

2022 LOTTE Chemical ESG Report

EVERY
STEP FOR
GREEN



About This Report

ESG Report



Homepage



Interactive PDF

This report is published in both Korean and English and is available in an interactive PDF to facilitate effective communication with global stakeholders.

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Overview

We have been publishing annual Sustainability Reports since 2007 to transparently share our sustainability management efforts and major achievements to the public and actively communicate with our stakeholders. In July 2023, we released our 16th report, now called the 2022 LOTTE Chemical ESG Report. We will continue to communicate our ESG management strategy and performance through the report, gather feedback from stakeholders, and reflect them in our management activities.

Reporting Principles and Framework

This report has been prepared in accordance with the Global Reporting Initiative (GRI) Standards 2021, which is a worldwide standard for publishing ESG reports. The report also takes into account the recommendations from the Task Force on Climate-related Financial Disclosure (TCFD) and the Sustainability Accounting Standards Board (SASB), particularly for the chemicals sector. The financial data presented in this report were prepared based on the Korean International Financial Reporting Standards (K-IFRS) using consolidated financial statements.

Reporting Period, Scope, and Boundaries

This report covers the period of January 1, 2022 through December 31, 2022, with some qualitative performances also including activities from the first half of 2023. The report includes data for three years for quantitative performance, taking into account the timeliness of information.

The main scope of the report is LOTTE Chemical's Seoul headquarters, Innovation Center, LOTTE Chemical Institute of Technology (LCIT), Uiwang Office, Yeosu Plant(Basic Chemicals), Yeosu Plant (Advanced Materials), Ulsan Plant, Daesan Plant, and Daegu Water Treatment Plant. Subsidiaries' activities and performances are also included in some categories. Any necessary information about the reporting scope and boundary is provided in the footnotes.

Data Assurance

This report is published after being reviewed by the ESG Committee under the Board of Directors of LOTTE Chemical. In addition, British Standards Institution (BSI), an independent verification agency, verified the reliability of the writing process, data, and contents to enhance the credibility of the report. The third-party assurance statement is available in the section of Appendices (page 112).

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LOTTE Chemical ESG Policy Book

EVERY
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CEO Message

We Lead Every Step For a Greener and Better Tomorrow

“LOTTE Chemical creates a better world and sustainable future through chemistry.”

**Dear esteemed stakeholders,
I am Kim Gyo-hyun, CEO of LOTTE Chemical.**

In 2022, negative factors such as the COVID-19 lockdown in China, the ongoing war between Russia and Ukraine, and continued inflation made existing businesses increasingly challenging. Despite these difficulties, LOTTE Chemical had a dynamic year, setting new goals and future directions for the company and making systematic preparations to achieve it.

I would like to take this opportunity to express my sincere gratitude to all of our stakeholders for your interest, unwavering support, and encouragement in our new vision and future direction despite the challenging circumstances.

In 2022, we unveiled our new vision, ‘Every Step for Green’, which will guide us towards sustainable growth. Based on this vision, we will expand the scope of our green future businesses and redouble our efforts towards ESG management to achieve net-zero by 2050.

To this end, we will move forward with the following four strategies.

First, we will focus on further developing our low-carbon technologies and expanding our products to increase the competitiveness of our petrochemical business.

LOTTE Chemical’s growth will go hand in hand with carbon-reducing growth. We plan to enhance the competitiveness of our existing petrochemical business through high value-added products, energy efficiency, and expansion of specialty products. We will also go beyond mechanical recycling and move towards plastic recycling to create social values, circulation, and coexistence.

Second, we will actively work to secure future growth engines.

We plan to enhance our capabilities in green businesses, including hydrogen energy business and battery material business, and expand into new sectors such as bio healthcare. Our goal is to raise the share of specialty high-value products and green businesses to 60% of our total business portfolio. In particular, we completed the acquisition of ‘Iljin Materials’, an anode material maker for secondary batteries, in March 2023, and launched ‘LOTTE Energy Materials’ to maximize synergies in battery materials and expand the global market.

Third, we will do our best to manage risks at all times.

We will establish a system that can proactively identify and respond to both financial and non-financial ESG risks. Additionally, our risk management efforts will extend to our subsidiaries and supply chains.

Finally, we will foster a culture based on trust and respect.

We are acutely aware that corporate culture is a crucial factor in the sustainable growth of an organization, and we strive to create a healthy workplace. We will establish a corporate culture of ‘trust and respect’ between the company and employees.

LOTTE Chemical will always listen to our stakeholders and reinvent itself as a sustainable chemical company that contributes to our society by practicing safe and eco-friendly values. We look forward to your interest and support on our journey towards a sustainable future.



July 2023
CEO **Kim Gyo-hyun**



LOTTE Chemical at a Glance

Company Profile

A Company that Creates a Better World through Chemistry

Founded in 1976, LOTTE Chemical is a leading chemical company in Korea that has secured outstanding competitiveness through continuous business expansion, and is building a stable business operation and an efficient business portfolio. In 2022, with the encouragement and attention of our stakeholders, we established our 2030 vision, 「Every Step for GREEN」, to strive for an abundant and green world with leading technologies.

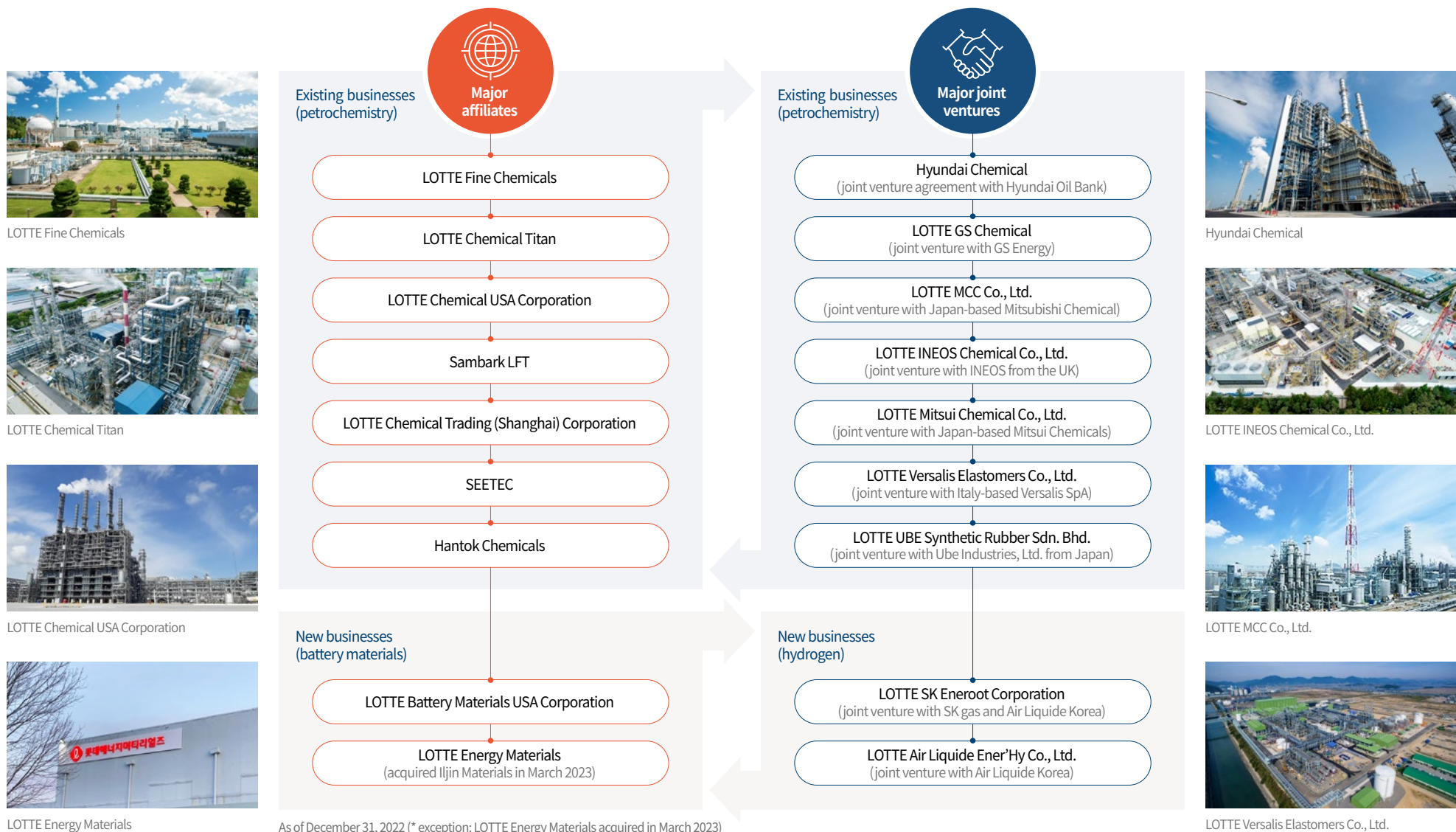


General Status (as of the end of 2022)

Category	Content
Company name	LOTTE Chemical Corporation
Global sales	KRW 21.6414 trillion
Operating income	▲ KRW 870.5 billion
Total assets	KRW 26.7846 trillion
Total equity	KRW 17.2642 trillion
Total no. of shares issued	34,275,419 shares
Date of establishment	March 16, 1976
CEO	Shin Dong-bin, Kim Gyo-hyun, Lee Young-joon, Hwang Jin-koo
HQ location	14-16F, LOTTE World Tower, 300 Olympic-ro, Songpa-gu, Seoul, Republic of Korea
Key businesses	Basic chemicals, monomers, polymers, synthetic resin, construction materials
Credit rating	AA+
Total no. of employees	4,724
Subsidiaries	Domestic Subsidiaries: 7 Overseas Subsidiaries: 24

Major Affiliates and Joint Ventures

Since its establishment in 1976, LOTTE Chemical has made significant progress, thanks to its extensive experience and exceptional technological capabilities. We have expanded our global presence through joint ventures and mergers and acquisitions. Going forward, we will focus on enhancing our competitiveness in high value-added businesses such as engineering plastics and fine chemicals. And we will work on expanding into promising areas such as hydrogen energy and battery materials. This will enable us to take our future value to new heights.

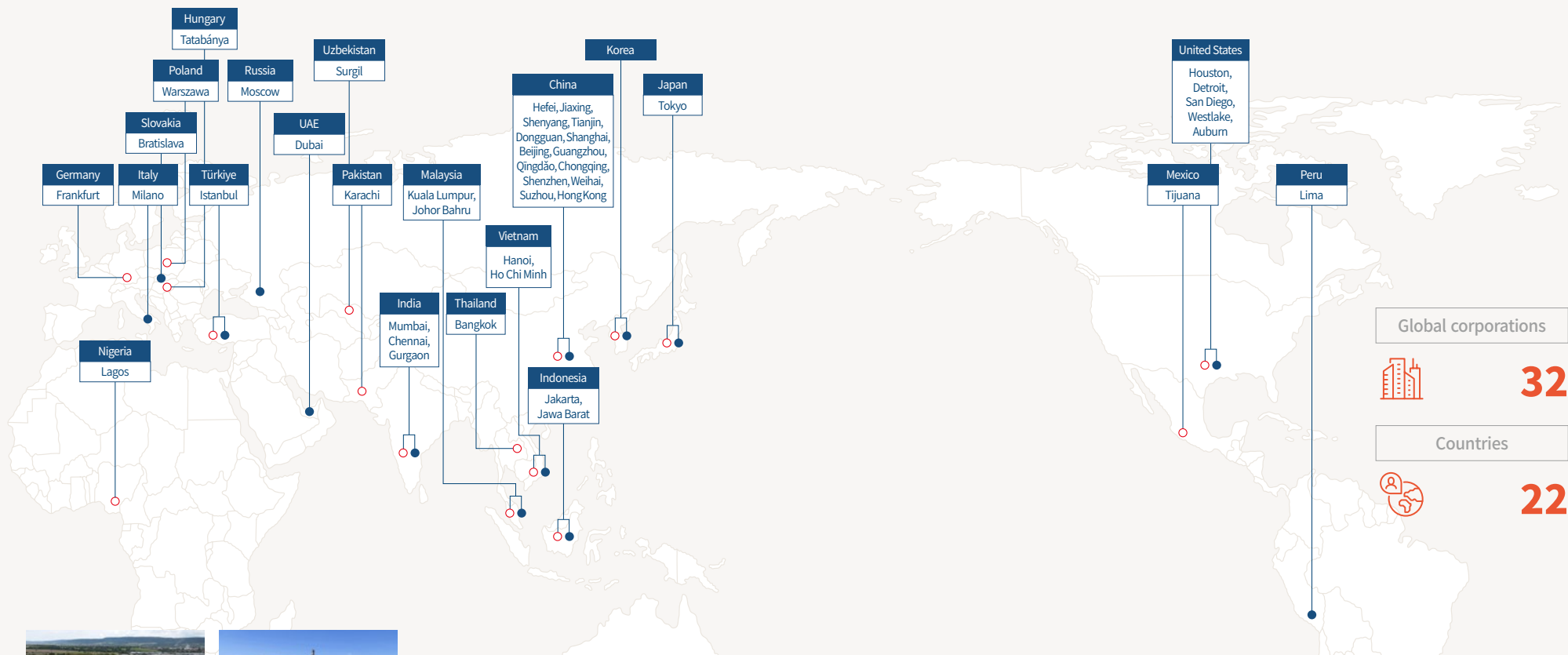


As of December 31, 2022 (* exception: LOTTE Energy Materials acquired in March 2023)

Global Network

Our network spans across the globe including the Americas, Europe, China, and Southeast and Southwest Asia beyond Korea. This extensive network allows us to improve our production efficiency, strengthen our strategic positions, and establish global partnerships to increase our corporate value.

○ Corporation ● Branch / Sales office



Hungary LCHU*



Uzbekistan Uz-Kor



China LC EP**



Malaysia, Indonesia LC TITAN



USA LACC, LCLA

* LOTTE Chemical Hungary Ltd. ** LOTTE Chemical (Jiaxing) Corp.

LOTTE Chemical Global Network

(Unit: EA, as of December 31, 2022)

	All business sites	Basic chemicals	Advanced materials	Battery materials
Overseas manufacturing & sales corporation ▶	17	4	12	1
Overseas sales offices ▶	7	2	5	-
Overseas branches ▶	25	7	18	-

Local Network

LOTTE Chemical boasts Korea's largest-scale production facilities within petrochemical complexes including Seoul Headquarters, Innovation Center, Institute of Technology, Uiwang Office, Yeosu, Ulsan, Daesan, and Daegu.



Seoul Headquarters

300 Olympic-ro, Songpa-gu, Seoul, Korea
LOTTE World Tower



**Innovation Center
(Seoul Research Center)**

201 Magokjungang-ro, Gangseo-gu, Seoul, South Korea



Uiwang Office

56 Gosan-ro, Uiwang-si, Gyeonggi-do, South Korea



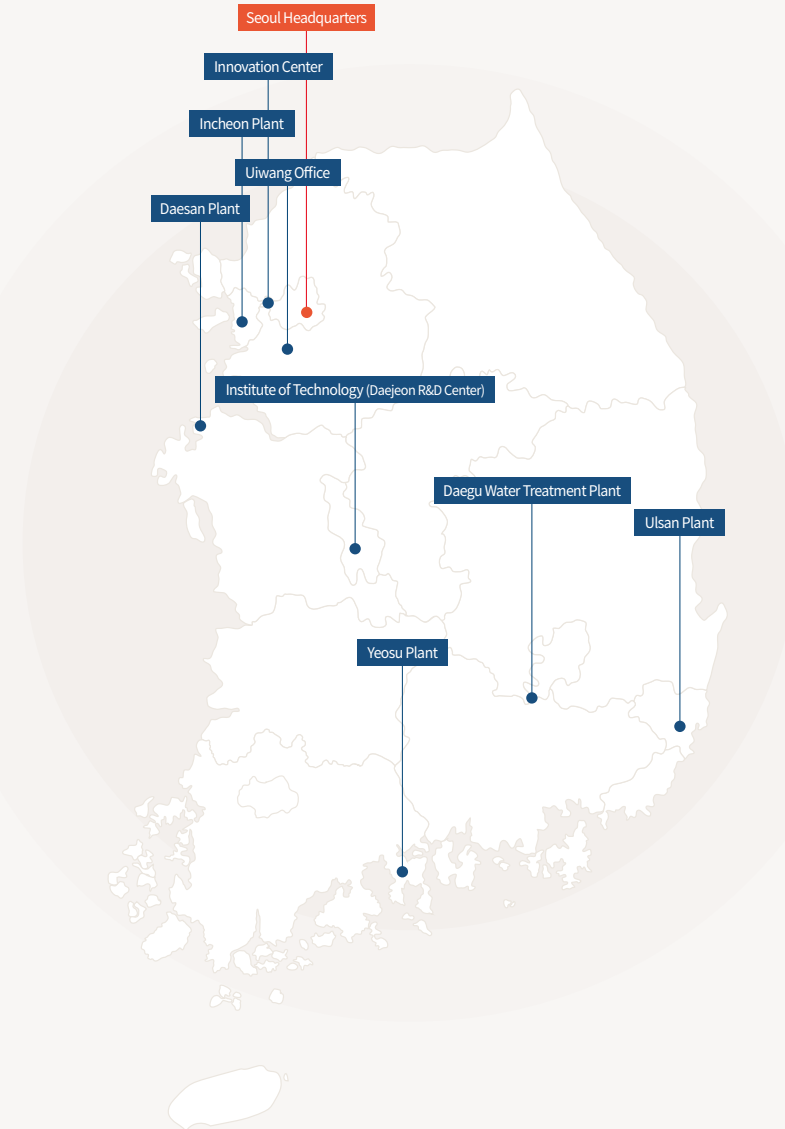
Incheon Plant

1F, Hbuilding, 8, Yeomjeon-ro 333beon-gil, Michuhol-gu, Incheon, Republic of Korea
• Major products: Containers for compressed and liquefied gas
※ Established in March 2023



Daesan Plant

82 Dokgot 1-ro, Daesan-eup, Sosan, Chungcheongnam-do, South Korea
• Major products: EL, LDPE, LLDPE, PP, EG, SM, BD, BTXM EVA



**Institute of Technology
(Daejeon R&D Center)**

Daejeon R&D Center 115
Gajeongbuk-ro, Yuseong-gu, Daejeon, South Korea



Ulsan Plant

119 Sapyeong-ro, Nam-gu, Ulsan, South Korea
• Major products: BZ, PX, OX, MeX, PET, PIA



Daegu Water Treatment Plant

35, Gukuksandan-daero 40-gil, Guji-myeon, Dalseong-gun, Daegu
• Major products: Water treatment UF membrane



Yeosu Plant (Basic Chemicals)

53, Yeosusandan 4-ro, Yeosu-si, Jeollanam-do
• Major products: EL, HDPE, PP, PC, PET, EG, BD, BTX



Yeosu Plant (Advanced Materials)

62, Pyeongyeo-dong, Yeosu-si, Jeollanam-do, Republic of Korea
• Major products: ABS, SAN, EPS, PC, engineered stone, artificial marble



Business Portfolio

Main Products

LOTTE Chemical specializes in chemical materials products and specialized material solution services. Our products and services cover a wide range of areas, including daily essentials such as polymers, basic chemicals, monomers, and building and interior design materials. We also offer products for agriculture, industry, healthcare, vehicles, and cutting-edge new materials.

Basic Chemicals Division



Basic chemicals, intermediate raw materials

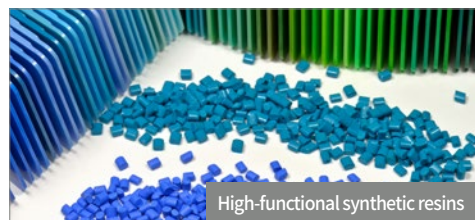


Polymers

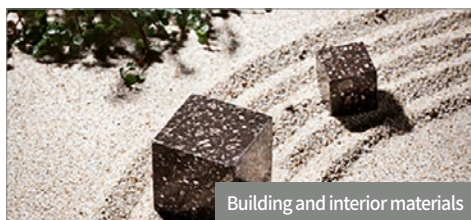


Monomers

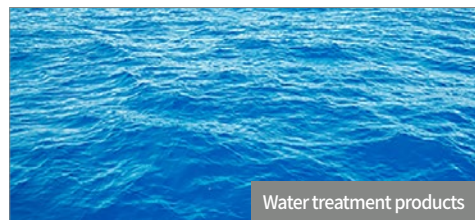
Advanced Materials Division



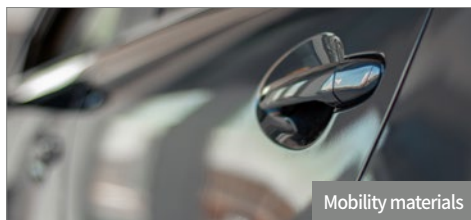
High-functional synthetic resins



Building and interior materials



Water treatment products



Mobility materials

Production Capacity for Key Products

(As of December 31, 2022)

Basic Chemicals

EL Ethylene 4,513 KTA	SM Styrene Monomer 577 KTA	BZ Benzene 766 KTA
OX Ortho-Xylene 210 KTA	PL Propylene 1,697 KTA	BD Butadiene 450 KTA
TL Toluene 339 KTA	PX Para-Xylene 750 KTA	MeX Meta-Xylene 360 KTA (Korea's No.1 production)

Monomers

EG ethylene Glycol 1,830 KTA (Korea's No.1 production)	PIA Purified Isophthalic Acid 520 KTA (Korea's No.1 production)	MMA Methyl Methacrylate 260 KTA (LOTTE MCC production included)
GE Glycol Ether 50 KTA	Engineered Stone 440 thousand sheets / year	EOA Ethylene Oxide Adduct 330 KTA (Korea's No.1 production)
PMMA Poly Methyl Methacrylate 110 KTA (LOTTE MCC production included)	Artificial Marble 970 thousand sheets / year	

Polymers

HDPE High-density Polyethylene 1,605 KTA (Korea's No.1 production)	LLDPE Linear Low-density Polyethylene 490 KTA	PC Polycarbonate 480 KTA (Korea's No.1 production)
EPDM Ethylene Propylene Diene Monomer 96 KTA (produced by LOTTE Versalis Elastomers)	LDPE/EVA Low-density Polyethylene/ Ethylene-Vinyl Acetate 360 KTA	S-SBR Solution Styrene Butadiene Rubber 100 KTA (produced by LOTTE Versalis Elastomers)
PET Polyethylene Terephthalate 520 KTA	PP Polypropylene 1,820 KTA	ABS Acrylonitrile-Butadiene-Styrene 730 KTA
		BR Polybutadiene Rubber 50 KTA (produced by LUSR)


Our History

LOTTE Chemical is a leading chemical company in Korea that has played a significant role in driving the country's economic growth and advancing its chemical industry. With a wealth of experience and a commitment to innovation, we will fulfill our mission of benefitting the world through chemistry. As part of the efforts to become a leader in sustainable management, LOTTE Chemical is taking bold steps towards a brighter future.

1976-1995

- 1976


1976.03 Inaugural meeting and company founding


- 1979

1979.06 Acquisition by LOTTE Group (privatization)
1979.12 Began commercial production
- 1982

Received 100 Mil USD Export Tower
- 1991

1991.05 IPO and stock listing
1991.06 Construction of Daejeon R&D Center (current Institute of Technology)
1991.12 Construction of Daejeon R&D Center



- 1995

1995.08 Obtained ISO 14001 certification (environmental management system)

2003-2010

- 2003

2003.06 Acquired Hyundai Petrochemical (current Daesan Plant)


- 2004

2004.07 Acquired KP Chemical (current Ulsan Plant)
- 2006

2006.07 Established LOTTE Chemical Trading (Shanghai) Corp.
2006.08 Established a joint venture, LOTTE MCC
- 2010


2010.11 Acquired Titan Chemical Corp. in Malaysia (current LOTTE Chemical Titan)

2011-2019

- 2011

2011.11 Established Honam Mitsui Chemical Corporation
- 2012

2012.12 Merged with KP Chemical and changed corporate name to LOTTE Chemical (former Honam Petrochemical)


- 2014

2014.04 Established Hyundai Chemical (joint venture with Hyundai Oil Bank)
- 2015

2015.10 Completed construction of gas field chemical project in Uzbekistan (current Uz Kor Gas Chemical)
- 2016

2016.05 Acquired Samsung Group chemical affiliates (former LOTTE Advanced Materials, current LOTTE Fine Chemicals)
- 2018

2018.05 Signed an MOU with Hyundai Oil Bank to jointly build new heavy feed petrochemical complex (HPC)
- 2019

2019.05 Completion of USA ethane cracker and ethylene glycol plant (current LOTTE Chemical USA Corporation)

2020-2023

- 2020

2020.01 Merged with LOTTE Advanced Materials


- 2020.02 Established a joint venture, LOTTE-GS Chemical Co., Ltd.
- 2021

2021.02 Announced 'Green Promise 2030', an eco-friendly initiative
2021.04 Ulsan Plant transitioned into a 'Green Factory'
2021.07 Announced '2030 Hydrogen Growth Roadmap'
- 2022

2022.01 Invested in LINE project in Indonesia (US\$3.9 billion)
2022.04 Created the Hydrogen Energy and Battery Material Business Group
2022.05 Unveiled the 2030 Vision Growth Strategy
- 2023

2023.03 Acquired Iljin Materials (current LOTTE Materials)

LOTTE Chemical in Our Life

LOTTE Chemical offers a variety of chemical material products and specialized material solution services. Our diverse products range from household items such as synthetic resins, basic oils, chemical products, building and interior materials, to agricultural, industrial, and medical products. These products are applied in a variety of fields, such as automobiles, parts materials, and advanced new materials.

