Ministry of Environment/ Korea Environmental Industry & Technology Institute
- Planning to gradually apply life-cycle assessments to other products as well

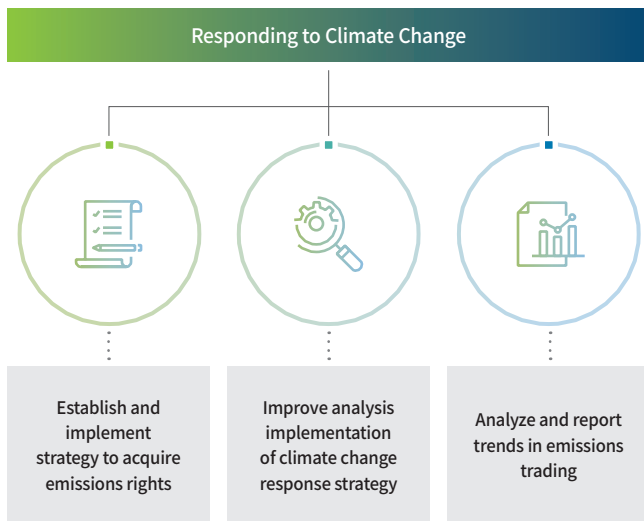




* For detailed figures on this section, refer to Appendix p.84-86.

Strategies to Respond to Climate Change

The international issue of responding to climate change is reflected as a key issue in LOTTE Chemical's business activities.



GHG Emissions Trading Management

- Strengthen efforts to secure more emissions rights on the basis of productivity-raising technologies and low-carbon processes
- Improve management efficiency in usage of Korea's domestic emissions market
- Invest/pursue cooperation in securing overseas emissions rights

Energy-saving Campaign

- Set and Implement yearly goals for energy conservation at plants
- Expanded investment in new and renewable energy (2019 investment in small-scale solar power facility in Yeosu)
- Replace office equipment with eco-friendly models
- Hold energy/GHG workshop to raise employee awareness of energy conservation

2019 GHG Emissions

6,372,644 tCO₂e



2019 Energy Consumption

121,389 TJ



Reductions of GHG Emissions and Energy Consumption

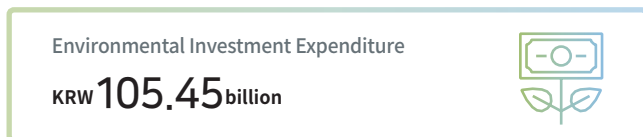


Main Energy Conservation Cases

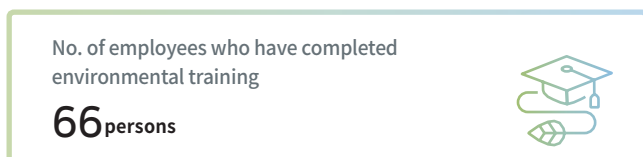
- Raised thermal efficiency and reduced fuel consumption through refractory coatings on decomposition furnace at NC plant
- Increased refrigeration efficiency and reduced energy use at PE plant by changing type of refrigeration system
- Increased steam generation at PTA plant through additional heat recovery in oxidation reactor

Integrated Environmental Impact Assessment

LOTTE Chemical maintains and expands investment in systems for monitoring environmental pollution in terms of air, water and waste, in which we continue to expand our investment. Furthermore, we continue to foster environmental experts, and manage and recycle limited resources efficiently.



Fostering Environmental Professionals

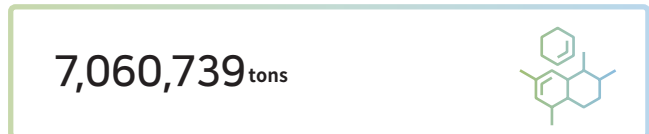


* Standard differs from previous year (reduced scope of acknowledged trainings)

Efficient Resource Management

Use of raw materials

- Procuring naphtha and mixed xylene, etc. through domestic and overseas refineries
- Minimizing energy consumption rate in logistics process through optimal transport



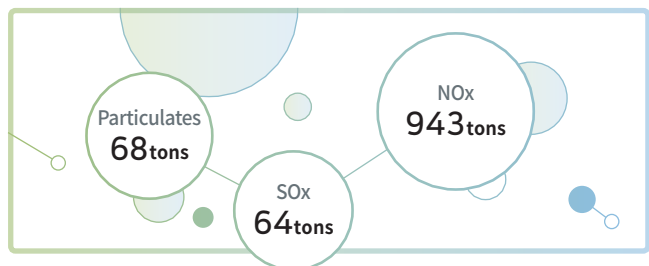
Water and Waste Water Management

- Procuring stable supply of water from area sources (with redundancy) (Yeosu – Juam Dam, Sueo Dam / Daesan – Daeho Lake / Ulsan – Daeam Dam, Nakdong River)
- Continuously engaging in activities to reduce water consumption; operating wastewater treatment facilities at plants to discharge water below the permitted limits



Air Pollutant Management

- Established Telemonitoring System (TMS) to systematically manage air pollutants (established and operating internal standards)
- Installed regenerative oxidizer, introduced closed system, recovering and incinerating volatile organic compounds (VOCs)



Preventing Emissions of Water Pollutants

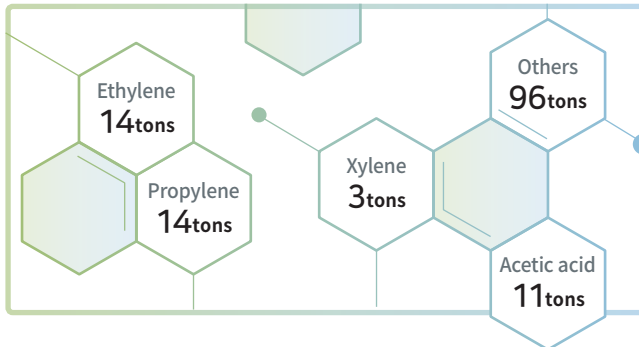
- Managing water discharge quality through site-specific water treatment facilities or integrated water treatment facilities at industrial complexes (established and operating internal standards)
- Constant wastewater monitoring through Telemonitoring System (Water TMS)

BOD	COD	SS
Yeosu 29ppm	Yeosu 64ppm	Yeosu 47ppm
Daesan 3ppm	Daesan 14ppm	Daesan 2ppm
Ulsan 2ppm	Ulsan 16ppm	Ulsan 17ppm

* Yeosu, Ulsan reflect inflow concentration standards for integrated water treatment facilities at industrial complexes (within legal limits)

Management of Chemical Emissions

- Securing safety through pre-evaluation of all chemicals
- Installing detectors and blocking equipment to prevent chemical spills
- Periodic safety inspection for handling facilities such as storage and transportation through LDAR (Leak Detection And Repair) system



Preventing Soil Pollution

- Providing guidelines for preventing soil pollution
- Facility floors paved with impervious concrete
- Managing tasks with environmental work permit
- Conducting regular tests for soil pollution

Increased Recycling of By-products

- Selling by-products such as steam, hydrogen and gas, or using them for independent energy

By-product produced	Recycling rate
5,742,333tons	100%

Examples of By-product Recycling

	Hydrogen	Steam	Methane	Gas by-products
Source(s)	Production of ethylene at NC plant	Waste heat recovery of PC MVR, EO Reactor, NC Heater, etc.	Production processes at NC plant	Production processes or wastewater treatment
Recycling Example	Used as raw material for BTX, PE, PP plants or as fuel	All by-product steam consumed by plants	Used on-site as raw material or fuel, some sold to local companies	All by-product gas used on-site as fuel

Minimizing Waste Generation

- Raising employee awareness of waste discharge and separate disposal by introducing real-name system for waste
- Waste generation tracked and managed by source and properties; as of the end of 2019, 111 specialized firms under contract and processing waste appropriately for production sites
- Reducing waste amounts and making improvements through data analysis

Waste Impact Assessment

- Gauging local environmental impact through periodic waste analysis
- Thorough management of waste storage facilities

General waste	45,575tons							
Designated waste	32,604tons							
Waste recycling rate	<table border="1"> <tr> <td>Yeosu</td> <td>Daesan</td> <td>Ulsan</td> </tr> <tr> <td>74.0%</td> <td>85.2%</td> <td>80.7%</td> </tr> </table>	Yeosu	Daesan	Ulsan	74.0%	85.2%	80.7%	
Yeosu	Daesan	Ulsan						
74.0%	85.2%	80.7%						

Eco-friendly Products and Services Purchasing Performance

Eco-friendly Products and Services Purchased	14,551.69million	
----------------------------------------------	-------------------------	--

Green Purchasing Guidelines

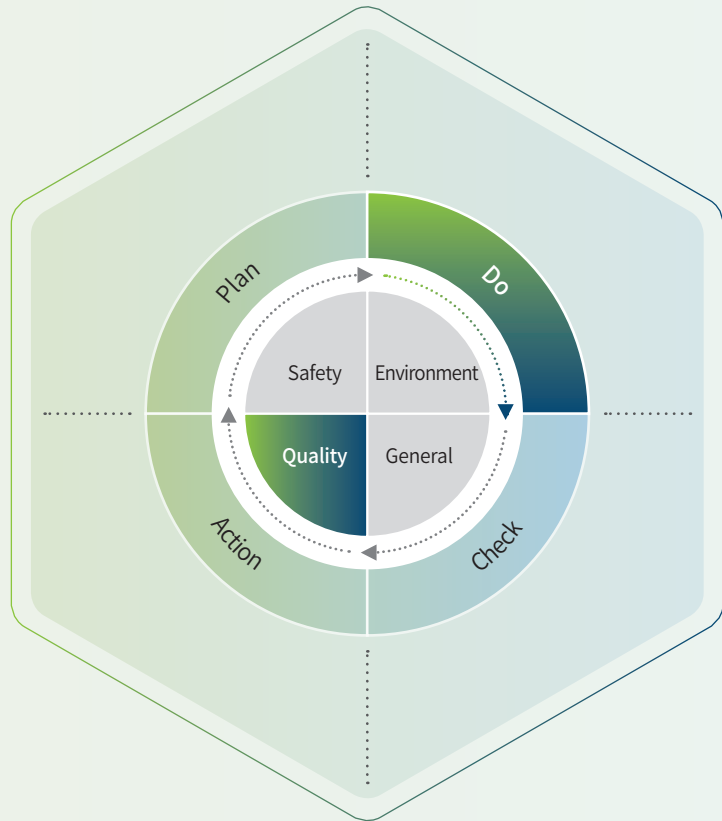
Scope of Application

These guidelines apply to raw materials and consumable office supplies used in the company's production and sales of products. They apply to all green-purchased raw materials/products/packaging from domestic and overseas suppliers.

Management System / PDCA

Objective

These guidelines that actively promote green purchasing serve to minimize environmental impact. They aim to consider the eco-friendliness of suppliers and materials from the initial purchasing stage to ensure that limited resources are used efficiently and that people can live sustainably.



A. Green Purchasing Planning

I. Green Purchasing Principles

- 1) The company, through all of its purchasing activities, shall build cooperative relationships with suppliers to enable the practice of environmental principles.
- 2) The company, through all of its purchasing activities, shall comply with laws and regulations and demonstrate social responsibility in the interest of environmental conservation and natural resource conservation.
- 3) The company shall engage in the stable production of eco-friendly products, and continuously improve quality.

II. Categories of Eco-friendly Items

- 1) Products environmentally certified under laws and regulations related to environmental technology development and support
- 2) Products certified for recycling under laws and regulations related to resource conservation and the promotion of recycling
- 3) Products certified for energy efficiency levels 1 and 2 under laws and regulations on energy saving
- 4) Items with reduced amounts of harmful substances such as lead, mercury, cadmium, chrome, PCB (polychlorinated biphenyl), asbestos, etc.
- 5) Items reducing waste through lighter-weight packaging units, refills, reverse vending, etc.
- 6) Other items recognized as environmentally sound, such as flame-retardant items, recycled goods made with discarded raw materials, items with overseas environmental labels, etc.
- 7) Products that, when applied to the same uses, achieve a relative reduction in environmental pollution and reduce energy consumption
- 8) Products that reduce emissions of environmental pollutants through reuse, etc.

B. Green Purchasing

I. Purchasing Requests

- 1) The team(s) using an item and/or requesting its purchase shall register a purchasing request through SAP.
- 2) When creating a purchasing request, the team(s) using an item and/or requesting its purchase shall consider categories of eco-friendly items and prevent the following kinds of purchasing requests.
 - ① Requests for ordinary products when there are eco-friendly products available
 - ② Requests for specific suppliers or materials
 - ③ Requests for materials with lower recycling rates than competing materials
 - ④ Requests with conditions irrespective of product quality (ex : printed materials with excessive color and brightness, etc.)
 - ⑤ Requests considering only performance standards and not environmental factors
 - ⑥ Other items designated by the leaders of teams purchasing and/or using an item and the leader of the Environmental Safety Team

II. Eco-Friendly Purchasing Review

- 1) The Purchasing Team shall make efforts to purchase eco-friendly items when possible. Furthermore, when a review of an item's harmfulness is needed, it shall be conducted in cooperation with the Environment Management Team.
- 2) As for the eco-friendliness of unverified items, such as those environmentally certified overseas, the environment management leader shall make a decision according to B.1.2) and notify the Procurement/Purchasing Team.
- 3) Eco-friendliness Evaluation
 - ① The general manager of the Procurement/Purchasing Team, in cooperation with the general manager of the Environment Management Team and the team using the item, shall develop and maintain an evaluation system for the eco-friendliness of suppliers and materials.
 - ② The eco-friendliness evaluation of materials shall give priority to chemical substances.
 - ③ The final results of the eco-friendliness evaluation shall be kept on file according to the system, and after notifying the relevant supplier, the purchase shall be made according to the company's purchasing process.

III. Requests for estimates, acquisitions and reviews, selections of suppliers and ordering

Related management processes shall be conducted according to purchasing regulations (J-00-01-00-00).

C. Performance Management

I. Green Purchasing Performance Management

The Procurement/Purchasing Team shall calculate green purchasing performance on a regular basis (once a year), and at the request of the department managing The Sustainability Report, it shall be disclosed in The Sustainability Report.

TOPIC 02

Health and Safety

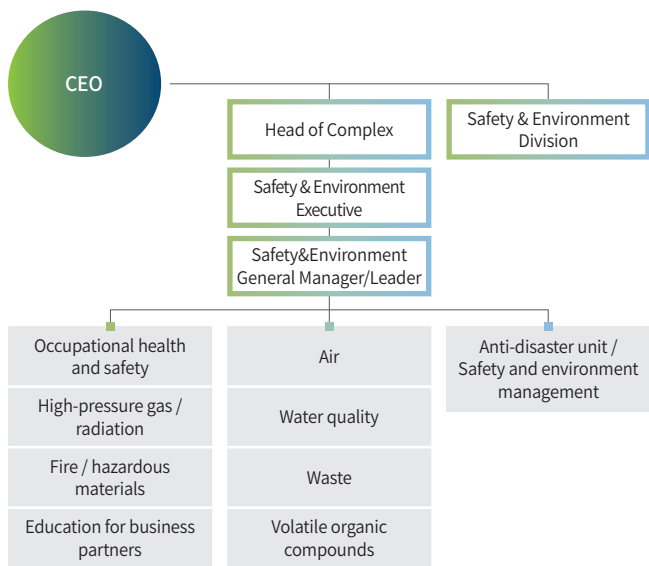
Health and Safety Management System

LOTTE Chemical is working to convert to the recently adopted global standard for health and safety management systems (ISO 45001). We are organizing our health and safety management system as a High Level Structure (HLS), and continuously improving the system in regard to Process Safety Management (PSM).

Health and Safety Standards System

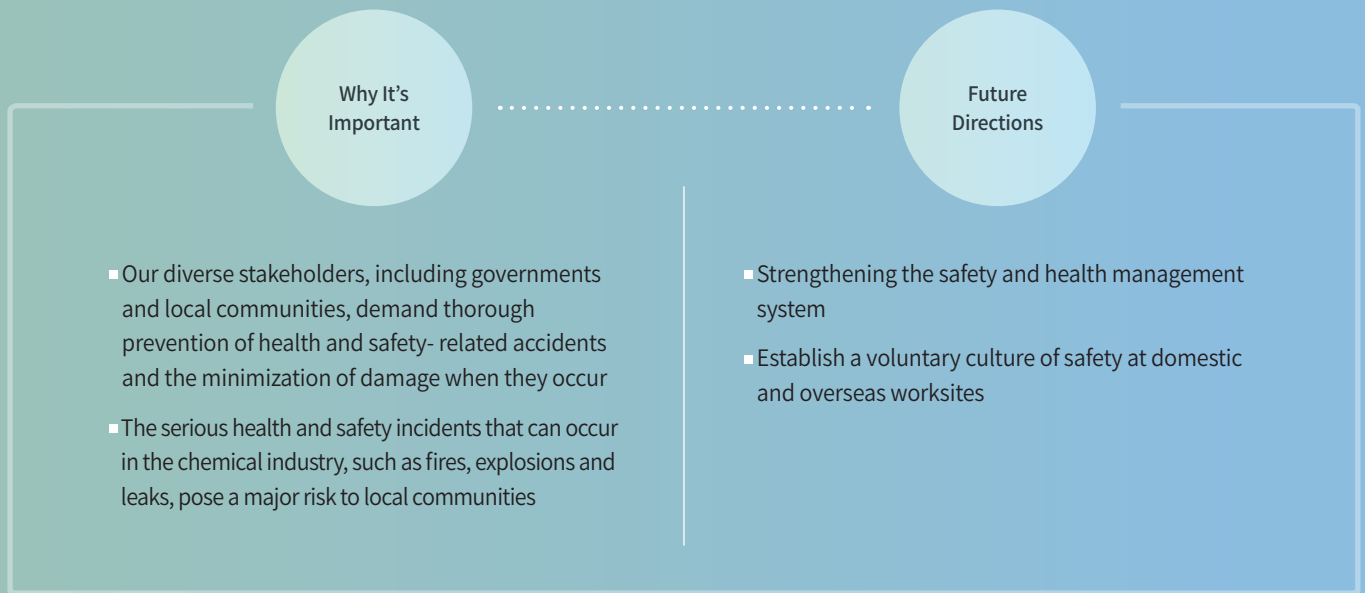


Safety, Environment and Technology Division



Occupational Health and Safety Committee

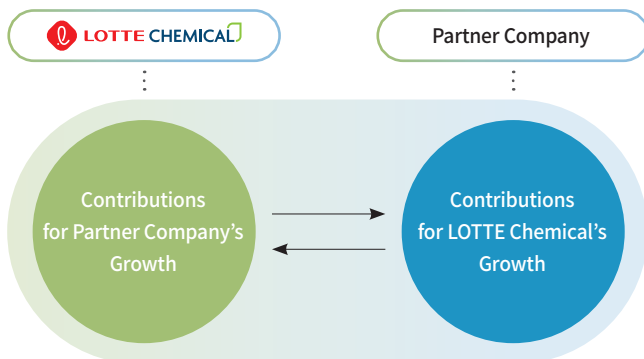
- An Occupational Health and Safety Committee operates in accordance with the Occupational Safety and Health Act
- In the committees, representatives of labor and management discuss and make decisions on key health and safety agenda for preventing industrial accidents



* For detailed figures on this section, refer to Appendix p.86-87.

Safety Management at Partner Companies

- A Cooperative Council, comprised of resident partner companies, is formed at each business site to identify and address risk factors through regular monthly meetings and monthly on-site inspections
- When selecting partner companies, we evaluate their health and safety management systems, health and safety training plans, work-related performance, industrial accident record, etc.
- We create and operate a pool of eligible partner companies
- (Ulsan) After working with partner companies, we provide awards and priority rankings for outstanding performance
- Support for partner safety and health management system and risk assessment certification for shared growth



Digital Transformation based Safety Systems

Trial plant for Work Safety Management Digital System

- Adhere to work processes by digitalizing Work Safety Management
- Share real-time on-site situations and respond quickly to improve on-site Work Safety Management through mobile anti-explosion devices and IoT gas detectors



Create VR safety experiences

- Create virtual safety experiences using virtual reality (VR) content to maximize effectiveness of safety training and raise awareness

Emergency Response Training System

- We operate an emergency response organization to respond to emergencies such as fires, explosions, leaks and environmental disasters
- When emergencies occur, rapid alerts and reporting ensure a fast response by the person(s) in charge



Fire drills at work

Promoting Employee Health and Wellness

- Fitness centers in company housing help support employee health management
- Employees receive general health check-ups in both the first and second half of the year, while comprehensive check-ups are provided biannually to employees over 35 and their spouses and to employees over 40 and their spouses on an annual basis
- Worksite 'Quit Smoking' programs and weight-loss programs help improve employee health management

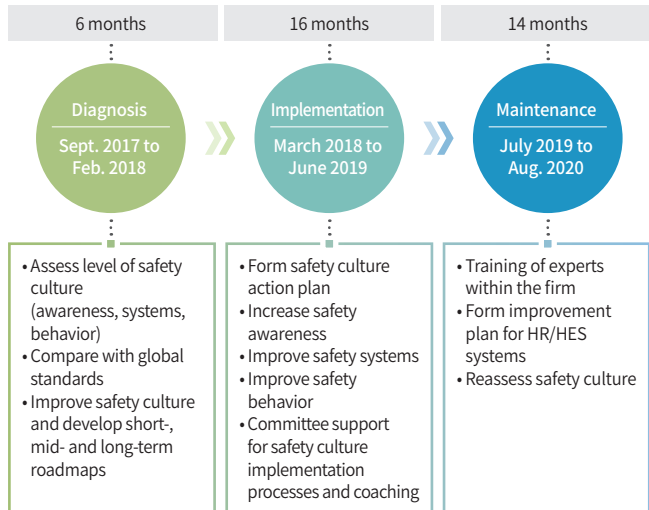


Promoting employee health and wellness

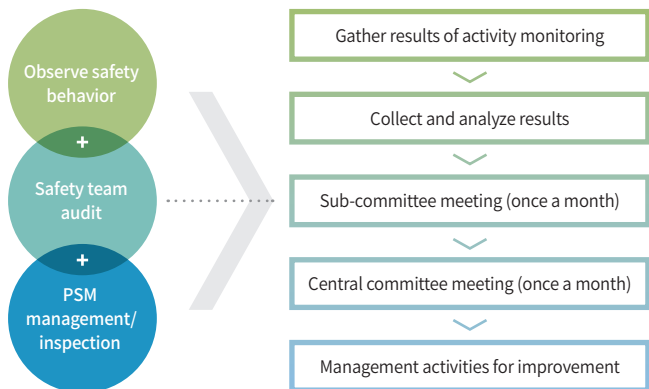
Enhancing Safety Culture

Action plan to enhance safety culture

Safety Culture Project Procedure



Safety Culture Committee Activity Procedure

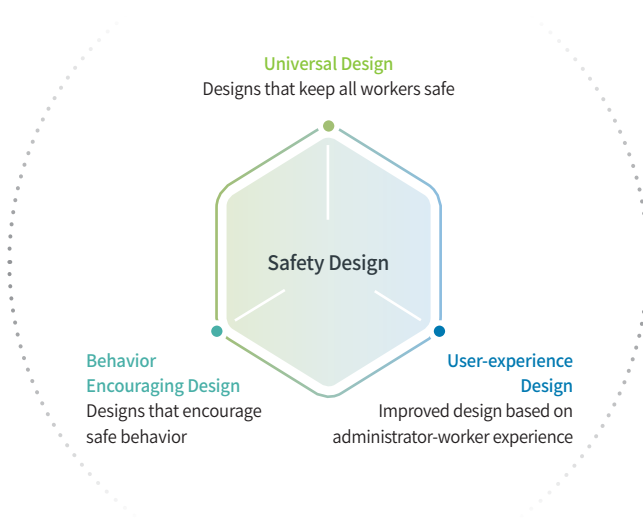


On-site practical training in safety behavior supervision for management supervisors

Building a safe working environment

Development of Safety Design Integration Manual

- To prevent accidents at worksites, we developed user-oriented facilities centered on human, physical and managerial factors and environment- and worker-related safety designs



Designs that provide safety information and encourage safe behavior

Strengthening Management of Chemical Substances

Since 2015, in accordance with the Act on Registration, Evaluation, etc. of Chemicals and the Chemicals Control Act, we have been strengthening our management of chemical substances. In response to the Act on Registration, Evaluation, etc. of Chemicals, we have established and jointly registered a consortium with leading companies in the petrochemical industry.

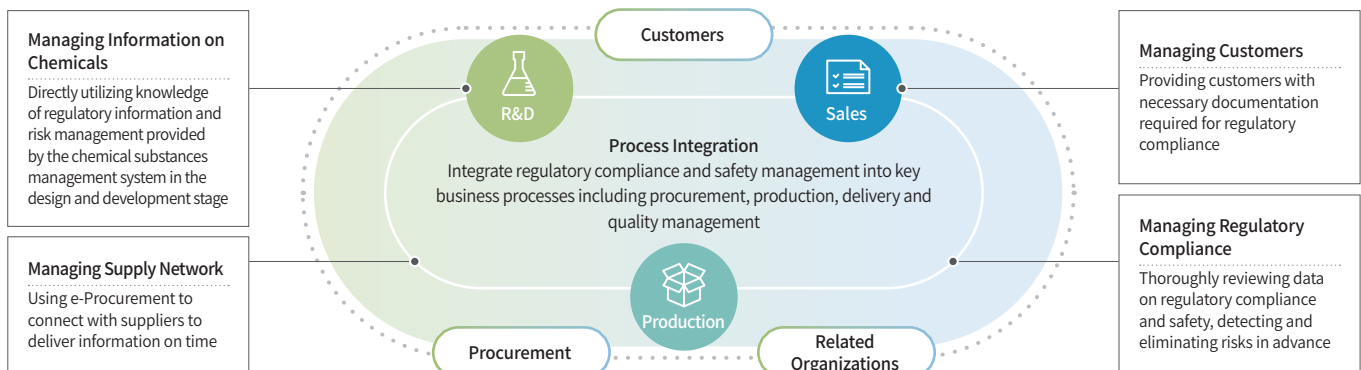
System for Strict Chemical Substance Management

- Improve stability of chemical substances transported by the company; develop and operate chemical substance management systems
- Real-time management of in/outflows of some 20,000 raw materials and products and preliminary regulatory compliance checks through independent standards and systems for chemical substance management
- Strictly manage the procurement and sale of regulated chemical substances
- Publish Material Safety Data Sheet (MSDS) in multiple languages and distribute them to employees and customers, notifying them in detail of the toxicity risk, emergency response steps and handling methods of the relevant substances
- Inspections once a week for facilities handling (storing, transporting, etc.) harmful chemical substances
- Ensure safety through safety diagnoses once a year
- Provide training for handlers once every two years through an external specialist organization

Reinforcing Chemical Control Facilities

- Installation of protective walls and floors of impervious concrete at facilities storing hazardous chemicals
- In case of hazardous chemical leak, substance is moved entirely to water treatment facility for disposal
- Provision of fire extinguishers, gas masks and related items at all times in adequate quantities and the right locations

Chemical Substance Management System (LCMS : LOTTE Chemical Management System)

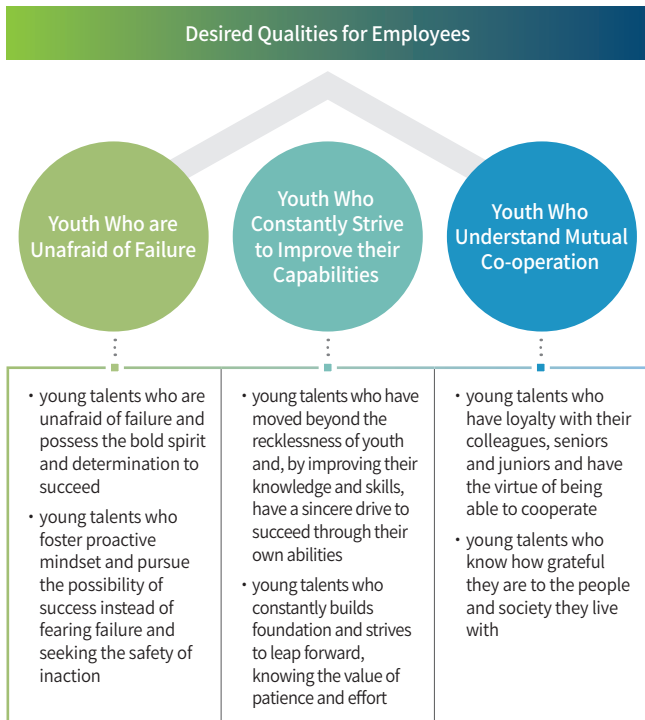


TOPIC 03

Employees

Talent Recruitment

Under the LOTTE Group recruitment slogan ‘Fair and Square,’ we recognize individuality and diversity, without discrimination on the basis of gender, academic background, disability, regional and national origins, etc. We hire outstanding talent on the basis of passion and capability through a fair and transparent process.



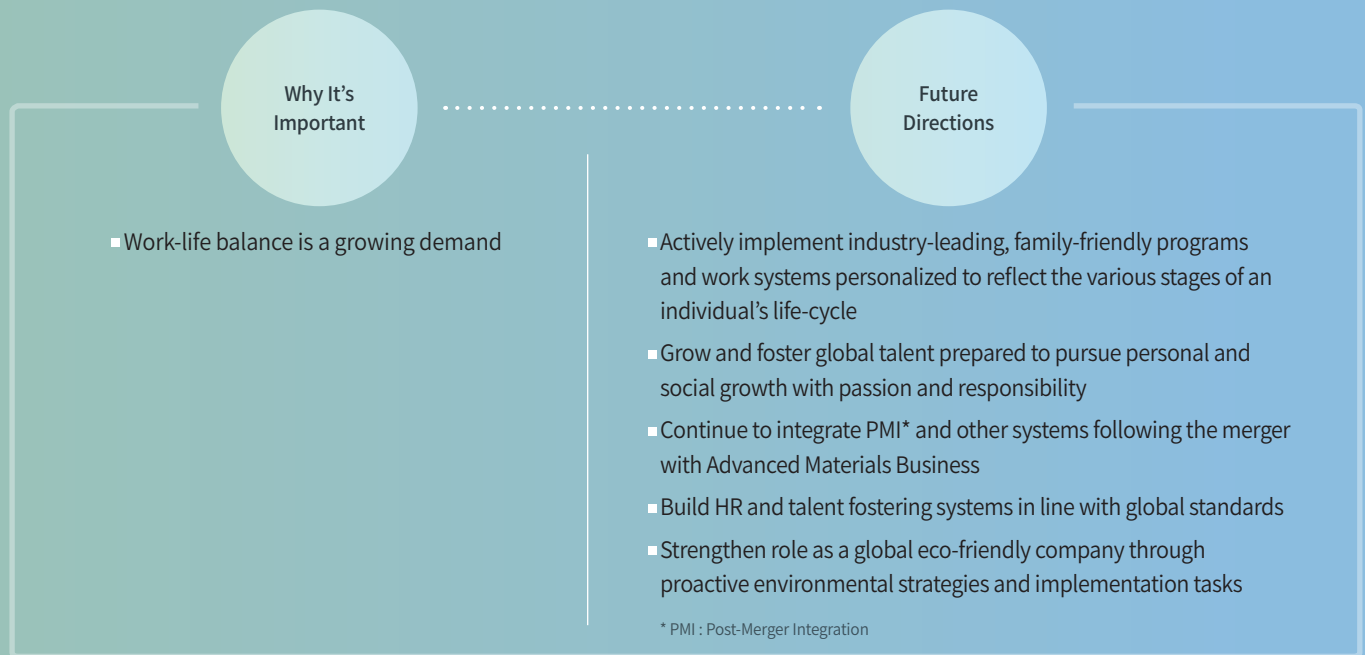
Hiring Talented Female Employees

LOTTE Chemical is implementing policies to enable female employees to balance work and family while managing their careers.

- Automatic childcare leave for female employees
- Infertility leave and support for infertility treatment expenses established in 2018

Hiring Outstanding Global Talent

- Since the establishment of a HR division at the R&D Center in 2015, we have focused on customized recruitment of outstanding R&D talent through diverse channels such as industry- academic partnerships, industry-academic scholarships and recruitment of overseas talent with doctorate degrees.



* For detailed figures on this section, refer to Appendix p.87-88.

Stimulating Corporate Culture

Capability-centered Talent Recruitment

- We operate a wide range of recruitment channels that include regular recruitment, 'SPEC-tackle,' recruitment for disabled applicants, female military officers and individuals who have made national contributions.



'SPEC-tackle' recruitment

Achieved Hiring Quota for Disabled Employees

- Developed and established jobs customized for disabled employees
- Achieved legally mandated quota in 2019 with a large increase in recruitment of disabled employees

Recruitment Rate of disabled employees*

Category	2017	2018	2019
Employment Rate (%)	1.54	1.55	3.05

*Duplicates included

LOTTE Chemical is making efforts in various areas to activate communication among our employees and invigorate our corporate culture.

Improving Communications and Organizational Culture

Individual Consulting Program for Career Development

- Supporting employee career planning through consultation system
- Available at all times not only for mid- to long-term career development but for work and personal difficulties as well
- Constant management of employee CDP to address difficulties in career development by planning education, training and departmental transfers

Program to Internalize Corporate Culture in Line with Organizational Growth

- Internalizing organizational vision and business status through CEO lectures, CEO letters, sharing sessions for company issues, etc.
- Organizing special guest lectures every month by inviting well-known speakers
- Regular publication and distribution of 'Communication Message,' a letter shared with all employees
- Creating a healthy organizational culture through annual workplace training on preventing sexual harassment and raising awareness of disability-related issues

'Boundless' Communication among Departments and Generations

- Reverse mentoring that pairs executives and employees from each division
- Continuous mentoring program to help new employees adapt to the organization

Win-Win Labor-Management Relations

Creative labor-management cultural events with the local communities

- Holding harmonious events for labor, management and local communities



Creative labor-management cultural events, together with the local community

Trust-based Employee Relations

- The Labor-Management Council serves as a consultative body for all management issues concerning the labor union and the company
- Communication programs operate through various channels such as the Site Operation Committee
- E-sports gatherings held for millennials
- Psychological consultations provided to shift workers
- The Grievance Committee, comprised of female attorneys, serves to address grievances such as sexual harassment
- Compliance reporting system 'Shinmungo' addresses workplace abuses and work violations

Fostering Talent

LOTTE Chemical is concentrating its efforts to strengthen the competitiveness of our human resources, which are the fundamental source of our company competitiveness.

Roadmap and Training System for Fostering Talent

	ASSOCIATE	SENIOR ASSOCIATE	MANAGER	SENIOR MANAGER	VICE PRESIDENT
General	Employee Communication Program		Safety Environment Training	Compliance Training	Information Protection Training
Rank-based Training	Introductory Education				Promoted Executive Course
	Promotion Qualification Education		Grade Essential Education		
			S grade Promotion Qualification Course		
Role-based Training	Accounting Academy				
	Chemical Engineering Academy				
	Sales Academy				
	R&D School (Polymer, Chemical School)				
	Job Expert Curriculum				
Fostering Talent /Global	Job License Acquisition Support				
	External Education for Improving Job Competency				
			EMBA Course External MBA Course/Graduate School of Professional Studies GLOBAL SCHOOL Local Expert		
	Overseas Exchange Work Program				

Rank-based Training



Newcomers	A program aimed at providing an understanding of the chemical industry through theory, practice and on-the-job training conducted over a period of four weeks, the longest in the industry
On-site Plant Workers	A job training school aimed at strengthening early-stage capabilities for newly hired specialist jobs by instilling an organizational mindset and an understanding of environmental and safety regulations
Management Leadership	Five sessions of leadership training for executives, general managers and leaders to promote an agile and integrated understanding of changes in the business environment

Role-based Training



Chemical Engineering Academy	Lectures on products and the production processes to improve employee understanding of the business
Sales Academy	Strengthening individual and organizational sales capabilities suited to the characteristics of the business
Accounting Academy	Newcomers are required to acquire a national accounting certificate after completion of onboard accounting training
Specialized Degrees and Certifications	Support for all training and training expenses of master-mechanic skills courses; tuition and admission fee support for researchers in doctorate and post-doctorate programs
External Partnerships for Outstanding Education	Partnerships with external organizations, such as Engineering Development Research Center (EDRC) and Chemical Market Research Inc. (CMRI)

Fostering Global Talent



Foreign Service Employee (FSE) Foster Program	Providing training on global leadership and culture to future FSEs, and creating a virtuous cycle of knowledge-sharing through returning FSEs who share their accumulated knowledge
Regional Expert Foster Program	Strengthening insight by dispatching key global talent to strategic business regions
Language Study Support System	A diverse range of support for training in 12 languages used in our strategic business regions
Talent Development at Overseas Subsidiaries	Training for employees of overseas subsidiaries to cultivate loyalty and reinforce management and talent development

Respect for Diversity

Since 2016, to respect diversity inside and outside of the company, LOTTE Chemical has operated an internal diversity committee.

Discrimination Ban and Human Rights Protection

- Respect for diversity of gender, culture, physical appearance, generations and others as part of the 'LOTTE Group Diversity Charter' established in 2013
- Strict ban on discrimination on the basis of gender, age, religion, disability status, race, educational background, region of origin, political preference, etc.
- Preventing unintentional human rights violations in advance
- Training provided on the prevention of sexual harassment and other human rights training

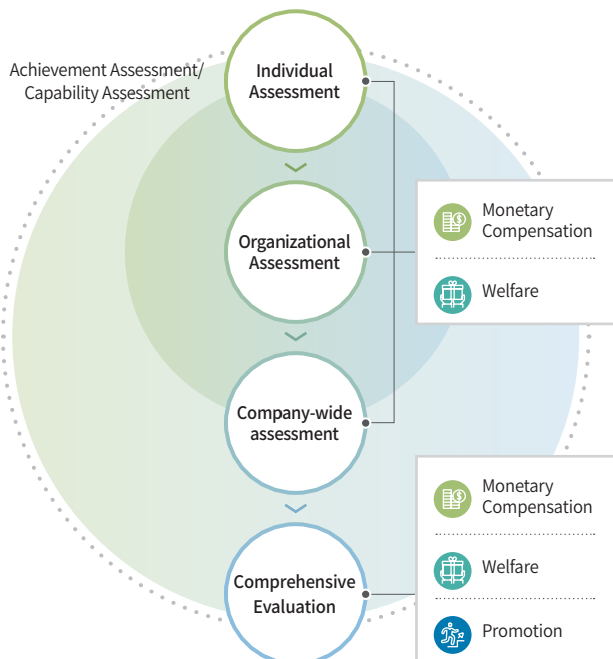
Prohibition of Child Labor and Forced Labor

- Child labor and forced labor are banned at LOTTE Chemical headquarters and all business sites
- Inspections are conducted every year to verify the absence of child labor and forced labor (2019 inspection found no instances of child labor or forced labor)

Performance Management and Welfare System

LOTTE Chemical operates a system of fair performance evaluations for all employees.

Employee Performance Evaluation Process



Performance Evaluation Feedback Process

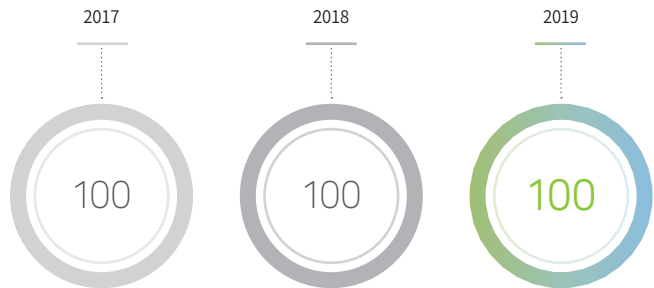
- After confirming the results of the personnel evaluation, the head of the department provides feedback in person.



Employees subject to periodic performance evaluations and career development assessment

Rate of employees to be evaluated

(Unit : %)



No. of employees to be evaluated

(Unit : Persons)



* Number subject to evaluation calculated according to different standard from previous year

Strengthening Welfare

- Creating a 'Great Work Place' (GWP) by giving fruit baskets as gifts to hospitalized employees to wish for their speedy recovery, 'welcome boxes' to new employees, encouragement for the children of employees when they take the college entrance exam, and encouragement for hard work in the heat of summer
- Providing general and specialized health check-ups not only for employees but also their families (spouses and parents), and comprehensive check-ups by outside institutions
- Helping employees manage and resolve their stress through a psychological counseling system
- Support for a wide range of more than 20 social groups for football, baseball and cultural experiences

Culture of Work-Life Balance

LOTTE Chemical recognizes the increasing demand for work-life balance and is working to build a corporate culture that balances our work and our lives.

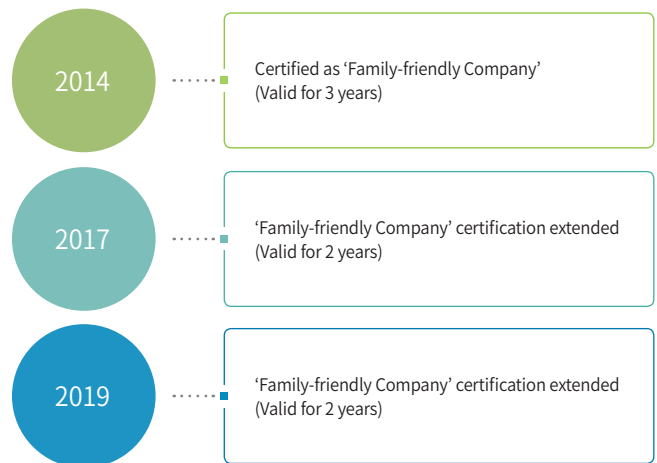
Work-Life Balance

- Proactively implemented a 'PC-off' system to improve work culture
- Instituted flexible and selective working systems to enable employees to schedule their own working hours
- Sabbatical Month System to enable newly promoted managerial employees to take a one-month leave of absence as an opportunity to carefully consider their new role inside the organization

Work-Family Balance

- Each worksite (headquarters, Yeosu, Daesan, R&D Center) operates a daycare center
- With mandatory childcare leave for male employees since 2017, they are entitled to take part in the childcare leave system (Leave taken by more than 85% of male employees with children from 2017 to 2019)
- Extended childcare leaves for female employees for a maximum of two years

Recertified as a 'Family-friendly Company' by Ministry of Gender Equality and Family



Expanding Family Participation Programs

- Organize a variety of family experience programs, such as company tours for children (LOTTE Family Day), invitational events for parents of new employees, cultural classes for spouses, school vacation experience activities for children, hobby-related classes, etc.



The 4th LOTTE Family Unity Event

- With the participation of some 8,000 employees from key affiliates and their families, various programs are held, including a baseball tournament, giveaway prize contest and a big concert

TOPIC 04

Customer Value

Raising Company Brand Value

LOTTE Chemical is engaged in a variety of activities to raise brand value. Advertisements can be found by searching ‘LOTTE Chemical ad’ on YouTube or by visiting the LOTTE Chemical homepage and navigating to the ‘PR’ section.

LOTTE Chemical TV Advertisements

2018 [Global Chemistry]

2019 [Think Chemistry, Move to the Future]

- 1 Philosophical Declaration : Enriching life through chemistry
- 2 New Resources : Finding the world’s future resources through chemistry



Philosophical Declaration



New Resources

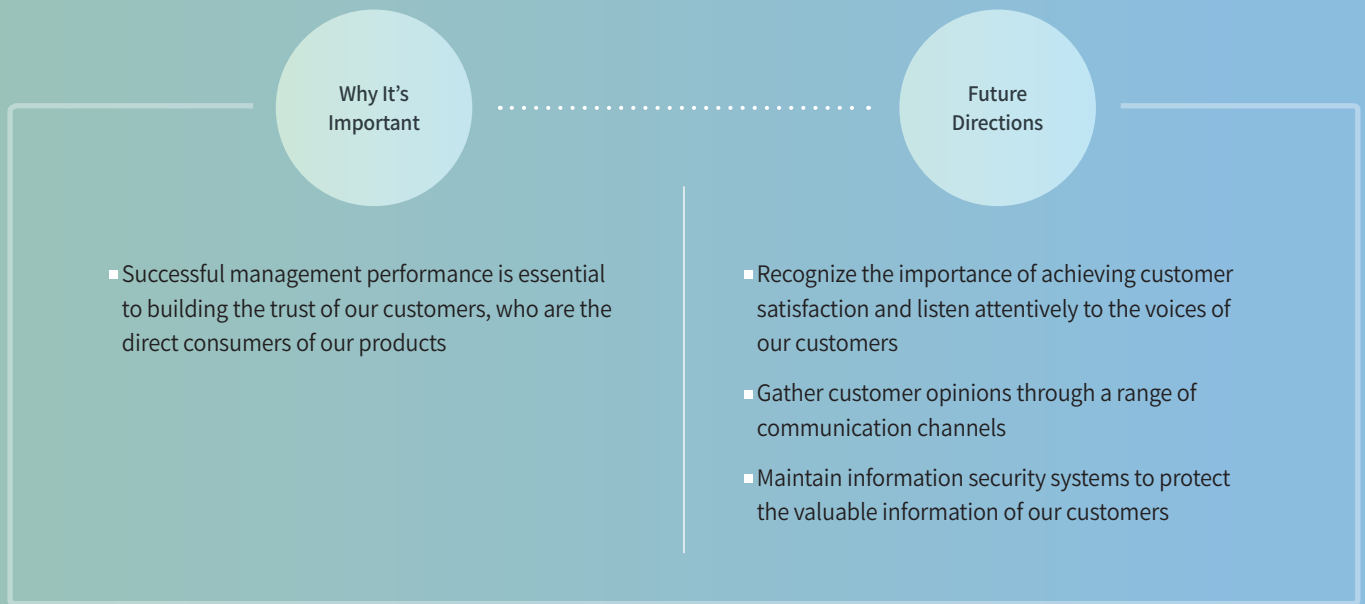
Print Advertisements

- Advertisements in newspapers and magazines have enabled us to effectively show our performance that we were not able to share in TV advertisements due to time limitations
- Print advertisements in key publications to inform the public of the successful completion of our plant in Louisiana, U.S. in May 2019

Digital Media Advertisements

- Produced “Think Chemistr-ee-hee-hee-hee” to promote “Think Chemistry” in an easy-to understand and entertaining manner
- Ads received around one million views within a month, with reviews calling them an easy and instructive introduction to chemistry, a field often considered difficult





* For detailed figures on this section, refer to Appendix p.88

Sports Marketing Sponsorship

- ▣ Advertising sponsorship for the LOTTE Giants, Korea's most popular sports team
- ▣ Sports marketing activities with key domestic and overseas pro golf competitions such as the LPGA LOTTE Championship and the LOTTE Rent-a-Car Women's Open, and the Kolon Marathon

Airport Advertisements

- ▣ Installed outdoor advertising on roads to and from overseas airports and at Korea's airports to raise global brand awareness
- ▣ Placed Company PR ads at Malaysia's Kuala Lumpur International Airport (LC Titan), Yeosu Airport (Yeosu plant), and Ulsan Airport (Ulsan plant)



Malaysia Outdoor PR

'CHINAPLAS 2019'

- ▣ Participated in the world's largest international plastics and rubber trade fair, CHINAPLAS 2019, in Guangzhou, Guangdong Province, China, from May 21 to May 24, 2019
- ▣ Promoted LOTTE Chemical's technological capabilities at an exhibition booth focusing on the latest material solutions for specialized industry fields



1 'L-STORY' ZONE
3 'LIFE&APPLIANCES' ZONE

2 'AUTOMOBILE' ZONE
4 'MEDICAL&INDUSTRY' ZONE

Customer Satisfaction Management

Our top priority at LOTTE Chemical is realizing value for our customers. To achieve this goal, we provide products and services that fulfill the customer's needs and are actively engaged in efforts for customer satisfaction.




Quality Management

To provide our outstanding customers with optimal products, LOTTE Chemical operates a proactive quality management throughout the production process and engages continuously in quality innovation activities.