1

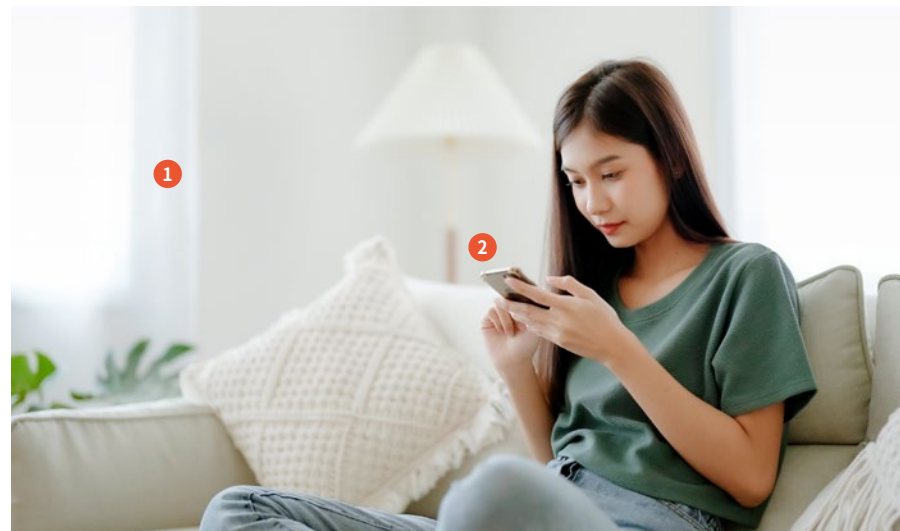
ASA (window frame)

ASA is a material with excellent chemical resistance, gloss, and injection properties. Due to its superior weather resistance, it shows little change in appearance even when exposed to the external environment for a long time. Hence, it is widely used for outdoor applications such as window frames and building cladding.

2

PC (TV housing, mobile phones)

PC is a high-strength, heat- and shock-resistant plastic material. In addition, it is highly transparent and non-toxic, so it is widely used for electrical/mechanical parts, optical discs, and automobile headlamps.



At Home



3

ABS (Inner case of refrigerator)

ABS is a practical material used in various household appliances such as refrigerators, washing machines, clothing management machines, and vacuum cleaners due to its excellent impact resistance, formability and coloring.

4

PMMA (kitchen top)

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.

5

HDPE (cutting boards)

As a type of PE, high-density polyethylene (HDPE) has excellent heat resistance, shock resistance, moldability, and cold resistance. It is used in kitchen containers, fishing nets, ropes, insulated cable, automobile fuel tanks, and various pipes and films.

In the Office

1

PC (ballpoint pens)

PC is a plastic material that has high-strength and is resistant to heat and shock. It is highly transparent and non-toxic, so it is widely used for electrical/mechanical parts, optical discs, and automobile headlamps.

2

PP (reusable cup)

Along with PE, PP material is resistant to heat and shock, resistant to chemicals, and is transparent. PP is used as raw material for various products, including automotive materials, disposable syringes, transparent containers, and non-woven fabrics for hygiene.

3

SM (laptop)

SM is produced from benzene and ethylene. It is used as raw material for polystyrene (PS), which is widely used in toys and cushioning materials, ABS, which is widely used in automobile parts and electrical products, and coatings such as paints.

4

TPE (wire and cable)

TPE has elasticity like rubber at room temperature and is deformable at high temperature. With low density, it reduces product weight. It is actively being conducted to use it in automobile parts; and is also widely used in wires and cables.



5

LDPE (disposable paper cups)

LDPE is easy to mold, flexible, resistant to moisture and water, and has excellent transparency. It is used in agriculture, packaging films, and various kinds of wraps. The coating film applied to paper cups to prevent them from getting wet is made of LDPE.

6

HDPE (water bottle)

As a type of PE, high-density polyethylene (HDPE) has excellent heat resistance, shock resistance, moldability, and cold resistance. It is used in kitchen containers, fishing nets, ropes, insulated cable, automobile fuel tanks, and various pipes and films.

7

LLDPE (food packaging film)

LLDPE is a type of plastic that has excellent mechanical strength and outstanding transparency. It also has high heat stability, processability, mechanical properties and fluidity, which make it suitable for various industrial applications such as films, containers, storage tanks, and toys.

8

PET (disposable lunch boxes)

PET is commonly used in food and beverage containers for its non-toxic and transparent properties.



1

TPC (wipers)

It is a TPE material that applies dynamic crosslinking technology. It has the elasticity of rubber and has excellent machinability. It also has excellent elasticity recovery, weather resistance, chemical resistance and ozone resistance, and can be used as a substitute for PVC and synthetic rubber.

2

BD (tires)

BD is a major raw material for synthetic rubber that replaces natural rubber. It is colorless gas with a unique odor at room temperature; it is used mainly as a raw material for tire, rubber hose, and others.

3

EO / EG (automobile antifreeze)

EO / EG is the main product of LOTTE Chemical, produced by the oxidation reaction of ethylene and oxygen. It has various applications as a synthetic raw material or for sterilization and disinfection purposes.

4

TPO (rear bumpers)

It is a product that combines synthetic resins such as PP or PE with other materials that add functions, resulting in improved characteristics and functionality that ordinary plastic cannot achieve. It is suitable for parts that require excellent stability and can reduce the product weight compared to existing materials.

5

EPP (helmets)

EPP is a PP composite resin with improved functions of polypropylene (PP) and is a representative petrochemical product. Increasing number of industries use EPP for it is non-toxic, sturdy, and has excellent insulation.

6

PC (sports goggles)

PC is a high-strength, heat- and shock-resistant plastic material. It is highly transparent and non-toxic, so it is widely used for electrical / mechanical parts, DVDs, and acoustic barriers.

7

EVA (shoes)

EVA is a material that combines the properties of rubber and plastic, and it has a soft texture, a high capacity for shock absorption, and a good thermal insulation. It is commonly used for making shoe soles.

For Leisure

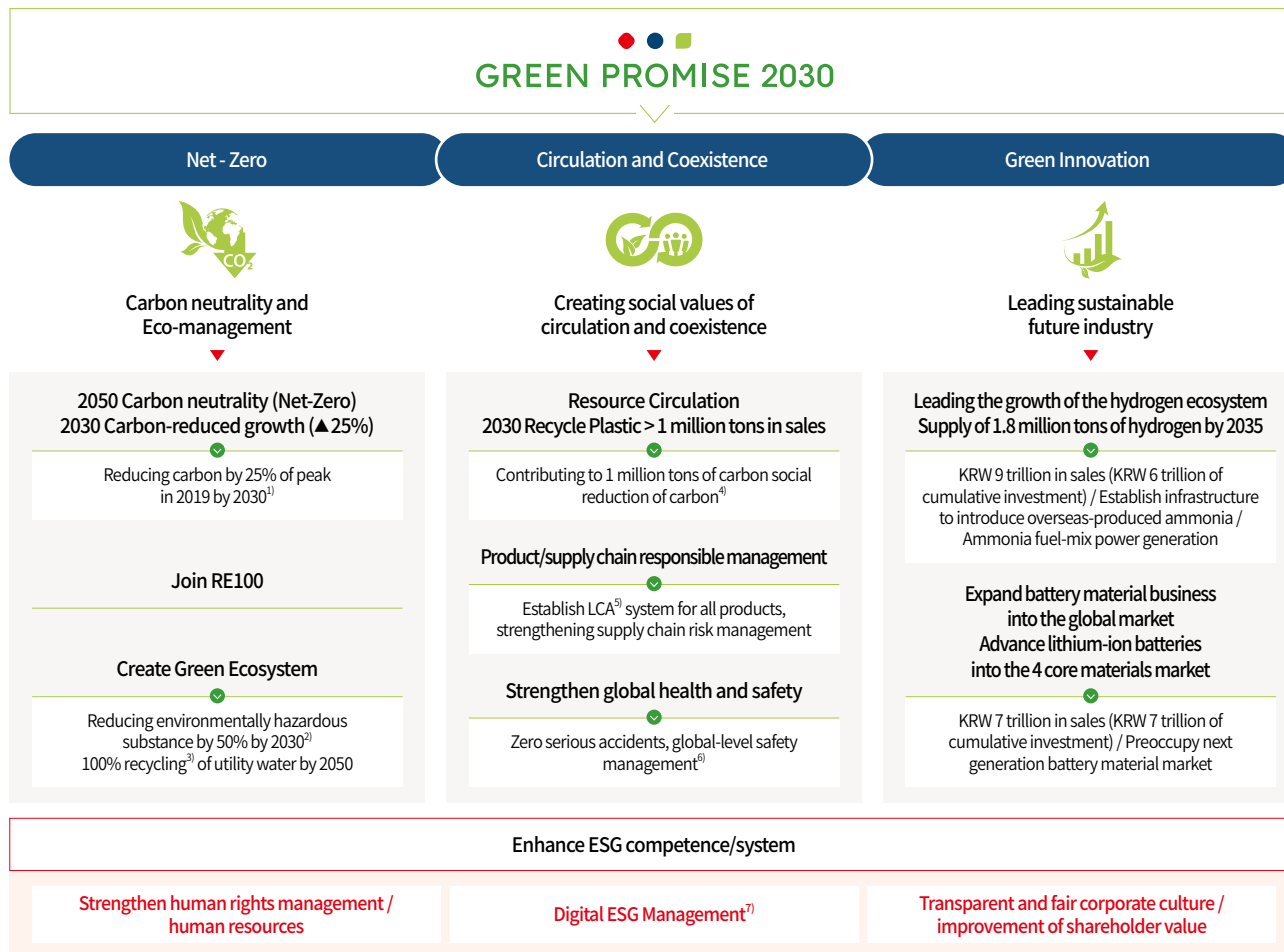
SUSTAINABILITY OVERVIEW

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- 022 LOTTE Chemical's Sustainability Journey & 2022 ESG Highlights

ESG Strategy and Governance System

“Green Promise 2030”, Sustainable Management Strategy

Our ESG Vision and Strategy



1) Domestic, based on Scope 1&2 2) Air, water quality, waste 3) 100% recycling of wastewater discharge (including purchase of recycled water) by 2050
 4) Expected social carbon reduction effect when 1 million tons of recycled plastic is sold 5) Life Cycle Assessment (across all process)
 6) Introduction of global safety management indicators → LTIR(Lost Time Injured Rate, number of casualties per 100 people per year) 0.065 ↓ or less
 7) Advancement of internal management systems such as carbon and energy management and safety management / integrated ESG information management and disclosure system / application of new IT technologies for process innovation (converging with AI)
 ※ After announcing our strategy, 'Green Promise 2030' in 2022, we updated some of the 'leading sustainable future industry' sector. We adjusted our hydrogen supply plan and sales and investment goals related to the hydrogen energy business, reflecting the changes in the government's clean hydrogen development plan. After acquiring Ijjin Materials (currently LOTTE Energy Materials), we raised our sales and investment goals related to battery material business.

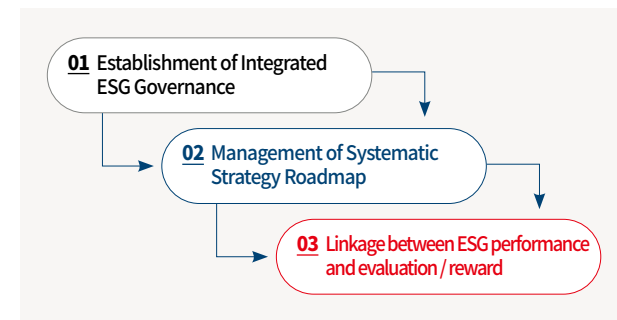
In 2022, LOTTE Chemical unveiled 'Green Promise 2030,' an ESG strategy that aligns with our new corporate vision of 'Every Step for GREEN.'

We aim to achieve future-oriented value growth by taking the lead in sustainable future industries, contributing to the environment and society by pursuing carbon neutrality, eco-management, and social value creation based on circulation and coexistence.

Three Elements of Green Promise 2030



Green Promise 2030 System

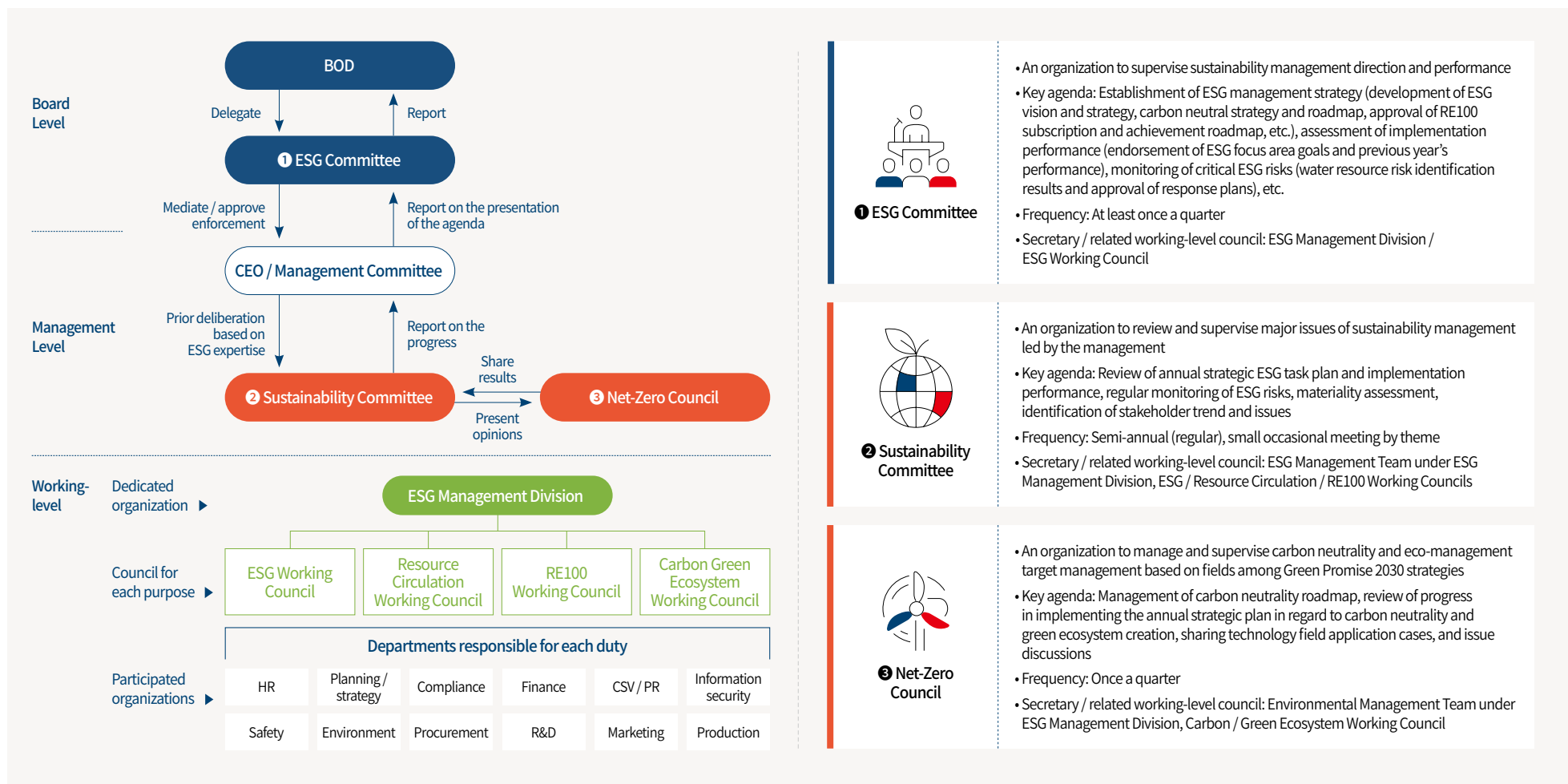


System for Green Promise 2030

Establishing Integrated ESG Governance

In executing ESG strategies, clear and prompt decision-making and organic participation of all business units are required. Therefore, we have systematically established an integrated ESG governance to achieve the 'Green Promise 2030' goal at all levels of the BOD, management, and working-level organizations. The BOD's resolution in September 2021 led to the formation of the ESG Committee. It supervises the direction and performance of sustainability management. Furthermore, in February 2023, we instituted the Sustainability Committee and the Net-Zero Council at the management level to guarantee continuous strategic task management and regular ESG risk management. We have established councils under different purposes to facilitate internal open innovation through collaboration and exchange between departments. This body also supports the work of higher-level committees.

LOTTE Chemical ESG Governance Structure



Systematic ESG Strategy Roadmap Management

We have developed 20 key strategic tasks and a roadmap to accomplish our ESG strategy, ‘Green Promise 2030’, enhancing our execution. In addition, the annual ESG task management process was systematically instituted, R&R and specific goals for each task were explicitly established, and annual plans and performance are organically managed in relation to the ESG integrated governance system and evaluation and reward system.

20 Key Strategic Tasks to Achieve Green Promise 2030

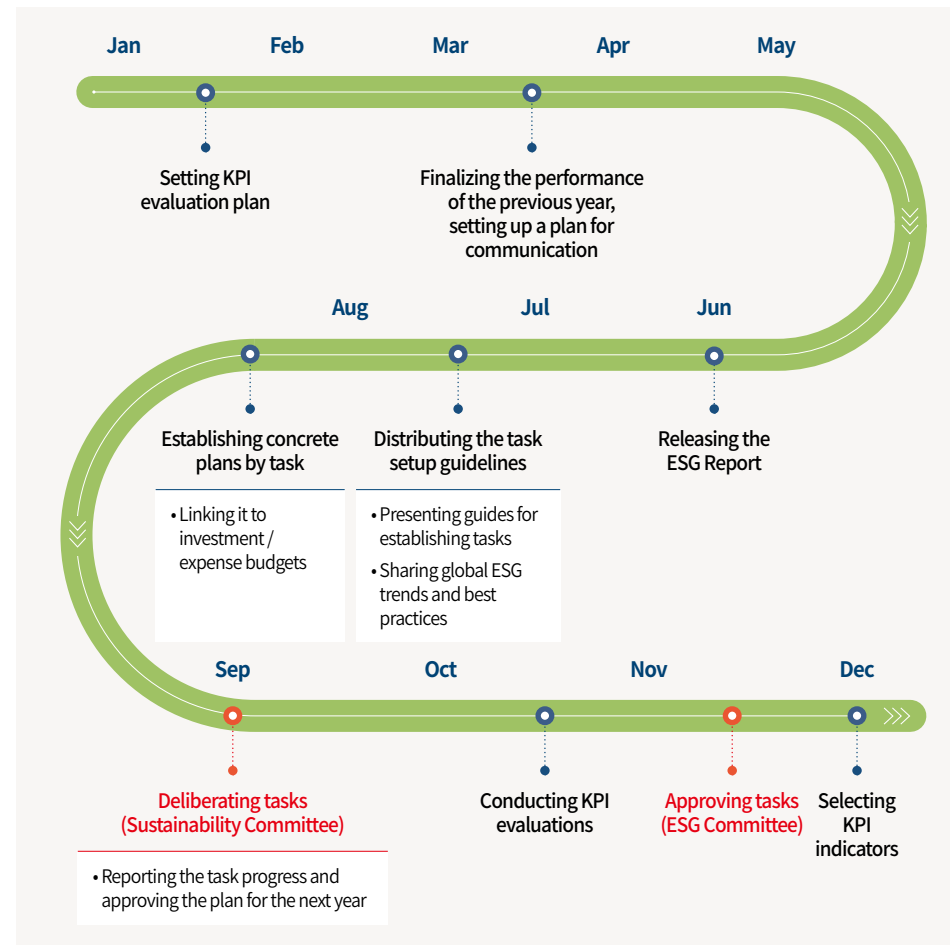
GREEN PROMISE 2030		Mid- to Long-term ESG Strategic Tasks (2021-2030)
Core Value	Strategy Category	
Net-Zero Carbon neutrality and eco-management	1 2030 Carbon-reduced growth (▲25%) 2050 Carbon neutrality (Net-Zero)	1 Mid- to long-term carbon emission reduction strategy, goal establishment and management 2 Establishment of detailed implementation strategies for carbon emission reduction and execution of tasks (1) Energy efficiency improvement and raw material substitution / fuel conversion 3 (2) Application of CCUS 4 (3) External reduction project (off-set) 5 Advancement of GHG data management
	2 Join RE100	6 Renewable energy transition
	3 Create Green Ecosystem	7 Waste management 8 Water / air pollutant discharge management 9 Water risk management
Circulation & Coexistence Creating social values of circulation and coexistence	4 2030 Recycle plastic > 1 million tons in sales	10 Establishment and management of resource circulation strategy
	5 Product / supply chain responsible management	11 Hazardous chemical management 12 Establishment and implementation of LCA system 13 Establishment and management of strategies related to supply chain ESG risks 14 Reinforcement of ESG mutual growth 15 Strengthening of strategies for development / marketing / branding / certification of green products
	6 Strengthen global health and safety	16 Diagnosis and improvement of safety risks and improvement of employee health
Green Innovation Leading sustainable future industry	7 Leading the growth of the hydrogen ecosystem*	※ The hydrogen / battery material business group was launched (April 2022) and its commercialization is in progress.
	8 Expand battery material business into the global market*	
ESG Capabilities / System Enhancement		17 Enhancement of human resource management
		18 Establishment of an integrated ESG risk detection and management system
		19 Establishment of ESG data management system and advancement of disclosure / communication
		20 Advancement of ESG business management and operation system

Linkage between ESG Performance and Evaluation / Compensation

In 2022, the LOTTE Chemical CEO’s Key Performance Indicators (KPIs) were comprised of 70% financial and strategy-related tasks and 30% ESG-related tasks. The evaluation included factors such as the development of a carbon-neutral roadmap, the creation of a new business strategy to enhance our clean technology capabilities, the establishment of strategies for key ESG indicators and performance improvement, and the strengthening of ethical management. The results of this evaluation were reflected in the CEO’s remuneration.

In 2023, 30% of ESG-related tasks were allocated within the CEO KPI, which is in line with 2022. We aimed to improve driving force by evaluating the establishment and achievement of annual performance goals for each ESG key strategy compared to the previous year. Furthermore, we made it more systematized by linking the working-level management related to the items of CEO’s KPI so that the overall execution can be organically managed.

Process for Annual ESG Plan, Performance Management, and Evaluation



Stakeholder Engagement and Communication

Stakeholder Classification and Response Activities

We have identified our key stakeholders as employees, customers, shareholders, investors, partner companies, government and related agencies, and local communities. These groups have an impact on our management and social responsibility activities. Using the stakeholder classification criteria presented by ISO 26000, we classified stakeholders into three groups based on legal, financial, and operational responsibilities and influence. We attentively listen to their needs and incorporate them into our business strategy and corporate decision-making while operating various communication channels according to the interests of each group. As the government's ESG regulation is heightened and investors' interest in ESG management level increases, ESG-related requirements are being further strengthened through mutual influence among stakeholders. We will continue to endeavor to provide fair management activities and transparent information through active communication with stakeholders.

Communication Channels by Stakeholder Group

Category	Stakeholders	Issues of interest	Request	Communication channel	Our activities
Internal	Employees	Enhancing safety and health of employees Promoting work-family balance	Work-life Balance Improving a working environment	<ul style="list-style-type: none"> Employee Council (quarterly) Grievance Committee (at all times) Organizational Culture TF (at all times) HR Presentation (at all times) Labor-management Council (quarterly) Chemi-talk (quarterly) Company magazine (monthly) 	<ul style="list-style-type: none"> Promote work-life balance Competency enhancement program Employee welfare and benefit program Working environment improvement activities Safety and health enforcement activities
		Product quality Stable supply R&D	Quality improvement ESG risk assessment of the supply chain Increasing the ratio of recycled raw materials	<ul style="list-style-type: none"> Customer satisfaction surveys (annually) In-person visit (as needed) Customer invitation programs (annually or more) Voice of customer processing procedure (at all times) Customer ESG survey, evaluation response, providing ESG management information (at all times) 	<ul style="list-style-type: none"> Continued operation of customer service digital platform (MaaS) Promptly responding to claims related to product quality and transportation Conducting customer satisfaction survey Conducting ESG risk assessment for supply chain Developing new products Offering product LCA information Introducing renewable energy
External	Government and related agencies	Environmental / human rights / safety legal compliance Strengthening trade compliance regarding ESG	Expanding regulations regarding environment and human rights Increasing the impact of overseas regulations in regions, including the U.S. and EU	<ul style="list-style-type: none"> National Assembly Debate (at all times) Government hearings (at all times) Other (Korea Enterprises Federation, Federation of Korean Industries, Korea Business Council for Sustainable Development), ESG meetings (at all times) 	<ul style="list-style-type: none"> Report on major issues in the industry Developing public-private cooperation project Reviewing participation in national projects Researching global ESG regulations and trends (at all times)
		Economic performance Sound governance ESG washing	ESG management activities and financial impact disclosure	<ul style="list-style-type: none"> Regular shareholders' meeting (annually or more) Corporate briefing (annually or more) Performance announcement (quarterly) Disclosure (at all times) IR Meetings (at all times) Investment information website (at all times) 	<ul style="list-style-type: none"> Introducing electronic voting at the general shareholders' meeting Disclosing mid-term shareholder return policy IR Conference, NDR Operating subcommittees within the board of directors CEO IR Day Disclosure in Korean and English
	Partner companies	Communication with partner companies	Expanding communication channels	<ul style="list-style-type: none"> Meetings with partner companies (annually or more) In-person visits to partner companies (at all times) Operating complaint-handling hotline channel (at all times) 	<ul style="list-style-type: none"> Providing ESG support for partner companies Recruitment support Technical support and protection Financial, welfare and benefits, and productivity improvement support
		Mutual growth	Increasing win-win programs		
	Local communities	Social contribution activities	Facilitating communication with local communities	<ul style="list-style-type: none"> Sisterhood ties (at all times) Meetings with local residents (at all times) Environmental clean-up (at all times) Charlotte Volunteer Group (at all times) 	<ul style="list-style-type: none"> Communication with local communities Social contribution activities

Stakeholder Mapping & Grouping



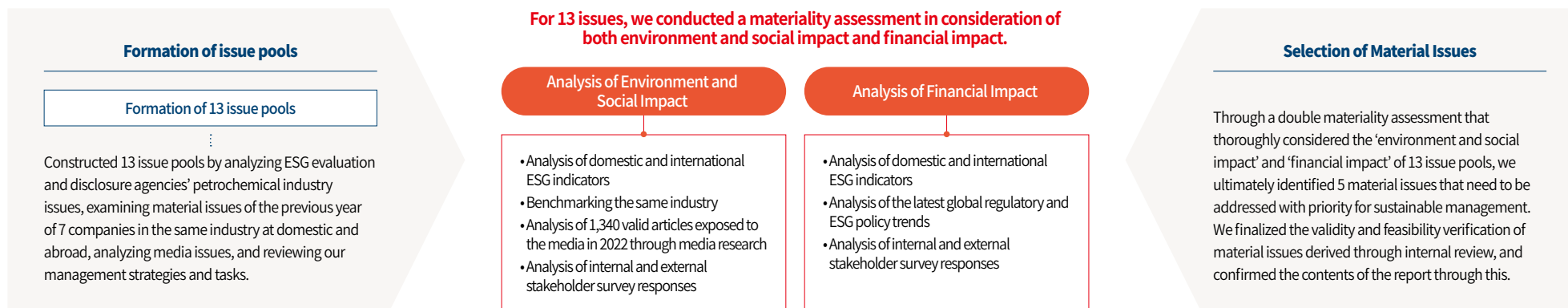
Category	Core	Strategic	Environmental
Definition	A group of people to whom LOTTE Chemical has legal, financial or operational responsibilities	A group of people that influences LOTTE Chemical's performance	A group of people that are affected by LOTTE Chemical's business performance
Features	Essential for survival of the company	Critical to the company when responding to specific issues	Stakeholders other than core and strategic groups
Stakeholder Group	Employees, customers, shareholders, and investors	Partner companies, government and related agencies, and local communities	Media, NPOs, research institutes, experts, etc.

Materiality Assessment

Double Materiality Assessment

LOTTE Chemical conducts an annual materiality assessment to identify and manage environmental, social, and governance (ESG) issues that may affect our business activities and to communicate these issues transparently with our stakeholders. In 2022, we adopted a double materiality assessment approach that considers both an 'inside-out' perspective, which examines the impact of our business activities on society as a whole (external), and an 'outside-in' perspective, which assesses the impact of external environmental and social factors on our financial performance (internal). As a result, we could more thoroughly analyze the external environment, including the requirements of internal and external stakeholders, domestic and international ESG regulations, policies and initiatives, and the same industry. By measuring 'environment and social impact' and 'financial impact' quantitatively based on them, we selected five material issues that need to be addressed with priority for sustainable management. The material issues in 2022 were the same as the previous year except for 'reinforcement of R&D and growth engine.'

Material Issue Identification Process



Derived Material Issues







●●● (Tier 1) : Top 5 impact scores ●●○ (Tier 2) : Middle 5 impact scores ●○○ (Tier 3) : Bottom 3 impact scores

Our top material issues in 2022	Impact Scores		Other material issues in 2022	Impact Scores	
	Environment and Social Impact	Financial Impact		Environment and Social Impact	Financial Impact
Response to climate change	●●●	●●●	Hazardous chemical management	●●○	●○○
Creation of a Green Ecosystem (management of waste / water resources / discharged substances)	●●●	●●●	ESG management within the supply chain and mutual growth	●●○	●○○
Establishment and management of resource circulation strategy	●●●	●●●	Human resource management and human rights protection	●●○	●●○
Diagnosis / improvement of safety risks and improvement of employee health	●●●	●●●	Responsible management of products	●●○	●●○
Strengthening ethical / compliance management	●●●	●●○	Advancement of ESG management and operation system	●○○	●●○
			Integrated management of financial / non-financial risks and opportunities	●○○	●●●
			Advancement of ESG disclosure and communication	●○○	●○○
			Reinforcing R&D and growth engines	●●○	●●○

Management Plan for Top 5 Material Issues for 2022

Management Aligned with ESG Initiative

We identify the impact of the five identified material issues and prepare a management plan in connection with the global disclosure framework and initiatives for each issue.

Material issue	Scope of impact of each issue for major stakeholders						Global disclosure framework and initiatives			
	Employees	Shareholders / investors	Customers	Partner companies	Local communities	Government / regulation	GRI	SASB	TCFD	UN SDGs
Response to climate change	●	●		●	●	●	GRI 201-2 GRI 302-1, 3~5 GRI 305-1~4, 7	RT-CH-110a.1 RT-CH-110a.2 RT-CH-130a.1	●	Goal 7 Goal 13  
Creation of a Green Ecosystem (management of waste / water resources / discharged substances)	●	●			●	●	GRI 303-1, 3~5 GRI 306-1~5	RT-CH-120a.1 RT-CH-140a.1 RT-CH-140a.2 RT-CH-140a.3 RT-CH-150a.1		Goal 6 
Establishment and management of resource circulation strategy	●	●	●	●		●	GRI 301-2	RT-CH-410a.1		Goal 12 
Diagnosis / improvement of safety risks and improvement of employee health	●			●		●	GRI 403-1~10	RT-CH-320a.1 RT-CH-320a.2 RT-CH-540a.1 RT-CH-540a.2		Goal 3 
Reinforcing R&D and growth engines	●	●				●	GRI 205-1~3 GRI 206-1	RT-CH-530a.1		Goal 16 

Activities and Performance for Material Issue Management

We identify and analyze risk and opportunity factors in an objective manner through active communication, such as gathering stakeholders' opinions on five material issues. Based on this, we define management goals for the 5 material issues and systematically manage them in relation to KPIs.

Material issue	Risk and opportunity management	Related strategy tasks	KPI	Performance in 2022	2030 Goal (target / achievement)	Page
Response to climate change	2030 carbon-reduced growth, 2050 carbon neutrality goal setting and roadmap refinement, implementation performance management	Implementation of the carbon neutral roadmap	Reduction of GHG emissions	6.21 million tons/year	25% reduction (5.01 million tons/year) compared to the peak in 2019 (6.8 million tons/year)	27
Creation of a Green Ecosystem* (management of waste / water resources / discharged substances)	Establishment and implementation of goals for water resource risk management	Reduction of wastewater discharge	Reduction of wastewater discharge	12,880 thousand tons/year	Wastewater discharge in 2030 to be 50% reduced compared to 2019	58
	Quantitative goal setting and performance management to reduce hazardous substance emissions / disposal	Reduction of air / water / waste discharge	Reduction of air / water / waste discharge	(Air) 7,579 tons/year (Water) 1,209 tons/year (Waste) 17,170 tons/year	Environmentally hazardous substances in 2030 to be 50% reduced compared to 2019	57-58
Establishment and management of resource circulation strategy	Establishment and execution of recycling business goals	Achieving sales target for recycled products	Achieving sales target for recycled products	44.6 thousand tons/year	2030 recycled plastics to be sold more than 1 million tons	32
Diagnosis / improvement of safety risks and improvement of employee health	Expansion of investment to strengthen safety and health	Planning and execution of safety innovation tasks	Safety and health investment performance**	KRW 19.3 billion/year	Strengthened global safety and health (LTIIR 0.065 or less)	61-65
Strengthening ethical / compliance management	Minimization of controversial issues in anti-corruption / ethical management	Prevention of controversial issues in anti-corruption / ethical management	Zero controversial issues in anti-corruption / ethical management	-	Building a compliance system at the level of a global leading company	80-85

* Green Ecosystem target management standard: 4 large-scale workplaces - Yeosu Plant (Basic Chemicals), Yeosu Plant (Advanced materials), Daesan Plant, Ulsan Plant

** Expense executed related to safety risk diagnosis / improvement and employee health improvement

LOTTE Chemical's Sustainability Journey & 2022 ESG Highlights

2016-2020

2017

- Awarded for excellent public announcement
- Renewed ISO 14001 (2004→2015) certification

2018

1st place in LACP 100

2019

Acquired ISO 37001 certification for anti-corruption management system

2020

- Received Grade A in the ESG Evaluation by Korea Corporate Governance Service (2011-2018)
- Established Sustainability Management Guidelines for Suppliers
- Published the first Mutual Growth Report
- Implemented Project LOOP, a resource circulation project

2011-2015

2011

- Received the Korea SR Grand Prize
- Incorporated into DJSI Asia Pacific for the first time

2012

Received the Environment Minister Award at the Leading Resource Circulation Company Award

2013-2014

- Received the Excellent Corporate Governance Award by the Korea Corporate Governance Agency
- Participated in CDP
- Selected as an excellent company with the climate change competitiveness index
- Selected as a 'family-friendly company'

2015

- Established chemical management system (LCMS)
- Participated in the GHG emissions trading market
- Formed Charlotte Lotte Volunteer Group

2007-2010

2007

Established social contribution system

2008

Published of the first sustainability report

2009

Entered DJSI KOREA for the first time

2010

- Endorsed the GEMS (green energy management system) for the first time in the industry
- Incorporated into Social Responsibility Investment Index of Korea Exchange
- CDP KOREA 2010 Best Company in New Sector / Leader in Raw Materials Sector
- Awarded the best company in social contribution



ESG 2.0

Put into action ESG strategies and advanced its management system

2022

2021

ESG 1.0

Declared 2021 as the inaugural year for ESG management and established its management system

- Declared our eco-friendly goal, Green Promise 2030
 - Announced our 2030 New Growth Roadmap
 - Unveiled our 2030 Hydrogen Energy Business Roadmap
 - Embarked on a hydrogen project in Sarawak, Malaysia
-
- Launched 1st social venture, 'Project LOOP'
 - Declared our commitment to creating a culture of safety, pledging to become 'the most safe company in the world'
-
- Mapped out our ESG vision / strategic system, and launched the ESG Committee
 - Raised KRW 50 billion for ESG funds for the first time as a chemical company
 - Issued ESG bonds worth KRW 200 billion

Evaluation Results in 2022

<p>CDP* in 2022</p> <p>Climate A-</p> <p>Water Recourses B</p>	<p>MSCI Evaluation Grade</p> <p>Maintained in 2022</p> <p>2021 BBB</p> <p>2022 BBB</p>
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* CDP Korea 2022 Award(name and category): Carbon Management Sector Honors (Raw Materials)

<p>KCGS Evaluation Grade</p> <p>Maintained</p> <p>from 2020 to 2022 A</p>	<p>EcoVadis Evaluation Grade</p> <p>Maintained in 2022</p> <p>Yeosu Plant(Advanced Materials)</p> <p>Gold Medal</p>
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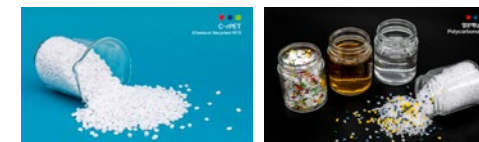
Announced our 2030 vision and slogan, 「Every Step for GREEN」

- Announced our 2030 Carbon-Reduced Growth Roadmap (▲25%)
- Declared our commitment to achieving 2050 Net-Zero and joined RE100
- Launched the Hydrogen Energy and Battery Material Business Group
- Established the LOTTE Chemical-KAIST 'Carbon Neutral Research Center'



Established a resource circulation ecosystem and brought eco-friendly businesses into full swing

- Began pilot production of chemically recyclable PET bottles, also known as C-rPET
- Became the first local petrochemical company to manufacture products using waste plastic pyrolysis naphtha
- Acquired the global certification for eco-friendly materials, 'ISCC PLUS'
- Launched 2nd social venture, 'Project LOOP'



Built a global-level sustainable safety system and forged a safety culture

- Our Basic Chemical Research Center received ministerial citation from the Ministry of Science and ICT for 'contribution to the safety of the center'



Promoted activities for coexistence and mutual growth

- Awarded a grand prize in the category of 'ESG business' at Korea Mutual Growth Awards
- Established the ESG Code of Conduct for Partner Companies and built a supply chain system
- Signed an agreement with the National Korea Commission for Corporate Partnership to resolve polarization



Strengthened the integrated ESG governance and upgraded our risk management system

- Established the LOTTE Chemical Statement on Human Rights, the LOTTE Chemical Statement on Environmental Management, and ESG policies
- Introduced an ESG KPI evaluation system
- Launched a Sustainability Committee that consists of our management (in February 2023)
- Obtained the compliance management system ISO 37301

SUSTAINABILITY STRATEGY

025 **Issue 1** Response to Climate Change

031 **Issue 2** Strategy Setting and Management for Resource Circulation

ISSUE 1

Response to Climate Change



ISSUE I

RESPONSE TO CLIMATE CHANGE

Our Efforts to Combat Climate Change

Reducing Greenhouse gas (GHG) emission has become a serious threat to our lives rather than just an issue of environmental protection. In response, many countries and companies around the world have set goals to reach net-zero emissions and have increased their Nationally Determined Contributions (NDCs). Korea has become the 14th country in the world to pass legislation for achieving net-zero emissions by 2050, which is a clear demonstration of its robust commitment to fighting climate change.

Against the backdrop, LOTTE Chemical has established its targets, 2030 Carbon-Reduced Growth* (25% reduction from the peak level in 2019), and 2050 Net-Zero. To reach these targets, multifaceted efforts are in full swing, including conducting energy audits, procuring renewable energy, introducing high-efficiency processes, capturing CO₂ through CCUS technologies, and producing green hydrogen.

As part of our commitment to sustainability, we have joined the global RE100 initiative and are working to increase our use of renewable energy sources such as solar and wind power. We plan to secure Power Purchasing Agreements (PPAs) and Renewable Energy Certificates (RECs) for our domestic business sites, while promoting the use of renewable energy at our overseas locations. Our goal is to increase the proportion of renewable energy used across all our business sites to 60% by 2030, and ultimately transition to 100% renewable energy by 2050 through the adoption of green hydrogen-fueled power generation facilities.

* Target of reducing emissions by 20% compared to the level of 2018, which is the NDC

In order to accelerate our transition towards carbon neutrality, we have established policies and tasks that are tied to our CEO's KPIs. The CEO's progress towards these goals is used to determine the remuneration of CEO. We will disclose our progress through the annual publication of an ESG Report in a transparent manner.

To improve climate disclosure, our main affiliates will create their own GHG inventories and share their performance. For example, LOTTE Chemical Titan established its GHG inventory in 2022 and we are considering expanding it to LOTTE Chemical USA Corporation. We also share our Scope 3 data through the CDP initiative, covering 9 out of 15 categories, with 3 categories verified. As we move forward, we plan to expand the scope of our data collection and verification to include more categories. We will also track carbon emissions from our partner companies' products to improve the accuracy and reliability of our data.



ISSUE I

RESPONSE TO CLIMATE CHANGE

Green Promise 2030 Net-Zero Roadmap

Our Goals, 2030 Carbon-Reduced Growth and 2050 Net-Zero

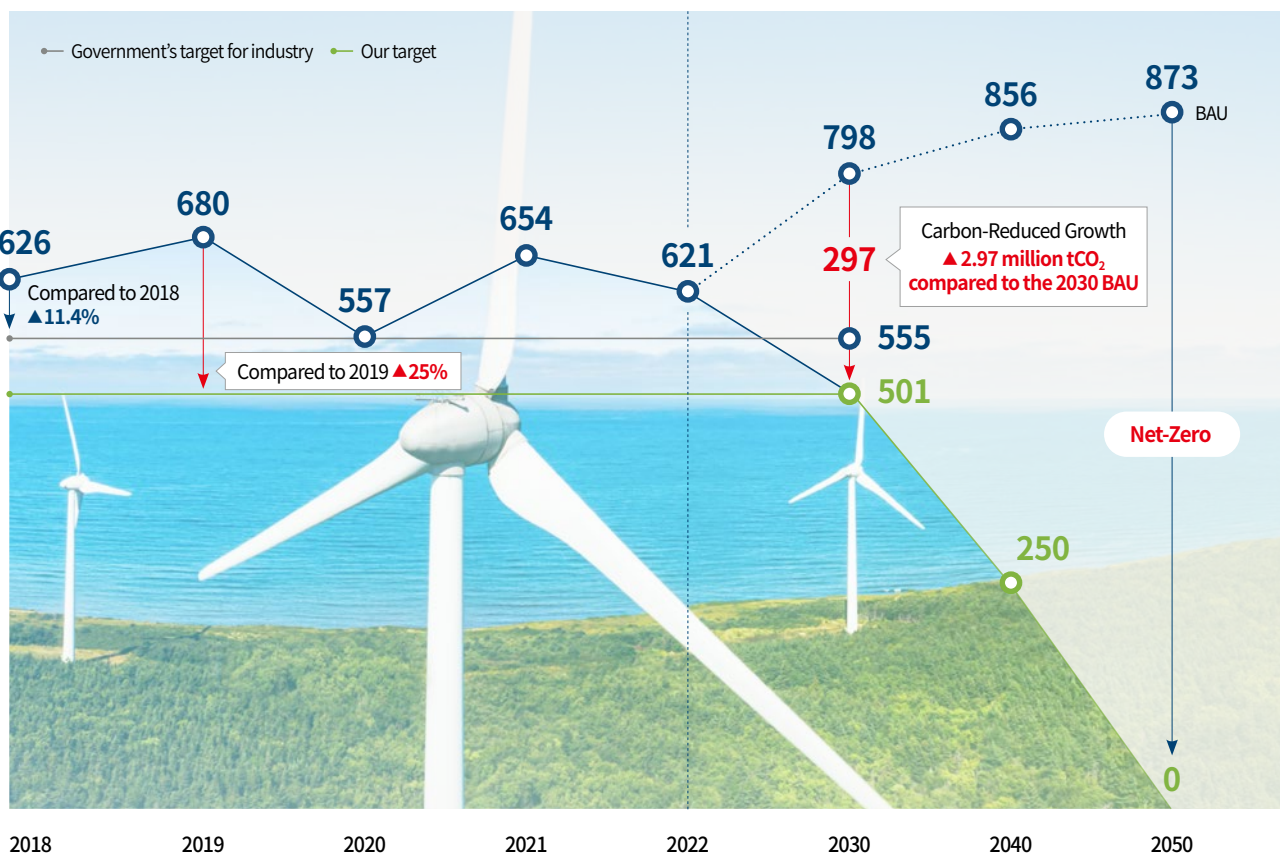
LOTTE Chemical has set a goal to mitigate its carbon emissions by 25% from its peak level of 6.8 million tons in 2019 by the 2030. This is higher than the government’s industrial sector target of an 11.4% reduction from 2018 and represents a reduction of carbon emissions by 2.97 million tons compared to the BAU level (emissions without any reduction measures taken) of 7.98 million tons.

In the long term, LOTTE Chemical has set a target to curtail its carbon emissions by 8.73 million tons compared to the BAU level by 2050, and LOTTE Chemical intends to actively participate in the global efforts to combat climate change.

To achieve our goal of mitigating GHG emissions, we have developed a short-term plan to improve our processes and construct zero-energy buildings. In the mid to long term, we plan to transition to low-carbon fuels such as LPG and eco-friendly fuels like LNG. We will also install solar power plants and hydrogen fuel cell facilities to increase our use of renewable energy. By doing so, we will keep moving towards carbon neutrality. Additionally, we are considering various carbon capture technologies, including CO₂ capture through membranes, carbonation processes, and underground storage overseas.

LOTTE Chemical Net-Zero Plan

(Unit: 10,000 tCO₂)



Carbon Reduction Tasks and Target Emissions

(Unit: 10,000 tCO₂)

Task	Details	2030 target emissions	2050 target emissions
Energy efficiency improvement	Improve procedures and build zero-energy buildings (Daejeon, Uiwang)	39	330
CCUS	Capitalize on CO ₂ capture through membranes and adopt carbonation processes	50	261
Fuel replacement	Switch to low-carbon fuels (LPG) and eco-friendly fuels for power generation (LNG)	28	43
Renewable energy	Install solar power plants and hydrogen fuel cell facilities	180	239
Total		297	873

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RESPONSE TO CLIMATE CHANGE

Climate Change Response System

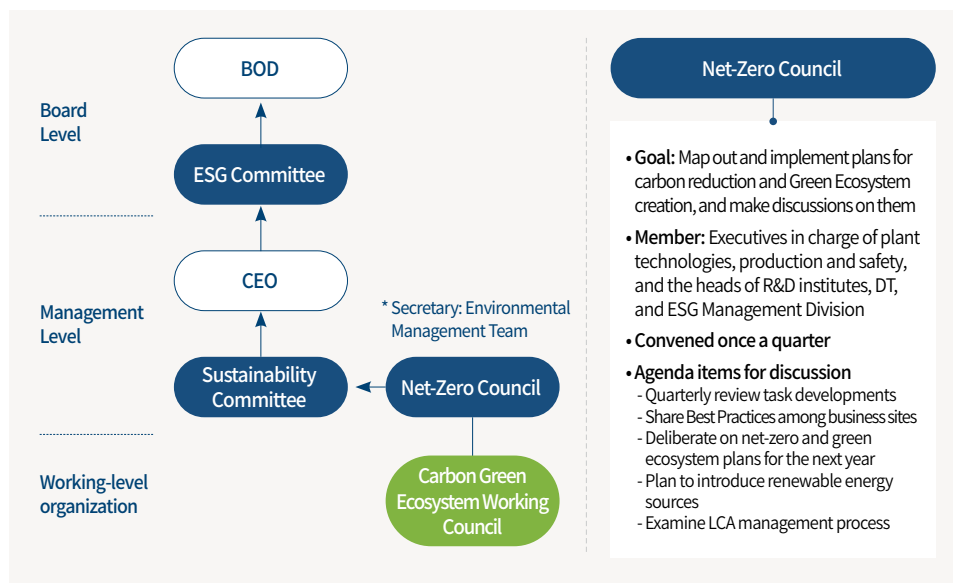
Governance for Climate Action

Our board’s ESG Committee oversees our environmental management plans and monitors our progress towards climate action and reducing energy use. The Sustainability Committee, made up of our executive members, discusses key issues related to ESG management and stakeholder risks. We have also established a Net-Zero Council to track our progress towards net-zero goals and improve our performance in a practical manner. This council, made up of experts, meets quarterly to address these issues. In the coming years, the council will serve as a platform for sharing best practices among our business sites.

Our ESG Management Division, which reports directly to the CEO, oversees our environmental affairs, such as climate action. The head of the ESG Management Division evaluates our environmental strategies, including our plans and projects for climate action while monitoring our GHG emissions and energy consumption targets by business site. The results are reported to the CEO and the ESG Committee under the board.

Within the division, the Environmental Management Team plays multiple roles in environmental management. These include developing GHG emission reduction strategies, collecting and analyzing data on energy use by facility, identifying climate-related risks and opportunities, formulating climate response strategies such as emission trading, and tracking and analyzing GHG reduction data.

Governance Structure for Climate Action



Analysis of Climate Risks and Opportunities for Climate Action

In response to climate change, our ESG Management Division is committed to addressing this issue by monitoring relevant laws and stakeholder trends, both locally and internationally. Internally, we issue newsletters and provide workshops to raise awareness of climate change risks among our personnel. And the division regularly conducts risk assessments, taking into account the impact period (short- / mid- / long-term), relevance, gravity, and stakeholder feedback to identify risks and opportunities.

The risk assessments include analysis of global standards, media analysis, and benchmarking against leading groups. We also communicate with various stakeholder groups, including employees, customers, government, investors, partner companies, and local communities, to incorporate their feedback into our assessments.