CASE | Quality Improvement

Eco-friendly EPP Buoy


- Development of a new eco-friendly, shock-resistant EPP buoy as an alternative to EPS buoys, which have been a main cause of marine pollution
- Applications to marine structures and modular buoyant materials for solar energy generation are expected in the future



The Advanced Materials Business


Materials for energy-efficient refrigerators

- Development of cutting edge thin-film technology that provides value by enabling slim designs for sleek exteriors, reduced weight, improved productivity and cost reductions




Recycled PCM technology

- The world's first successful mass production of PCM and ABS alloy recycled plastic
- A highly eco-friendly material solution with outstanding impact resistance and stain resistance, and even coming in a variety of colors



Anti-bacterial material 'evermoin'

- Launched 'evermoin,' a material with outstanding anti-microbial effects with optimal functionality when used in indoor and outdoor environments
- A material that can be used anywhere, 'evermoin' is safe and retains its features without the need for additional care



Strengthening Information Protection

To maintain our competitiveness, LOTTE Chemical is doing its utmost to protect business secrets and personal information of our customers.

Information Security System

<h4>Administrative Security</h4> <ul style="list-style-type: none"> Definition and implementation of policy, standards, guidelines, and processes Establishment of a specialized team and managerial supervision of security Employee and consignee management/training 	<h4>Technical Management</h4> <ul style="list-style-type: none"> Introduction and operation of information security solutions Annual inspection of IT system through hacking simulation IT system emergency recovery management/training
<h4>Physical Security</h4> <ul style="list-style-type: none"> Operation and management of video information processing equipment Facility and equipment surveillance and control Restriction of access to unauthorized persons 	<h4>Personal Information Protection</h4> <ul style="list-style-type: none"> Management of personal information life cycle Processing of personal information encryption Security management of personal information processing systems

Raising Information Protection Standards

- Obtained certification in 2015 from the International Organization for Standardization (ISO) for our information security management system (ISO 27001) and have since maintained the certification
- Preventing information security incidents by providing regular training to employees and partner companies on security compliance and sharing information protection-related issues
- One training session per quarter on information protection through e-mail
- Established systems to enable swift and accurate responses to information security issues with the implementation of the LOTTE Group control center system



TOPIC 05

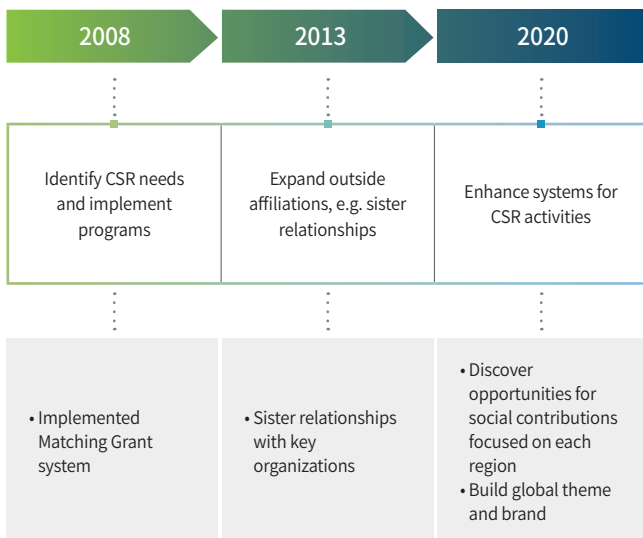
Social Contributions



Social Contributions

To become a company that prospers and develops together with local communities, LOTTE Chemical has implemented a system of strategic social contributions and is engaged in related activities throughout the company. Through active social contributions at headquarters and at each domestic and overseas business site, we aim to build close relationships with local communities.

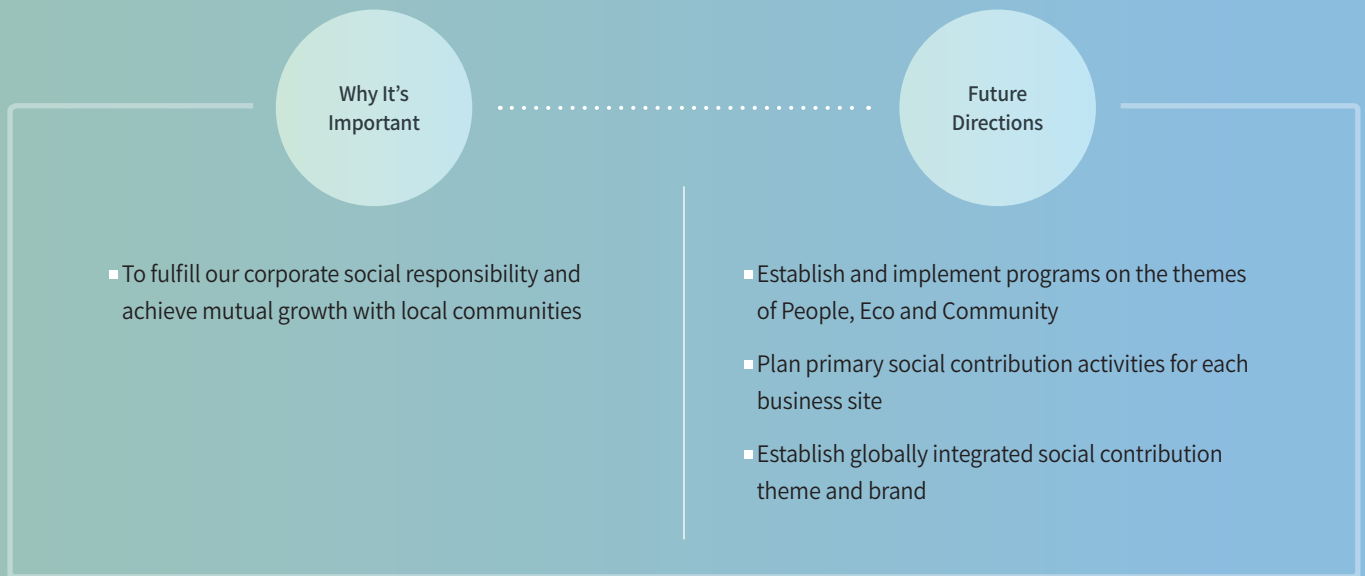
Social Contribution Road Map



Social Contribution Program

LOTTE Chemical is engaged in social contribution activities that are practical, held on a regular basis, and centered on the following three themes - People, Eco and Community. The ultimate goal is to achieve qualitative growth in terms of Creating Social Value in which the value generated by the company is shared with society.





* For detailed figures on this section, refer to Appendix p.90

Matching Grants

To promote strategic social contribution activities, LOTTE Chemical has been operating a Matching Grant system since 2008. Through the Matching Grant system, the company matches 100% of employee donations. The funds collected through the system are used in a variety of ways for social contributions of each region's business sites.



Charlotte Volunteer Group

The Charlotte Volunteer Group, since 2015, has unified the volunteer groups organized by each business site, and encouraged the voluntary participation of employees. As a friendly companion for local communities, the Group not only promotes active social contributions, but provides a place for employees to gather and engage in a wide variety of activities. As such, it has served as a channel for establishing a creative labor-management culture.

Activities by Charlotte Volunteer Group

Item	Unit	2017	2018	2019
No. of participants	Persons	2,248	2,330	1,963
Participation hours	Hours	14,800	15,476	10,478
Average participation hours per person	Hours	6.58	6.64	5.34

* Includes duplicate participation



Social Contribution Activities by Theme



To build a happy society, LOTTE Chemical is engaged in a variety of activities for people, especially children, youth and women.

Music Therapy at Bobath Children's Hospital (Rehabilitation)

- Sponsored music therapy for 3,000 children with incurable diseases, 256 caretakers, 135 of their siblings, etc
- Treatment for disabled children, and mental well-being and stress reduction for parents

Healing Time for Single Parent Families

- Sponsoring family camps and concerts for 100 single parent (mother) families
- Opportunities for mothers to bond with their children while enjoying culture

Supporting the Right to Education

- Providing KRW 9 million worth of basic science books every month to Daejeon area schools
- Scholarships, school uniform funds for the underprivileged



As an environment-friendly company, LOTTE Chemical considers the environment to be vital and pays careful attention to environmental and safety management.

A Pilot Project on Creating a Virtuous Cycle of Resources

- Improving plastic waste disposal culture and creating a circular economy
- Establishing a system for recovering PET plastic bottles and producing recyclable goods

Environmental Clean-up Activities

- Participating in "1 Company 1 River Clean-up" campaign
- Cleaning up beaches, parks, forests, etc. near our business sites

Fire Safety Promotion Activities

- Providing fire extinguishers and smoke detectors to reduce damage from house fires
- Sponsoring invitational concert for 1,500 firefighters and their families

CASE | Project LOOP

To improve our plastic waste disposal culture and build a circular economic system for plastic waste, LOTTE Chemical is carrying out a pilot program called 'Project LOOP.' As part of the project, we have installed an AI-based PET bottle automatic disposal device called 'Nephron' at six locations, including LOTTE World Mall and LOTTE World. The discarded PET bottles will be used as materials to make eco-friendly products such as clothing, bags and shoes.





In order to be a company that grows together with local communities, LOTTE Chemical is planning and organizing a variety of social contribution activities.

Support for Economic Self-reliance

- Providing monthly food trucks and side dishes to the underprivileged
- Providing daily necessities to home-bound elderly people, North Korean defectors and families of veterans and patriots
- Paying boiler fees for multicultural households and the disabled
- Providing 'Cool Box' care packages every year to 800 low-income households for the summer heatwaves (summer survival products)
- Home repairs for seniors living alone and the disabled

Support for the Self-reliance of Local Facilities

- Providing operating expenses for welfare centers, care facilities, orphanages, etc.
- Facility volunteering by employees from each business site



We are engaged in specialized social contribution activities at our overseas business sites to provide their communities with practical assistance.

LC Titan

- Scholarships for 109 low-income students, internship support
- Setting up recycle bins at schools to recover old appliances and electronics
- Planted and donated 25,000 trees
- Providing food and gifts after Ramadan

LC Pakistan

- Scholarships for NED University of Engineering & Technology (15 students a year)
- Support for non-profit groups operating schools in underdeveloped regions
- Tree-planting for Earth Day and environmental art contest for children
- Support for ambulance purchases at The Indus Hospital
- Founded EYE CAMP and provided support for eye exams

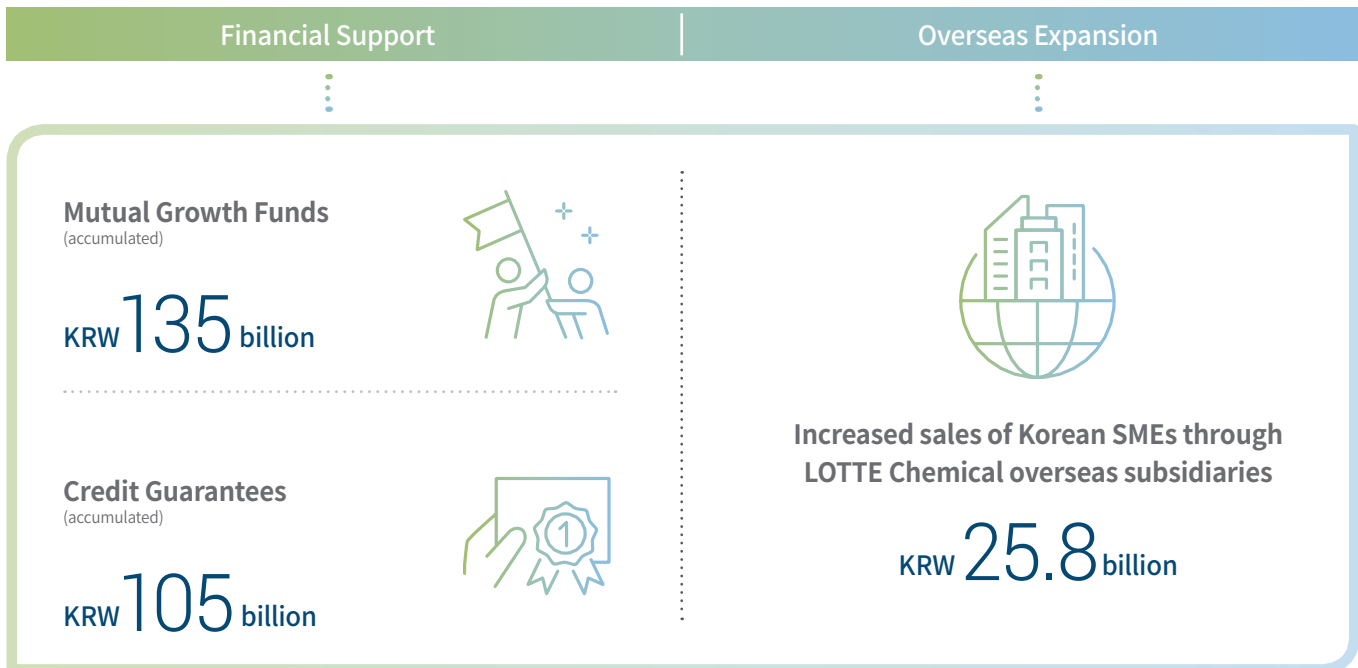


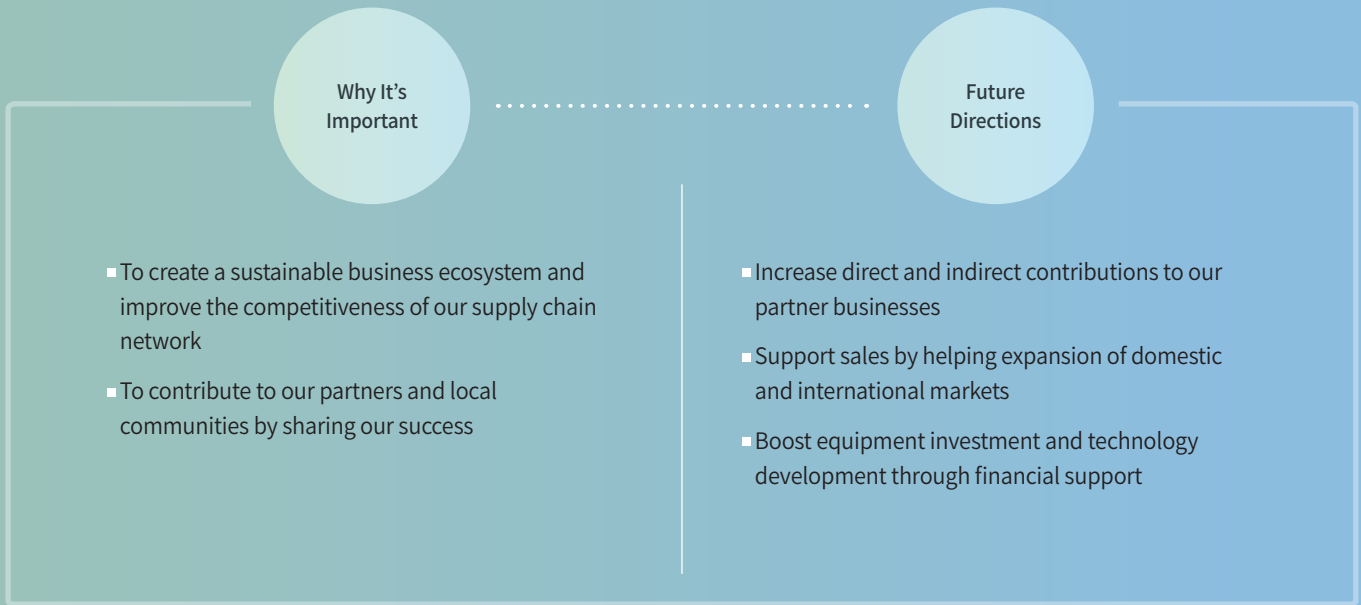
TOPIC
06

Mutual Growth

2019 Mutual Growth Highlights

LOTTE Chemical has been supporting the growth and development of our partners in a variety of ways, including financially and technologically, and also helping them raise their competitiveness and expand overseas. Moreover, we have established various two-way communication channels to improve our relationships and trust, and to create a win-win culture of cooperation.





* For detailed figures on this section, refer to Appendix p.90

Strengthening Partner Competitiveness	Technological Support
<p>Expanding sustainable management</p> <p style="font-size: 2em; font-weight: bold;">30</p> <p>companies</p>	<p>Joint technology development</p> <p style="font-size: 2em; font-weight: bold;">22</p> <p>cases</p>
<p>Innovation partnerships</p> <p style="font-size: 2em; font-weight: bold;">6</p> <p>companies</p>	<p>Analysis of material properties</p> <p style="font-size: 2em; font-weight: bold;">1,517</p> <p>cases</p>
<p>Safety assessments</p> <p style="font-size: 2em; font-weight: bold;">15</p> <p>companies</p>	<p>Dispatch of researchers</p> <p style="font-size: 2em; font-weight: bold;">114</p> <p>researchers</p>

Mutual Growth Policies and Programs

LOTTE Chemical operates practical mutual growth programs aimed at strengthening win-win cooperation with our partners and reinforcing a virtuous cycle of business. We want to develop long-lasting partnerships through the help of various support programs, such as financial support, technical cooperation, consulting, as well as training and enhanced communication, which strengthen our partners' capabilities and create a sound business environment.

Mutual Growth Implementation System

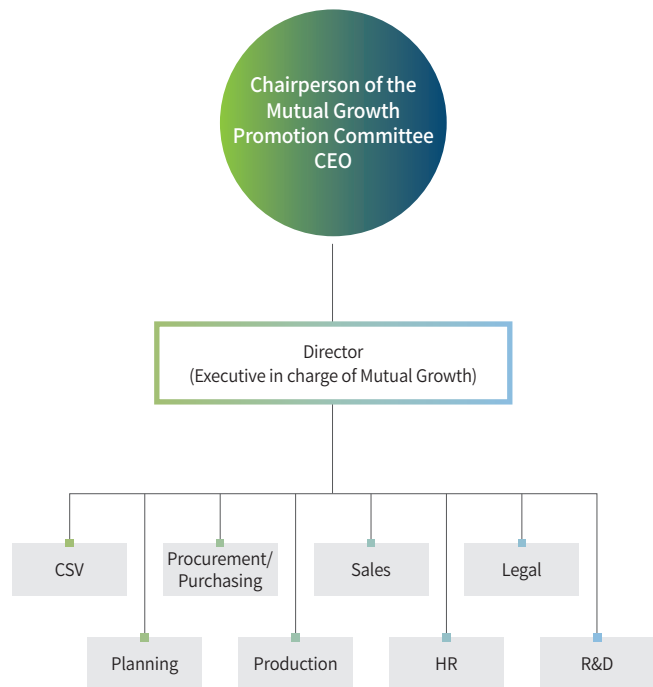
LOTTE Chemical has established a three-part system to ensure communication, win-win cooperation and fair trade with our partners. A mutual growth KPI has also been included in our executive evaluations as means to stimulate a win-win cooperation with our partners.



Mutual Growth Promotion Committee

LOTTE Chemical has been operating an 'Mutual Growth Promotion Committee' since 2011 in order to systematically implement our strategy for mutual growth.

With the CEO as chairperson, the office plans and implements systematic strategies for mutual growth while continuously monitoring key results and finding ways to make improvements.

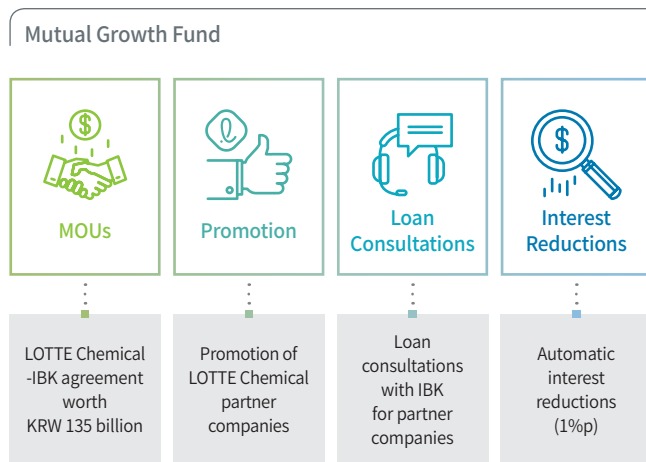


Technological Support

- Joint research projects on a variety of subjects are carried out to strengthen the technological competitiveness of our partners, including product development and process enhancement
- Our own research facilities are used to provide material analysis on substances requested by partners
- Our expert dispatching system enables partners to improve the quality of their products

Financial Support

- A mutual growth fund, in operation since 2010 and worth KRW 135 billion, provides low-interest loans to SME partners at rates 1.0%p lower than the market rate
- Guarantee fund in 5 stages since 2008 have secured around KRW 105 billion in credit



Active Communication

- Annual meetings with our purchasing partners to strengthen cooperation and resolve issues through communication
- In 2019, a biannual meeting was held with regional partners, which included an awards ceremony and opportunities for cooperation through active communication
- CEO visits and face-to-face talks twice a year for key partners



Strengthening Competitiveness of Partners

- Expanding our Corporate Social Responsibility (CSR) activities to improve the sustainability standards of our partners
- Enhancing the competitiveness of our partners by operating a consulting support program in which partners can freely choose the sector and organization from which they require consulting
- Heightening the safety management standards of our partners by encouraging partners to acquire the ISO 45001 (Health and Safety Management System) certification
- Partners can participate in a system in which outside experts are provided to evaluate their working environment

CASE | Increasing Sustainable Management Efforts

In collaboration with the National Commission for Corporate Partnership and the Ministry of SMEs and Startups, and taking into account global CSR standards and domestic regulations, we have established the 'LOTTE Chemical Partner Sustainable Management Guidelines.' These are not only for the producers of end products, but the whole company supply chain, so that we actively and widely ensure social responsibility in all areas, including labor, environment, human rights, safety and ethical standards. These guidelines provide detailed information on key CSR areas, including how to meet global management standards, as well as domestic regulations and restrictions. Experts are also sent to carry out on-site evaluation and coaching at partner companies, as well as resolve any potential risks.