Category	Issue	Term	Climate risks' financial impact	Climate opportunities' financial impact	
Transition risks and opportunities	Regulatory aspect	GHG emission trading system	Short-term	• Rising prices of carbon credits and more tightened emission regulations could lead to an increase in response costs	Carry out GHG reduction activities to minimize the procurement of carbon credits (PFO → LNG → hydrogen fuels, investing in green hydrogen / ammonia production, transition to renewable energy, etc.)
		Carbon pricing system adoption (Carbon tax, Carbon Border Adjustment Mechanism, etc.)	Mid-term	• Increasing costs incurred by low-carbon certifications for products • Decrease in the sales of products emitting a large amount of carbon emissions	Introduce low-carbon fuels and manage LCA to secure cost competitiveness
	Energy paradigm shift	Carbon-intensive business (petrochemistry)	Long-term	• Fossil fuel-based technologies could increase raw material costs • Increasing investments in R&D on green products	Optimize our process to reduce GHGs emission from our business sites, and save energy costs
		Changing consumers' and market's preference for products	Mid-term	• Increasing costs of high-efficiency and green products (low-carbon, recycling) certifications	Recycle plastic products and expand the production using post consumer recycle (PCR) to increase sales
		Expanded use of renewable energy	Mid-term	• An increase in electricity bills in the short term could result in higher production costs	Conclude agreements on the supply of renewable energy and participate in power generation businesses to save electric costs
		Natural disasters (typhoons, floods, etc.)	Short-term	• Rising investments in natural disaster prevention, environment, and safety facilities • Natural disasters can result in increased restoration costs and lost business opportunities	Operate an emergency response system to prevent accidents and respond to risks to prevent any losses
Physical risks and opportunities	Water scarcity	Long-term	• Lack of water resources could discontinue plant operation, which could, in turn, lead to the losses of business opportunities	Secure cost competitiveness by expanding wastewater recycling through water treatment business, such as membranes	

ISSUE I

RESPONSE TO CLIMATE CHANGE

Action on Climate Change and Progress

Our activities to Mitigate GHG Emissions

The global community has set goals to reduce GHG emissions by 2030, with the aim of reducing their overall emissions. LOTTE Chemical is actively participating in the government’s GHG reduction policy by reducing GHG emissions through various reduction activities such as development of new technologies to reduce GHGs, upgrading energy-efficient facilities, and improving operational efficiency. Some of our business sites are already using solar power to fuel their operations. We are also considering the implementation of an AI-based Factory Energy Management System (FEMS) to further improve energy efficiency, and are preparing to build an eco-friendly building powered by renewable energy for the Institute of Technology. In 2022, we evaluated the energy usage of our Yeosu Plant in collaboration with a specialized energy diagnosis agency. We plan to expand this assessment to our Daesan Plant in 2023. Our energy diagnosis approach is comprehensive and based on modeling, and we provide integrated solutions for reducing GHG emissions and energy usage while increasing energy yield and operational efficiency. We also joined the government’s voluntary energy efficiency innovation cooperation pilot project(April 2021) and the energy efficiency partnership agreement (KEEP 30) since October 2022. As a result, we are carrying out various well-organized activities to curtail our energy consumption.

Energy Management System Operation

In 2010, LOTTE Chemical became the first company in its industry to introduce a Greenhouse Gas & Energy Management System. The system underwent two rounds of advancement in 2013 and 2020. This system comprehensively manages data related to GHG emission reduction targets and implementation, energy and inventory data, and progress towards these targets. It allows us to analyze data on potential GHG reduction, assess climate-related risks, and respond effectively to them.

Introducing Zero-Emission Vehicles

We have joined the Management for Target Vehicle Purchase program, which is driven by the Ministry of Trade, Industry and Energy, to increase the share of eco-friendly vehicles such as electric, hydrogen, and hybrid eco-friendly vehicles. We are also participating in the K-EV100 initiative led by the Ministry of Environment. Our goal is to expand the adoption of 100% emission-free vehicles by 2030 through the establishment of the necessary infrastructure.

Voluntary Efforts to Mitigate and Expand the Operation of Carbon Credits for Carbon Offsetting

LOTTE Chemical has been actively working to reduce its carbon footprint both domestically and internationally. In 2022, we conducted a pre-feasibility study for a project called REDD+ (Reducing Emissions from Deforestation and forest Degradation plus) in an Indonesian rainforest. The REDD+ project aims to preserve forests and improve their carbon absorption capacity, in addition to reducing GHG emissions for preventing deforestation and forest degradation. The project is currently under review for further development. Additionally, we have joined the Cook Stove CDM project to secure carbon credits and offset its emissions, among other measures taken for carbon offsetting.

Scope 1 and 2 Reduction

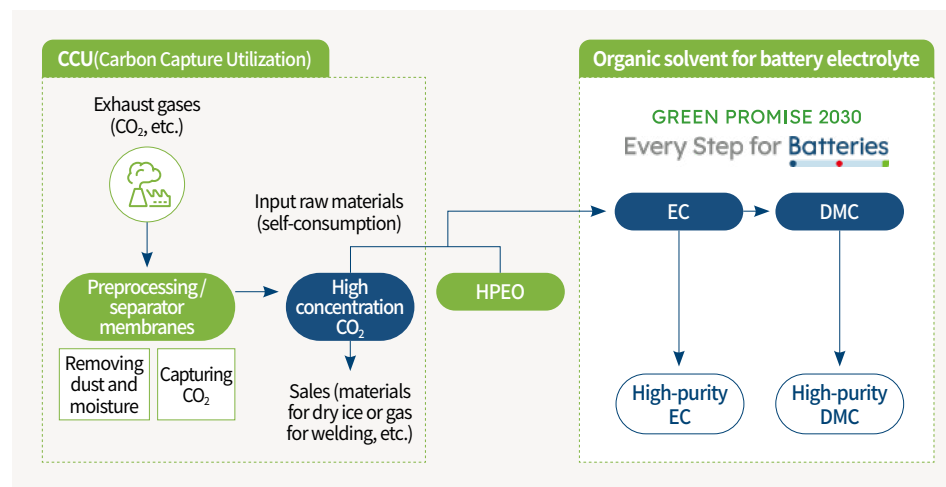
In 2022, we successfully reduced our emissions by 5% from the previous year, emitting 6.21 million tons, which is approximately 350,000 tons less than our target of 6.56 million tons. This reduction was due to the implementation of energy-saving activities at existing plants and partial reduction in utilization rates.

In 2023, we joined the RE100 initiative, a global effort to encourage companies to transition to 100% renewable energy for power generation. As part of this initiative, we have been committed to sourcing 60% of its electricity from renewable energy sources through renewable energy PPAs by 2030. By 2050, we aim to fully transition to renewable energy sources by adopting fuel cell-powered and green hydrogen-fueled power generation facilities.

Promoting CO₂ Capture Business

We have developed and demonstrated Carbon Capture Utilization (CCU) facilities that use gas separator membranes and are in the process of commercializing them. CCU technologies capture CO₂ from exhaust gases and use it for industrial purposes, as well as safely storing it for long periods of time. The captured CO₂ will be used to make electrolytes for electric vehicle batteries, high-purity Ethylene Carbonate (EC) for organic solvents, Dimethyl Carbonate (DMC), and Polycarbonate (PC) for plastics. We will also sell the captured CO₂ for use in dry ice and semiconductor cleaning solutions. Our CCU technologies will be applied to expand our Yeosu Plant and produce green methanol. This will increase our CO₂ capture capacity to 500,000 tons by 2030 and 2.61 million tons by 2050. Additionally, we are also conducting feasibility studies for a CCS(offshore storage) project in collaboration with seven global companies.

CCU Technologies and Utilization



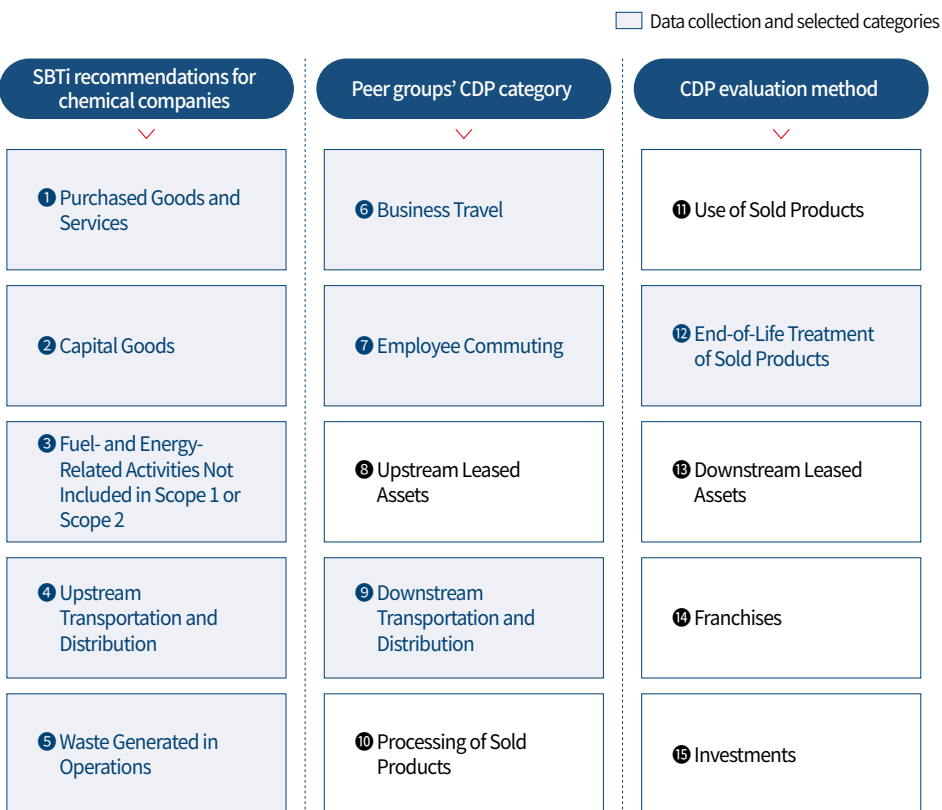
ISSUE I

RESPONSE TO CLIMATE CHANGE

Scope 3 Emission Management

We have analyzed the recommendations from the Science Based Targets initiative (SBTi) for chemical companies, as well as the CDP categories of peer groups. Based on these results, we have selected 9 out of 15 Scope 3 categories and collected data for calculation, with three categories verified by a third-party agency.

As more local and overseas investors and corporations focus on Scope 3 emissions, we plan to expand the scope of categories and verification to cover more data. This will be followed by the establishment of a calculation system for all categories, and the presentation of solutions for reduction.



Scope 3 Calculation System and Expanded Verification Area

In 2022, we focused on establishing a system for calculating Scope 3 emissions. We defined criteria for calculating emission factors and R&R for data management for each of the 9 categories. Our total Scope 3 emissions for these 9 categories amounted to approximately 18 million tons, with three categories verified by a third-party agency. The detailed calculation methodology for the major emission sources (categories 1, 4, 9, and 12) is as follows.

Category ① Purchased Goods and Services

We use our LOTTE Chemical Management System (LCMS) to collect data on the amount of raw materials we purchase. From this data, we determine the weight of each material and then multiply it by the material's carbon emission factor* to calculate the emissions.

* Carbon emission factor: The data from the Ministry of Environment's Environmental Product Declaration was used to determine the carbon emission factor. For materials not listed in the declaration, the emission factor from Ecoinvent was used

Category ④, ⑨ Upstream Transportation and Distribution & Downstream Transportation and Distribution

We calculate the transportation distances between departure and arrival locations for different modes of transportation, such as vessels, aircraft, and trucks. Then, we multiply the freight weight by the distance and the carbon emission factor to estimate the carbon emissions from transportation.

Category ⑫ End-of-Life Treatment of Sold Products

We compile the sales performance of our products and use the 'nation-wide waste generation and disposal' data published on the Korea Resource Recirculation Information System to calculate the emission factor. This is done by determining the ratio of disposal methods (recycling at 69%, incineration at 25%, landfill at 4%, and others at 2%) and then multiplying the sales figures of each product by the plastic disposal to calculate the emission factor.

We continue to expand the scope of Scope 3 data calculation, and also come up with measures to reduce Scope 1 and 2 emissions as well as to mitigate emissions from the value chain.

Scope 3 Emissions by Category

(Unit: 10,000 tCO₂e_q)

Category	2022
① Purchased Goods and Services	837
② Capital Goods	0.02
③ Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2	1
④ Upstream Transportation and Distribution	36
⑤ Waste Generated in Operations	4
⑥ Business Travel	0.01
⑦ Employee Commuting	0.002
⑨ Downstream Transportation and Distribution	8
⑫ End-of-Life Treatment of Sold Products	915
Total	1,801

※ Category ①, ③, and ⑤ verified by the Korean Foundation for Quality(KFQ) in July 2022

ISSUE 2

Strategy Setting and Management for Resource Circulation



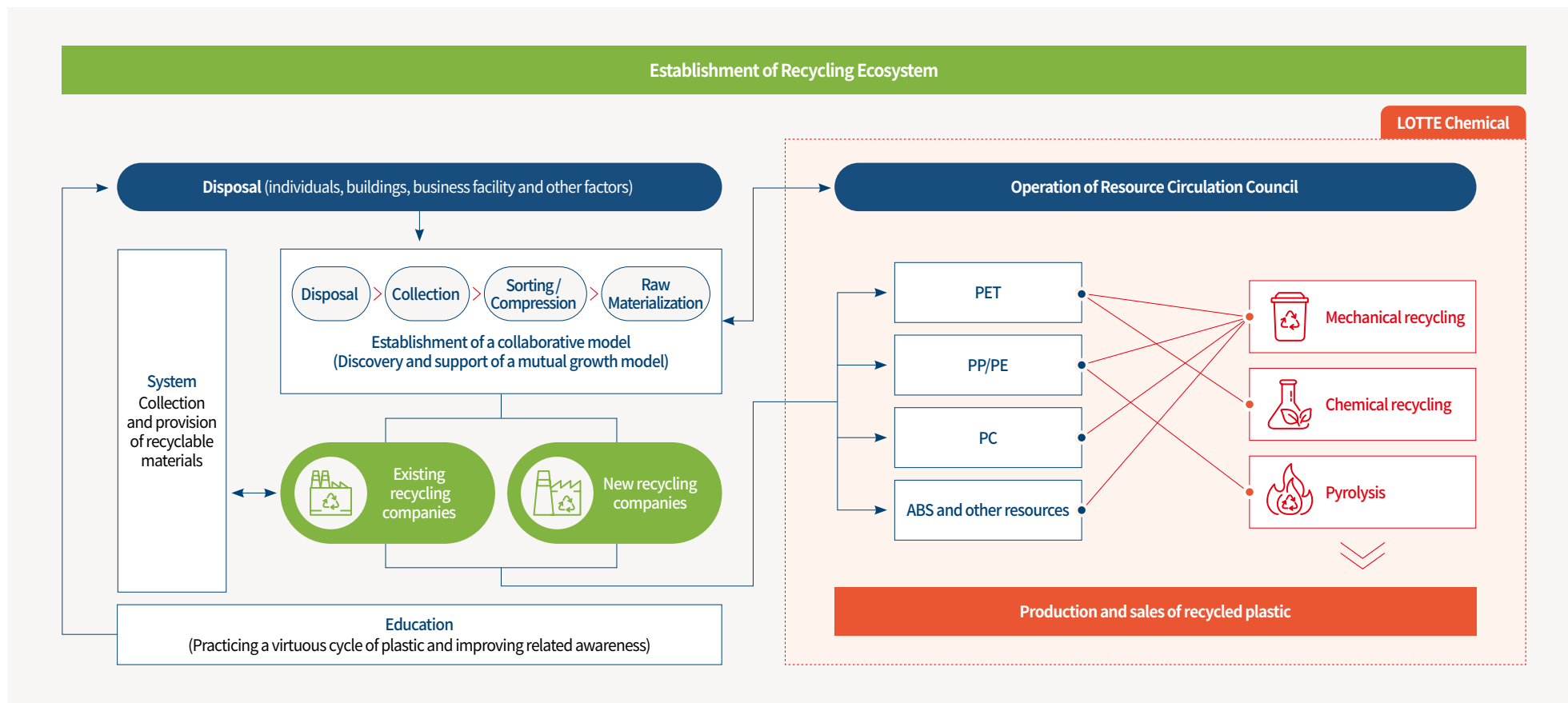
ISSUE II

STRATEGY SETTING AND MANAGEMENT FOR RESOURCE CIRCULATION

Our Efforts for Resource Circulation

Plastic has indeed contributed to the comfortable life of human beings and the preservation of the earth’s resources. However, low plastic recycling rates have led to environmental issues. How should we approach the plastic issue in a modern society where plastic cannot be 100% replaced by other resources? What we have found as an efficient alternative to address this question is to establish a sustainable plastic cycle. LOTTE Chemical, as a company primarily engaged in plastic production, aims to enhance the establishment of a recycling ecosystem for sustainable business operations and growth.

The key to reducing the continuously increasing amount of plastic waste, conserving the earth’s resources, and maintaining the quality of life lies in enhancing mechanical recycling and expediting the commercialization of chemical technologies by establishing a platform for plastic resource circulation. For sustainable business operation and growth, LOTTE Chemical will systematically create a sustainable plastic cycle by providing necessary systems and education and interconnecting plastic recycling processes and stakeholders. These efforts will be made by establishing a resource circulation platform.



ISSUE II

STRATEGY SETTING AND MANAGEMENT FOR RESOURCE CIRCULATION

Resource Circulation Roadmap

Roadmap & Targets for Recycling Plastic Projects

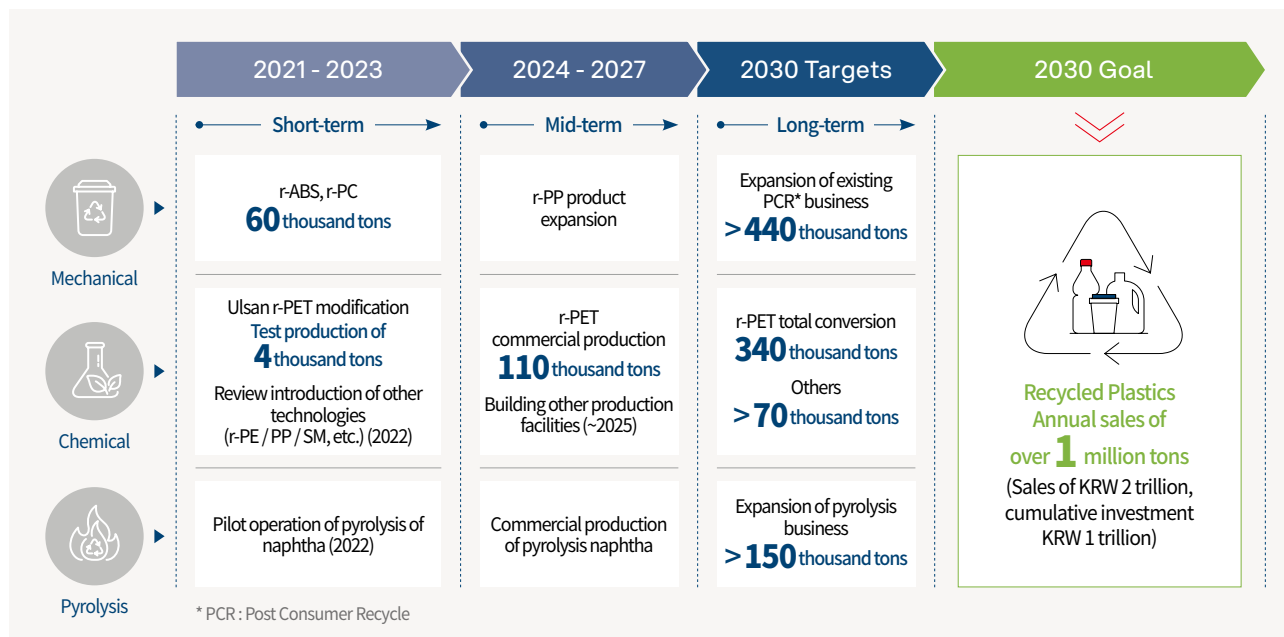
As using recycled materials becomes mandatory in advanced countries and companies around the world are putting more effort to enhance environmentally sustainable practices, the demand for recycled materials is steadily increasing, mainly from customers in fields such as electricity, vehicles, and home appliances. Thus, LOTTE Chemical aims to continuously expand our recycling plastic business to annual sales of more than 1 million tons and KRW 2 trillion in revenue by 2030.

The plastic recycling business can be largely divided into mechanical recycling, chemical recycling, and pyrolysis businesses.

In the mechanical recycling business, we have the capacity to manufacture high-quality, high-performance resins that cater to needs of the global IT, home appliance, and automobile industries. We are continuously expanding our market presence by meeting global customers' growing demands for recycling and providing them with recycled materials of equivalent quality to virgin plastic. We aim to sell more than 440,000 tons of Post Consumer Recycle (PCR) material products by 2030.

In the chemical recycling business, PET is a product that allows us to rapidly and efficiently build an ecosystem. With our ownership of PET production facilities and decades of experience in stable plant operation, LOTTE Chemical seeks to commercially produce 110,000 tons of recycled PET by 2025 and transition the entire PET line at our Ulsan plant into a chemical recycling facility by 2030. This strategic plan will enable us to produce a total of 340,000 tons of recycled PET. Meanwhile, plans to produce recycled products through pyrolysis naphtha are also under development, and we work toward expand the business to a level of 150,000 tons by 2030.

Roadmap & Targets for Recycling Plastic Projects

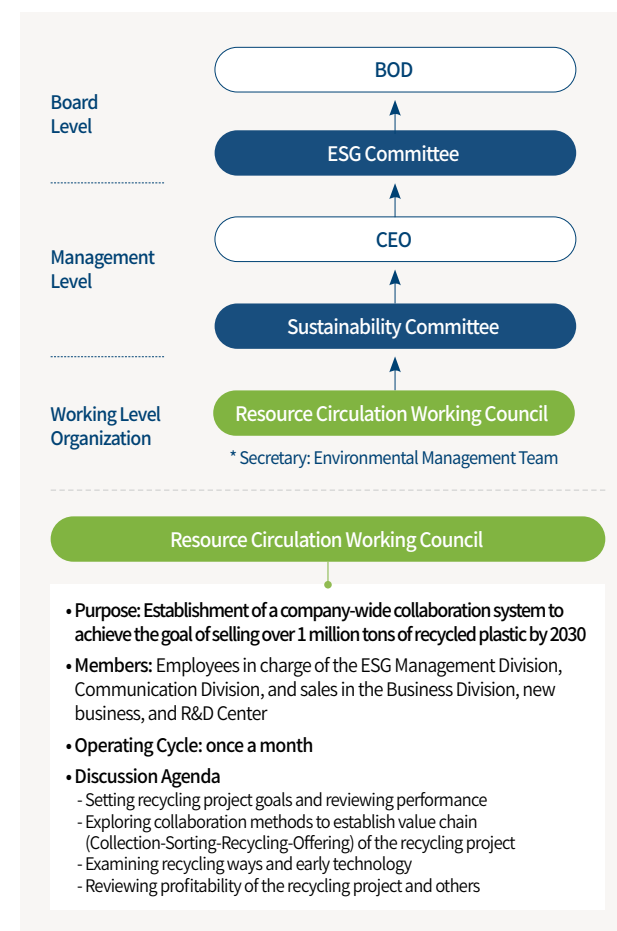


Resource Circulation Governance

Operation of Resource Circulation Council

LOTTE Chemical has established the Resource Circulation Council to achieve the goal of selling over 1 million tons of recycled plastic by 2030, as part of its 20 strategic tasks to accomplish Green Promise 2030. The council is responsible for executing recycling initiatives, exploring collaboration opportunities, setting targets, and monitoring performance.