Performance

Education support

71 companies



Self-evaluation support

43 companies



Compliance rate increase for 30 companies

42.4%

Reduced fines and penalties

KRW 5,129 million



TOPIC 07

New Business Highlights

Overseas Business

U.S. Louisiana Ethane Cracker and Ethylene Glycol Business

- Ethane is refined from shale gas at this site to produce 1 million tons of ethylene, a key raw material for petrochemicals, as well as 700,000 tons of ethylene glycol (EG)
- Mechanical completion achieved in late 2018
- Completion ceremony held in May 2019 ■ U.S.
- Commercial production began in the second half of 2019

Indonesia petrochemical complex construction site ✓



^ U.S., ethane cracker and ethylene glycol plant

Indonesia Petrochemical Complex Construction

- In Banten, Indonesia, a petrochemical complex worth KRW 5 trillion is under construction, with a capacity to produce 1 million tons of ethylene and other downstream products
- By providing the ability to ensure our own raw materials for our 450,000 ton PE plant in Indonesia, we aim to increase profitability and become a leader in the Indonesian market
- Groundbreaking ceremony held in December 2018
- Mechanical completion scheduled for 2023

■ Indonesia



The Advanced Materials Business

■ Hungary



Turkey – acquisition of Belenco ^

Turkey – Acquisition of Belenco

- In March 2019, LOTTE acquired a 72.5% stake in Belenco, Turkey's market leader in engineered stone
- By acquiring a company that produces 230,000 pieces of engineered stone annually in its two production lines, we have secured a bridgehead to enter the fast-growing luxury interior materials market in developed countries such as the U.S.
- Investment has been made to add a production line that will produce 120,000 pieces of engineered stone annually, from which commercial production is expected to start in the latter half of 2020

■ Turkey

■ China

Construction and Expansion of Overseas Compound Plants

- In January 2019, additional EP equipment was supplied to our plants in Hungary and China (Dongguan), and production was increased by 65,000 tons
- A new compound plant with an annual production capacity of 27,000 tons was established in the Bawal region of India, and we plan to begin mass production by the second half of 2020 to lead the market in Southwest Asia

Construction and expansion of overseas compound plants v



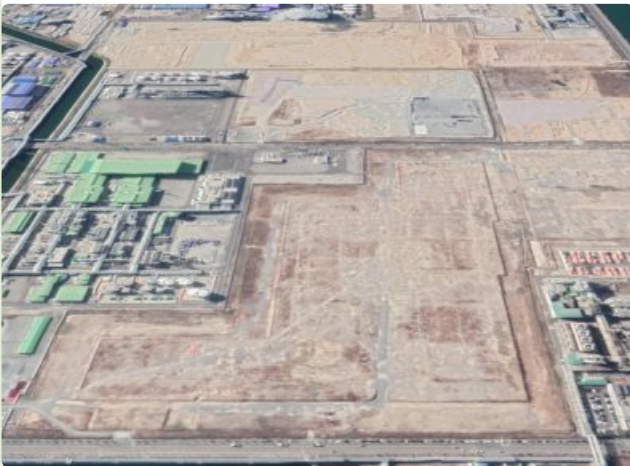
■ India

Domestic Business

Petroleum joint ventures for heavy feed naphtha cracking facilities

- In this large-scale business that produces 850,000 tons of polyethylene and 500,000 tons of polypropylene, we use desulfurized heavy crude oil, a by-product from our refineries, as raw material for cracking, which helps improve production cost competitiveness compared to naphtha-based cracking
- In May 2018, we signed an investment agreement for a petrochemical joint venture with Hyundai Oilbank
- In February 2019, an agreement was reached on the size and structure of the joint venture with Hyundai Oilbank
- Construction to be completed in second half of 2021

Site for establishment of LOTTE GS Chemical ✓



✓ Petroleum, heavy oil and naphtha cracking facility joint venture

Establishment of LOTTE GS Chemical

- A new facility worth KRW 800 billion, with an annual production capacity of 200,000 tons of BPA and 210,000 tons of C4 petrochemical products, is scheduled to be completed by 2023
- In February 2020, a joint venture was established with GS Energy to produce Bisphenol-A (BPA) and C4 petrochemical products
- Through this venture, we expect to secure an improve our price competitiveness for PC products and expand our C4 petrochemical products business
- Expected to contribute 7,700 jobs directly and indirectly to the local economy

✓ Yeosu EOA plant expansion site

Yeosu EOA Plant Expansion

- A new expansion is under construction at the Yeosu plant that will produce 100,000 tons of EOA (Ethylene Oxide Adducts) and 100,000 tons of HPEO, a raw material for EOA
- We expect a steady growth in earnings by expanding our EOA business, which offers stable returns from EO (Ethylene Oxide) derivatives
- Completion of expansion scheduled for the second half of 2020



Yeosu PC plant ✓



Yeosu PC Plant Expansion

- A new 110,000-ton polycarbonate (PC) production line has been established at the Yeosu plant
- Commercial production began after construction was completed in the second half of 2019
- Along with the acquisition of Advanced Materials Business, this expansion increases PC production capacity to 460,000 tons and makes LOTTE Chemical world's third-largest PC production company

Ulsan Meta-Xylene Plant Expansion

- In November 2019, the construction of a MeX (Meta-Xylene) production facility with an annual production capacity of 200,000 tons was completed at the Ulsan plant in order to safely produce raw materials for PIA (Purified Isophthalic Acid)
- Through this investment, annual production capacity for MeX has increased to 360,000 tons, creating a stable supply of raw materials for high-value PIA



Ulsan Meta-Xylene plant ✓

Ulsan PIA Production Facility Expansion

- To strengthen business competitiveness and profitability, we are considering the construction of new facilities to increase production of PIA (Purified Isophthalic Acid) at the Ulsan plant
- Currently 460,000 tons is produced annually, but we expect production to increase to 840,000 tons after the expansion
- The planned facility will also be able to switch production to regular PTA (Purified Terephthalic Acid)
- Construction expected to be completed in the first half of 2020
- PIA production scheduled to begin in the second half of 2020, and an improvement in earnings is expected

✓ Ulsan PIA plant



TOPIC 08

R&D Highlights

LOTTE Chemical R&D Center

We are striving to secure original technology and develop high value-added products to continue our competitive advantage in existing business areas, and we are expanding research personnel and investment to create future businesses. We will continue to grow and contribute to becoming a Global Top 7 Chemical Company through solid vision.

Year of establishment

1986

Location

Daejeon, Seoul

Ratio of female researchers

29.3%

(As of December 2019)

Providing convenience to our customers' lives



Through research and development into a wide range of products, from daily necessities to industry, medical products and cutting-edge materials, we aim to enrich people's everyday lives.

Strengthening industry infrastructure



We are actively engaged in research to improve performance and develop new materials, which are utilized in various businesses, including automobile parts and electronics.

Creating added value



We consistently provide products that fulfill customer needs and create added value by developing new applications and providing technological support.

Developing eco-friendly technology

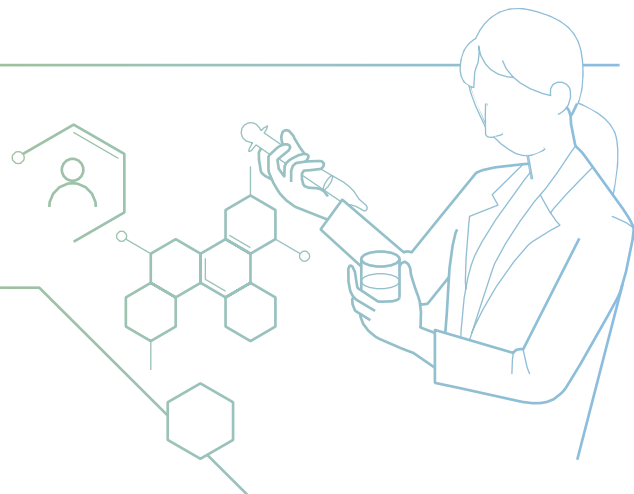
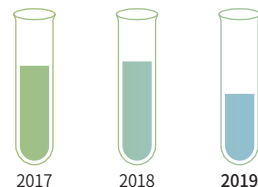


By committing fully to an eco-friendly business, we actively seek to create shared value, through which both businesses and society can grow together.

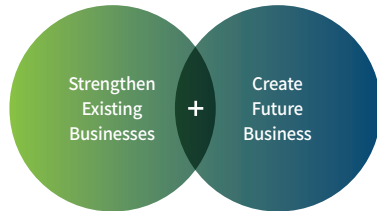
R&D Status

R&D Costs
(Unit : KRW million)

91,748 92,367 84,575



R&D Center Vision



No. 1 Products, No. 1 Technologies, No. 1 Experts Identify promising future businesses and commercialize early

Vision-oriented R&D Center for Competitive Advantage & Sustainable Growth



Global Top 7 Chemical Company

Polyolefin

HDPE, LDPE, LLDPE, EVA, PP



We are conducting research on Polyolefin resin, a representative plastic polymer resin widely used around our lives as automobiles, home appliances, film, packaging and household goods.

Monomer

EO, EG, PIA



In terms of monomer research, we are focusing on developing new products and new processes in the fields of olefins, aromatics and EO derivatives.

Performance materials

LFT, HMSPP, TPO, EPP, TPV



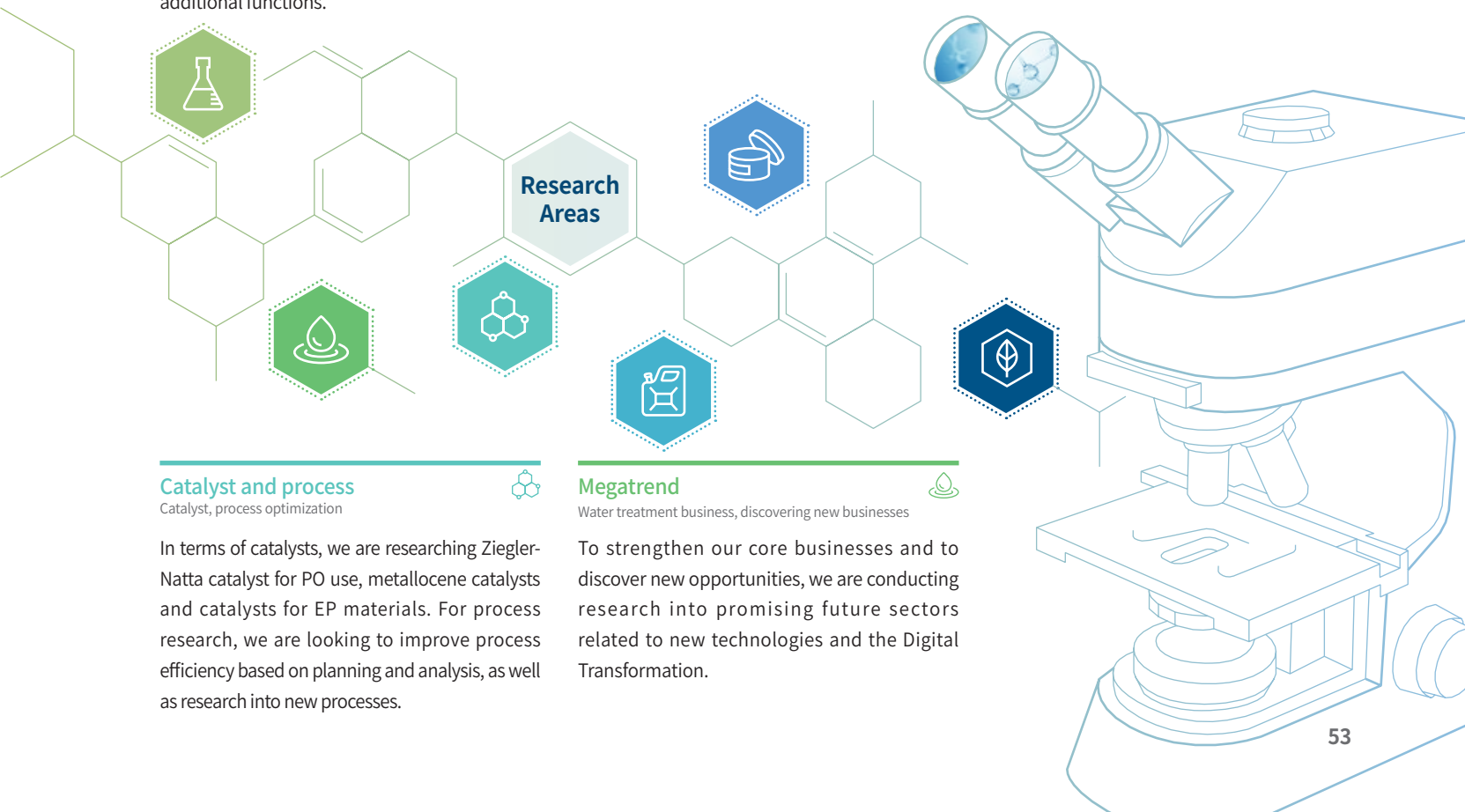
Based on the reactive extrusion process technology, polymer composite manufacturing technology and foam technology, we are developing performance materials that have additional functions.

Engineering plastic

PET, PC, PC Compounds



We are developing engineering plastic material with sufficient heat resistance and impact resistance to be used as a substitute for metal.



Catalyst and process

Catalyst, process optimization



In terms of catalysts, we are researching Ziegler-Natta catalyst for PO use, metallocene catalysts and catalysts for EP materials. For process research, we are looking to improve process efficiency based on planning and analysis, as well as research into new processes.

Megatrend

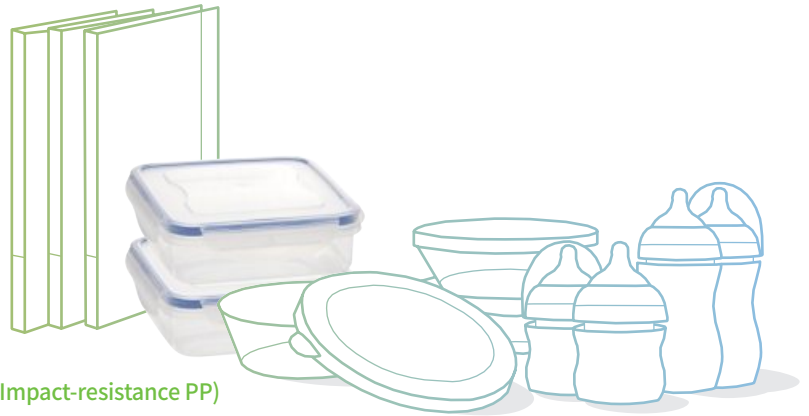
Water treatment business, discovering new businesses



To strengthen our core businesses and to discover new opportunities, we are conducting research into promising future sectors related to new technologies and the Digital Transformation.

2019 R&D Performance Portfolio

Based on our advanced technological capabilities and outstanding quality, LOTTE Chemical has been recognized for excellence in the global market, and we will continue to explore new growth businesses. We have successfully developed high-value products and lightweight automobile products, and through the development of new eco-friendly, cutting-edge materials, we have also received certification and awards from external organizations.



TIPP (Transparent Impact-resistance PP)

- TIPP (Transparent Impact-resistance PP), a plastic material that we developed, has greater impact resistance and transparency than regular PP (Polypropylene)
- We successfully mass produced TIPP to be used in a variety of products, from everyday goods to medical materials, and have expanded production volume of this high-value product

▲ TIPP
 (Transparent
 Impact-resistance
 PP)



LFT (Long Fiber Thermoplastic) Injection Molded Back-beams for Automobiles

◀ LFT injection molded back-beam
Weight : 2.22kg

- Parts integration
- 45% reduction in weight

- LFT is a lightweight material that weighs 20-30% less than metals, and is considered to be a lightweight substitute for metals due to its exceptional quality and dimensional stability
- We are the first in Korea to successfully develop a LFT stiffener that can be produced by injection molding, and through parts integration, we can create stiffeners that are 45% lighter than regular steel stiffeners

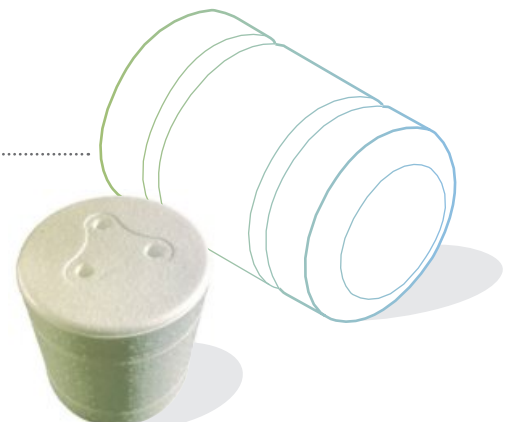
Water Treatment Business

- We began water business-related research and development in 2011, and developed a membrane that can filter the smallest particles found in water
- In 2018, at the Korea Water Cluster in the Daegu National Industrial Complex, we completed construction of a production plant for this membrane to be used in water purification and wastewater management, and began its full commercialization
- We are currently researching ways to make use of this membrane to positively impact the environment

Foam Research (EPP)

- EPP (Expanded Polypropylene) : Replacing the EPS buoys that have been identified as a major cause of marine plastic pollution through continuous development of eco-friendly lightweight materials
- The buoys have received eco-friendly certification, as well as certification by the Ministry of Maritime Affairs and Fisheries for new technologies
- We also established a cycle of eco-friendly practices through various shared growth programs, such as providing technological support to EPS products makers so that they can adopt HRF (High Resilience Foam)

Eco-friendly >
 EPP buoy

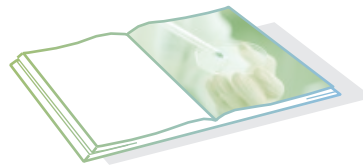


The Advanced Materials Business

World's first phosphorus-nitrogen flame retardant solution

- Developed technology to produce raw materials for phosphorus-nitrogen flame retardants that are environmentally friendly and harmless to humans, but still retain exceptional flame retardant properties
- Through this breakthrough, we are seeking to increase the overall quality and market size of flame retardant products

Phosphorus-Nitrogen > Low Smoke Flame Retardant



Materials for use in NSF*-accredited water purifier filters

- Developed the world's first ABS material with high-quality properties, such as impact resistance and fluidity, that also meets the NSF standards that were raised in 2019

UF (Ultra filtration) > Filter

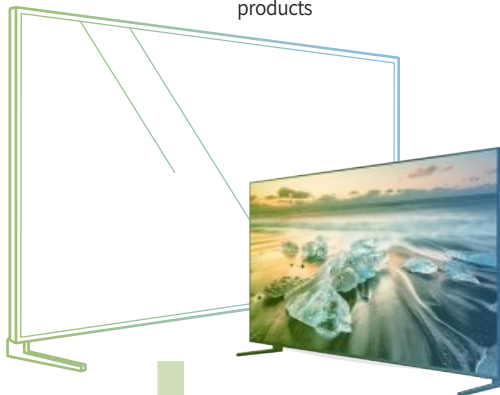


* NSF : National Sanitation Foundation

High-quality PC*/ABS/MF surface materials for use in TVs**

- Introduced industry-leading quality in our high-impact resistant and high-quality PC/ABS/MF surface materials for use in large displays
- By controlling and optimizing the flow of resins inside different molds, and suppressing the occurrence of gas and gate marks that are a characteristic of mineral fillers, we developed high-quality surfaces that will lead the market for TV materials in terms of technology and quality

* PC : Polycarbonate
** ABS : Acrylonitrile Butadiene Styrene

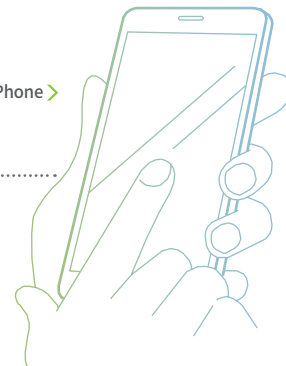


Q-LED, UHD, HD TV >

Glasstic PC material as substitute for Exterior Glass of Mobile Phones

- Developed a high-quality glass substitute that increases communication capabilities and enables design variations

Mobile Phone >

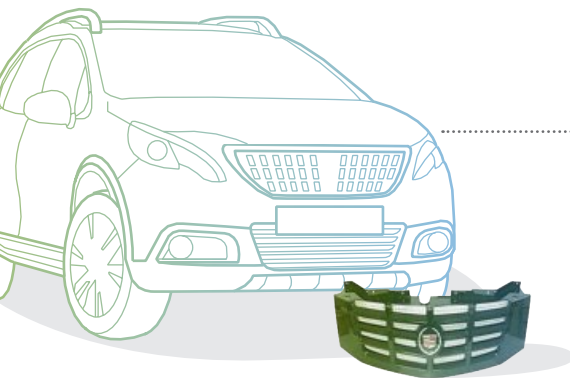


ASA* for high-quality, waterproof automobile surfaces

- By developing ASA with high waterproofing properties and outstanding surface characteristics, we can provide exceptional quality even in large or high-gloss parts

* ASA : Acrylonitrile Styrene Acrylate

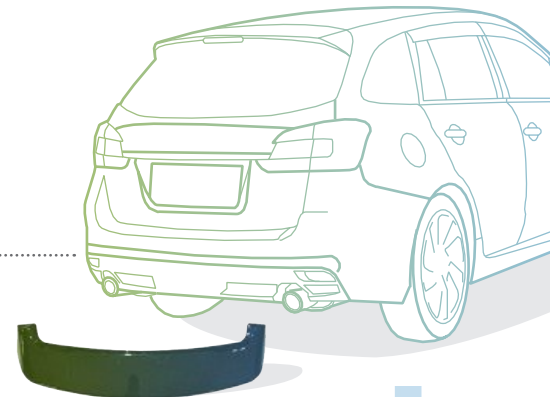
> Automobile Spoiler



Automobile Radiator Grille >

High heat-resistant blow molding for automobiles

- By developing materials optimized for blow molding production with high formability, surface quality and recycle stability, we have successfully entered new markets







ESG FACTBOOK

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Governance

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Compliance

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Ethical Management

P. 64
Risk Management

P. 66
Stakeholder Engagement

■ Governance

Compliance
Ethical Management
Risk Management
Stakeholder Engagement

Governance

The establishment and operation of a sound, and transparent corporate governance is one of the essential requirements for building a strong company. Through its advanced Board of Directors operating system, LOTTE Chemical aims to ensure that the interests of various stakeholders are considered in decision-making.

Board of Directors (BOD)

Name	Gender	Position	Initial date of appointment	Title and experience
Shin Dong-bin	Male	Chairman & CEO	2004.05.28	Current) Chairman of LOTTE Group
Kim Gyo-hyun	Male	President & CEO, Chairman of BOD	2017.03.24	Current) CEO of LOTTE Chemical and Head of Chemical Business Unit Current) Chairman of Board of Directors of LOTTE Chemical Former) CEO of LC Titan
Lim Byung-yun	Male	Vice-President & CEO	2019.03.27	Current) CEO of LOTTE Chemical Basic Chemicals Business Former) Director of Value Management Division, LOTTE Corporation
Lee Young-jun	Male	CEO	2020.03.25	Current) CEO of LOTTE Chemical Advanced Materials Business Former) Head of PC Business Department, LOTTE Advanced Materials
Oh Sung-yup (General Management)	Male	Non-Executive Director	2020.03.25	Current) Director of Communication Division, LOTTE Corporation Former) CEO of LOTTE Fine Chemical
Park Kyung-hee (Finance)	Female	Outside Director, Chairman of the Audit Committee Member	2015.03.20	Current) Professor of Business Administration, Ewha Womans University
Lee Geum-ro (Legal)	Male	Outside Director	2020.03.25	Current) Representative Lawyer of Law Firm, Sol Former) Chief Prosecutor, Daejeon High Prosecutor's Office and Suwon High Prosecutor's Office
Jeon Woon-bae (Labor)	Male	Outside Director	2020.03.25	Current) Advisor of Law Firm, Lee&Ko Former) Director of Employment and Labor Training, Korea University of Technology and Education
Kang Jeong-won (Chemical)	Male	Outside Director	2020.03.25	Current) Professor of Department of Chemical and Biological Engineering Current) Chairman of Korea Association of Laboratory Safety&Environment Former) Vice Chairman of The Korean Institute of Chemical Engineers
Choi Hyon-min (Tax)	Male	Outside Director, Audit Committee Member	2020.03.25	Current) Representative Tax Accountant of Tax Corporation Dasol Leaders Former) Director of Busan Regional Tax Office
Jeong Joong-weon (Fair Trade)	Male		2020.03.25	Current) Advisor of Law Firm, Bae Kim & Lee Former) Outside Director of LOTTE Insurance

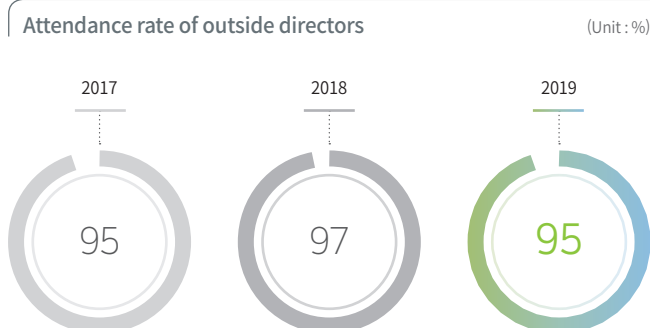
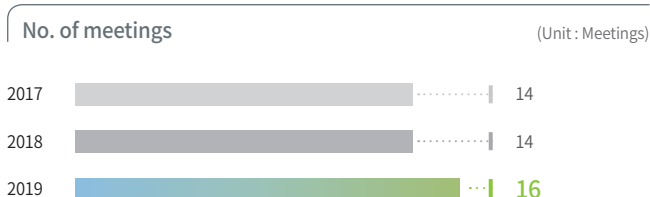
(As of the end of March, 2020)

Ensuring BOD Diversity and Independence

- Board members are selected according to internal regulations, which are based on the application of relevant laws and ordinances, such as the Commercial Act
- Inside directors are appointed upon the recommendation of the Board of Directors at the general shareholders' meeting, and outside directors are selected by the Outside Director Candidate Recommendation Committee according to the 'Diversity Policy' and careful review of the candidates' expertise
- To maintain a sound governance structure, the ratio of outside directors on the Board is set at 50% and above (currently six out of eleven directors)
- Using their diverse backgrounds and expertise, outside directors conduct in-house reviews on agendas brought up by Board members, as well carry out effective monitoring of the management's performance
- At least one position is reserved for a female outside director to reflect opinions on diversity policies and other related matters





BOD Operation

In 2019, the BOD held sixteen meetings, while subcommittees, including the Audit Committee, met four times. This enabled us to review pending issues in a thorough and careful manner.



Strengthening BOD Expertise

- Comprehension of the company's management situation is increased through regular visits to domestic and international business locations, and through internal training
- Important situations that could influence the company's sustainable management efforts in the economic, social and environmental sectors are regularly reported to the Board
- Under the Board, four expert subcommittees (Outside Director Candidate Recommendation Committee, Transparent Management Committee, Audit Committee, Compensation Committee) are operating to strengthen expertise and improve efficiency

Subcommittee	Name & Member	Objectives and Rights
 Outside Director Candidate Recommendation Committee	Lim Byung-yun Inside Director Lee Geum-ro Outside Director Choi Hyon-min Outside Director	Recommend outside director candidates
 Transparent Management Committee	Park Kyung-hee Outside Director Lee Geum-ro Outside Director Jeong Joong-weon Outside Director	Review and propose changes to internal transactions and private contracts over a certain size
 Audit Committee	Park Kyung-hee Outside Director Choi Hyon-min Outside Director Jeong Joong-weon Outside Director	Audit company accounting and business
 Compensation Committee	Oh Sung-yup Outside Director Jeon Woon-bae Outside Director Kang Jeong-won Outside Director	Review and propose changes regarding director compensation

(As end of March, 2020)

Audit Committee

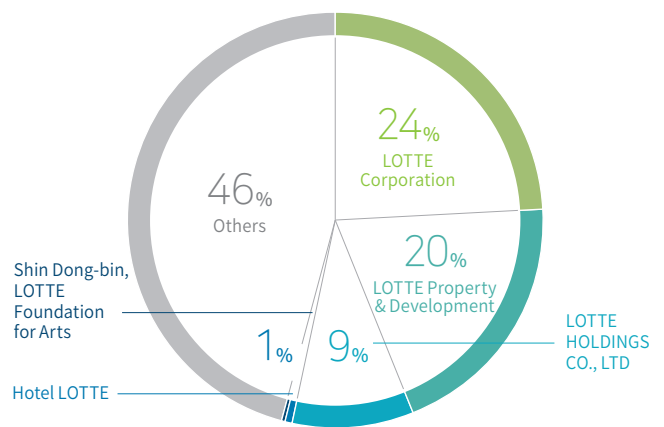
- All Audit Committee members are outside directors elected at the general shareholders' meeting
- To guarantee their independence, the tenure of the Audit Committee members is designated by the Articles of Incorporation
- The purpose of the committee is to fundamentally prevent risks arising from conflicts of interest by carrying out preemptive audits, which cover everything from the initial decision-making process to operational execution

Performance Evaluation and Compensation

In 2019, LOTTE Chemical established a Compensation Committee to ensure transparency and impartiality in setting compensation limits for the board members and CEO. Their compensation is ultimately confirmed at the general shareholders' meetings, and related details are made public through annual business reports.

Shareholder Composition

LOTTE Chemical strives to maximize shareholder value by listening to the opinions of major and minority shareholders alike. All shareholders are free to exercise a variety of rights within the scope of the law and regulations. The major shareholders are LOTTE Corporation and LOTTE Property & Development.



Shareholder	No. of shares owned	Shares (%)
LOTTE Corporation	8,145,201	23.76
LOTTE Property & Development	6,855,084	20.00
LOTTE HOLDINGS CO., LTD	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	15,741,583	45.93

Providing Transparent Management Information

- Accurate and ample information related to the company's current and future value is provided
- In 2019, 53 disclosure declarations were submitted

Credit Ratings and Most Recent Rating Date

Regular Ratings

2019.06.13
Korea Investors Service (KIS)

AA+

Current Ratings

2019.04.15
National Information & Credit Evaluation (NICE)
2019.04.16
Korea Ratings Corporation

AA+

Compliance

LOTTE Chemical has established a global-standard compliance system that meets today's rising expectations for corporate compliance standards. We are also operating a compliance risk prevention program that covers all business activities, including fair trade and anti-corruption efforts.

Compliance Management

Establishment and Operation of a Compliance System

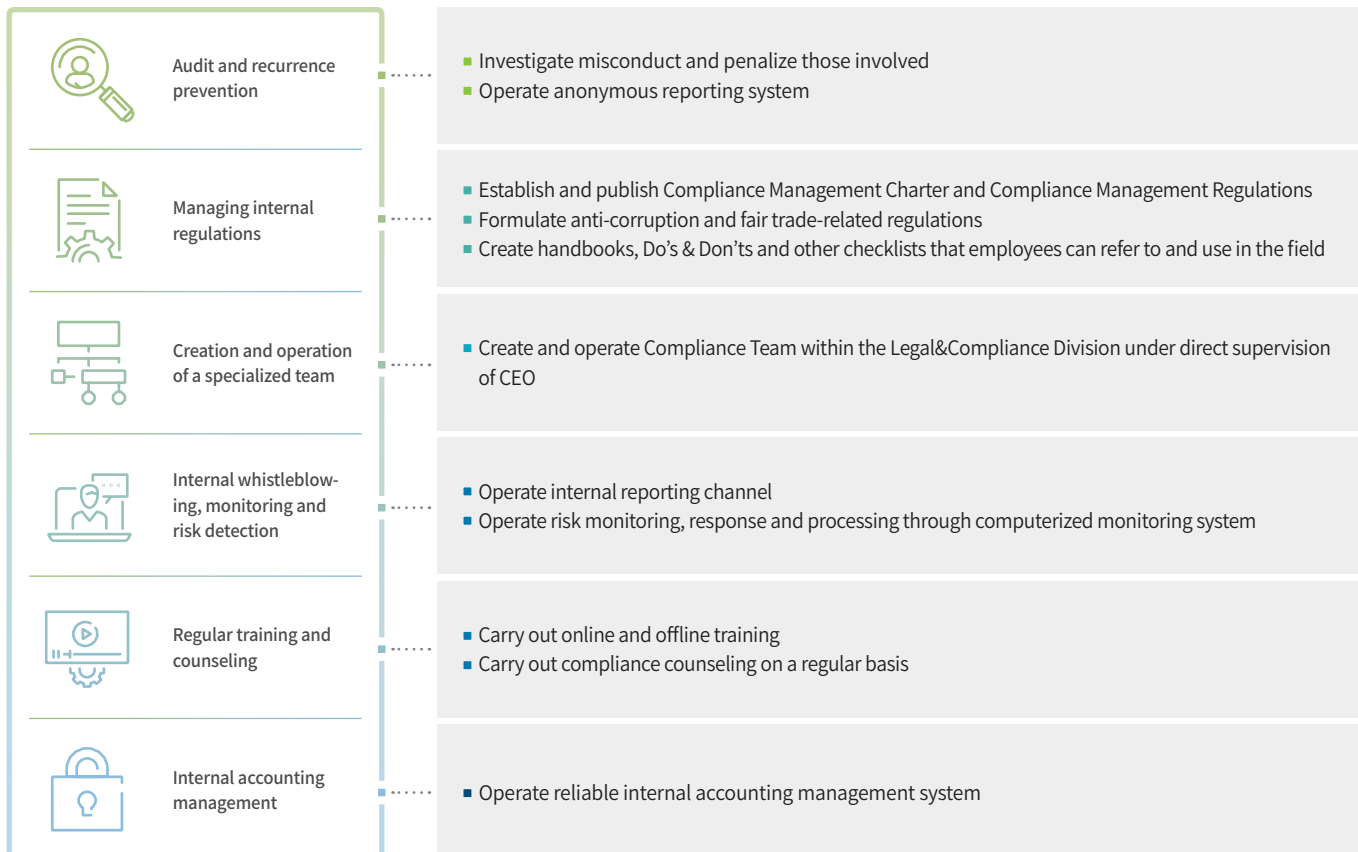
- A Compliance Team has been established and is in operation
- All compliance risks in our business activities are being managed to make compliance a part of our corporate culture
- The scope of application has continued to grow through various means : a compliance management charter and compliance management regulations, modification of internal regulations, such as regulations related to anti-corruption and fair trade issues, online and offline training and compliance counseling, operation of an internal accounting management system, and channels for internal whistleblowing

Strengthening Compliance-related Programs

- 1 Group training provided according to business role, theme and location; online training provided for all employees
- 2 Standard contracts introduced and managed
- 3 Legal compliance messages posted for company staff, and legal compliance messages sent to all partner companies
- 4 Activities of Transparent Management Committee expanded
- 5 ISO 37001 (Anti-bribery Management System) certification received
- 6 Standardized anti-corruption clause made mandatory in key contracts
- 7 Employees notified via intranet after publication of compliance newsletter

Moreover, we are carrying out activities to strengthen fair trade business management, compliance training, fair trade and anti-corruption compliance counseling and responding to external evaluation indices.

Compliance System



Mid- to Long-Term Vision for Compliance

AS-IS



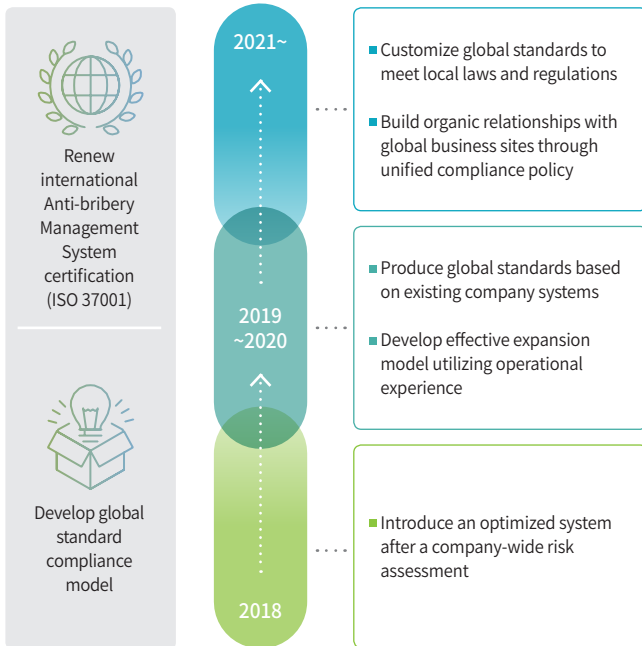
- Operate electronic monitoring system
- Create regulations and processes that meet global standards
- Build know-how in system creation and management

TO-BE



- Establish compliance chain that connects LOTTE Group, LOTTE Chemical and domestic/international affiliates
- Operate a compliance system that meets the highest global standards

Action Plan



Renew international Anti-bribery Management System certification (ISO 37001)



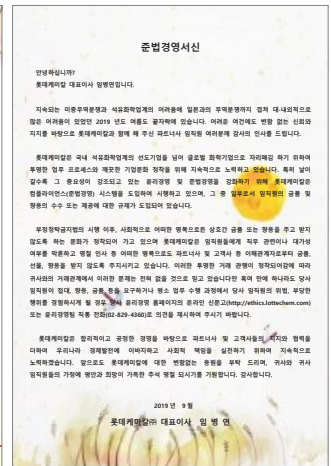
Develop global standard compliance model

Strengthening Supply Chain Compliance

- Our 'Code of Conduct for the Integrity of Suppliers' was established in 2015 and has been operating since
- In order to carry out transparent and fair transactions with our partners, we have continuously strengthened our supply chain compliance by implementing mandatory use of standard contracts and by expanding the use of the Electronic Contract System (ECS)
- In 2019, we revised our standard contract for subcontracting work, and we introduced and are managing new standard contracts. We also made the inclusion of anti-corruption clauses in all contracts mandatory, including the standard contractor contracts in the ECS. Compliance training for all staff in the supply chain was expanded as well
- A corruption prevention management system has been established that is dedicated to compliance with domestic and international anti-corruption laws, such as Korea's anti-graft law

Compliance Letter

- CEO sent a compliance letter to all employees and partners, making clear his determination to practice compliance management and to build a fair and transparent business culture



ISO 37001 (Anti-bribery Management System) Certification

- By operating an effective anti-corruption management system, we have been able to adhere to related laws and regulations. To maintain international best practices, we aim to obtain relevant certifications
- We were the first in the chemical industry to receive the ISO 37001 (Anti-Corruption Management System) certification, and we have established a compliance system that meets global standards. We will continue to operate and develop the system



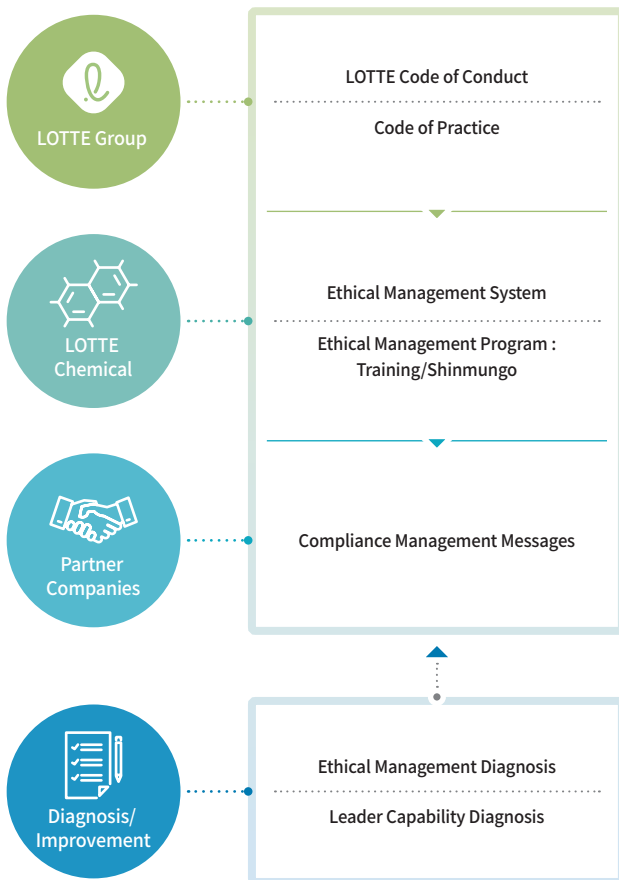
ISO 37001 (Anti-bribery Management System) Certification

Ethical Management

LOTTE Chemical is building a transparent and clean corporate culture, recognizing that ethical management is key to the establishment of a healthy social culture and is the competitive edge needed for a company's continued growth.

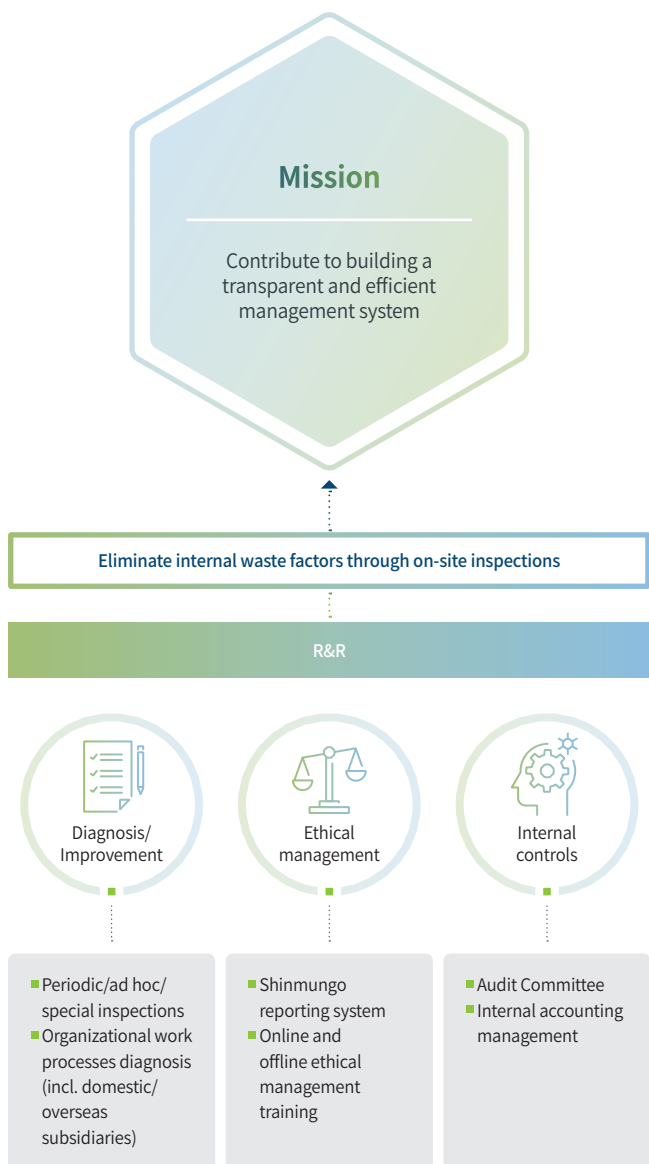
Ethical Management Implementation System

- The Management Improvement team operates under the direct supervision of the CEO
- A culture of ethical management has been adopted through various activities, such as declaring intent for ethical management both internally and externally through ethical management practice guidelines establishing and implementing ethics regulations and ethics management system, and supporting ethics management-related activities



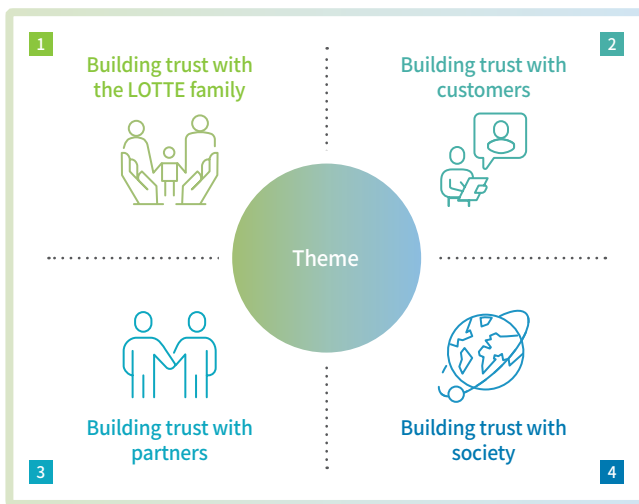
Ethical Management System

- An ethical management system has been established so that all employees can monitor and share the culture of ethical management
- An ethical management website (<http://ethics.lottechem.com>) is managed to share with those inside and outside the company the ethical principles that employees have to follow
- A systematic reporting channel is established so that internal and external stakeholders can report any unethical activities



Ethical Management Diagnosis and Improvement

- A Code of Practice has been adopted to clearly indicate the direction of ethical management
- Continuous management of the Code has been maintained through constant monitoring
- The company's level of ethical management is assessed through the advance management system for 'Ethics Management Diagnosis'.



20 Practices

<p>1 Building trust with the LOTTE family</p> <ul style="list-style-type: none"> ■ Fair organizational culture ■ Organizational culture based on mutual respect ■ Safe working environment ■ Accounting transparency ■ Asset protection and abuse prohibition ■ Protection of intellectual property rights ■ Compliance with information protection regulations ■ Prohibition of bribery ■ Prohibition of insider trading ■ Prohibition of unethical political activity 	<p>2 Building trust with customers</p> <ul style="list-style-type: none"> ■ Best products and services ■ Honest marketing ■ Protection of customer information
<p>3 Building trust with partners</p> <ul style="list-style-type: none"> ■ Fair trade ■ Respect for partnerships ■ Fair competition ■ Legal collection of competitor information 	<p>4 Building trust with society</p> <ul style="list-style-type: none"> ■ Environmental protection ■ Social contributions ■ Respect for local cultures and compliance with local laws and regulations

Ethical Management Program

Raising awareness through training on ethical management

- Regular training on ethical management is provided through a variety of methods, including online and group training
- The company's ethics are internalized in the mindset of our employees
- Online Education : 52 weeks
- Enrollment rate : 95.7%

December 2019		
Course Name	Time	Participation
1 st Week Ethical Management Program of 1 st Week, December	2019.12.02~2019.12.08	Complete Review
2 nd Week Ethical Management Program of 2 nd Week, December	2019.12.09~2019.12.15	Complete Review
3 rd Week Ethical Management Program of 3 rd Week, December	2019.12.16~2019.12.22	Complete Review
4 th Week Ethical Management Program of 4 th Week, December	2019.12.23~2019.12.29	Complete Review

Ethical Management Training Status

Category	Course Name	Time	Trainees	Content
Group training	New employee orientation training	2019.01.08	'19 Spring/ Summer recruits	Introduction to ethical management system and role of new employees
		2019.07.23	'19 Fall/Winter recruits	
Online training	Ethics e-learning course	Weekly (52 weeks)	All employees	Online lessons related to spreading ethical management in company culture

Online Shinmungo (Compliance-Reporting System)

- Tip-offs related to violations by internal and external stakeholders are received through the 'Shinmungo' compliance reporting system on the ethical management website
- Various online and offline reporting channels are also managed, including mail, phone and e-mail
- The identities of informants are strictly protected, and we make sure they do not suffer any disadvantages or unfair treatment

<p>Reports received</p> <p>13</p>	<p>Issues resolved</p> <p>13</p>
------------------------------------------	-----------------------------------------

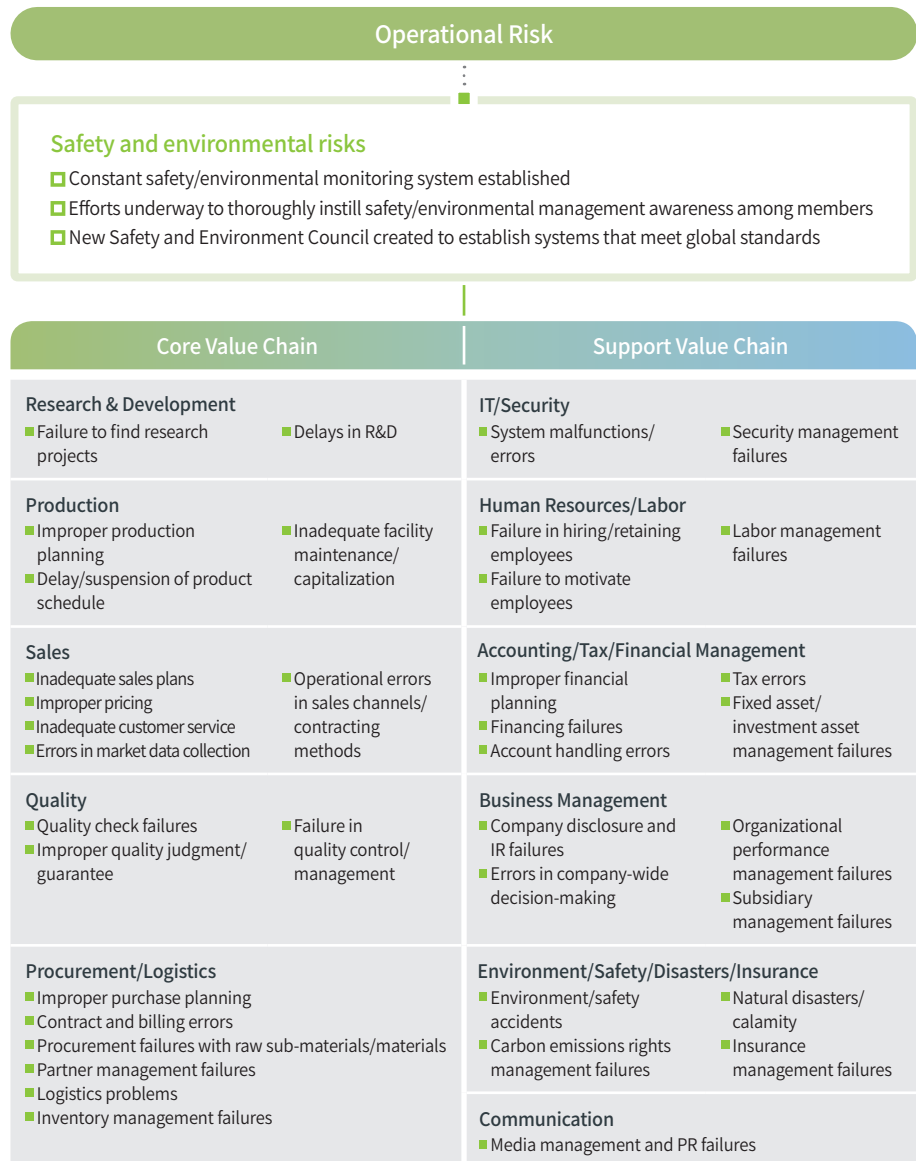
Risk Management (ERM : Enterprise Risk Management)

Driven by our leadership’s interest in and determination to practice risk management, LOTTE Chemical is building an effective response system to identify and respond to the causes of not only economic risks, but also social and environmental risks.