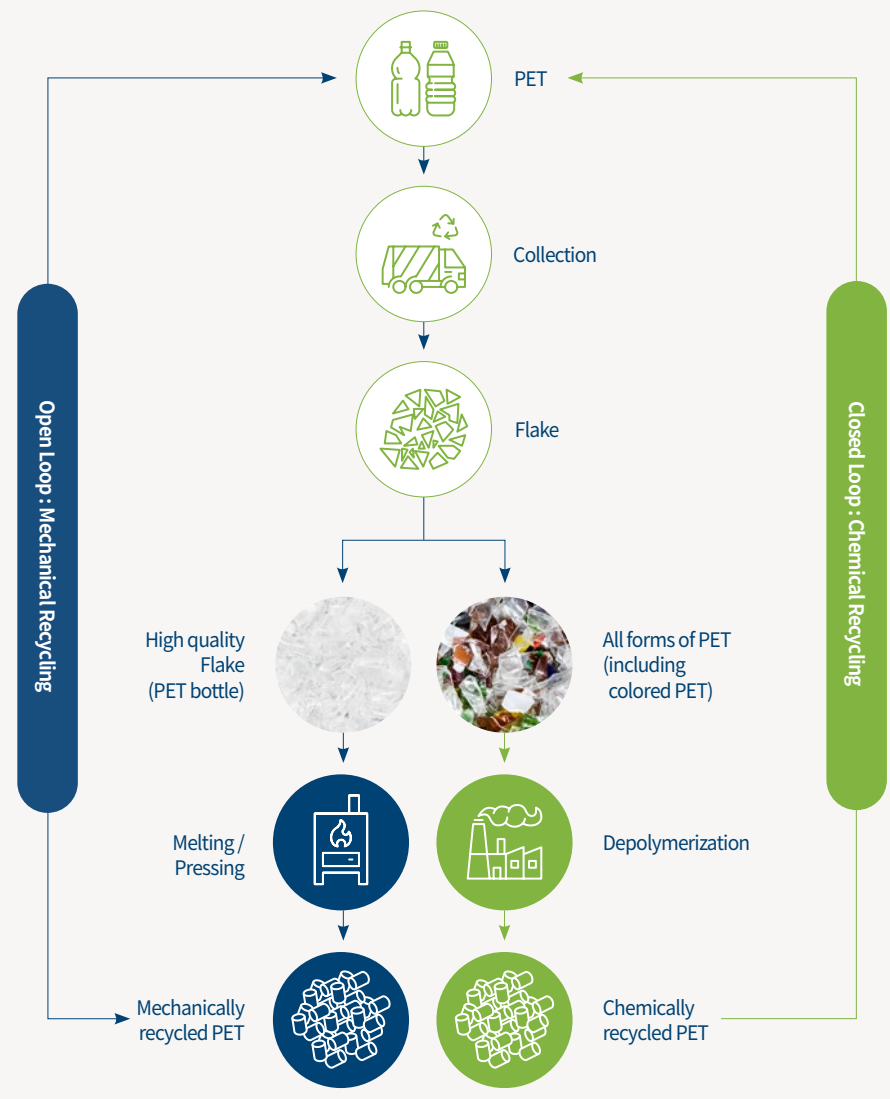
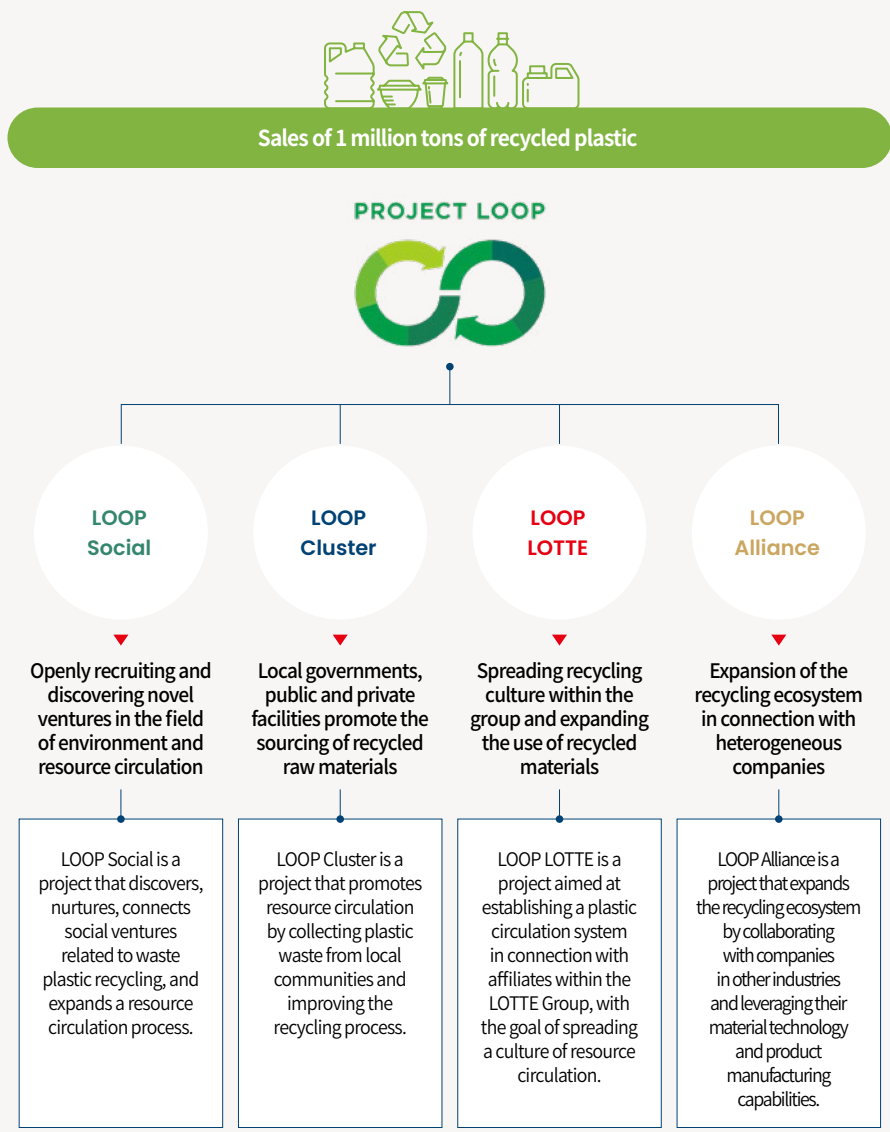
Our Resource Circulation Governance System



ISSUE II

STRATEGY SETTING AND MANAGEMENT FOR RESOURCE CIRCULATION

Recycling Plastic Projects Implementation Strategy



ISSUE II

STRATEGY SETTING AND MANAGEMENT FOR RESOURCE CIRCULATION

Resource Circulation Activities

LOOP Social

In 2022, LOTTE Chemical started its first Project LOOP Social Venture Incubation Program with LOWLIT COLLECTIVE, WOORIM ICT, Kokkirigongjang, Foresys, and PLUS LIFE, and accelerated the establishment of a waste plastic circulation system. Through this, various materials such as waste toys were collected and sorted into raw materials, and benches made by upcycling were installed in Cheonggyecheon Stream.

In December 2022, three social venture companies were selected for the second project cohort, and various activities are planned to establish a resource circulation system through ongoing support. In 2023, as part of our eco-friendly vision, Every Step for Green, we introduced a new program to identify and support venture companies that contribute to carbon neutrality. We will also work to expand the circular economy for carbon reduction by collaborating with relevant agencies such as the Ministry of Environment and the Ministry of SMEs and Startups.



Every Step for Green resource circulation green product exhibition



Final presentation day of the first Project LOOP Social Venture Incubation Program



Benches made by recycled plastic installed in Cheonggyecheon Stream

LOOP Cluster

In 2022, LOTTE Chemical signed a 'Memorandum of Agreement(MOU) on Establishment of Plastic waste Resource Recycling Culture' with the Incheon Metropolitan City Office of Education and the Incheon Environmental Conservation Organization, and installed and operated 40 waste PET collectors in about 20 schools located in Incheon. In addition, resource circulation educations utilizing PET collecting machines and exhibitions were conducted to educate teenagers on correct environmental awareness.

In December 2022, 'Our Neighborhood ESG center', a waste plastic collection base utilizing local seniors, in collaboration with Busan City and the Korea Labor Force Development Institute for the Aged. In addition to collecting waste plastic, we are contributing to expanding the base of resource circulation by expanding the cluster to create eco-friendly jobs for the elderly and providing environmental education for children.



PET collecting machine installed at Incheon Metropolitan City Office of Education



Incheon Resource Circulation Exhibition on National Science Day



Opening ceremony of Our Neighborhood ESG Center in Busan

LOOP LOTTE

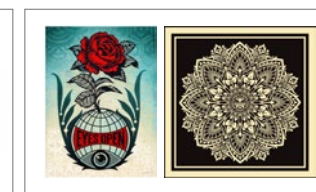
In 2022, LOTTE Chemical collaborated with the LOTTE Giants to produce player uniforms made from recycled PET bottles collected in Busan, and held a resource recycling and separation event at the Sajik Baseball Stadium in Busan for the 40th anniversary of its founding. In addition, LOTTE Chemical collaborated with LOTTERIA, Krispy Kreme Donuts, and Angel-in-us, all under LOTTE GRS, to carry out a project using chemically recycled PET (C-rPET) material to produce aprons and uniforms. Furthermore, in collaboration with LOTTE Museum of Art, C-rPET scarves expressing environmentally friendly messages by Shepard Fairey were produced and sold. We will continue to enhance synergy in building a resource circulation system through collaborative projects among affiliates within the LOTTE Group.



LOTTE Chemical's eco-friendly uniform in collaboration with LOTTE Giants



LOTTE Chemical's C-rPET based eco-friendly uniform in collaboration with LOTTE GRS



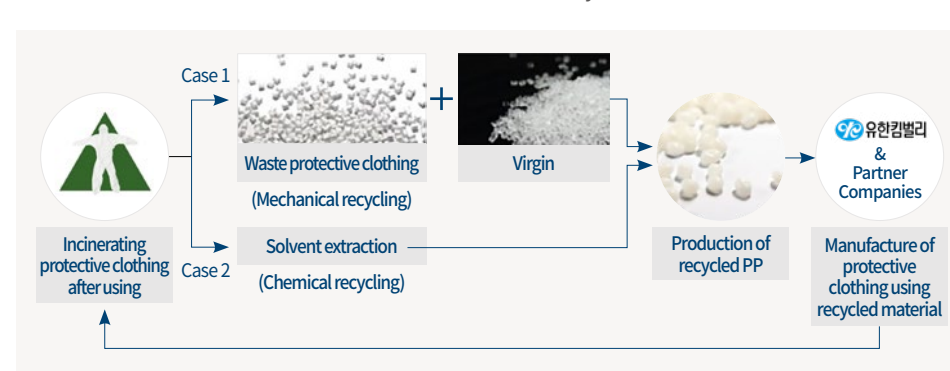
LOTTE Chemical's C-rPET based eco-friendly scarf in collaboration with LOTTE Museum of Art

LOOP Alliance

In July 2022, we signed the 'Green Action Alliance,' a Memorandum of Agreement(MOU), with Yuhan-Kimberly for sustainable product development. As part of the collaboration, Yuhan-Kimberly is promoting a collaboration model that recycles protective clothing made of polypropylene (PP). This is a form in which waste protective clothing, which is typically incinerated, is collected and separated for recycling. We convert it into recycled resin (PP) and Yuhan-Kimberly manufactures protective clothing using recycled materials, which is then supplied to its employees and partners. We aim to enhance synergy in building a resource circulation system through collaborative projects with other companies.



Our Resource Circulation Collaboration Model with Yuhan-Kimberly



ISSUE II

STRATEGY SETTING AND MANAGEMENT FOR RESOURCE CIRCULATION

Contribution to Social Carbon Reduction through Resource Circulation

The carbon (GHG) market is divided into a compliance carbon market, where carbon credits are traded through strict regulations based on mandatory reduction obligations, and a voluntary carbon market for carbon neutrality and RE100 declarations. The compliance carbon market refers to a market that is mandatory for companies with obligations to minimize carbon emissions under the ‘Act on Allocation and Trading of Greenhouse Gas Emission Permits.’ On the other hand, the voluntary carbon market is a market where companies, institutions, and individuals voluntarily reduce carbon, such as through carbon neutrality or RE100, to fulfill their social responsibilities and contribute to environmental protection.

Voluntary carbon reduction credits can also be applied to carbon reduction through plastic recycling, contributing to a resource-circulating economy. We aim to contribute to revitalizing related markets by quantifying the carbon abatement effect of recycled products by utilizing POPLA, a domestic voluntary carbon trading platform in Korea.

2022 GHG Reduction in Advanced Materials Business (Applying POPLA* Methodology)

Category	GHG reduction per 1 ton of recycled material	Recycled material usage in 2022 (ton)	Total GHG reduction in 2022 (calculated value)	POPLA uncertainty applied final accreditation performance
ABS	4.27 tCO ₂	554 tons	2,370 tCO ₂	1,446 tCO₂
PC	7.59 tCO ₂	14,906 tons	113,176 tCO ₂	59,757 tCO₂

* POPLA: Voluntary Carbon Reduction Credit Trading Platform

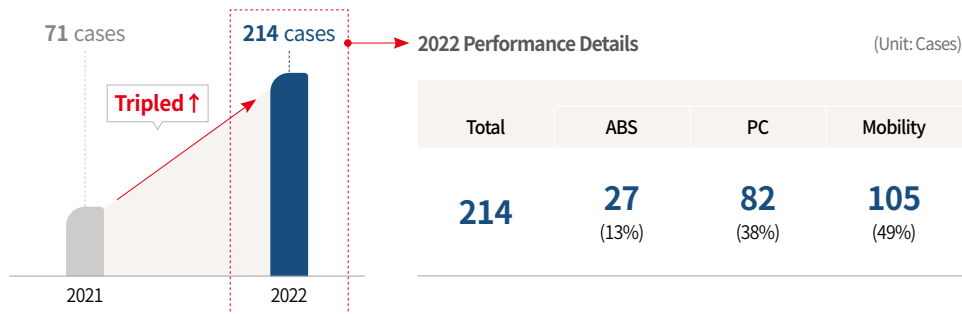
- POPLA uncertainty criteria

1) ABS (Quantity: Korea 62%, China 38%, Recognized Value: Korea 80%, China 30%)

2) PC (Quantity: Korea 66%, Europe 10%, China 11%, Southeast Asia 13%, Recognized Value: Korea 80%, Overseas 30%)

Product Life Cycle Assessment (LCA)

Global customers have been requesting LCA data for each product in order to confirm quantitative figures on environmental impact and resource and energy consumption during the entire production process. LOTTE Chemical calculated and provided more than 200 cases of LCA information in 2022. These LCA assessment results will be recognized in the voluntary carbon market and will be used to increase the reliability and accuracy of lowering carbon emissions.



Stakeholder Interview



LOTTE Chemical is practicing representative ESG management not only in the chemical sector but also in other sectors. For example, we are responding to climate change through voluntary carbon credit purchases and donations to environmental foundations in 2022. In addition to carbon reduction, we are spreading a culture of resource circulation through various activities such as developing eco-friendly materials and the social venture ‘Project LOOP.’ Since LOTTE Chemical is leading the chemical industry in Korea and actively carrying out various activities to cut down on carbon emissions, we consider the process of assessing the social value of carbon reduction activities and issuing them as carbon credits to be essential.

Accordingly, Greenery has developed a business methodology for ‘Project LOOP,’ an eco-friendly project that LOTTE Chemical has been voluntarily undertaking since 2020, and supports the certification and issuance of voluntary carbon credits to enable objective outcomes from LOTTE Chemical’s carbon abatement activities. As LOTTE Chemical is actively pursuing various carbon reduction activities, it is expected that the voluntary carbon market in Korea, which is currently in its early stage, will be further activated through processes such as measuring social and economic impacts, publicity, and advancement.

Greenery / General Director Hwang Yoo-sik

Acquisition of ISCC Plus Certification

In July 2022, LOTTE Chemical obtained ISCC Plus* certification, an international green product certification, for seven synthetic resin products produced using ISCC-certified pyrolysis oil naphtha raw materials obtained through chemical recycling of plastic waste. LOTTE Chemical’s certified products include PE (Polyethylene), PP (Polypropylene), PC (Polycarbonate), BD (Butadiene), and PET (Polyethylene Terephthalate). These are petrochemical raw materials, and ABS (Acrylonitrile Butadiene Styrene), which are high-performance synthetic resin products, and Compound PC. In 2023, we plan to further expand certified green products.



ISCC (International Sustainability and Carbon Certification) Plus Certification

A 3rd party verifies whether the raw materials of green products are properly managed throughout the entire supply chain, including suppliers, production, and sales processes, and grants certification. In order to achieve ISCC certification for the final products, the entire supply chain of raw materials must also hold ISCC certification.

SUSTAINABILITY MAGAZINE

- 038 **Section 1** Introduction of New Renewable Energy
- 040 **Section 2** Expansion of Green Products
- 044 **Section 3** ESG Risk Management and Mutual Growth within Supply Chain
- 047 **Section 4** ESG Disclosure and Advanced Communication

SECTION I

Introduction of New Renewable Energy



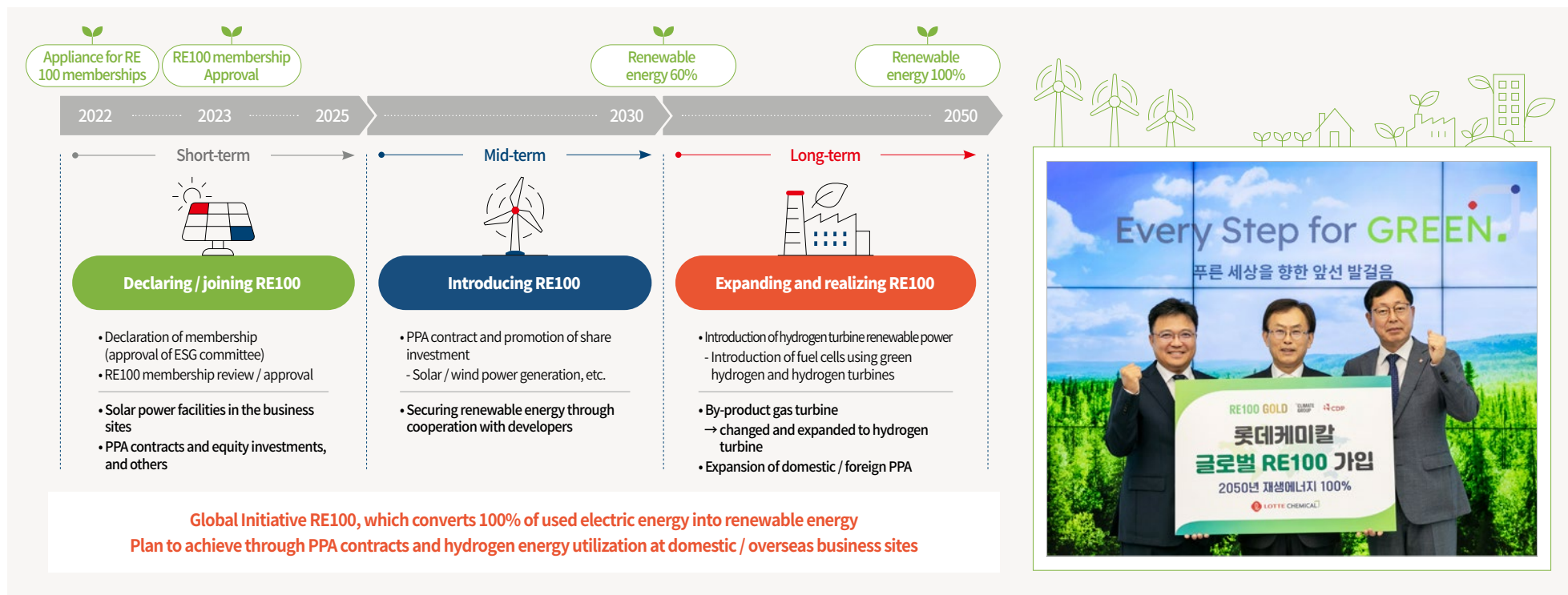
RE100 Roadmap Refinement

Announcement of RE100 membership and Implementation Plan

LOTTE Chemical signed up for Global Initiative RE100 in 2023, one of the 20 strategic tasks to achieve Green Promise 2030. Accordingly, we intend to increase the use of renewable energy, such as solar and wind power to 60% of all domestic and overseas business sites by 2030. By 2050, we will convert our energy usage to 100% renewable energy through the introduction of fuel cells and power generation facilities using green hydrogen.

We plan to secure Power Purchasing Agreements (PPAs) and Renewable Energy Certificates (RECs) for domestic business sites and at the same time, seek to introduce renewable energy to each overseas business site.

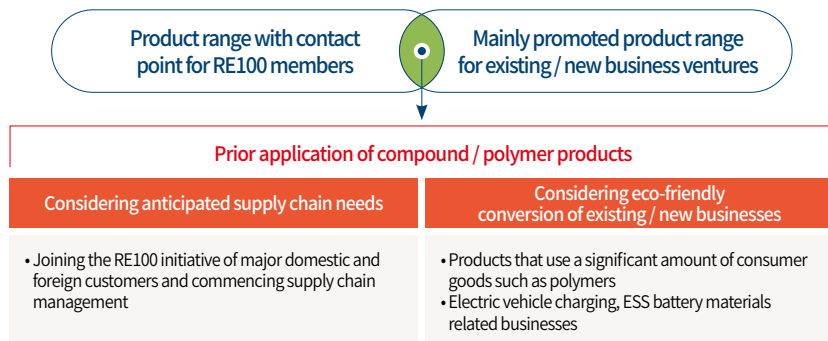
RE100 Roadmap of LOTTE Chemical



1) PPA (Power Purchase Agreement): a contract that regulates the sale and purchase of electricity and how to obtain it; a method of securing renewable energy through a contract between a power-generation company that produces electricity for the sale of renewable energy, and an electricity consumer who wants to purchase electricity.
2) Renewable Energy 100%: 100% electricity generated from renewable energy (solar / wind / hydro / geothermal) by 2050 (60% by 2030)

RE100 Roadmap Implementation Governance

Renewable Energy Introduction Strategy

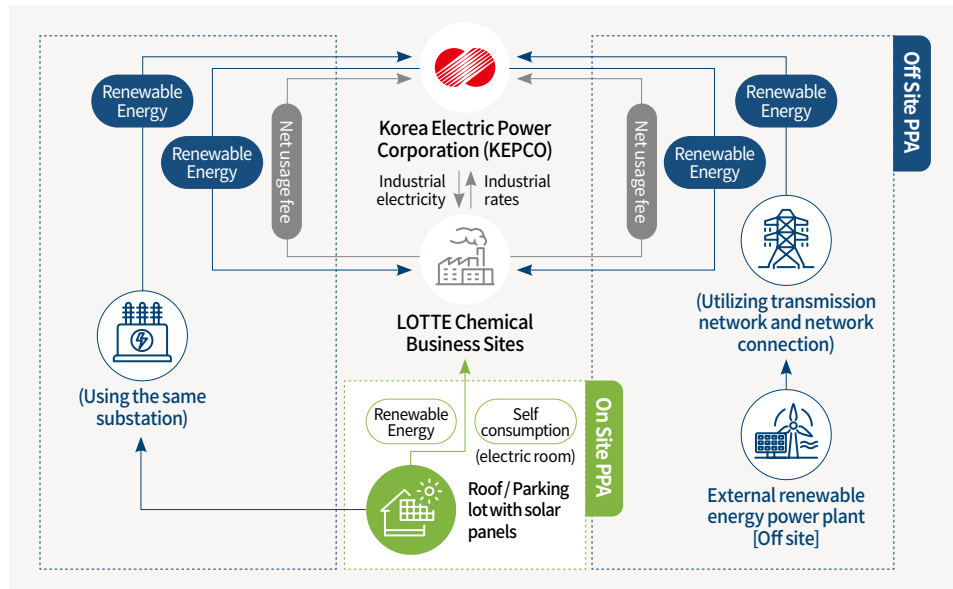


Renewable Energy Adoption Status

Current Status of Renewable Energy Introduction in Domestic Workplaces

We plan to install solar power generation facilities and introduce renewable energy within 2023 by utilizing the roofs of buildings or idle spaces in parking lots for a total of seven LOTTE Chemical business sites in Korea. In addition, we are seeking renewable energy supply contracts and pursuing the goal of converting 60% of our energy to renewable energy by 2030.

Renewable Energy Introduction Concept



Current Status of Renewable Energy Introduction at Overseas Workplaces

LOTTE Chemical USA Corporation, a US subsidiary, is currently engaging in talks with the current electricity supplier to implement a strategy that will replace over 50% of their electricity consumption with renewable energy. Going forward, we have plans to extend the adoption of renewable energy by acquiring Power Purchase Agreements (PPA) or Renewable Energy Certificates (REC). In the case of the advanced materials business, LOTTE Chemical Vietnam Corporation signed a contract with a renewable energy power generation company and installed approximately 0.9MW of solar power generation facilities in April 2022. This corresponds to an annual renewable energy electricity of 1,300MWh, which is approximately 17% of the total electricity consumption at the business site.

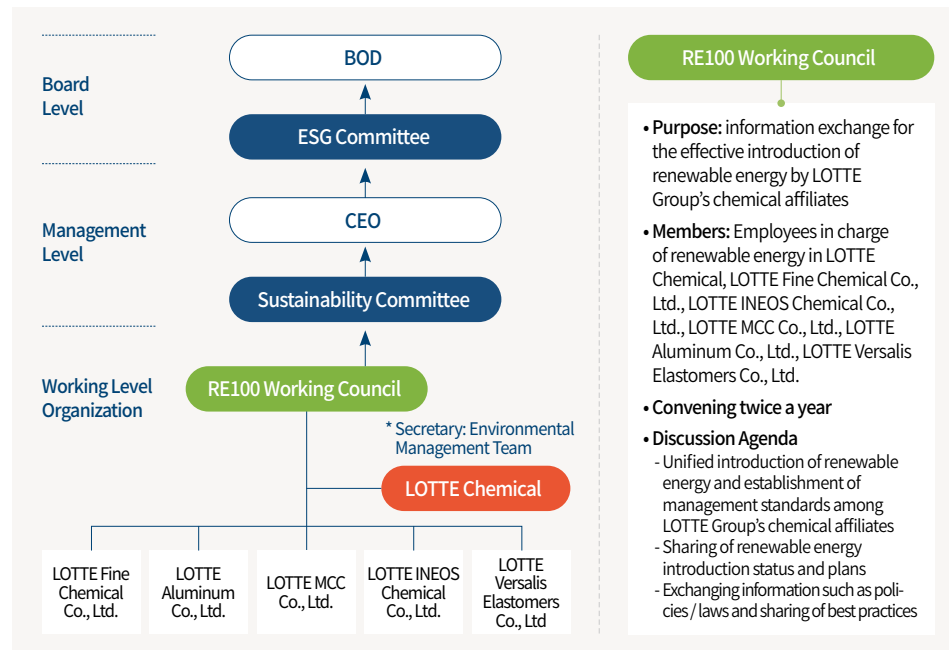


LOTTE Chemical Vietnam Corporation solar power plant

RE100 Working Council

The RE100 Working Council was formed as a platform for sharing information, facilitating the net-zero ambitions of LOTTE Group's chemical affiliates, and promoting the efficient effective introduction of renewable energy. Centered around LOTTE Chemical, the five domestic LOTTE Chemical companies work toward collaborate on implementing RE100 initiatives. We will regularly convene in biannual council meetings focused on developing response strategies and securing renewable energy sources. The council intends to extend its reach to encompass all affiliates within the LOTTE Group Chemical Group, establishing a comprehensive strategy and system for introducing renewable energy within the LOTTE Group Chemical Group.

Governance System for Implementing RE100



SECTION II

Expansion of Green Products



A Lee Byeong-guk, Manager of Institute of Technology Strategy Team **B** Han Seung-joo, Senior Manager of Advanced Materials Business Marketing Strategy Team

Q1 | What kind of work are you in charge of?



A Hello, I am a member of Institute of Technology, working on establishing research and development strategies for future new business technologies, including petrochemical products. In particular, we continuously collaborate and exchange with researchers in charge in the R&D on resource circulation to cooperate in terms of implementation in accordance with the direction our company pursues.