Integrated Risk Management System

- A systematic integrated risk management system has been established and is in operation, ensuring the company’s sustainability
- The system aims to identify all potential economic, social and environmental risks, so that we may swiftly enact, company-wide response measures
- The system is also designed to uncover any latent internal or external risks, so that they can be resolved preemptively
- If a risk does arise, processes are in place to ensure that all members respond optimally

Risk Portfolio



Risk Management Governance

- A risk management team has been created to identify, manage and establish response plans for risk factors that could affect the company in all stages of business operations
- The role of the Risk Management Committee, with the CEO as the committee chair, is to notify the company of the current risk management situation, as well as to improve risk management policies and other related company policies
- Risk management governance has been implemented throughout the company by allocating roles to the appropriate departments



Internal Control System

- In March 2019, the Internal Accounting managing department was changed to the Internal Accounting Team, and an internal control system has since been managed
- After risk assessments are carried out by management and responsible organizations, the Internal Accounting Team evaluates and verifies how far internal controls can be applied
- The results of the internal control evaluation are reported to the Audit Committee and the Board of Directors, and then reviewed and evaluated by external auditors and the Audit Committee



Financial Risk

Tax risk management

- Comply with tax filing and payment deadlines
- Share audit reports and electronic disclosure system transparently

Compliance Audit Risk

Compliance risk management

- Implement compliance management system
- Support system established for various areas, including anti-corruption, anti-trust/fair trade, environment, safety and hygiene, human resources, tax accounting, and trade secret protection

Strategic Risk

Industry growth risk

- Diversify raw materials diversification
- Develop specialty products
- Enter into new business areas

Competition risk

- Generate steady profits from commonplace products, create portfolio from high value-added products

Economic fluctuation risk

- Manage geopolitical risks, such as oil price fluctuations, novel coronavirus outbreak, US elections and domestic general elections.

Resourcing risk

- Secure profitability by establishing customized strategies
- Diversify supply and demand of raw materials
- Create a preemptive response system

Market

- Interest rate fluctuations
- Exchange rate fluctuations

Liquidity

- Errors in cash flow forecasts
- Disruptions in financing
- Failure to fulfill debt repayment obligations

Credit

- Inadequate credit management of trading partners
- Insolvency in bonds

Legal/Regulatory

- Fair trade violations
- Intellectual property violations
- Violation of labor laws
- Violation of environmental/safety laws
- Violation of information protection laws
- License/permit violations

Legal/Internal regulations

- Disruption in litigation
- Insufficient legal review and advice
- Poor management of wrongdoing

Company Management Strategy

- Failure to secure future growth engines
- Failure to optimize global business structures

Business strategy by product

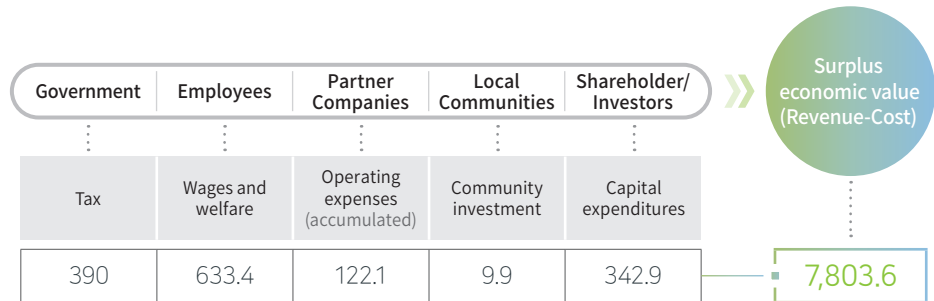
- Failure to respond to market changes

Stakeholder Engagement

LOTTE Chemical is acutely aware of the importance of open communication with stakeholders in our business activities, and so we are actively engaging with them through various channels. Through feedback from our wide range of stakeholders, including governments, employees, partner companies, shareholder/investors, local communities and customers, we find areas for improvement, and we share the economic gains from our business activities with our stakeholders so that we can all continue to develop together.

Stakeholder Economic Value Distribution

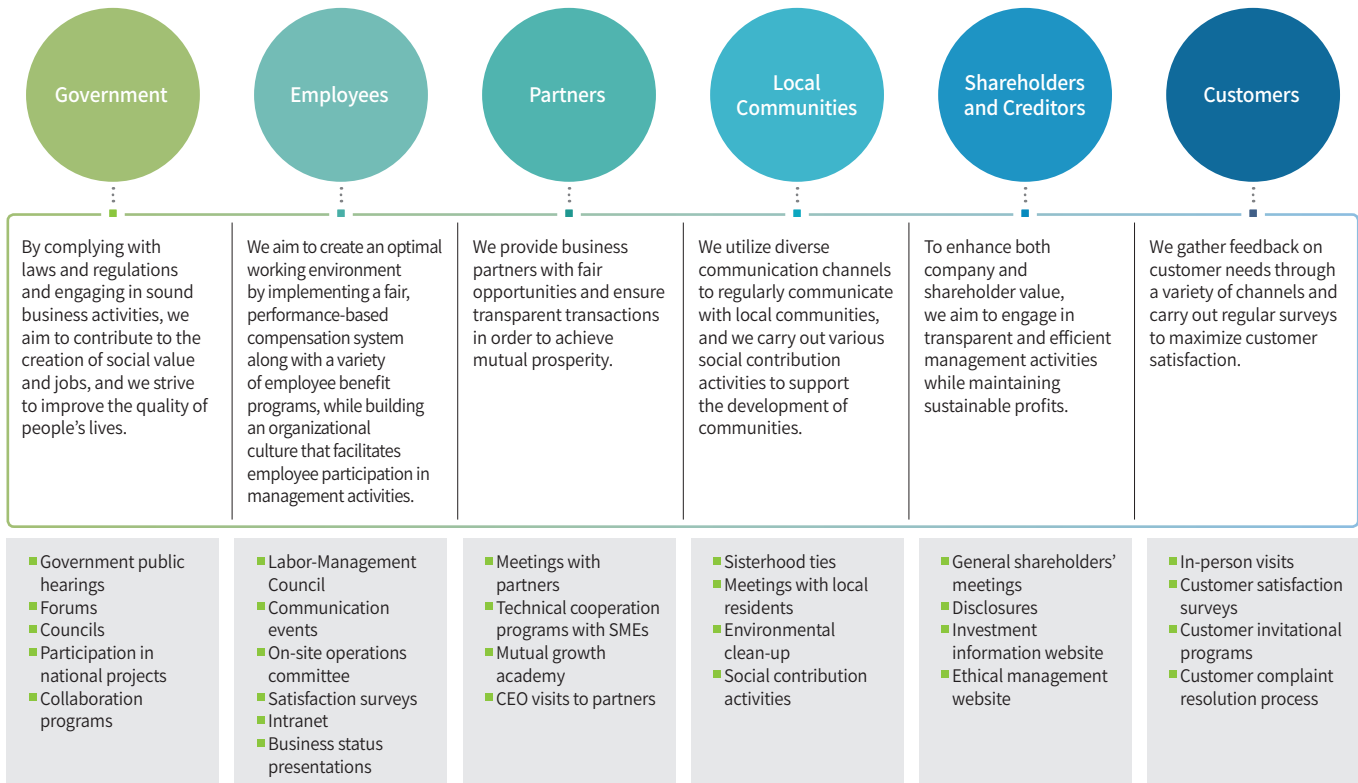
(As of December 2019, Unit : KRW billion)



※ Economic value for partner companies (operating expenses) based on figures different from the previous year (Mutual Growth program)

Invigorating Stakeholder Engagement

LOTTE Chemical maintains various communication channels to pursue co-prosperity with our stakeholders, and we welcome opinions on sustainability management and management in general. With the mid- to long-term future in mind, we aim to establish business directions and management policies that take into account our stakeholders' interests, and so we are actively seeking to communicate with our stakeholders.



Stakeholder interviews

Shareholder/
Investor

Expanding from the strength it has shown in traditional petrochemical products, LOTTE Chemical is diversifying its business through efforts such as the merger with LOTTE Advanced Materials and the acquisition of the artificial marble company in Turkey. The company's entry into the high value-added product markets are very positive, and we believe the investments will continue to yield results. Through eco-friendly programs such as 'Project LOOP,' LOTTE Chemical can be seen responding preemptively to social demands, but this is also the point at which it needs balanced management of economic, social and environmental risk. Going forward, through continuous communication with its stakeholders, I hope LOTTE Chemical will be a top-tier chemical company that manages internal and external risk effectively.



KEB Hana Bank
Lee Seung-han, Team Leader

Relevant
Organization

To develop a sound economy for the people, the Federation of Korean Industries aims to improve the business environment, recommends measures for the sustainable growth of the Korean economy and supports the expansion of firms' global territory. The petrochemical industry has been affected not only by the coronavirus pandemic, but also by a decline in oil prices and the entry of petroleum companies into the petrochemical industry, which require thorough preparations. In particular, the recent highlighting of the environmental problem of plastic products seems to demand an active response to environmental issues.



Federation of Korean Industries
Chung Bong-ho,
Head of Department

Customer

As a specialized materials company, Youl Chon Chemical manufactures flexible packaging material using polypropylene resin purchased from LOTTE Chemical. LOTTE Chemical is not focused narrowly on immediate profit from sales. Rather, we feel a sense of trust in LOTTE Chemical because it continuously seeks to understand its customers' needs and to find ways for both sides to profit from a long-term perspective. On the basis of this trust, we and LOTTE Chemical have a relationship that goes beyond mere business transactions – we have formed a strategic partnership. We hope LOTTE Chemical continues to prioritize communications with its stakeholders, including its customers, and strive for mutual growth.



Youl Chon
Han Chang-hoon,
Deputy Head of Department

Employee

To build a company where employees are happy to work, LOTTE Chemical is leading the industry in actively running family-friendly programs and working systems suited to personal life-cycles. In particular, employees are able to balance work and life through measures such as the PC-OFF system, a flexible working system in which they can schedule their own work hours and mandatory parental leave for fathers. Through parental leave for fathers and the flexible working system, I have been able to do my part in parenting and spend quality time with my child. I hope LOTTE Chemical will continue to make HR policy from the point of view of the employees and make us proud of our company.



Communication Team
Park Chan-keol, Manager

Partner

LOTTE Chemical is a company that sincerely stands by the side of its small and medium-sized partner companies and walks with them on a path of coexistence. Through the support of LOTTE Chemical's mutual growth fund, we have been able to access funding at lower cost than on the open market. This has enabled us, by reducing expenses, to become a more competitive company. Furthermore, through a wide range of support such as meetings and consulting, LOTTE Chemical is building steady, mutually beneficial relationships with its partner companies. We hope LOTTE Chemical continues to grow as a sustainable company, gathering opinions from its stakeholders through continuous communication and maintaining its systems for cooperation.



KyongDong Chemical Co., Ltd
Lee, Jung-suk, CEO

Local
Community

LOTTE Chemical is engaged in a diverse range of social contribution activities suited to the characteristics of local communities. In particular, since 2018, LOTTE Chemical has sponsored musical therapy to promote physical & psychological rehabilitation and development of disabled children under a Music Therapy program at Bobath Children's Hospital. In many cases, social corporate social contribution activities serve only promotional purposes, but we can tell that LOTTE Chemical is focused, rather than focusing on company PR. Primarily on setting up programs from the point of view of the beneficiaries. We look forward to LOTTE Chemical continuing these sincere social contribution activities and bringing even more smiles to the world.



LOTTE Medical Foundation
Kim Tae-yeon, Team Leader





APPENDIX

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Major Product Output

↓

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Product Portfolio

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GRI Standards Index

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P. 91
LOTTE Chemical Declaration of Human Rights

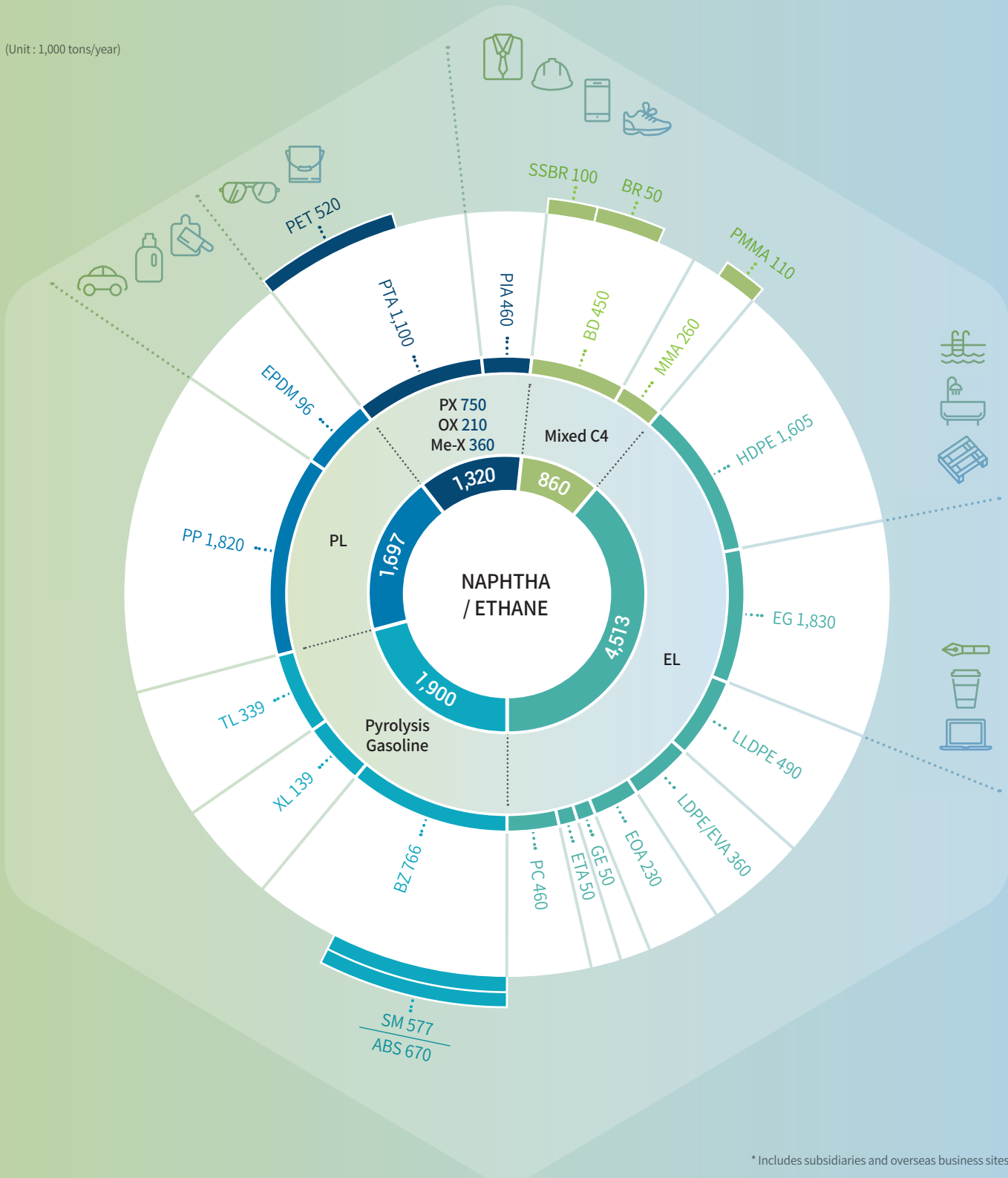
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P. 92
Third Party Assurance

Major Product Output

LOTTE Chemical's extensive portfolio ranges from polymers and monomers to megatrend products. With our world-class production complexes and stable profitability, we will continue to grow as a global chemical company.

(Unit : 1,000 tons/year)



* Includes subsidiaries and overseas business sites

Product Portfolio

POLYMERS



PE | Polyethylene

Polyethylene is the most widely used polymer, found in a variety of fields and applications, due to its outstanding properties and processability.

<p>HDPE High Density Polyethylene</p>		<p>Properties Stiffness, impact resistance, moldability, cold resistance, electrical insulation</p>	<p>Applications Paletts, containers, fuel tanks, pipes, packaging film</p>
<p>LDPE Low Density Polyethylene</p>		<p>Properties Processability, flexibility, low neck-in, thermal sealing, impact resistance</p>	<p>Applications Kitchen container lids, artificial grass, paper coatings, tarpaulin coatings, flexible packaging</p>
<p>LLDPE Linear Low Density Polyethylene</p>		<p>Properties Weather resistance, transparency, processability, stiffness, crushability</p>	<p>Applications Agricultural/industrial films, lids for household items, base resin for electrical wires, water tanks</p>
<p>EVA Ethylene-Vinyl Acetate</p>		<p>Properties Processability, adhesiveness, electrical properties, transparency, foaming properties</p>	<p>Applications Hot-melt adhesives, semi-conductive compound base resins, solar cell encapsulants, shoe soles</p>



PP | Polypropylene

LOTTE Chemical is working to lead the market as a global chemical company by researching and developing advanced products, such as metallocene PP, HCPP, RTPO, TIPP and retort, that overcome the limitations of conventional polypropylene.

Injection



Properties High stiffness, impact resistance, transparency, heat resistance

Applications Automotive interior and exterior materials, home appliances, industrial materials, food containers, household goods

Blow



Properties High stiffness, impact resistance, transparency, heat resistance

Applications Food packaging, blow containers, wrapping sheets, stationery, danpla

Yarn,Fiber



Properties Stiffness, elongation, spinning properties

Applications Woven bags, rope, multi-filament, diapers, non-woven fabric for agricultural use

Film



Properties Processability, transparency, high stiffness, glossiness

Applications Conventional films, films for deposition, retort pouches, shrink film, lamination

TIPP

Transparent-Impact Resistance Polypropylene



Properties High transparency, impact resistance, whitening resistance

Applications Transparent containers for injection molding, transparent containers for blow molding, transparent packaging film, medical syringes, medical fluid bags/bottles

POLYMERS



Performance Materials

LOTTE Chemical has developed and is selling a diverse range of products based on the expertise and technology we have accumulated over 30 years, which includes stable and competitive sourcing of raw materials, ownership and expansion of global production bases, and the development of functional polymer products as part of building an eco-friendly future society.

<p>LOTTMER</p> 	<p>Properties Heat resistance, processability, high elasticity, fluidity</p> <p>Applications Air intake hoses, air bag covers, glass run channels, bellows</p>
<p>ADPOLY</p> 	<p>Properties Adhesiveness, heat resistance, durability, impact resistance, usability, transparency, non-toxicity</p> <p>Applications Steel pipe coating, composite panels, PA shock reinforcements, compatibilizers, multi-layer films for food packaging</p>
<p>TPO Thermoplastic Olefin</p> 	<p>Properties High strength, heat resistance, impact resistance, scratch resistance, low density</p> <p>Applications Door trim, instrument panels, engine covers, bumpers, headlamp housings</p>
<p>LFT Long-Fiber reinforced Thermoplastics</p> 	<p>Properties High strength, durability, high fluidity, high impact, high heat resistance</p> <p>Applications Door modules, FEM carriers, stiffeners, washing machine out tubs, fan shrouds</p>
<p>EPP Expanded Polypropylene</p> 	<p>Properties Buffering properties, lightweight, adiabatic, soundproofing, recyclability</p> <p>Applications Automotive parts, packaging materials, furnitures, sports goods, toys</p>

SYNTHETIC RESINS



PC | Polycarbonate

LOTTE Chemical not only produces polycarbonates of outstanding quality for use in a wide range of products, we also manufacture polycarbonate compounds such as functional additives, and PC/ABS compounds that improve processability and chemical resistance through a mixture of PC and ABS.

PC
Polycarbonate



Properties Impact resistance, heat resistance, transparency

Applications Lenses, sheets, mobile components, headlamps

PC Compound
Polycarbonate Compound



Properties Stiffness, flame retardant properties, heat resistance, impact resistance

Applications Smartphone covers, earphones, antenna housings, LED lamp covers

PC/ABS
Polycarbonate /
Acrylonitrile-Butadiene-
Styrene Resin



Properties Processability, chemical resistance

Applications OA housings, TV housings, laptop housings, automotive interior/exterior materials

PET | Polyethylene Terephthalate

PET bottles made from LOTTE Chemical PET have a variety of strengths, such as non-toxicity, transparency, maintainability, chemical resistance, light weight, processability, and outstanding economical efficiency. Furthermore, the moldability of LOTTE Chemical PET at low temperatures reduces cycle time and utility costs.

Properties Non-toxicity, transparency, chemical resistance, light weight, economical efficiency

Applications Soft drink containers, mineral water containers, heat-resistant containers, cosmetics containers



MONOMERS



EO/EG | Ethylene Oxide / Ethylene Glycol

Ethylene Glycol, is a colorless liquid, produced by reacting water and Ethylene oxide, which itself is created by the oxidization of ethylene. EG is used in surfactants, antifreeze and polyester, the most common synthetic fiber.

Properties Surfactants (EO), concrete admixtures (EO), antifreeze (EG), synthetic resins (EG)

GE | Glycol Ether

Glycol ether is a high-purity product distilled from a reaction of alcohol with ethylene oxide or propylene oxide. It does not easily evaporate due to its low content of VOCs (volatile organic compounds).

Properties Low toxicity, high solubility, low volatility

Applications Paint solvents, fully automatic cleaning agents, automotive brake fluids



EOA | Ethylene Oxide Adduct

LOTTE Chemical produces ethylene oxide adduct of excellent quality and uniform high purity. Through the vertical integration of raw materials and products, we are continuously striving to provide a stable supply to the market and to develop new products that meet the needs of users.

MPEG

Methoxy Polyethylene Glycol



Properties Water-use reduction, high strength

Applications High-rise buildings, high-speed rails

VPEG

Alkylallylether Polyethylene Glycol



Properties Water-use reduction, long-lasting fluidity, high strength

Applications High-rise buildings, high-speed rails

PEG

Polyethylene Glycol



Properties Wettability, lubricity, emulsibility

Applications Organic synthetic intermediate materials, lubricants, additives for agents

MONOMERS



MMA | Methyl Methacrylate

With its outstanding strength and transparency, methyl methacrylate is used as a raw material for optical disks, lighting, automobile lamps and artificial marble. LOTTE Chemical produces MMA using processes that are eco-friendly and that generate less waste than conventional methods.

Properties Outstanding transparency, high stiffness, weather resistance, outstanding moldability/processability

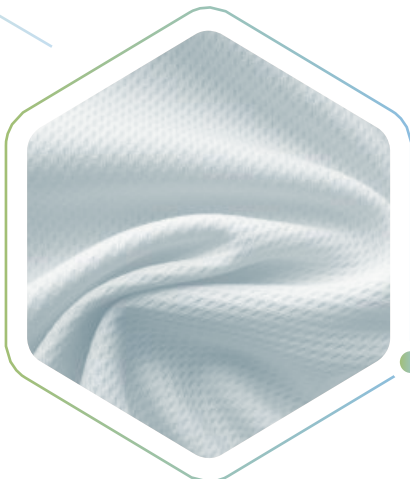
Applications PMMA raw material, artificial marble, automotive lamps, paint, lenses

PIA | Purified Isophthalic Acid

The purified isophthalic acid manufactured by LOTTE Chemical is produced using in-house technology. It is a high value-added, technology-intensive product that only seven companies in the world, in six countries, are able to produce. It has been designated by Korea's Ministry of Trade, Industry and Energy as a 'world-class product' in recognition of its quality and technology.

Properties Durability, improved transparency, glossiness, corrosion resistance, outstanding weldability

Applications PET bottles, paint and coatings, adhesives (low melt)



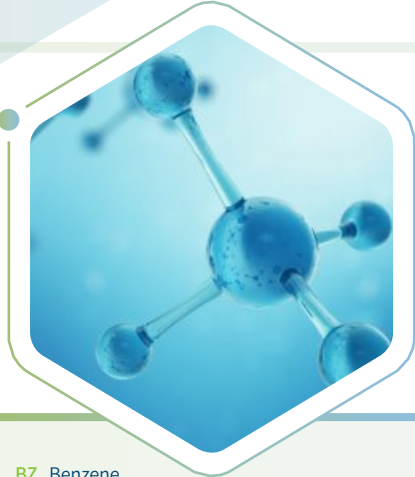
PTA | Purified Terephthalic Acid

Purified terephthalic acid is a product that has outstanding mechanical strength, heat resistance, water resistance and insulation. LOTTE Chemical has the capacity to produce PTA in large quantities, which enables us to provide a stable supply and PIA-linked sales.