B Hello, I am responsible for eco-friendly materials and related business planning within LOTTE Chemical's advanced materials business.



Q2 | How does LOTTE Chemical define an 'green product'?

A Green products are those deemed to possess exceptional environmental attributes, achieved by minimizing environmental pollution across their entire lifecycle. This includes production, consumption, disposal, and collection, accomplished through reduced natural resource consumption and avoidance of hazardous substances. LOTTE Chemical, being a leading plastic manufacturing company in Korea, is dedicated to eco-friendly business practices through the development of sustainable and environmentally responsible products.

B Yes, that's correct. LOTTE Chemical is implementing eco-friendly initiatives with the objective of 'growth through resource circulation and carbon reduction.' The green product' line defined by LOTTE Chemical includes Mechanically recycled products that collect used plastic products, sort and crush them by material, and reintroduce them into the production process; chemically recycled products that convert used products or by-products from the production process into raw materials through chemical decomposition and reintroduce them into the process; and Bio-(&Bio-circular) products made by recycling plant-derived ingredients or waste vegetable oil for cooking.

Q3 | What is the background behind promoting the 'expansion of green products'?

A The intensity of environmental regulations is growing globally, and climate change is deteriorating. As this issue is being widely discussed as a matter of politics, economics, and society LOTTE Chemical is actively engaging in various eco-friendly policies to address it. In our pursuit of developing improved green products, we are dedicated to leveraging internal technological research and external resources, while actively responding to global trends and risks.

Q4 | How does the process unfold, from production and development to sales?

B Once customer demand for green products is confirmed in the market, we initially examine whether there is a suitable lineup to meet their needs. If it is feasible to propose an existing product, we evaluate its applicability to injection parts after matching eco-friendly content, physical properties, and color. If the existing lineup does not address the customer's needs, we proceed to develop new components using innovative materials and technologies that fulfill the specified requirements. Subsequently, we conduct customer evaluations to ensure their satisfaction.

A Yes, that's correct. During the R&D process for a new product, the production of the final product involves a series of trial-and-error iterations and extensive research. Notably, throughout this production phase, we actively communicate with customers to ensure that the product characteristics meet their satisfaction.

Q5 | The growing significance of sustainable management and ESG management has put green products in the spotlight. Please share your thoughts on this matter.

B LOTTE Chemical places emphasis on the quantitative goal of 'carbon neutrality' and consistently pursues the development of products and technologies that can deliver eco-friendly value to customers. To cater to customer demands for eco-friendly materials in various fields such as automobiles, TVs, mobile devices, and toys, we are building a diverse lineup using recycled raw materials. In addition, we are committed to securing technology for development that has a more positive impact on the environment.

A In the past, eco-friendliness was considered the most important factor when choosing green products, even if they were not as effective as traditional products. However, there is now a growing demand for green products that are not only environmentally friendly but also perform as well as or better than traditional products. Considering the current global investment trends, ESG management without economic viability will no longer attract substantial investments. Consequently, the development of new technologies that stakeholders can embrace and accept becomes even more crucial.

Q6 | What is the ultimate goal that LOTTE Chemical aims to achieve through the expansion of green products?

A B Based on our ESG vision of Green Promise 2030, LOTTE Chemical is committed to expanding its green business for carbon neutrality and achieving a sales volume of 1 million tons of resource-circulating plastic products, thereby creating social values of circulation and coexistence. In addition, LOTTE Chemical aims to become a global leader in resource circulation technology, establish technology licenses, and secure premiums for green products.

LOTTE Chemical, LICORN (LOTTE Chemical Inventive UniCorn) System

LOTTE Chemical has been operating the in-house venture program ‘LICORN’ since April 2021 to foster a creative and challenging company culture and identify new growth drivers. The LICORN system is an internal open innovation program with the purpose of spearheading new markets through in-house innovation, particularly in response to a rapidly evolving business environment, including the acceleration of ESG management and the advent of the 4th Industrial Revolution. Through the LICORN system, we actively promote the development and commercialization of various green products.

Eco Marine, Developing HDPE Materials for Eco-friendly Ships

Eco Marine’s primary objective is to tackle the challenge of non-recyclable Fiber Reinforced Plastic (FRP), a commonly used material in boat manufacturing. To address this, Eco Marine has successfully developed the first recyclable and eco-friendly HDPE material for ships in Korea. In addition, in partnership with other companies, Eco Marine manufactured Korea’s first 16m-class HDPE boat named ‘Possibility,’ and showcased it at various domestic and international exhibitions. The Eco Marine Team was recognized for its eco-friendliness and innovation and received the ‘Minister of Oceans and Fisheries Award’ at the ‘2022 Busan International Boat Show.’

Eco Box, Developing Eco-friendly EPP Sharing Box and Establishing a Platform

Eco Box is establishing a sharing box platform for reducing disposable packaging and promoting resource circulation. Our efforts are focused on creating a resource circulation process by designing reusable, multi-use packaging boxes and promoting their recycling into raw materials once they are no longer needed. Under our business-to-customer (B2C) brand THINGBOX, we have successfully introduced an eco-friendly icebox called THINGBOX BASIC, made from Expanded Polypropylene (EPP), which has been developed and made available for purchase.



Exhibition of Eco Marine Team’s Possibility ship

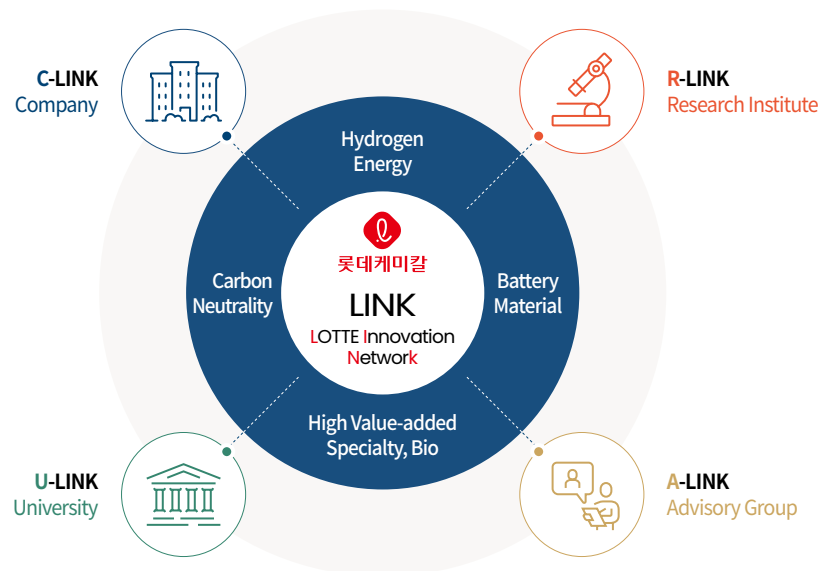


Eco Box Team’s THINGBOX BASIC

LOTTE Chemical, LINK (LOTTE Innovation Network) Project

In August 2022, LOTTE Chemical launched the LINK (LOTTE Innovation Network) project to secure core technologies and facilitate early commercialization in order to achieve Green Promise 2030. The LINK project is organized with the aim of proactively securing future technologies necessary for LOTTE Chemical’s business through open innovation research activities with universities, research institutes, companies, and experts, and of achieving technological expansion through collaboration between non-contiguous industries.

LOTTE Chemical LINK Project



LINK (LOTTE Innovation Network) Project Activities

As part of the LINK project, in 2022, the LOTTE Chemical-KAIST (Korea Advanced Institute of Science and Technology) Carbon Neutral Research Center were established and five research and development projects are underway to unleash a carbon-neutral society and solve the issue of waste plastic. Additionally, we are developing solid electrolyte and coating separator technologies in collaboration with ‘SOELECT,’ a startup that focuses on next-generation battery core materials, including lithium metal anodes and solid electrolyte.

Additionally, in August 2022, a joint research and technology transfer agreement was signed with the Korea Research Institute of Chemical Technology (KRICT) in the areas of ‘carbon neutrality,’ ‘resource circulation,’ and ‘hydrogen energy’ technologies. Research projects including ‘joint research on new processes in the carbon neutral field and waste plastic recycling technology’ and ‘transfer of source technology for hydrogen energy-related catalysts and processes’ have been conducted for a duration of three years.

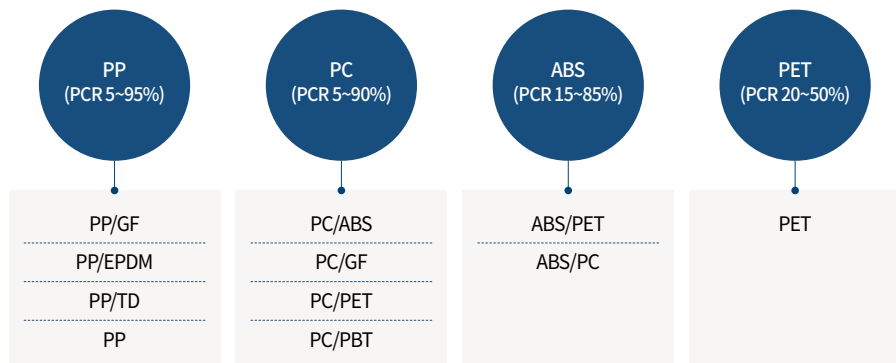
Our Recycled Products

Mechanical Recycling

It is a recycling process that involves collecting used products, sorting plastic products by type, crushing them, and reintroducing them into the production process.



Product Lineups



Applications



E&E(Electronic Equipment)



Home Appliances



Clothing & Footwear



Mobility



Consumer Products

Recycling Collected Marine Plastic

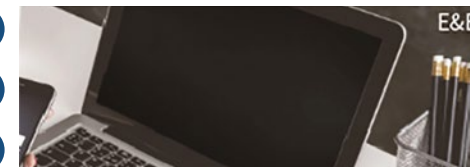
As part of marine environmental protection, this solution is re-introducing plastic waste collected from the coastal areas, just before it enters the deep sea, into the recycling process.

Product Lineups

- ABS/PET(OBP* 5%)
- PC(OBP 10~50%)
- PA/GF(OBP 30%)

*OBP : Ocean Bound Plastic

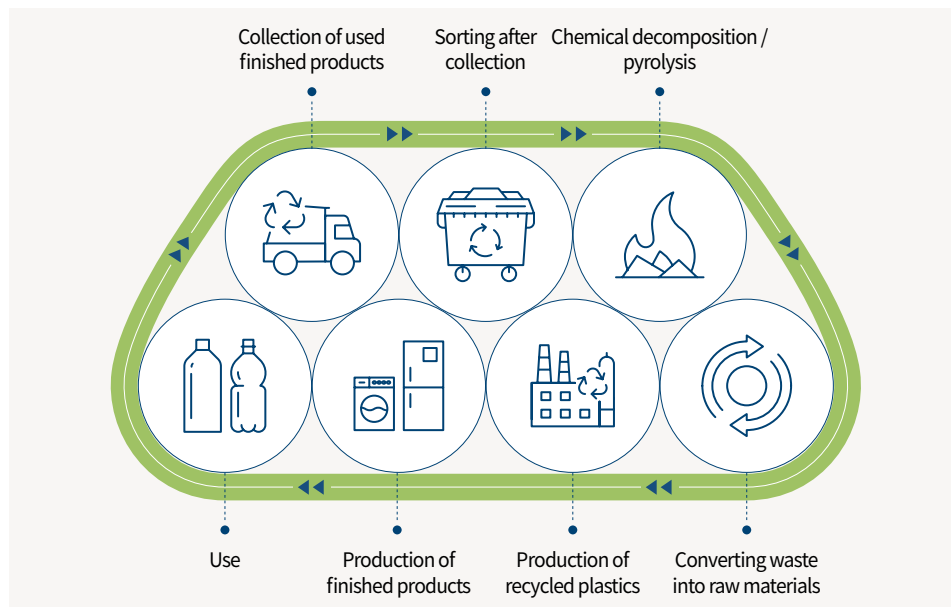
Applications



E&E(Electronic Equipment)

Chemical Recycling

The chemical recycling process is a recycling process that involves the chemical pyrolysis of spent products or by-products from the process into raw materials for regeneration. Chemical recycling can utilize all flake raw materials, including colored flakes, and has the advantage of being applicable in a wide range of products, including food products.



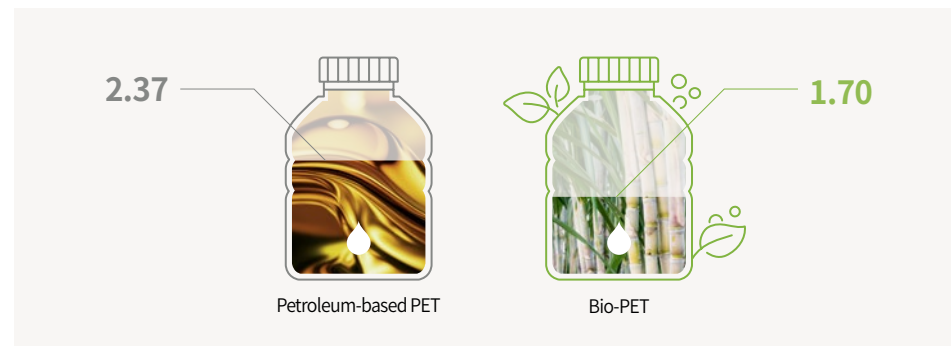
Product Lineups	Applications
Transparent MABS	<p>Food Packaging(Soft Drink, Mineral water) Cosmetic container</p>
ABS	
PET	

Bio-PET

LOTTE Chemical's Bio-PET product is produced using Bio-MEG extracted from sugarcane as a raw material, resulting in lower carbon dioxide emissions compared to petrochemical-based PET.

LCA (Life Cycle Assessment) Assessment / CO₂ Emission

(Unit: kg CO₂/kg PET)



Acquisition of Eco-friendly Certification



UL9789 20% biobased content from sugarcane

BP LABEL

Eco-Label (S.Korea Ministry of environment)

- UL9789(Environmental Claim Validation)
- BP Label(KBMP Certified)
- Korea Eco-Label(Ministry of environment Certified)
- EPD(Environmental Product Declaration, S.Korea)

[BIC] Portable Razor Application Case

LOTTE Chemical's groundbreaking chemically recycled transparent ABS is currently being utilized in portable razors, specifically the Click 3 and 4 models manufactured by BIC, a renowned global household product company. The application of this chemically recycled transparent ABS is set to extend to more models of the same product in upcoming developments. The material has showcased remarkable stability and quality, exhibiting comparable levels of impact strength, transparency, and fluidity as conventional transparent ABS.

High transparency, excellent appearance quality

Impact strength

Fluidity



SECTION III

ESG Risk Management and Mutual Growth within Supply Chain



We conduct ESG evaluations of our partners to assess and analyze their current status with the objective of cultivating cooperative alliances that encourage mutual growth. To build a sustainable supply chain, LOTTE Chemical and our partners will collaborate as a team to actively practice ESG management.

Our ESG Supply Chain Management Strategy



PART I ESG Risk Management

A Jang So-yeub, Manager of ESG Management Team in the ESG Management Division

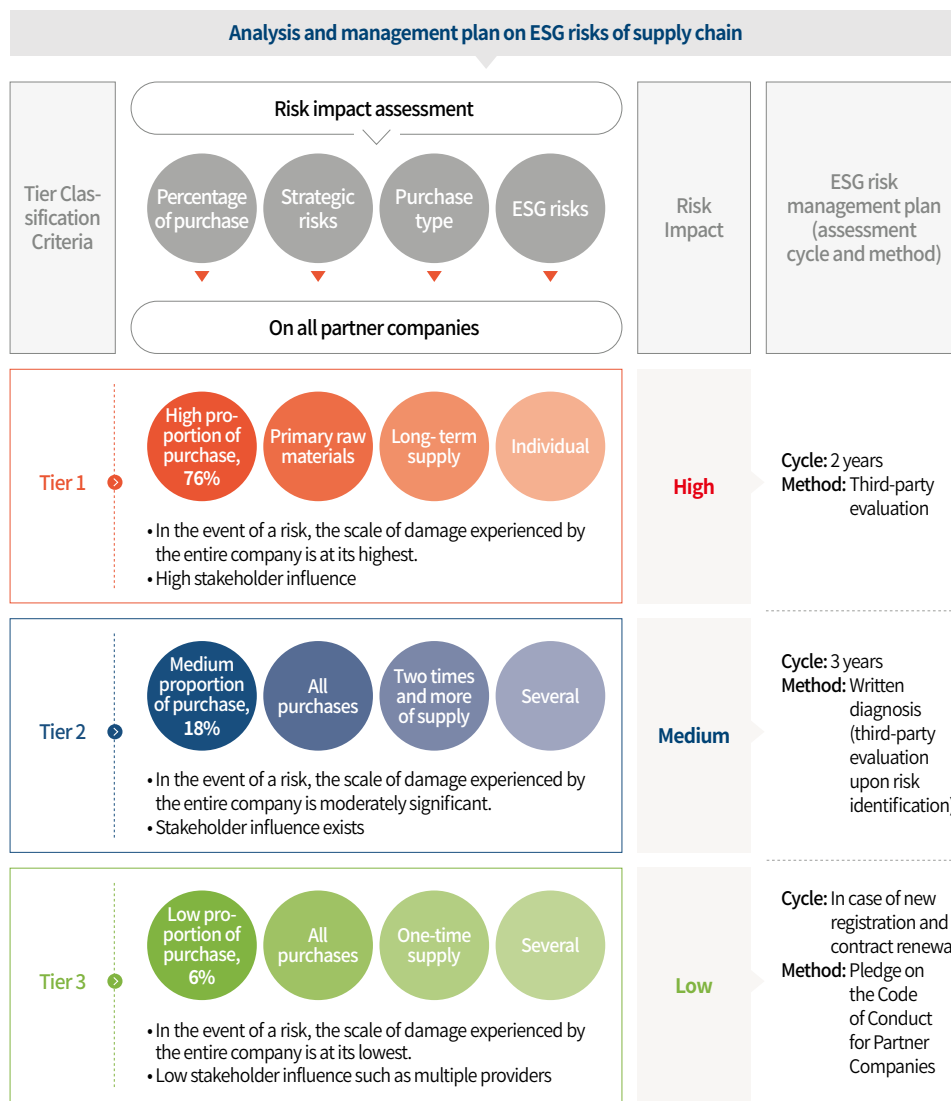
Q1 | What kind of work are you in charge of?



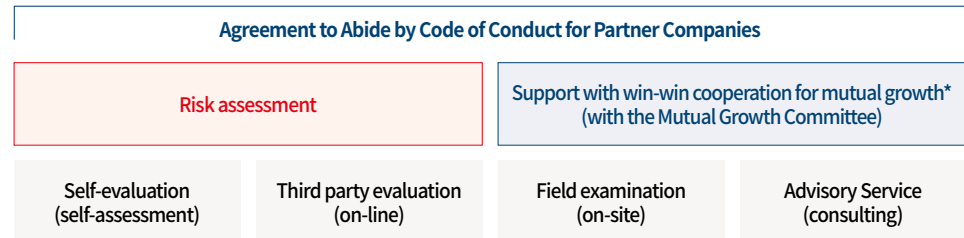
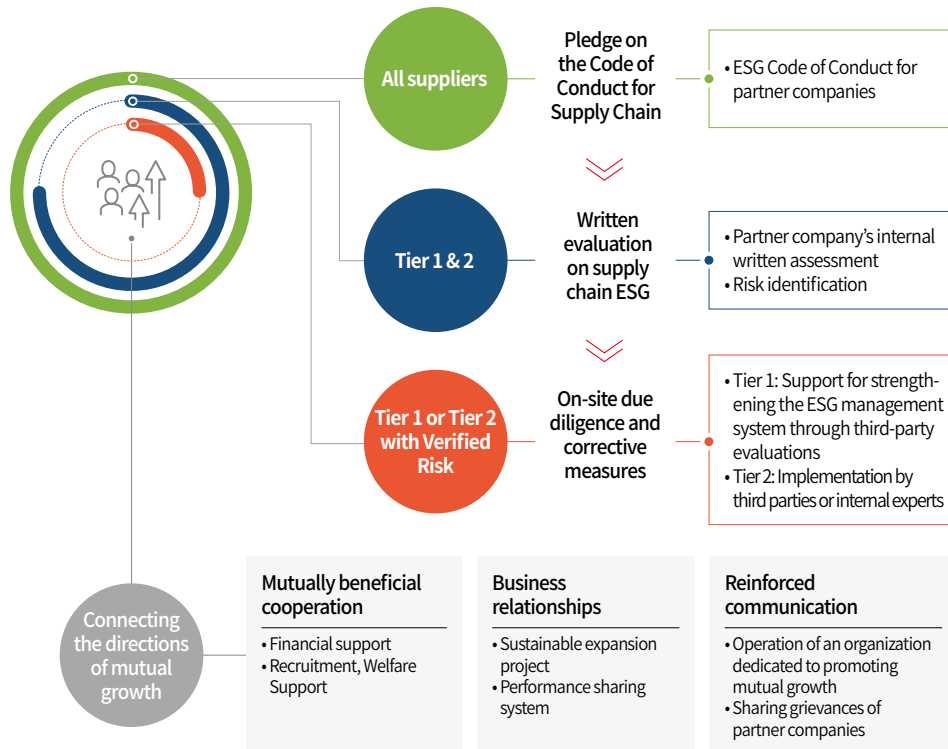
A I am responsible for sensing risks across the headquarters, subsidiaries, and supply chain, establishing a response system, and engaging in planning. In addition, I collaborate and communicate with various relevant departments for external evaluations and stakeholder engagement.

Q2 | Please, explain LOTTE Chemical's ESG supply chain management system.

A We have established a periodic ESG risk assessment system for approximately 2,500 partner companies to identify the major risks that could arise from an ESG perspective. We have categorized our partners into three groups (Tier 1-3) based on factors such as annual purchase costs, strategic risks, purchase type, and ESG risks, considering their business impact. Furthermore, we have developed a comprehensive supply chain ESG risk assessment and management measures that take into account the risk impact according to the classification system.



ESG Risk Management System of Supply Chain



* Participating every year since 2019, supporting 28 companies in the second half of 2022, amount of improvement effect: KRW 5.9 billion

Q3 | Please explain the ongoing ESG supply chain evaluation activities for partner companies.



A LOTTE Chemical conducted an ESG supply chain assessment of 50 key partner companies in 2023. As for the evaluation method, work efficiency was improved through the introduction of a supply chain management platform, and training by experts with various know-how and reliable third-party verification were conducted so that partner companies could be evaluated with expertise. In addition, LOTTE Chemical enacted the Code of Conduct for Partner Companies in 2022 and established a plan to send and collect compliance agreements in the third quarter of 2023, and is currently in the implementation stage.

Q4 | How is the 2023 supply chain evaluation going?

A An evaluation plan was prepared from the second half of 2022, and a briefing session for partner companies was held in February after discussions with related departments in early 2023. And after self-evaluation at the end of April 2023 and third-party verification at the end of May, we plan to analyze the results. Since it was the first implementation, there were many trials and errors. However, thanks to the understanding of the responsible individuals from our partner companies regarding the objectives of the implementation, we were able to make successful progress. We are fully devoted to constant improvements, with the goal of ensuring a more convenient and inclusive participation in the times ahead.

Q5 | What are LOTTE Chemical's unique strengths for establishing a sustainable supply chain?

A LOTTE Chemical intends to lead win-win cooperation in connection with support for mutual growth while conducting a risk assessment to confirm the evaluation of ESG status of partner companies. To ensure practical support for our partner companies, we offer a comprehensive 'One Stop' consulting service, which includes assessment, on-site due diligence, and improvement support to select partner companies in conjunction with the ESG support project for mutual growth.

Q6 | Please tell us about LOTTE Chemical's future goals and plans.

A To effectively respond to and prepare against ESG risks, it is crucial for LOTTE Chemical and our partners to clearly assess the current ESG status and devise support strategies with the mindset of one team. Moving forward, we will actively work on developing measures to offer tangible support to our partner companies while enhancing the evaluation process.

PART II Mutual Growth, Collaborative Partnerships

A Choi Keun Young, Senior Associate of the CSV Team in the Communication Division

Q1 | What kind of work are you in charge of?



A The CSV Team functions as the department responsible for fostering mutual growth, actively designing and implementing a range of programs to enhance partner companies' ESG response capabilities. Furthermore, we engage in close communication and collaboration with diverse departments, including purchasing, research, production, finance, and compliance teams, to deliver tangible assistance to our partner companies.

Q2 | Please explain the ongoing ESG management activities for partner companies.

A We have been participating in the 'Small and Medium Enterprise ESG Support Program' organized by the Korea Commission for Corporate Partnership for three years to enhance partner companies' ESG capabilities. The 'Small and Medium Enterprise ESG Support Program' is a program designed to enhance the ESG capabilities of our partner companies. It includes ESG training and the deployment of experts to conduct on-site assessments and provide consulting services. Furthermore, we implement a mutually beneficial cooperation strategy with our partner companies through various means, including financial support, recruitment assistance, welfare support, technical aid, and consulting services. To gather partner companies' feedback, we utilize Online Shinmungo, an online platform dedicated to receiving opinions. Additionally, we conduct quarterly surveys and hold briefing sessions to ensure effective communication.

Financial support

In order to stabilize business management through smooth fund management of partner companies, we raised and supporting KRW 135 billion of Mutual Growth Fund and KRW 105 billion of Credit Guarantee Fund together with Industrial Bank of Korea.