Properties Heat resistance, insulation, water resistance

Applications Polyester fibers, PET bottles, PET films

BASIC PETROCHEMICALS



BTX | Benzene / Toluene / Mixed Xylene

The term BTX refers to Benzene, toluene and mixed xylene. They are produced from pyrolysis gasoline, a by-product of ethylene plants. These are high value-added products used as raw materials in construction, home appliance and textile industries.

BZ Benzene

Applications Synthetic detergent, medicine, synthetic fragrances, pesticides

TL Toluene

Applications Dyes, bleaching agents

MX Mixed Xylene

Applications Dyes, bleaching agents

MeX/PX/OX | Meta-Xylene / Para-Xylene / and Ortho-Xylene

Meta-xylene (MeX), Para-xylene (PX) and Ortho-Xylene (OX) are produced from the raw material Mixed Xylene (MX). They are distinguished by their different boiling points.



Applications PIA raw material

MeX Meta-Xylene

Applications PTA raw material, DMT raw material

PX Para-Xylene

Applications Phthalic anhydride, maleic anhydride, solvents

OX Ortho-Xylene



C5 Petrochemical Products

As part of the Isoprene project, LOTTE Chemical has introduced C5 into the production processes at our Yeosu plant. C5 is transformed into a raw material for high value-added products.

IPM Isoprene Monomer

Applications Rubber for automobile tires, glue/adhesives for sanitary products

DCPD Dicyclopentadiene

Applications Perfume/spices, optical materials, antioxidants, automotive materials, adhesives for sanitary goods, building materials, bathtubs

PIP Piperylene

Applications Petroleum resin for road-marking paints, adhesives for petroleum resin

BASIC PETROCHEMICALS



BD | Butadiene

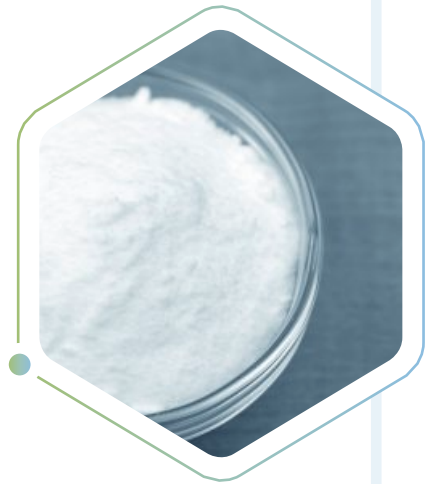
Butadiene is produced by extracting 1,3-butadiene from mixed C4 produced in ethylene plants. A colorless gas with a unique odor, it is used mainly as a raw material for synthetic rubbers (BR, SBR, SBL, etc.) and synthetic resins (SBS, etc.).

Applications BR, SBR, SBL, ABS

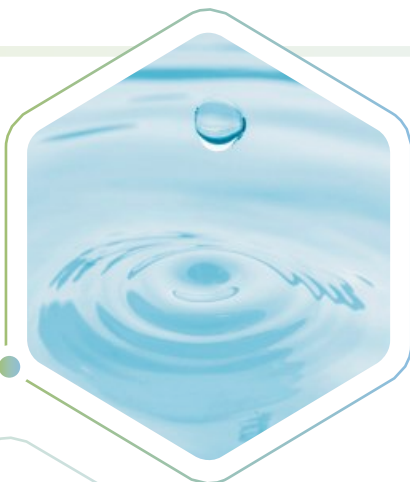
SM | Styrene Monomer

Styrene monomer is produced from a reaction of ethylbenzene, which is a synthesis of benzene and ethylene. It is colorless and has a unique odor, and is used as a raw material in PS, EPS, ABS, SB latex, synthetic resin coating, ion exchange resin, etc.

Applications ABS, EPS, PS, SBR



MEGATREND



Water Treatment Membrane

In 2011, LOTTE Chemical identified water treatment as a next-generation growth engine and began to develop related technology. Through continuous development, we have acquired world-class membrane technology for wastewater treatment and water reuse and also offer related services.

Application areas

Water treatment for drinking water production, wastewater treatment and discharging, reuse of scarce water resources, production of deionized water for electronic and pharmaceutical fields, seawater desalination for industrial use and drinking water

Services provided

Plant design, equipment supply, technical support, operational monitoring, maintenance



ADVANCED MATERIALS PRODUCTS

starex



starex® is the main brand for styrene and commodity resins of LOTTE Chemical Advanced Materials Business. It represents our efforts to combine our customer-centered expertise and experience.

Product groups ABS, ABS Alloy, ASA, EPS, PP

Applications Home appliances, electronics & IT, automotive interior/exterior materials, building&construction, miscellaneous

INFINO®



INFINO® is the engineering plastics brand of LOTTE Chemical Advanced Materials Business. It represents our commitment to creating unlimited possibilities and value for our customers.

Product groups PC, PC Alloy, PBT, mPPE, PA, PPA, PPS, PCT

Applications IT, mobile, energy/lighting, healthcare, interior&exterior for automotive

BUILDING/INTERIOR MATERIALS

staron



staron is a high-quality artificial marble brand that embodies the textures and colors of nature. An interior material that comes in a variety of colors and patterns, it can be seamlessly sculpted, enabling easy-to-maintain creative designs.

Properties

Non-porous, thermoformability, seamless joints, infinite range of colors and patterns, various designs

Radianz



Radianz is made of 99.9% pure, natural quartz, giving it high strength, a luxurious texture and sophistication. An interior material molded through vacuum compression, it can express a variety of colors not found in natural stone.

Properties

Stain resistance, abrasion resistance, chemical resistance, non-porous, color uniformity, crack preventing

Locelain



Locelain, made from 100% natural minerals and materials, is a premium magnetic panel with the texture, beauty and hardness of premium natural stone. It has overcome the functional limitations of natural stone while perfectly reproducing the esthetics.

Properties

Safe for humans, outstanding weather resistance, flexural strength, waterproof, easy to clean, outstanding sanitary qualities, outstanding heat resistance, scratch resistance, suitable for contact with food

GRI Standard Index

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	201-3	Defined benefit plan obligations and other retirement plans	62~63
Indirect Economic Impacts	203-1	Infrastructure investments and services supported	52
	203-2	Significant indirect economic impacts	52

Topic	Disclosure		Pages/ References
	No.	Title	
Anti-Corruption	205-1	Operations assessed for risks related to corruption	60~61,65
	205-2	Communication and training about anti-corruption policies and procedures	60~61,65
	205-3	Confirmed incidents of corruption and actions taken	No Violations
Anti-Competitive Behavior	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	No Violations
Materials	301-3	Materials used by weight or volume	54~55
Energy	302-1	Energy consumption within the organization	84~85
	302-2	Energy consumption outside of the organization	84~85
	302-3	Energy intensity	84~85
	302-4	Reduction of energy consumption	84~85
	302-5	Reductions in energy requirements of products and services	84~85
Water	303-1	Interactions with water as a shared resource	22, 85
	303-2	Management of water discharge-related impacts	22, 85
	303-3	Water withdrawal	22, 85
Emissions	305-1	Direct (Scope 1) GHG emissions	84~85
	305-2	Energy direct (Scope 2) GHG emissions	84~85
	305-4	GHG emissions	84~85
	305-5	Reduction of GHG emissions	84~85
	305-6	Emissions of ozone-depleting substances (ODS)	84~85
	305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	84~85
	306-1	Water discharge by quality and destination	22~23, 85~86
Effluents and Waste	306-2	Waste by type and disposal method	23, 85~86
	306-3	Significant spills	22~23, 85~86
	401-1	New employee hires and employee turnover	89
Employment	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	N/A
	401-3	Parental leave	89
	403-1	Occupational health and safety management system	90
Occupational Health and Safety	403-2	Hazard identification, risk assessment, and incident investigation	90
	403-3	Occupational health services	90
	403-4	Worker participation, consultation, and communication on occupational health and safety	90
	404-1	Average hours of training per year per employee	90
Training and Education	404-2	Programs for upgrading employee skills and transition assistance programs	32~33
	404-3	Percentage of employees receiving regular performance and career development reviews	89
	408-1	Operations and suppliers at significant risk for incidents of child labor	34
Child Labor			
Forced or Compulsory Labor	409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	34
Human Rights Assessment	412-2	Employee training on human rights policies or procedures	90
Customer Health and Safety	416-1	Assessment of the health and safety impacts of product and services categories	39
	416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	No Violations
Marketing and Labeling	417-1	Requirements for product and service information and labeling	71~79

Consolidated Financial Statement

Consolidated Statement of Financial Position

Account Title	Unit	2017	2018	2019
Assets				
I. Current assets	KRW	8,225,469,338,408	8,143,917,538,954	7,220,858,878,213
1. Cash and cash equivalents	KRW	1,685,211,989,030	1,329,974,466,103	1,351,954,868,848
2. Short-term financial instruments	KRW	3,086,656,512,787	3,306,356,089,721	1,606,579,519,102
3. Available-for-sale financial assets	KRW	100,046,195,000	-	-
4. Financial assets at fair value through profit or loss	KRW	2,434,730,122	61,228,839,825	843,603,427,108
5. Financial assets at fair value through other comprehensive income	KRW	-	4,544,530,000	34,810,000
6. Accounts receivables and other receivables	KRW	1,667,550,760,928	1,536,464,504,902	1,512,052,951,782
7. Inventories	KRW	1,535,989,483,699	1,777,344,107,136	1,679,720,619,364
8. Financial lease receivables	KRW	138,598,084	138,598,084	138,598,084
9. Current income tax assets	KRW	15,381,900,865	23,703,051,222	45,549,391,256
10. Other current financial assets	KRW	19,507,537,143	31,091,183,088	26,655,588,650
11. Other current assets	KRW	112,551,630,750	73,072,168,873	94,932,222,007
12. Non-current assets held for sale	KRW	-	-	59,636,882,012
II. Non-current assets	KRW	11,325,501,762,242	12,655,221,294,150	12,822,246,278,915
1. Long-term financial instruments	KRW	67,512,500,000	67,512,500,000	67,512,500,000
2. Available-for-sale financial assets	KRW	255,241,155,482	-	-
3. Financial assets at fair value through profit or loss	KRW	-	10,477,026,362	2,681,475,011
4. Financial assets at fair value through other comprehensive income	KRW	-	105,494,703,734	52,528,464,045
5. Financial lease receivables	KRW	2,888,357,916	2,761,874,442	2,634,857,432
6. Investments in associates	KRW	1,438,963,136,291	1,610,446,273,728	2,036,156,543,768
7. Investments in joint ventures	KRW	945,616,486,554	990,502,713,594	1,025,578,345,526
8. Tangible assets	KRW	6,716,184,181,432	8,036,093,695,375	7,505,115,476,923
9. Right-of-use assets	KRW	-	-	282,945,728,094
10. Investments in real estate	KRW	114,606,808,510	112,015,364,493	50,738,229,837
11. Goodwill	KRW	723,796,856,918	723,796,856,918	672,123,719,852
12. Other intangible assets	KRW	986,777,410,423	929,231,047,968	1,052,988,414,792
13. Other financial assets	KRW	20,253,421,140	21,961,882,770	21,100,868,512
14. Other non-current assets	KRW	15,230,234,510	12,351,445,832	9,308,643,780
15. Deferred income tax assets	KRW	38,431,213,066	32,575,908,934	40,833,011,343
Total Assets	KRW	19,550,971,100,650	20,799,138,833,104	20,043,105,157,128
Liabilities				
I. Current liabilities	KRW	3,790,891,299,787	3,961,420,261,244	2,740,030,326,653
1. Purchase payables and other payables	KRW	1,420,006,265,123	1,102,408,993,149	1,213,444,206,257
2. Financial liabilities at fair value through profit or loss	KRW	133,610,266	223,020,520	4,380,487,916
3. Loans payable and corporate bonds	KRW	1,498,617,635,176	2,185,774,111,188	1,179,502,553,224
4. Current lease liabilities	KRW	-	-	25,028,253,981
5. Current income tax liabilities	KRW	516,405,147,316	369,321,658,376	30,713,058,241
6. Other financial liabilities	KRW	181,182,416,161	126,034,288,844	86,904,570,086
7. Other current liabilities	KRW	161,173,576,770	168,474,654,674	176,048,308,768
8. Provisions	KRW	13,372,648,975	9,183,534,493	24,008,888,180
II. Non-current liabilities	KRW	3,505,312,739,432	3,293,391,331,347	3,249,944,438,951
1. Financial liabilities at fair value through profit or loss	KRW	25,238,394,790	43,310,577,157	10,148,669,271
2. Loans payable and corporate bonds	KRW	2,703,800,471,060	2,600,624,849,061	2,322,906,756,552
3. Non-current lease liabilities	KRW	-	-	104,133,223,144
4. Net defined benefit liabilities	KRW	26,509,772,488	34,038,128,999	10,226,148,343
5. Deferred income tax liabilities	KRW	587,754,527,688	512,169,390,749	628,580,123,669
6. Other financial liabilities	KRW	43,060,201,548	13,765,745,922	66,661,432,127
7. Other non-current liabilities	KRW	10,557,221,128	14,162,651,831	11,676,587,844
8. Provisions	KRW	108,392,150,730	75,319,987,628	95,611,498,001
Total Liabilities	KRW	7,296,204,039,219	7,254,811,592,591	5,989,974,765,604
Equity				
I. Equity attributable to the owner of the parent	KRW	11,489,628,164,151	12,734,717,751,049	13,204,399,243,017
1. Capital share	KRW	171,377,095,000	171,377,095,000	171,377,095,000
2. Other paid-in capital	KRW	880,743,872,602	880,861,285,570	880,837,946,542
3. Retained earnings	KRW	10,582,113,942,798	11,784,662,256,446	12,158,354,451,643
4. Other components of equity	KRW	(144,606,746,249)	(102,182,885,967)	(6,170,250,168)
II. Non-controlling interests	KRW	765,138,897,280	809,609,489,464	848,731,148,507
Total Equity	KRW	12,254,767,061,431	13,544,327,240,513	14,053,130,391,524
Total Equity and Liabilities	KRW	19,550,971,100,650	20,799,138,833,104	20,043,105,157,128

Consolidated Statement of Comprehensive Income

Account Title	Unit	2017	2018	2019
I. Sales	KRW	15,874,510,689,910	16,073,061,465,123	15,123,477,947,655
II. Cost of sales	KRW	12,081,876,222,814	13,368,922,712,367	13,208,748,237,908
III. Gross profit	KRW	3,792,634,467,096	2,704,138,752,756	1,914,729,709,747
Selling and administrative expenses	KRW	862,913,509,269	757,961,371,256	807,470,800,524
IV. Operating income	KRW	2,929,720,957,827	1,946,177,381,500	1,107,258,909,223
Financial income	KRW	253,053,655,691	184,348,488,102	178,096,327,674
Financial costs	KRW	273,186,322,842	189,387,947,129	237,353,470,829
Valuation losses and gains using equity method	KRW	284,443,693,668	202,316,945,067	184,901,952,786
Other non-operating incomes	KRW	213,268,096,980	277,791,521,332	352,712,288,568
Other non-operating expenses	KRW	322,614,040,202	212,746,274,036	337,061,163,039
V. Net income before income tax	KRW	3,084,686,041,122	2,208,500,114,836	1,248,554,844,383
Income tax expense	KRW	800,109,102,761	608,677,598,112	389,970,380,485
VI. Consolidated net income from continuing operations	KRW	2,284,576,938,361	1,599,822,516,724	858,584,463,898
VII. Consolidated net income (loss) from discontinued operations	KRW	-	42,111,621,112	(101,918,470,012)
VIII. Profit for the year	KRW	2,284,576,938,361	1,641,934,137,836	756,665,993,886
IX. Other comprehensive income	KRW	(428,342,968,836)	107,719,724,682	148,864,875,233
1. Items that will not be reclassified subsequent to income	KRW	(57,569,625,822)	(12,142,722,394)	28,727,317,041
Re-measurements of defined benefit plans	KRW	(19,208,894,765)	(20,424,474,469)	(10,795,103,565)
Other comprehensive income -valuation gain/loss of financial assets at fair value	KRW	-	758,177,215	(1,529,917,133)
Retained earnings using the equity method	KRW	642,665,098	(20,863,647,286)	39,765,848,624
Overseas business translation gain/loss	KRW	(43,476,747,966)	27,939,229,487	28,752,844,580
Changes in capital variation using the equity method	KRW	-	(14,712,032,490)	(23,015,732,472)
Tax effects	KRW	4,473,351,811	15,160,025,149	(4,450,622,993)
2. Items that will be reclassified subsequent to income	KRW	(370,773,343,014)	119,862,447,076	120,137,558,192
Valuation gain of available-for-sale financial assets (Other pre-tax income)	KRW	18,235,014,796	-	-
Valuation loss (gain) of derivatives	KRW	1,252,661,761	(129,744,253)	47,322,074
Overseas business translation gain/loss	KRW	(355,338,412,119)	105,640,140,601	104,344,567,411
Changes in capital variation of equity method	KRW	(29,013,393,026)	14,316,371,058	15,758,682,278
Tax effects	KRW	(5,909,214,426)	35,679,670	(13,013,571)
X. Total comprehensive gain/loss	KRW	1,856,233,969,525	1,749,653,862,518	905,530,869,119
Net income attributable to :				
Owner of the parent	KRW	2,243,875,142,823	1,579,194,571,925	714,978,059,663
Current net income from continuing operations	KRW	2,243,875,142,823	1,537,082,950,813	816,896,529,675
Income (loss) from discontinued operations	KRW	-	42,111,621,112	(101,918,470,012)
Non-controlling interests	KRW	40,701,795,538	62,739,565,911	41,687,934,223
Current net income from continuing operations	KRW	40,701,795,538	62,739,565,911	41,687,934,223
Comprehensive income attributable to :				
Comprehensive income attributable to the owner of the parent	KRW	1,859,116,215,130	1,658,916,975,700	835,101,554,081
Comprehensive income attributable to non-controlling interest	KRW	(2,882,245,605)	90,736,886,818	70,429,315,038
Earnings per share				
Basic and diluted income per share	KRW	65,625	46,074	20,860
Basic and diluted income per share from continuing operations	KRW	65,625	44,845	23,833
Basic and diluted income per share from discontinued operations	KRW	-	1,229	(2,973)

Status of Main Products, etc.

Sector	Items	Unit	Total Sales
Olefin	Ethylene, propylene, benzene, toluene, para-xylene, ortho-xylene, etc.	KRW billion	2,696
Monomers	Styrene monomer, butadiene, ethylene oxide adducts, ethylene oxide glycol, purified isophthalic acid, purified terephthalic acid, and methyl methacrylate monomer, etc.		3,749
Polymers	High-density polyethylene, polypropylene, low-density polyethylene, polyethylene terephthalate, linear low-density polyethylene, polycarbonate, LFT, EPP, etc.		9,431
Others	By-products and others		171
Elimination of internal transactions			(923)
Total Sales			15,123

Sustainability Data

> Environment : Response to Climate Change

LOTTE Chemical's Response

2019 Performance

Category	Key Issues	2019 Targets	Achievement Index	Target Date	Performance by Target	Achievement Status ●○○
Response to Climate Change	Responding actively to regulations on emissions trading scheme	Cover emissions rights shortage	Create diverse channels for securing emissions rights	~2019	Created diverse channels for securing emissions rights - Long-term forward contracts, auction purchasing, negotiated purchases, external purchases of emissions reductions	●
Environmental Management	Implementing the Special Act on the Reduction and Management of Fine Dust (Fine Dust Law)	Reduce risk by adhering to compliance principles	1. Report on active participation in emergency reduction measures and actions taken 2. Consistently improve processes and invest in facilities to reduce concentration of NOx emissions	~2019	Completed performance report and distributed facility investment guidelines (implemented gradual facility investments)	●
	Implementing the Act on Integrated Control of Environmental Pollution-Generating Facilities (Integrated Act)		Conduct integrated environmental management review at all business sites and submit plan	~2019	Carried out review of integrated environmental management and submitted plan	●
	Implementing the Act on the Registration and Evaluation, etc. of Chemicals (Chemical Evaluation Act)		1. Advance reporting of substances produced/imported 1 ton/year or more (~ June 30, 2019) 2. Reporting of substances produced/imported 1 ton/year or more (~ Dec. 31, 2021)	~2021	Reported and registered according to plan	●
Sustainability Management	Adopting revised Environment, Quality and Safety (EQS) standards	Internalize standards	Establish plans for implementation of standards and conduct monitoring	~2019	Verified standard implementation status through EQS management system (From 2020, will carry out detailed life-cycle inspections and make improvements)	●

2020 Targets

Category	Key Issues	2020 Targets	Achievement Index
Climate Change	Responding actively to regulations on emissions trading scheme	Secure supplemental emissions rights	Increase supplementary emissions rights compared to previous year (additional allocation)
Environmental Management	Activating resource circulation management systems	Respond to resource circulation target management system	Set and implement internal resource circulation targets
Chemical Substances	Responding to overseas regulations on chemical substances	Submit overseas REACH reports in advance (Turkey, Russia)	Submit overseas REACH reports completed in advance (Turkey, Russia)
	Responding to domestic regulations on chemical substances	Follow up on registration of substances registered under Chemical Evaluation Act	Complete for 50% of substances
Sustainability Management	Establishing life-cycle management systems	Expand life-cycle management products	Carry out life-cycle assessments (LCA) for at least two products

GHG Emissions

(Unit : tCO₂e)

Category		2017	2018	2019
Direct emissions	Yeosu plant	1,933,057	1,773,519	2,390,026
	Daesan plant	1,712,806	1,706,839	1,659,302
	Ulsan plant	743,481	696,108	634,824
	HQ and other business sites	1,220	1,470	1,878
Indirect emissions	Yeosu plant	531,583	635,442	681,922
	Daesan plant	665,943	717,547	679,571
	Ulsan plant	351,371	345,409	319,394
	HQ and other business sites	4,967	4,935	5,728
Total emissions	Yeosu plant	2,464,640	2,408,961	3,071,948
	Daesan plant	2,378,749	2,424,386	2,338,872
	Ulsan plant	1,094,852	1,041,517	954,218
	HQ and other business sites	6,187	6,405	7,606
GHG emission intensity (tCO ₂ e/MT)	Yeosu plant	0.557	0.597	0.634
	Daesan plant	0.529	0.525	0.558
	Ulsan plant	0.463	0.457	0.437

1. Headquarters and other business sites : Headquarters (Seoul), R&D centers (Daejeon, Seoul), Kukje Building (Busan), Water Treatment Membrane Plant (Daegu) [R&D Center (Seoul) and Water Treatment Membrane Plant (Daegu) newly established in 2018]

2. Figure differs from last year's report following adjustments according to government's final report

3. Calculated GHG emission intensity is based on output.

Energy consumption

(Unit : TJ)

Category		2017	2018	2019
Direct energy consumption	Yeosu plant	37,317	33,182	45,641
	Daesan plant	37,998	37,966	35,189
	Ulsan plant	10,386	9,567	9,196
Indirect energy consumption	Yeosu plant	10,603	12,470	12,821
	Daesan plant	11,550	12,314	11,851
	Ulsan plant	7,327	7,232	6,686
Total energy consumption (TJ)	Yeosu plant	47,920	45,652	58,462
	Daesan plant	49,548	50,280	47,040
	Ulsan plant	17,713	16,799	15,882
Energy intensity (TOE/MT)	Yeosu plant	0.257	0.269	0.288
	Daesan plant	0.263	0.26	0.268
	Ulsan plant	0.175	0.171	0.174

1. Energy consumption figures changed due to Ministry of Environment revision of conformity assessment and computation guidelines for steam emissions
2. Energy source unit is calculated based on product production

Reductions of GHG emissions and energy consumption at each plant

Category		2017	2018	2019
No. of reduction activities	Yeosu plant	31	23	22
	Daesan plant	26	24	25
	Ulsan plant	3	7	3
GHG reductions (tCO ₂ e)	Yeosu plant	22,281	13,631	13,345
	Daesan plant	10,543	21,171	25,353
	Ulsan plant	3,954	4,184	8,370
Energy conservation (TJ)	Yeosu plant	424	261	260
	Daesan plant	146	368	416
	Ulsan plant	79	84	145

Environmental investment expenditures

(Unit : KRW billion)

Category		2017	2018	2019		
				Planned	Performance	Achievement Rate (%)
Environmental management expenses	Yeosu plant	21.67	23.43	-	25.96	-
	Daesan plant	20.92	26.52	-	26.07	-
	Ulsan plant	22.26	23.39	-	23.99	-
Environmental investments	Yeosu plant	16.10	11.30	4.31	15.0	34.80
	Daesan plant	43.35	6.35	2.96	9.33	31.52
	Ulsan plant	2.65	4.80	6.94	5.10	7.35
Total	Yeosu plant	37.77	34.73	-	40.96	-
	Daesan plant	64.27	32.87	-	35.40	-
	Ulsan plant	24.91	28.19	-	29.09	-

No. of employees who have completed environmental training

(Unit : persons)

Category	2017	2018	2019
Yeosu	21	31	23
Daesan	22	12	22
Ulsan	20	10	21

Raw material use

(Unit : ton)

Category	2017	2018	2019
Yeosu	2,950,232	2,565,070	3,023,700
Daesan	3,313,481	3,161,967	2,935,354
Ulsan	1,190,286	1,108,518	1,101,685

Water use

(Unit : 1,000 tons)

Category	2017	2018	2019
Yeosu	17,931	18,823	20,886
Daesan	13,416	13,810	13,217
Ulsan	11,434	11,321	10,456

Wastewater discharge

(Unit : 1,000 tons)

Category	2017	2018	2019
Yeosu	3,461	4,161	4,171
Daesan	2,367	2,419	2,488
Ulsan	7,122	6,729	5,852

Air pollutant emissions

(Unit : ton)

Category		2017	2018	2019
Particulates	Yeosu plant	32	32	45
	Daesan plant	4	4	11
	Ulsan plant	22	15	12
SOx	Yeosu plant	21	9	19
	Daesan plant	1	0	4
	Ulsan plant	48	45	41
NOx	Yeosu plant	425	468	452
	Daesan plant	5	7	8
	Ulsan plant	633	568	483

Water Quality

(Unit : ppm)

Category		2017	2018	2019
BOD	Yeosu plant	15	18	29
	Daesan plant	3	2	3
	Ulsan plant	1.2	1.3	2.0
COD	Yeosu plant	38	45	64
	Daesan plant	20	23	14
	Ulsan plant	8	19	16
SS	Yeosu plant	41	38	47
	Daesan plant	3	6	2
	Ulsan plant	8	19	17

* Wastewater concentrations at all plants are within legal limits. The discrepancy in waste water concentrations is due to the differences in standards between integrated water treatment facilities at industrial complexes (Yeosu, Ulsan) and independent wastewater treatment facilities (Daesan).