Recruitment support

For the stable operation of partner companies, we provide financial support by subsidizing a portion of the contributions made by partner companies that have joined the Naeil Chaeum (Brighter Future) Mutual Aid Program. Additionally, we assist partners facing challenges in recruiting young talents by supporting their online recruiting channels and job fairs, helping them secure skilled individuals.

Protection of technology

We operate a support program for the technical data escrow system to protect partner companies' technologies. This program involves storing core technical data and trade secrets of our partners in the technical data escrow center, providing a system to prove that the technology is under development.

Q3 | What was the background behind the program?

A LOTTE Chemical operates various win-win cooperation programs to enhance partner companies' ESG capabilities for supply chain ESG management. Although the 'Supply Chain Due Diligence Act,' which expands corporate responsibility to the supply chain, is being actively discussed, many partner companies, mostly small and medium-sized enterprises (SMEs), still face challenges in effectively meeting ESG requirements. LOTTE Chemical is undertaking mutual growth activities to support these partner companies and alleviate their challenges.

Q4 | Please share with us the future goals and plans of LOTTE Chemical.

A ESG management of the supply chain is impacting not only large corporations but also our partner companies, which include SMEs, in various ways, such as international regulations and trade barriers. LOTTE Chemical plans to sharpen its competitiveness for mutual growth through constant communication and collaboration based on a spirit of mutual respect.

Welfare support

We are operating a vacation support project to improve the welfare of our partner companies' employees. In 2023, we will provide national tourism gift cards and travel kits that can be used at affiliated hotels, department stores, duty-free shops, and travel agencies.

Technological support

We are actively working on collaborative research projects with our partner companies to strengthen their technological competitiveness. These projects involve joint efforts in various research tasks, such as product development and process improvement. Furthermore, we provide support to our partners by utilizing our research facilities for the analysis of physical properties of products.

Supporting productivity improvement

To enhance the competitiveness of our partner companies, we provide support for consulting expenses they deem necessary for areas like labor and safety. In addition, we dispatch external experts to elevate their safety management standards and offer consulting assistance to achieve ISO 45001 certification, Occupational Safety and Health Management System.

SECTION IV

ESG Disclosure and Advanced Communication



A Kim So-mi, Senior Manager of ESG Management Team in the ESG Management Division

Q1 | What kind of work are you in charge of?



A Hello, I am responsible for ESG management planning and operations within the HQ ESG Management Team for LOTTE Group's chemical unit. LOTTE Chemical is composed of the basic chemicals business division, which focuses on manufacturing and selling general-purpose petrochemical products, and the advanced materials business division, which specializes in producing and marketing customized compound products to meet specific customer requirements. As each business division possesses unique characteristics, there is a growing need from diverse stakeholders for the disclosure of ESG-related information.

Furthermore, as we expand into various global markets, including Europe and the United States, as well as our domestic market, Korea, we are highly interested in and actively monitoring sustainability policies and trends in each country. Especially, given the recent emphasis on ESG information disclosure, we acknowledge that addressing ESG information disclosure and enhancing communication are crucial matters. As a result, we are proactively preparing to address these challenges in advance.

Q2 | What kind of communication activities are being carried out with stakeholders regarding ESG?

A We are keenly aware that there is a growing and deepening demand for both quantitative and qualitative ESG information disclosure from stakeholders, including investors, customers, and appraisers, and the pace of this demand is accelerating. Our customers ask us and our partner companies to adhere to the Code of Conduct for Partner Companies and provide information about our company-wide ESG management activities. Our ESG Management Team collaborates closely with several internal related departments to review and offer support in addressing these requirements.

In response to investor demands, we arrange stewardship meetings to discuss and communicate our ESG management policies and activities. Moreover, we actively participate in evaluations conducted by reputable organizations such as KCGS, MSCI, and EcoVadis. Additionally, we emphasize transparent disclosure of our annual performance by publishing the ESG Report.

Furthermore, we ensure the integration of diverse stakeholders' voices into our management processes by conducting regular management reporting through two dedicated ESG governance bodies: the ESG Committee and the Sustainability Committee. We are actively engaged in performance management tasks. Throughout this process, we incorporate stakeholder needs into internal decision-making, pursue continuous improvement efforts, and effectively manage our performance.

Q3 | Please explain the way to improve transparent information disclosure and communication in regard to LOTTE Chemical's ESG management.

A LOTTE Chemical has developed a pool of non-financial indicators based on stakeholders' input, the Global Reporting Initiative (GRI) for sustainability, and the non-financial indicators requested by appraisers. Additionally, we have developed a comprehensive non-financial indicator specification document. This document outlines the criteria for each indicator and provides detailed information on LOTTE Chemical's data calculation process and management measures. Through this process, we established a system in which data can be calculated and managed under equal standards. This specification document will be progressively expanded and disseminated to LOTTE Chemical's consolidated companies to ensure reliable and transparent information disclosure.

Q4 | What was the background behind the implementation?

A With ESG management activities becoming a crucial aspect of corporate value evaluation, stakeholders' interest in ESG washing (known as greenwashing) has significantly risen. Both domestic and international legislation and standards for sustainability disclosure have been introduced. With a significant increase in stakeholders, both at home and abroad, seeking ESG-related information, the need for standardization and the development of an efficient information management system has become pressing. Considering the presence of multiple subsidiaries both in Korea and overseas, LOTTE Chemical has identified that strategic expansion of subsidiaries and the reorganization of the headquarters' system as essential steps to take in advance. As part of a long-term project spanning the next 2 to 3 years, we have commenced its first project in 2022.

Q5 | Please tell us about LOTTE Chemical's future goals and plans.

A In order to disclose non-financial indicators transparently and reliably, it is necessary to manage indicators through a system. Accordingly, we plan to develop an ESG management platform that will facilitate the establishment of a system-based management system and enable integrated information management among our affiliated companies. In addition, we will make further efforts to create a virtuous cycle in which long-term ESG management improvement activities can be planned by strengthening information management, planning long-term ESG management improvement activities effectively. This will, in turn, facilitate continuous enhancement of our internal management system. Furthermore, we will continue to enhance information management to plan long-term ESG management improvement activities. By doing so, we aim to create a virtuous cycle allowing continuous upgrades of our internal management system. We look forward to your continued interest and valuable feedback. Thank you for your support.

ESG SYNERGY

049 **Leading Role in Sustainable Future Businesses**

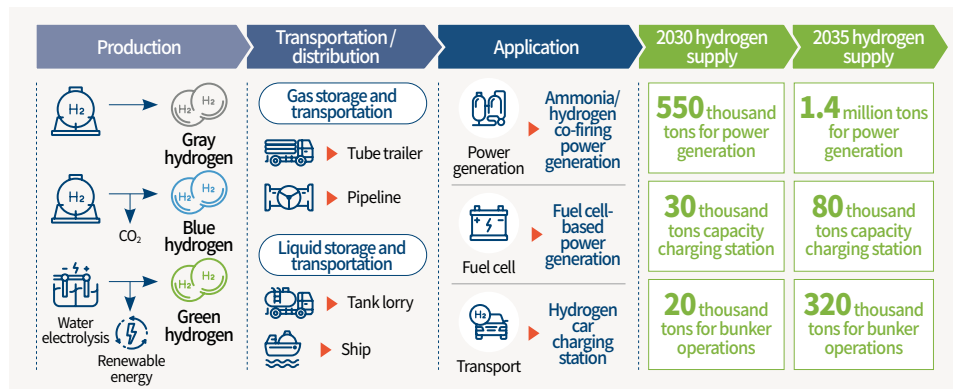
Leading Role in Sustainable Future Businesses

Goals and Roadmap of Green Business (Hydrogen Energy / Battery Material Business)

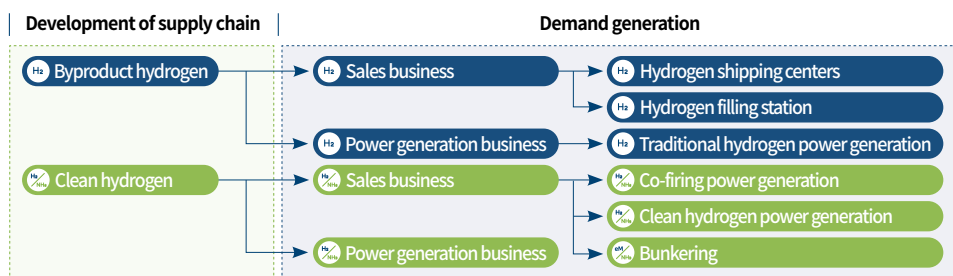
Goals and Roadmap of Hydrogen Energy Business

LOTTE Chemical aims to seize business opportunity in the ESG trend by taking the lead in the hydrogen market, thereby establishing a foundation for future growth. Hydrogen energy is essential for expanding the carbon-neutral and eco-friendly energy market and can be said to be a key factor in an energy paradigm shift. LOTTE Chemical released its objectives and roadmap for the hydrogen energy business in 2022, and later adapted its investment and revenue strategies to accommodate the government's changes in clean hydrogen power generation plans. We plan to supply 600,000 tons of hydrogen by 2030 and 1.8 million tons of hydrogen by 2035 for various purposes and build infrastructure for the overall hydrogen business, including hydrogen delivery centers and charging stations. Our goal is to reach KRW 3 trillion in sales by 2030, leveraging our cumulative investment of KRW 3 trillion in various businesses. Furthermore, our long-term objective is to achieve KRW 6 trillion in cumulative investment and KRW 9 trillion in sales by 2035 through business expansion. By engaging in the hydrogen energy sector, we will take a proactive stance in addressing climate change and position ourselves as a socially responsible company at the forefront of ESG management.

Target of Supplying 1.8 Million Tons of Hydrogen by 2035



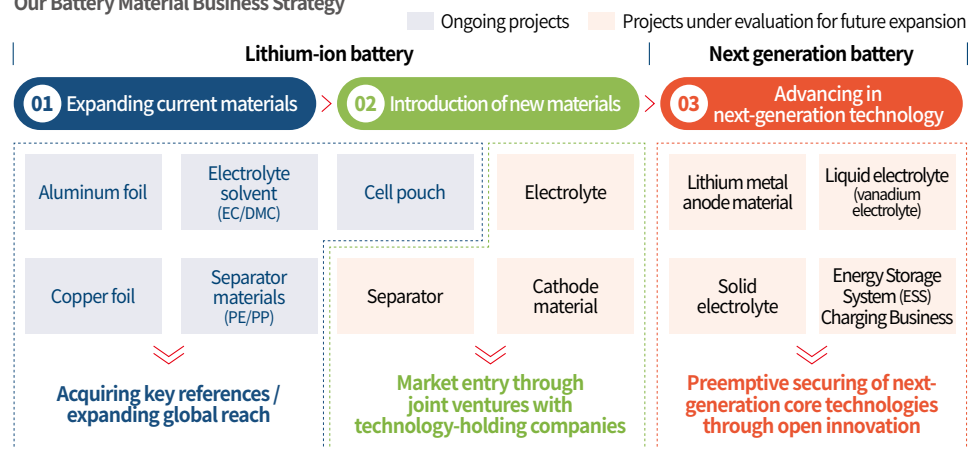
LOTTE Chemical Hydrogen Energy Business Areas



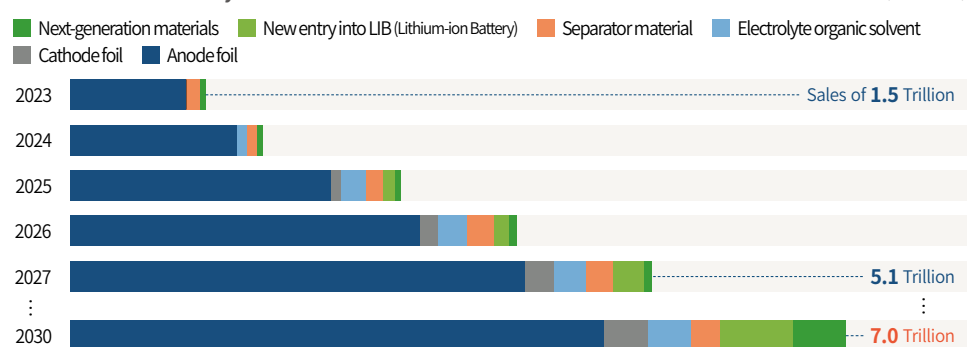
Goals and Roadmap of Battery Material Business

LOTTE Chemical is pursuing its business with speed, aiming for KRW 7 trillion in sales by 2030 to establish itself as a 'global leader in battery materials'. In pursuit of this goal, LOTTE Chemical is actively conducting and assessing construction of a global production base for battery materials, including aluminum foil, copper foil, and electrolyte organic solvents, all of which are part of chemical unit of our battery material business. We are also in the process of establishing an integrated local supply chain network. Moreover, to enter the next-generation new material industry for lithium-ion batteries, LOTTE Chemical is actively engaging in open business partnerships, such as early-stage investments and establishing cooperative ties with leading technology firms known for their cutting-edge battery material technology. Furthermore, to secure a leading position in the market for next-generation batteries and their corresponding materials, such as all-solid-state batteries, vanadium-ion batteries, and lithium metal anode materials, LOTTE Chemical is actively engaging in technology development and open innovation through collaborations with various start-ups.

Our Battery Material Business Strategy



Sales Goal for Our Battery Material Business



Key Activities for Green Business (Hydrogen Energy / Battery Materials Business)

As a growth strategy to achieve the 2030 vision, LOTTE Chemical aims to restructure its business into a sustainable and continuously growing business model by increasing the share of sustainable future businesses, including high value-added specialty products, hydrogen energy, battery materials, recycling, and bio, to constitute 60% of total sales. To proactively address the strategic execution of sustainable future businesses and to effectively adapt to the evolving petrochemical industry, LOTTE Chemical has set up the 'Hydrogen Energy Business Group' and the 'Battery Material Business Group'. Each business group aims to secure a leading position in the hydrogen market and explore further opportunities in the battery and high value-added materials business through systematic cultivation of new ventures and investment execution.

Jan. 2022

Memorandum of Understanding (MOU) between LOTTE Chemical and Standard Energy

An equity investment of KRW 65 billion was made in Standard Energy, a manufacturer of vanadium ion batteries for Energy Storage Systems (ESS), acquiring a 15% stake.

LOTTE Chemical is actively driving open innovation initiatives to secure a leading position in next-generation battery technology. This includes actively engaging in a pilot project for ESS at an ultra-fast electric vehicle charging station, using vanadium ion batteries ESS in partnership with Standard Energy.



Apr. 2022

Establishment of Hydrogen Energy Business Group and Battery Material Business Group

To systematically foster new businesses and strategically implement investments, we have established the Hydrogen Energy Business Group and the Battery Material Business Group.



Establishment of joint venture for next-generation battery materials, including lithium metal anode, through MOU between LOTTE Chemical and USA SOELECT

To construct a lithium metal anode material production facility with a capacity of approximately 1 gigawatt-hour (GWh) in the US by 2025, representing an investment of around 200 million dollars, LOTTE Chemical has entered into a Memorandum of Understanding (MOU) with the US start-up, SOELECT, a renowned developer of lithium metal anode materials and solid electrolytes, essential components for next-generation batteries. As part of this collaboration, we have established a joint venture (JV).



Jun. 2022

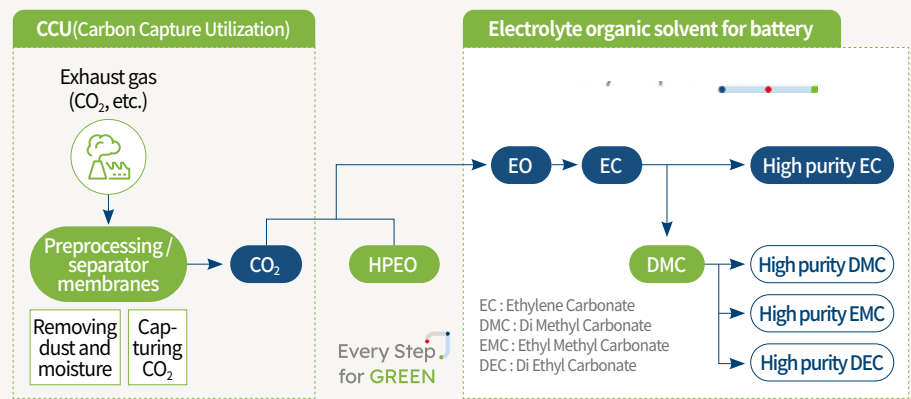
Establishment of LOTTE Battery Materials USA Corporation

LOTTE Chemical established LOTTE Battery Materials USA to expand its major battery material business in the United States. Additionally, we have commenced the construction of a cathode materials plant through a joint venture with LOTTE Aluminum, with the plant scheduled to be fully operational by 2025.

LOTTE Chemical is actively pursuing collaboration with Sasol Chemicals to expand globally in the field of electrolyte organic solvent for electric vehicle batteries.

Expansion of Production for Four Core Organic Solvent Materials (EC / DMC / EMC / DEC) Used in Lithium Battery Electrolytes

LOTTE Chemical has initiated the construction of EC and DMC plants in Daesan, Korea, with the aim of preoccupying the organic solvent market for electrolytes, and targeting commercial production by 2024. In addition, LOTTE Chemical is also promoting the construction of EMC and DEC plants using technologies developed by LOTTE Chemical. All four core materials for electrolyte organic solvents, which are used in lithium-ion batteries for electric vehicles, will be produced. In order to secure a global production base using this capability, we have signed a Memorandum of Understanding (MOU) with Sasol Chemicals for preliminary feasibility and is actively exploring collaboration opportunities.



EC (Ethylene Carbonate), DMC (Di Methyl Carbonate), EMC (Ethyl Methyl Carbonate), DEC (Di Ethyl Carbonate)

EC, DMC, EMC, and DEC are representative organic solvents used in the electrolyte, one of the four main components of lithium-ion batteries. Organic solvents constitute approximately 30% of the total cost of electrolytes, indicating significant growth potential. However, these materials are entirely reliant on imports. LOTTE Chemical has successfully built an electrolyte organic solvent production facility within the Daesan Plant, making it the first in Korea to complete the development of EMC and DEC technologies. The organic solvent in the electrolyte plays a crucial role in dissolving lithium salt, facilitating the movement of lithium ions (Li+) between the anode and the cathode, and ensuring smooth lithium-ion mobility.

Sep. 2022



Establishment of LOTTE SK Eneroot Corporation

LOTTE Chemical, together with SK Gas and Air Liquide Korea, established a hydrogen business joint venture named 'LOTTE SK Eneroot'.

As the first project, 'LOTTE SK Eneroot' is investing approximately KRW 300 billion in constructing a by-product hydrogen fuel cell power plant on a site of about 3,700㎡ within the LOTTE Chemical Ulsan Plant. The project is underway with the aim of commencing operations in the first half of 2025.

The power plant will have an annual power generation capacity of 500,000 MWh, which is equivalent to the electricity consumption of approximately 120,000 four-person households for one year.

'LOTTE SK Eneroot' plans to not only construct hydrogen fuel cell power plants but also establish hydrogen filling stations at key locations nationwide. Additionally, the company intends to explore business opportunities in clean hydrogen and ammonia sectors.



Nov. 2022



Investment in a US-based ammonia photolysis* company (Participation in a USD 76 million investment round by Syzygy)

LOTTE Chemical invested in the Series C Round of US Syzygy Plasmonics, a company specializing in ammonia photolysis technology. (Series C: Total investment of USD 76 million, equivalent to around KRW 100 billion) Earlier, in August 2022, LOTTE Chemical entered into a Joint Business Development Agreement (JDA) for ammonia photolysis technology with LOTTE Fine Chemical, Syzygy, and the Sumitomo Corporation Group from Japan.

Thus, LOTTE Group's chemical unit has not only showcased ammonia pyrolysis technology but has also made strides in demonstrating photolysis technology, advancing further in securing a leading role in the future hydrogen industry.

The LOTTE Group's chemical unit plans to contribute to the promotion of domestic hydrogen and ammonia utilization. We will supply clean hydrogen, based on ammonia pyrolysis technology, to large-scale hydrogen consumers with continuous demand. Additionally, we will complete a portfolio that utilizes ammonia photolysis technology to meet the needs of small and medium-sized hydrogen consumers.



* Ammonia photolysis technology: The energy source for the decomposition process is the light, and the equipment is operated using electricity, allowing for quick start-up and shutdown times, making it suitable for rapid operation and advantageous for small and medium-scale hydrogen production. Additionally, this technology does not involve combustion processes, resulting in no GHG emissions.

Dec. 2022

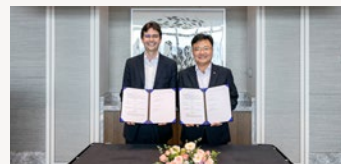


Establishment of LOTTE Air Liquide Ener'Hy Co., Ltd.

LOTTE Chemical established LOTTE Air Liquide Ener'Hy Co., Ltd., a hydrogen business joint venture with Air Liquide Korea, to expand the hydrogen supply chain.

As the first project of LOTTE Air Liquide Ener'Hy, it aims to construct a large-scale high-pressure hydrogen shipping center using LOTTE Chemical's by-product hydrogen within the Daesan Plant site. The goal is to commence operations in the second half of 2024. This center is planned to have the largest hydrogen production capacity in Korea (more than 5,500 tons per year), which is equivalent to refueling 4,200 passenger cars or 600 commercial buses per day.

In addition, through this high-pressure hydrogen shipping center within the Daesan Plant, we will preoccupy the metropolitan mobility market, and later build an additional hydrogen shipping center in Ulsan to take charge of hydrogen shipments in the Yeongnam area. Starting with this, we aim to develop and expand the hydrogen mobility market to meet nationwide demand, including LOTTE SK Eneroot Corporation and other LOTTE affiliates.



Mar. 2023



Establishment of LOTTE Energy Materials Corporation

LOTTE Chemical has acquired Iljin Materials, a leading domestic copper foil producer, in order to expand its presence in overseas markets for eco-friendly electric vehicle battery materials, particularly in the US and Europe. Following the acquisition, Iljin Materials has been renamed to LOTTE Energy Materials and integrated as a subsidiary of LOTTE Chemical.

LOTTE Energy Materials Corporation possesses core technologies that enable them to develop diverse product lineups, ranging from general-purpose copper foil products to high-strength, high-stretch, value-added products. This positions the company for promising future growth.

LOTTE Chemical's battery material business initially set a goal of achieving KRW 5 trillion in annual sales by 2030. However, with the completion of this acquisition, the target has been revised upward to KRW 7 trillion in sales by 2030.



ESG PERFORMANCE

053 **Environmental**

060 **Social**

079 **Governance**

Environmental

054 Eco-friendly Management

057 Creation of Green Ecosystem



Environmental Eco-friendly Management

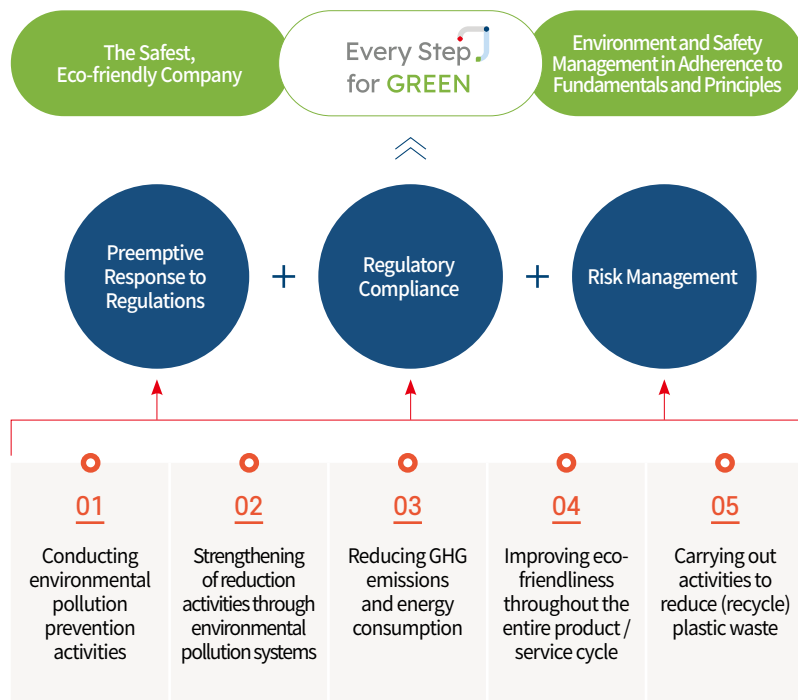
Eco-friendly Management Operation System

Eco-friendly Policy and Strategy

While regulations to prevent climate and environmental risks are spreading around the world, LOTTE Chemical is making company-wide efforts to minimize the environmental impacts of business activities and reduce related risks. We establish eco-friendly strategies in line with the corporate vision of 'Every Step for Green' and prepare policies and guidelines for implementation to promote systematic eco-friendly management activities.