Chemical emissions (PRTR : Pollutant release and transfer register) (Unit : ton)

Category		2017	2018	2019
Ethylene	Yeosu plant	12	14	13
	Daesan plant	12	7	1
	Ulsan plant	-	-	-
Propylene	Yeosu plant	10	12	12
	Daesan plant	16	2	2
	Ulsan plant	-	-	-
Xylene	Yeosu plant	-	-	-
	Daesan plant	-	-	-
	Ulsan plant	7	3	3
Acetic acid	Yeosu plant	-	-	-
	Daesan plant	-	-	-
	Ulsan plant	10	9	11
Others	Yeosu plant	70	65	62
	Daesan plant	57	47	24
	Ulsan plant	19	11	10

By-product management

(Unit : ton)

Category		2017	2018	2019
By-product amount generated	Yeosu plant	2,804,455	2,432,273	2,994,596
	Daesan plant	2,971,388	2,910,006	2,698,713
	Ulsan plant	56,196	51,769	49,024
By-product amount recycled	Yeosu plant	2,804,455	2,432,273	2,994,596
	Daesan plant	2,971,388	2,910,006	2,698,713
	Ulsan plant	56,196	51,769	49,024
By-product recycling rate (%)	Yeosu plant	100	100	100
	Daesan plant	100	100	100
	Ulsan plant	100	100	100

Integrated recycling rate of general and designated waste* (Unit : %)

Category	2017	2018	2019
Yeosu plant	67.5	65.6	74.0
Daesan plant	91.1	87.0	85.2
Ulsan plant*	43.5	61.6	80.7

* Totals may differ due to rounding.

*Reason for increase in recycling rate at Ulsan plant : Organic sludge (waste sludge) treated by sponsored recycling business that used the recyclable properties of organic sludge; recyclable items used partly as landfill covering and as raw material for a cement company

> Health and Safety

LOTTE Chemical's Response

2019 Performance

Category	Key Issues	2019 Targets	Achievement Index	Target Date	Performance by Target	Achievement Status ●○○
Internalization of safety culture	Raise standards of safety culture	1. Expand monitoring of safety behavior to all employees and foster in-house safety culture experts 2. Improve health and safety training system	Implementation rate	~2020	1. Fostered 359 in-house safety experts (difference of 15) 2. Currently establishing health and safety training system	●
Improving safety management	Establish safety management system	1. Issue permits for safety work 2. Monitor safety behavior 3. Establish safety reporting system	Completion rate	~2019	1. Trial implementation of digital safety work management system at Daesan	●

Management of general waste

(Unit : ton)

Category		2017	2018	2019
Incineration	Yeosu plant	3,220	3,400	2,484
	Daesan plant	310	274	768
	Ulsan plant	235	176	65
Landfilled	Yeosu plant	2,995	3,328	2,559
	Daesan plant	902	1,524	1,804
	Ulsan plant	19,633	9,974	4,905
Recycling	Yeosu plant	6,104	6,566	8,140
	Daesan plant	4,390	3,298	4,392
	Ulsan plant	9,184	15,945	20,458
Total	Yeosu plant	12,319	13,294	13,183
	Daesan plant	5,602	5,096	6,964
	Ulsan plant	29,052	26,095	25,428

Management of designated waste

(Unit : ton)

Category		2017	2018	2019
Incineration	Yeosu plant	1,338	3,076	2,689
	Daesan plant	207	171	522
	Ulsan plant	28	531	122
Landfilling	Yeosu plant	8	92	95
	Daesan plant	-	1	38
	Ulsan plant	11	19	122
Recycling	Yeosu plant	9,617	12,265	14,009
	Daesan plant	10,082	9,886	13,613
	Ulsan plant	348	1,191	1,394
Total	Yeosu plant	10,964	15,433	16,793
	Daesan plant	10,289	10,058	14,173
	Ulsan plant	387	1,741	1,638

Sales of eco-friendly products

(Unit : KRW)

Category	2017	2018	2019
Water treatment business	-	-	7,871,978,571
TIPP	1,505,764,478	4,937,361,810	9,701,812,659
Ti-PET	-	1,102,410,827	598,935,750
Bio-PET	12,347,614,342	9,748,753,810	12,076,400,886
LFT injection-molded back-beams for automobiles	164,672,300	173,716,622	232,983,107

Eco-friendly Products and Services Purchasing Performance

(Unit : KRW)

Category	2017	2018	2019
Eco-friendly Products and Services Purchasing Performance	12,359,490,350	12,542,396,470	14,551,687,440

2020 Goals

Category	Key Issues	2020 Targets	Achievement Index
Internalization of safety culture	Safety awareness/safety behavior/safety system/ company-wide reassessment of safety system	Establish 2 nd phase roadmap	Standards of leading companies (maturity stage) : 57~77 points
Enhancement of management system	Convert all business sites from OHSAS-18001 to ISO 45001	Acquire ISO 45001 certification for all business sites	100% acquisition of ISO 45001 upon verification

> Employees

LOTTE Chemical's Response

2019 Performance

Category	Key Issues	2019 Targets	Achievement Index	Target Date	Performance by Target	Achievement Status ●○○
Global	Establishing direction for world-class HR	1. Establish HR organizational system in line with global standards 2. Establish global HR governance/support systems geared toward overseas expansion	1. Establish HR organizational system in line with global standards 2. Establishing global HR governance/support systems geared toward overseas expansion	~2020	1. Carried out HR organizational restructuring : system consisting of company-wide organization + departmental implementation - Company-wide : HR policy planning (set directions, monitoring) - Departments : Carried out HR policy implementation 2. Carried out consulting to increase HR competitiveness - Identified direction for Global HR Governance design (Clarified mid-to-long-term organizational structure and R&R by organization)	●○○
	Recruiting	1. Retain exceptional/expert talent - Retain outside experts to actively respond to market changes - Expand international graduate/doctoral recruiting programs in key business areas	1. Retain exceptional workforce for overseas expansion 2. Retain outside experts to actively respond to market changes 3. Expand international graduate/doctoral recruiting program in key business areas	~2019	1. Retained experts, including DT specialists, attorneys, inspection specialists and R&D PhDs 2. Prepared to hire experienced talent for new overseas projects (Hiring in 2020 according to changes in project plans)	●○○
HR Management	Operating policies conducive to HR development and retention	1. Establish career development system and compensation policy to improve job satisfaction and competency	1. Establish career development system and compensation policy to improve job satisfaction and competency	~2019	1. Carried out consulting to increase HR competitiveness - Identified direction for world-class CDP system, and performance appraisal and compensation policy - Set detailed action plans through innovation task force	●○○
Talent Development	Developing global talent in advance to become a global Top 7 company	1. Systematize training of global core talent pool - Develop 'Regional Experts' for future projects in advance and foster competencies in strategic languages	1. Strengthen training of core talent pool and leadership development for managers 2. Operate training system for future expat employees 3. Conduct Round 4 of 'Regional Expert' selection and improve operation 4. Develop strategic language competency for future projects	~2019	1. Leadership training for executives/team leaders/leaders (5 times total) 2. Provided course for eight Future Expat employees and their families 3. Conducted Round 4 of Regional Expert program (Vietnam and Myanmar) and disseminated their learning in-house 4. Average of 840 on strategic language test scores (improvement of 33 points over previous year) and conducted specially tailored Indonesian language instruction	●○○
	Preparing synergy for talent development by integrating petrochemical companies	1. Expand in-house training programs to strengthen core capabilities of petrochemical companies 2. Prepare in advance by operating task force with integrated petrochemical company HR departments	1. Increase importance of in-house training compared to training at talent training centers 2. Strengthen partnerships with exceptional outside job training institutes 3. Integrate and operate petrochemical companies into priority courses for core talent and orientation training	~2019	1. Fostered Vision Evangelists (20 executives) Conducted Vision 2030 dissemination training (1,515 trainees) 2. Conducted competency enhancement basic course for Chonnam National University cooperative engineers (22 trainees) 3. Conducted new employee orientation with petrochemical employees integrated (43 trainees)	●○○
Workers' Rights	Spreading creative labor-management culture	1. Establish stable labor-management culture	1. Achieve cooperative and reasonable labor-management relations	~2021	1. Successful no-strike wage negotiation and agreement 2. Re-certified as Family-Friendly Company (certification period : 3 years)	●○○
Employee-Friendly Organizational Culture	Creating culture based on work-life balance	1. Strive to enhance productivity in proportion to reduced working hours	1. Improve weekly working hours and work immersion levels	~2019	1. Adopted flexible work system (in June) : Enhanced productivity by operating various work schedules	●○○
	Vitalizing communication in rapidly-growing organization	1. Strengthen communication between CEO/executives and employees 2. Run communication messages and campaigns to promote immersion in work 3. Provide special lectures on management policy	1. Support CEO's on-site communication-based management and interactive communication with executives 2. Diversify communication channels and adopt video/information services 3. Provide theme-specific lectures and project lectures relating to management issues	~2019	1. Operated CHEMI MAKING and reverse mentoring program (35 times in total) - Hosted discussions between diverse groups including differing ranks, occupations, generations and also talented women 2. Adopted DT in communication messages (20 messages) 3. Conducted special lectures aligned with management policy (5 sessions)	●○○
	Continuing to improve corporate culture	1. Continue to operate corporate culture task force and diversify programs	1. Improve organizational effectiveness index	~2019	1. Implemented in-house psychological program to manage employee stress 2. Adopted completely free dress code 3. Improved organizational effectiveness score : 81 (2018) → 84 (2019)	●○○

2020 Goals

Category	Key Issues	2020 Targets	Achievement Index	Target Date
HR Management	Improving HR policy	1. Improve appraisal system	1. Adopt absolute/regular/multifaceted appraisals	~2020
		1. Establish strategy to improve rank/wage system	1. Improve rank system 2. Establish direction for role- and performance-linked wage system	~2020
	Setting up and upgrading systems	1. Set up advanced HR system	1. Establish post-HR consulting task force and advanced HR system 2. Establish integrated HR management system (based on AI and big data)	~2020
	Supporting the strengthening of R&D	1. Support strengthening of research capabilities	1. Establish research performance and reward levels	~2020
Respect for Human Rights	Promoting creative labor-management culture	1. Promote a trusting labor-management culture	1. Restore mutual trust between labor and management and establish mutually understanding in labor-management relations	~2022
Employee-Friendly Organizational Culture	Implementing GWP	1. Provide psychological counseling for staff	1. Actually implement psychological counseling for staff	~2020
	Innovating work culture	1. Implement Smart Work	1. Establish and implement plans for Smart Work	~2020
	Continuing to upgrade corporate culture	1. Formally inaugurate Corporate Culture Improvement Committee	1. Establish vision-aligned corporate culture 2. Pursue work efficiency plans to achieve management goals 3. Pursue work method innovation by pursuing DWP	~2020
Talent Development	Strengthening core leaders and global capabilities	1. Increase competencies of core talent and newly appointed team leaders 2. Establish a training system for new and returning expat employees	1. Establish platform to develop core female talent 2. Carry out leadership assessment/analysis/workshop for newly appointed team leaders 3. Propose guidelines for developing local core talent at overseas offices 4. Establish a flow process for onboarding expat employees and relocating returning expat employees	~2021
			Strengthening job understanding	1. Strengthen work knowledge of production workers
	Enhancing integrated synergy	1. Plan and operate training that integrates petrochemical companies	1. Integrate systems and values; plan and operate vision-sharing program 2. Plan and operate a program teaching the differences between organizational cultures	~2020

> Customer Value

LOTTE Chemical's Response

2019 Performance

Category	Key Issues	2019 Targets	Achievement Index	Target Date	Performance by Target	Achievement Status
Customer Communication	Customer satisfaction surveys	1. Periodic monitoring of customer satisfaction rate	1. Continued execution, feedback on improvements to quality	~2019	1. Strengthen customer affinity through continuous satisfaction surveys and feedback on improvements to quality	●
	Awards ceremony for most outstanding customers	1. Continue invitational customer communication	1. Continued implementation	~2019	1. Practice sustainability management by continuing to build relationships of trust	●
	'Green' invitational events for customers from each region	1. Engage in communication activities with customers in each region	1. Continued implementation	~2019	1. Provide customers with tailored services, understand customer needs and reflect them in improvements	●

2020 Targets

Category	Key Issues	2019 Targets	Achievement Index	Target Date
Customer Communication	Customer satisfaction surveys	1. Periodic monitoring of customer satisfaction rate	1. Continued execution, feedback on improvements to quality	~2020
	Award events for the most outstanding customers	1. Continued communication through invitational events for customers	1. Continued execution	~2020
	'Green communication' events for customers in each region	1. Communication activities for customers in each region	1. Continued execution	~2020

Results of Customer Satisfaction Survey

Category	Unit	2017	2018	2019	Remarks
Customer Satisfaction Score	Points	88.6	82.8	85.0	

> Economy

Sales of domestic and overseas business sites

Category	Unit	2017	2018	2019
Sales of domestic business sites	KRW trillion	12.9	11.8	10.6
Sales of overseas business sites	KRW trillion	2.9	4.8	4.5
Total	KRW trillion	15.9	16.5	15.1

Government financial assistance

Category	Unit	2017	2018	2019
Government grants*	KRW million	1,880	1,230	461

* Includes only government R&D subsidies

R&D investments

Category	Unit	2017	2018	2019
R&D expenses	KRW million	91,748	92,367	84,575

Society

Number of domestic employees

Category	Unit	2017	2018	2019	
Type of employment	Regular	Persons	2,958	3,067	3,204
	Irregular	Persons	203	91	81
Gender	Male	Persons	2,762	2,761	2,866
	Female	Persons	399	397	419
Age	Under 30	Persons	543	595	604
	30~50	Persons	1,853	1,773	1,842
	Above 50	Persons	765	790	839
Total number of domestic employees	Persons	3,161	3,158	3,285	

Number of overseas employees in 2019

Category	Unit	2017	2018	2019	
Type of employment	Regular	Persons	117	120	85
	Irregular	Persons	13	17	1
Gender	Male	Persons	129	135	85
	Female	Persons	1	2	1
Age	Under 30	Persons	4	5	0
	30~50	Persons	88	88	59
	Above 50	Persons	38	44	27
Total number of overseas employees	Persons	130	137	86	

Number of employees by business site

Category	Unit	2017	2018	2019
No. of domestic worksites	Facilities	11	11	12
No. of domestic employees	Persons	3,161	3,158	3,285
No. of overseas worksites	Facilities	18	20	20
No. of overseas employees*	Persons	2,376	4,150	4,335

* Including local workforce

Turnover rate

Category	Unit	2017	2018	2019
Turnover rate*	%	2.0	2.0	1.9

* Based on annual average number of employees

Employees subject to regular performance evaluations and career development reviews

Category	Unit	2017	2018	2019
Percentage of employees subject to review	%	39.6	38.4	38.8
No. of employees subject to review	Persons	1,251	1,212	1,274

Retirement pension subscription rate

Category	Unit	2017	2018	2019
Subscription rate*	%	84	78	76
No. of employees*	Persons	2,655	2,429	2,248

* As of the end of December of the corresponding year

Childcare leave

Category	Unit	2017	2018	2019
No. of employees taking childcare leave	Persons	92	110	165
No. of employees returning to work after childcare leave	Persons	57	95	135
No. of employees who work at least 12 additional months after returning	Persons	50	75	93

Employee satisfaction rate

Category	Unit	2017	2018	2019
Employee satisfaction rate	Points	75	85	84

Number of employees subject to collective bargaining

Category	Unit	2017	2018	2019
No. of employees subject to collective bargaining	Persons	1,421	1,422	1,477
Total no. of employees	Persons	3,161	3,258	3,285
Percentage of employees subject to collective bargaining	%	45	44	44

Employees represented by the Labor-Management Joint Health and Safety Committee

Category	Unit	2017	2018	2019
Number of employees*	Persons	2,070	2,093	2,191

* Yeosu/Daesan/Ulsan

Occupational injury rate

Category	Unit	2017	2018	2019
Total occupational injury rate	%	0.21	0	0.02
Total number of occupational injuries	Cases	2	0	1

Employee Education

Category	Unit	2017	2018	2019
Total training hours	Hours	388,382	398,292	400,000
Total number of employees*	Persons	2,770	3,067	3,204
Training hours per person	Hours	140	130	125

* Number of full-time employees

2019 training on prevention of sexual harassment

Category	Unit	2019
Attendance	Persons	3,158
Training expenditures	KRW 1,000	12,599

Other human rights training*

Category	Unit	2017	2018	2019
No. of training sessions	Sessions	5	7	6
Persons subject to training	Persons	190	194	240
Persons who completed training	Persons	190	191	234

* Other human rights training : 'Grade' training on subjects including respect for diversity and a WoW forum on protecting the human rights of female workers

Ethical management training

Category	Unit	2017	2018	2019
No. of training courses	Courses	6	5	1
Training hours per course	Hours	1	1	1
Persons who completed the training	Persons	805	394	65

Online complaint submissions

Category	Unit	2017	2018	2019
Bidding and contracts	Cases	1	3	2
Sales and bonds	Cases	-	-	2
Partner grievances	Cases	1	6	2
Job-related complaints	Cases	4	5	7
Total	Cases	6	14	13
Follow-up measures and steps to prevent recurrence	Cases	6	14	13

Performance in supporting mutual growth with partners

Category	Unit	2017	2018	2019
Mutual growth fund	KRW billion	135	135	135
Companies participating in mutual growth	Companies	350	350	350
Partner support programs	Programs	16 [financial support (4) /technology support (6) /training support (2) /management support (4)]	12 [financial support (3) /technology support (6) /training support (0) /management support (3)]	15 [financial support (4) /training support (2) /technology support (3) /management support (3)]
No. of training courses held for partners	Courses	2	0	4
No. of partner employees who have completed training	Persons	157	0	79
No. of companies supported for overseas expansion	Companies	61	30	31

Membership fees for related organizations

Category	Unit	2017	2018	2019
Membership fees for related organizations*	KRW million	197	180.8	189.6

* Membership fees paid to the Korea Petrochemical Industry Association

Social contribution investments


Category	Unit	2017	2018	2019	Remarks
Social welfare investment	KRW million	2,087	1,672	1,972	Improvement of residential environments, investments in social welfare facilities
Education and scholarship investment	KRW million	64	215	320	Investments in child welfare centers
Environment and culture investment	KRW million	18	30	67	Nature clean-ups, etc.
Other	KRW million	14,163	6,034	7,069	

LOTTE Chemical Declaration of Human Rights

As a global chemical company working to build a healthy and prosperous future for humankind, LOTTE Chemical practices social responsibility and aims to achieve sustainable growth based on the trust of all of its stakeholders.


LOTTE Chemical hereby declares its support for the international principles set forth in documents such as the ‘Universal Declaration of Human Rights’ and the ‘UN Guiding Principles on Business and Human Rights; Ruggie Framework’, and pledges to fulfill all related responsibilities.

We will do our best to prevent any violations of human rights in the course of doing business, and we publicly pledge our commitment, as fully stated fully below, to respecting and protecting the human rights and free will of all of our stakeholders, including customers, members, local communities, partner companies and others.




■ Employee Human Rights

- Preventing discrimination based on gender, race, religion, disability, origins, etc.
- Fundamentally preventing wrongful labor practices such as forced labor and child labor
- Complying with all labor principles recommended by the International Labour Organization (ILO) and ratified by the Korean government, including those on health and safety, working hours and others



■ Customer Human Rights

- Requesting, recording and storing only the minimum amount of personal information needed to comply with laws and regulations
- Establishing strong security systems, such as encryption, to prevent leaks of personal information
- Using personal information responsibly and limiting its use to providing services and marketing



■ Human Rights of Local Communities

- Recognizing our responsibilities and participating actively in social contribution activities for the development of local communities
- Measuring and managing the impacts of activities that can cause environmental and social problems in local communities



■ Human Rights of Partners

- Establishing fair and equal business relationships as a win-win partner
- Prohibiting discrimination against members of partner companies and preventing forced labor and child labor

As a corporate citizen with a sense of responsibility in the global business environment, LOTTE Chemical will do its utmost to ensure that subsidiaries and partner companies adhere to these human rights policies, and we will work to be leaders in the promotion of human rights management.

Thank you.

June 2020

Kim Gyo-hyun, CEO of LOTTE Chemical



Third Party Assurance

To the Readers of LOTTE Chemical Sustainability Report 2019 :

Foreword

Korea Management Registrar Inc. (hereinafter “KMR”) has been requested by of LOTTE Chemical to verify the contents of its LOTTE Chemical Sustainability Report 2019 (hereinafter referred to as “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

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.

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> ■ GRI Standards Reporting Principles ■ Universal Standards ■ Topic Specific Standards - Management approach of Topic Specific Standards - Economic Performance : 201-1, 201-3 - Market Presence : 202-1 - 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 | <ul style="list-style-type: none"> - 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 - Labor/Management Relations : 402-1 - Occupational Health and Safety : 403-1, 403-2, 403-3, 403-4 - Training and Education : 404-1, 404-2, 404-3 - 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, 417-2, 417-3 - Customer Privacy : 418-1 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

This Report excludes 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 :

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> ■ Reviewed overall report ■ Reviewed materiality test process and methodology ■ Reviewed sustainability management strategies and targets | <ul style="list-style-type: none"> ■ 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 disclosed of key achievements in sustainability highlights for higher visibility. It also reported the organization's performance and future plans from the readers' standpoint in the context of sustainability to enhance understandability. The company is advised to include economic performance of overseas operations as well as social performance in the Report for completeness.

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.

June, 18th, 2020

CEO