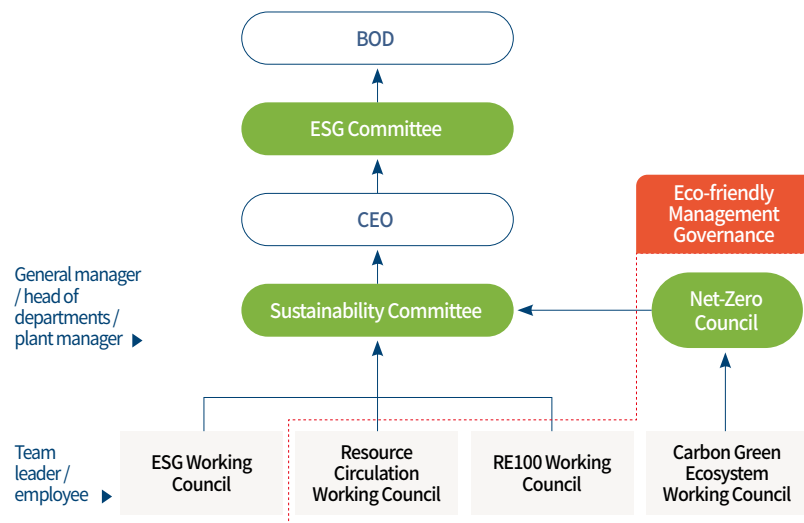
Eco-friendly Strategy Direction and Environmental Guidelines



Eco-friendly Management Governance

LOTTE Chemical's eco-friendly management governance is integrated with our ESG management governance, and in-house councils for each type specializing in the management of important environmental issues such as responding to climate change, creating a Green Ecosystem, introducing renewable energy, and expanding resource circulation (recycling) are operated together.

LOTTE Chemical Eco-friendly Management Governance System



The ESG Committee within the Board of Directors makes decisions on major ESG strategies and goals / performance management, including the environment sector, and regularly reports the results to the BOD. In addition, the Sustainability Committee, composed of in-house executives, deals with task performance management of overall ESG management and stakeholder risks as the main agenda.

In particular, we formed the Net-Zero Council, which has the expertise to promote practical performance in issues regarding carbon neutrality and establishing a Green Ecosystem. Management of goals and discussions on issues are carried out quarterly, and we will activate this as a venue for internal open innovation, such as by sharing best practices among business sites.



Environmental

Eco-friendly Management

Environmental Management System

LOTTE Chemical has established an integrated operating system for environment, safety and health, and quality management to create synergies in various areas. To promote global-level environmental management, we are actively acquiring external certifications related to environmental impact while securing objective evidence through deliberation processes. In addition, in order to establish a system required by the international community, we have re-established and revised standards at each business site and conducted activities to improve work efficiency. All of LOTTE Chemical's domestic business sites have been certified with ISO 14001 (production plant 100%). By establishing an overall evaluation system for products, eco-friendly buoys from EPP (Environmental Labeling) and PC compound products that replaced the raw materials to recycled PC (Poly Carbonate) received the UL EPD certification in 2019 and 2021, respectively.

Bio-PET products using bio-derived materials as raw materials acquired the Environmental Label in March 2021 and the Environmental Mark Certification in October 2021. We evaluate the entire product process, and actively respond to customer requests for information.

We conduct regular inspections and rigorously monitor compliance with environmental regulations to prevent violations. To this end, all our business sites carry out environmental impact assessments and compliance evaluations in accordance with ISO 14001 and report the results to management annually. Our Environmental Management Team at headquarters, in collaboration with external experts and our own personnel, supports comprehensive environmental management across all our business sites. The environmental teams at each site work to improve compliance with environmental regulations. In this process, we not only hedge the expected risks but also contribute to the dissemination of internal and external environmental culture through system improvement. We operate the LOTTE Chemical Awards, such as awarding the Best Performance award in the field of safety and environment to the excellent employee, and established a procedure to link the environmental performance evaluation results with employee compensation. LOTTE Chemical's PDCA* cycle for the environmental impact assessment can be verified through third party assurance and ISO 14001 certification.

* PDCA: Plan-Do-Check-Action



ISO 14001

Activities to Promote Eco-friendly Management

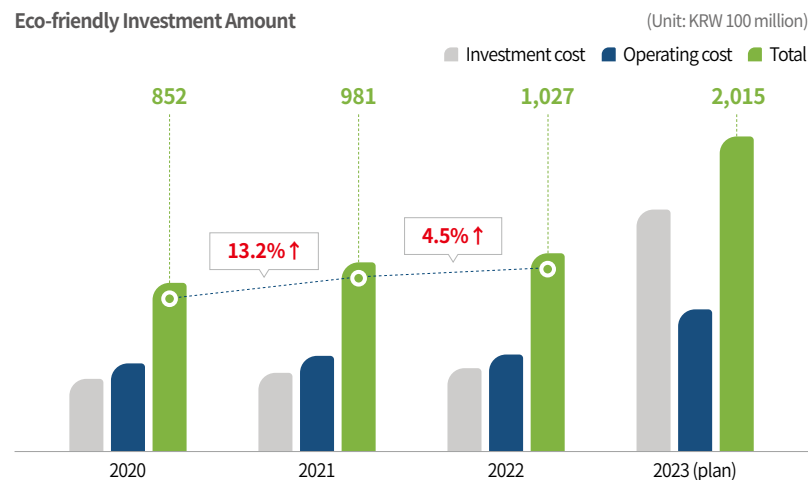
Investment Plan and Performance for Eco-friendly Management Practice

We established annual environmental investment plans to minimize the emission of pollutants and protect the natural environment. In 2022, we invested about KRW 103 billion in environmental facilities to detect / monitor / reduce pollutant emissions. LOTTE Chemical has a strong commitment to environmental investment, such as announcing the 「Green Promise 2030」, an ESG strategy that includes the expansion of eco-friendly business by 2030, and the promotion of carbon-reduced growth. In addition, when reviewing and deliberating new investment projects, we are securing mid- to long-term competitiveness in environmental management by checking environmental risks and opportunities.

2022 Eco-friendly Investment Details

Main content	
Air environment improvement	<ul style="list-style-type: none"> Invest in reducing nitrogen oxides, such as replacing decomposition furnaces and boilers with low NOx burners Invest in new installations, such as heating medium boiler SCR, CTO
Water environment improvement	<ul style="list-style-type: none"> Establish reduction plan and periodically analyze components of water pollutants Improve and establish recycled wastewater line
Waste treatment environment improvement	<ul style="list-style-type: none"> Reduce amount of generated waste through introducing high-efficiency dehydrator

Eco-friendly Investment Amount





Environmental

Eco-friendly Management

Environmental Education Campaign for Employees

LOTTE Chemical has set up and provided various education programs to strengthen environmental management. In 2022, we conducted specialized education on environmental management, which included related laws and regulations and risk prevention methods according to environment media for employees in charge of relevant affairs, such as the environment manager and each plant manager, production / official team leaders. For general employees, we produced and distributed video education to enhance the level of environmental management in business sites and strengthen facility management. In addition, we cultivated proper environmental awareness among environmental engineers and managers, and also supported them in completing various legal education according to the legal training cycle to further build their ability to manage overall environmental duties. We will continue implementing environmental education programs in 2023 to improve our management capability.



Seminar to Reinforce Environmental Safety Capability of Small and Medium-sized Partner Companies

We hold environmental safety seminars to improve cooperative relationships with partner companies and reinforce mutual growth. As a result of surveying the demand for environmental safety education, we confirmed that around 2,000 small and medium-sized partner companies were facing difficulty in acquiring information due to a lack of professionals and cost-related problems. Accordingly, we provided integrated education on laws for environment management, chemical substance management and assessment, centering on main cases, and received good feedback. We will play a role as a counseling channel to resolve environmental risks of partner companies and continue to operate and expand the environmental seminars for partner companies so that they can grow and develop independently.



	Category	Participants
Environmental management education	Introductory course (September – December)	Persons in charge in business site and employees
	Advanced course (September – December)	Environment Division employees
	Video education (regular)	Field professionals
	Course for new employees (regular)	New employees
Legal education	Environment seminar for partner companies (October)	Small and medium sized partner companies (106 companies in 2022)
	Chemical Substances Control Act	Hazardous chemicals manager
	Clean Air Conservation Act	Air environment engineer
	Water Environment Conservation Act	Water environment engineer
	Marine Environment Management Act	Marine facility manager
	Wastes Control Act	Waste disposal manager

Main Seminar Topics

Law	Seminar Topic
Integrated law	Reporting change on air / water quality and report procedures
Individual law	Interpretation on laws and regulations regarding exemption from installing air pollution control facilities
Chemical Substances Control Act & Wastes Control Act	Legal procedure for disposal of toxic substances
Act on the Regulation and Evaluation, etc. of Chemical Substances	Relevant procedures and MSDS* management

* MSDS : Material Safety Data Sheet



Environmental

Creation of Green Ecosystem

Air Pollutant Management

Air Pollutants Reduction Activities

Understanding the seriousness of the problem and the need for improvement, LOTTE Chemical signed a voluntary agreement with the government to reduce emissions of substances that cause fine dust. We are also investing in pollutant emission reduction facilities such as changing to ULNB (ultra-low NOx burner), installing SCR (selective catalytic reduction), and filters. Moreover, we are also making an effort to reduce and manage various air pollutants through the installation and operation of RTO (regenerative thermal oxidizer). For systematic air quality management, we set and manage interior air pollutant emissions to 80% or less of the permissible standard. We also extended the establishment of TMS (telemonitoring systems) to reinforce regular monitoring of the air environment. In addition, in order to predict and manage pollutant-emission concentrations in advance, we are actively promoting smart environmental management pilot projects using the IoT in partnership with the National Academy of Environmental Sciences.

LOTTE Chemical has independently designated 9 air pollutants, set goals to reduce them by 50% compared to 2019 by 2030, and established detailed measures in the short-, mid-, and long-term to achieve the goals. Through annual periodic performance evaluations, we will reduce air pollutant emissions significantly and achieve sustainable eco-friendly management.

Air pollutant emission reduction goal
(2030 performance compared to 2019)

50%

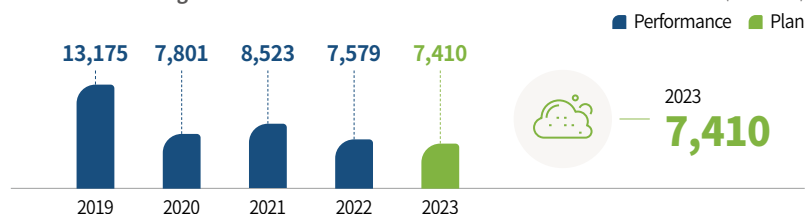
Air Pollutant Reduction Goal and Performance

(Unit: Tons)

Item	2019 Performance	2022		2023		Main tasks (plans) (including other pollution reduction activities)
		Performance	Reduction rate (compared to 2019)	Goal	Reduction rate (compared to 2019)	
Air	13,175	7,579	42.5%	7,410	43.8%	<ul style="list-style-type: none"> Change decomposition furnaces and boilers with low NOx burners (ULNB) Connect wastewater storage tank with RTO (Daesan Plant) Install air pollution prevention facilities (CTO/RTO)

Air Emissions Management Indicators

(Unit: Tons)



※ Green Ecosystem goal management standards: 4 large business sites – Yeosu Plant (Basic Chemicals), Yeosu Plant (Advanced Materials), Daesan Plant, Ulsan Plant

Waste and Pollutant Management

Waste Management Activities

LOTTE Chemical implements intensive waste management to minimize waste generation, and promotes green management through strict waste sorting and recycling. To raise a sense of responsibility, we introduced a real-name system for waste discharge and trace. And we manage, inspect, and analyze the collected data regarding the waste generation by source and volume to reduce disposal and make improvements. In addition, LOTTE Chemical thoroughly manages and supervises the entire process from waste discharge and storage through the 'Allbaro System' of the Ministry of Environment, to minimize its environmental impact.

As part of our commitment to sustainable eco-friendly management, LOTTE Chemical has set a goal to reduce the amount of waste sent to landfills and incinerators by 50% compared to 2019 levels by 2030. To achieve this goal, we will continue to seek out recycling companies and develop technologies for reuse.

Waste Disposal Management Goal and Performance

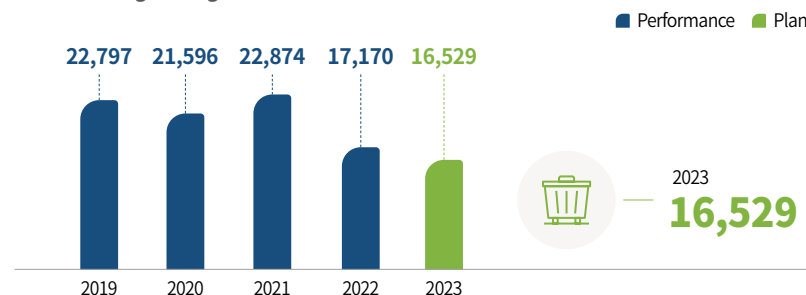
(Unit: Tons)

Item	2019 Performance	2022		2023		Main tasks (plans) (including other pollution reduction activities)
		Performance	Reduction rate (compared to 2019)	Goal	Reduction rate (compared to 2019)	
Waste	22,797	17,170	24.7%	16,529	27.5%	<ul style="list-style-type: none"> Active recycling such as wastewater treatment sludge, thermosetting resin (discover companies) Promote reduction of waste generation source by using recycled materials, recognizing resource recirculation

※ Waste emission calculation: Total waste discharge – amount of recycled waste

Waste Discharge Management Indicators

(Unit: Tons)





Environmental

Creation of Green Ecosystem

Quarterly inspection on underground pipes



At least once

2030 Water and effluent reduction goal (2030 performance compared to 2019)

50%

Soil Pollution Management Activities

LOTTE Chemical has established guidelines on soil pollution prevention and uses impermeable concrete in floor paving of its facilities where there is a possibility of soil contamination. In some facilities, we obtain additional environmental work permit before and after work to thoroughly prevent soil contamination caused by chemicals between the production process and transportation. In addition, we prevent pollution by conducting inspection on underground pipes buried inside and outside the facilities at least once per quarter (electrical method, soil resistivity, and pH measurement, direct excavation diagnosis, etc.). Furthermore, we conduct regular contamination tests to examine the impact on the soil around the business sites.

Water Resource Management

Water Resource Risk Management

Global warming is causing global water shortages and flooding in some regions. Due to the large fluctuations in regional / seasonal precipitation in Korea, droughts have become more frequent in recent years and floods are also occurring in some regions. To mitigate this global warming phenomenon, water resource management is essential in maintaining the lives of all humankind. LOTTE Chemical has expanded its portfolio from general-purpose products to high-value-added specialty products, and is currently manufacturing and selling aromatic petrochemical products and olefin, such as synthetic resins and chemical fibers. In particular, fresh water used in production and utilities is essential for the manufacturing process. Since most of the suppliers also use fresh water to produce their products, there could be delays in the manufacturing schedule when the supplier cannot provide their products due to water shortages. Thus, indirect use of water is also important.

We monitor our water withdrawal and water quality 100% for each water intake source for direct water resource management. We also check the risk index of the areas where LOTTE Chemical's domestic business sites are located by using the WRI water stress index and analyzing past data to check our withdrawal from water stress areas. Among the business sites, Daesan Plant was found to have high risk of water shortage due to seasonal differences, and Yeosu and Daesan Plants were found to have high risk of flooding due to its location on the coast.

To respond to water shortages, LOTTE Chemical uses at least two water intake sources for stable supply of industrial water and operates an emergency water storage. We monitor Real Time Database (RTDB) to manage water leaks in real-time due to abnormal use of water resources and pipe damages. We will continue to carry out regular inspections for flood and storm, and make investments in enhancing safety to reduce future flooding risks.

Water Use and Recycling

LOTTE Chemical responds to global water resource issues by managing the efficiency of water consumption, including activities to cut down on the amount of discharged effluent and inflow water. For efficient use of water resources, we reduced the use of water and minimized the treatment for reusable water (process water, washing water, firefighting water, etc.), and made efforts to minimize the energy by identifying the level of contamination of recycled water. In addition, by

lessening water usage through process improvement and re-treatment of recyclable wastewater, we aim to reduce the amount of water and wastewater to 50% of 2019's performance by 2030.

Due to recent shortages of water resources, water cannot be properly supplied, and the reuse of sewage or wastewater is increasing using membranes. LOTTE Chemical's membrane is a submerged type, which mainly has strengths in water purification treatment (service water, industrial water), wastewater treatment and reuse water. It is also considered superior to the existing wastewater treatment method due to its higher-quality water. As such, LOTTE Chemical plans to continuously invest in water resource conservation and pollution prevention by introducing more advanced technologies and facilities.

Effluent and Water Pollution Management Activities

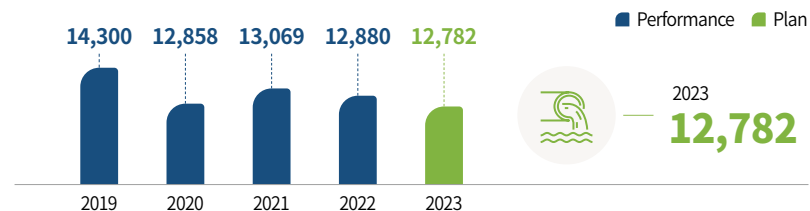
LOTTE Chemical operates its own wastewater treatment plants at our Daesan, Yeosu, and Ulsan locations. During the reporting period, there were no accidental spills of hazardous substances into the soil or seawater. Our Daesan Plant has established and adheres to strict internal standards, treating wastewater to levels 20-30% below the legal emission standards before discharging it directly. In Yeosu and Ulsan Plants, despite being able to discharge after re-treatment through the wastewater treatment plant within the industrial complex, they ensure that the water flowing into the wastewater treatment plant is treated beforehand until it reaches the allowable standards.

Water Pollution Management Goal and Performance

Item	2019 Performance	2022		2023		Main tasks (plans) (including other pollution reduction activities)
		Performance	Reduction rate (compared to 2019)	Goal	Reduction rate (compared to 2019)	
Water quality (tons/year)	1,138	1,209	▲6.2%	1,176	▲3.3%	<ul style="list-style-type: none"> Improve water quality through process ESD minimization and stable treatment plant operation New investment in wastewater treatment plants and installation of rainwater drainage recovery system (Ulsan Plant (Basic Chemicals), Daesan Plant) Establish an early detection system of pollutants in the final discharge zone of rainwater drainage
Waste-water (thousand tons/year)	14,300	12,880	9.9%	12,782	10.6%	

Wastewater Discharge Management Indicators

(Unit: Thousand tons)



※ Green Ecosystem goal management standards: 4 large business sites – Yeosu Plant (Basic Chemicals), Yeosu Plant (Advanced Materials), Daesan Plant, Ulsan Plant



Environmental

Creation of Green Ecosystem

Eco-friendly purchasing



Procurement of Sustainable Raw Materials

Green Procurement Policy

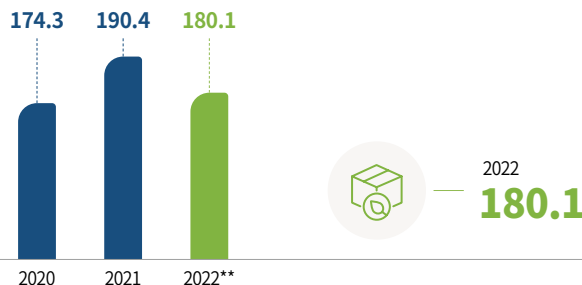
To contribute to reducing greenhouse gases, LOTTE Chemical aims to prevent waste of resources and environmental pollution, and mitigate such gases by using, promoting and spreading consumption of products that minimize the input of energy and resources, and generate less GHGs pollutants.

Procurement of Eco-friendly Raw Materials

We are actively promoting green procurement from the early stages of purchasing to help mankind lead a sustainable life, by minimizing the impact on the environment and ensuring efficient use of resources. The promotion of green procurement contributes to establishing and applying the Green Purchasing Guidelines when considering suppliers and material eco-friendliness. The guidelines apply to office supplies, raw and subsidiary materials, products, and packaging materials of domestic and overseas suppliers. We have also established a cooperative relationship with suppliers to realize environmental policies in all procurement activities, and make efforts to preserve environmental and natural resources through legal compliance and social responsibility. Green procurement performance is evaluated annually, and based on this, the status of green procurement is reported.

Status of Green Product* Purchase

(Unit: KRW 100 million)



* Product that obtained third-party certification, such as green product, carbon labeling, low-carbon labeling, and high energy efficiency certification, which can contribute to the conservation of resources and reduce environmental pollution in preparation for other products or services with the same purpose.

** Operation lowered as sales of plastic products decreased due to easing of COVID-19 measures since 2022, has had impact on the overall purchasing performance (however, the purchase amount of recycled raw materials has been calculated from 2022, and including this, the total eco-friendly purchase amount is KRW 59.1 billion)

Raw Material Procurement Risk Management

As LOTTE Chemical's has a high percentage of sole suppliers for raw and subsidiary materials, it is important to minimize these risks and establish a stable supply chain management (SCM) system. Due to the raw materials' nature, we have continued to endeavor to promote dualization and localization of parts where the percentage of sole suppliers was high in relation

to quality or licensor. As a result, we reduced the percentage of sole supplier purchases from 61% in 2017 to 50% in 2022, and accordingly, contribute to cost reduction as well. LOTTE Chemical will continue to make efforts for stable supply of raw materials and risk management.

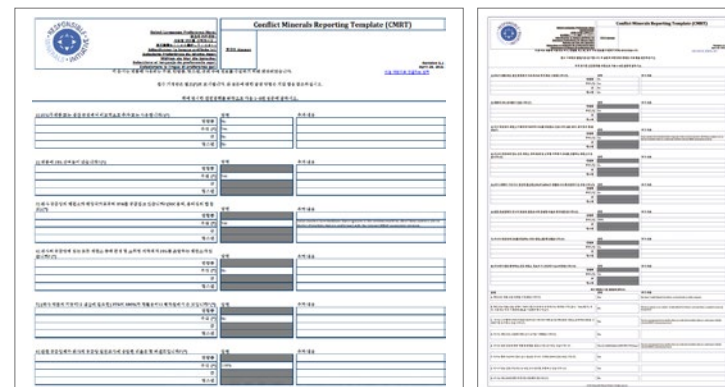
Stable Procurement of Raw Materials through Robotic Process Automation (RPA)

In line with its advancement, the use of AI technology has increased in clerical, administrative, and managerial work. LOTTE Chemical has been realizing automation for repetitive and regular contracts, material purchases, and ordering tasks by applying RPA since the end of 2019. Through this, we are trying to improve work productivity by minimizing human errors. We have automated about 20% of all procurement activities with RPA, and based on this, we are focusing on management regarding additional raw material procurement.

Compliance with Responsible Minerals Regulations

As LOTTE Chemical recognize that human rights violations and environmental destruction caused by mineral mining in conflict and high-risk areas are serious problems, we do not use conflict minerals such as tin, tantalum, tungsten, and gold, and responsible minerals such as cobalt which are illegally mined in conflict and high-risk areas. We investigate compliance with regulations on 6 types of conflict minerals from the supplier to procure responsible raw materials. We issue CMRT*(Tantalum, Tin, Gold, Tungsten), EMRT**(Cobalt, Mica) Certification upon request from the customers. Currently, LOTTE Chemical procures some raw materials that contain tin, and uses CMRT to obtain and manage information on the current status of conflict minerals and tin of suppliers and smelter information (country, smelter name, smelter ID, etc.) in the supply chain. (Example of CMRT below)

* CMRT : Conflict Minerals Reporting Template
 ** EMRT : Extended Minerals Reporting Template



Social

061 Enhance Safety and Health

066 Human Resources Management

071 Human Rights

072 Increase Customer Satisfaction

075 Local Community Impact

078 Reinforce Information Security



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Enhance Safety and Health

Safety and Health Management System

Safety and Health Management Governance

In order to become the world's safest and healthiest company, LOTTE Chemical has reorganized its internal safety and health management system with the goal of zero serious accidents, LTIR* below 0.08**, and PSIR*** below 0.047. In addition to strengthening the safety and health sector organization, we reorganized the management system by establishing and revising internal standards to comply with the newly enacted Serious Accidents Punishment Act. We announced that safety and health are the top priority of management by revising the safety and health policy separately from the existing integrated quality, safety and health, and environment policy. Also, we newly established the Safety and Health Council to assist managers in fulfilling their safety and health obligations, making decisions, allowing systematic safety and health management to be established between organizations and workplaces centered on managers.

* LTIR: Lost Time Injury Rate ** Goal for 2022 *** PSIR: Process Safety Incident Rate

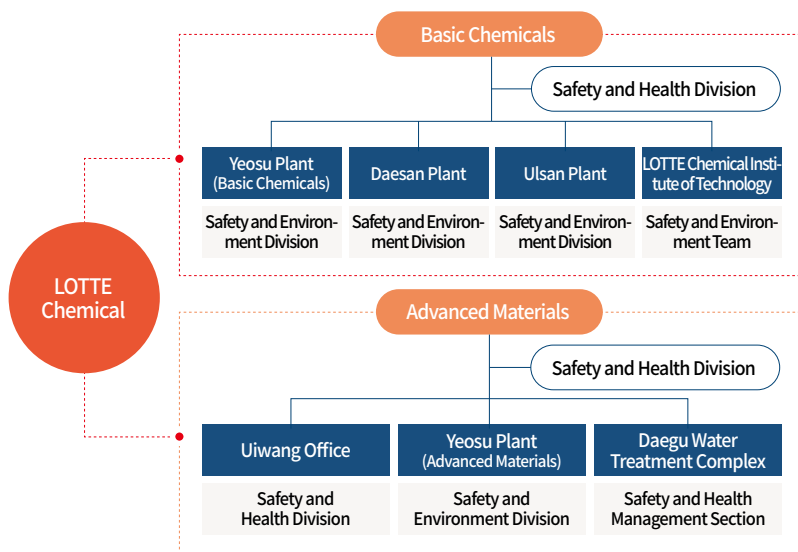


ISO 45001



LOTTE Chemical's Safety and Health Policy

LOTTE Chemical Safety and Health Management System



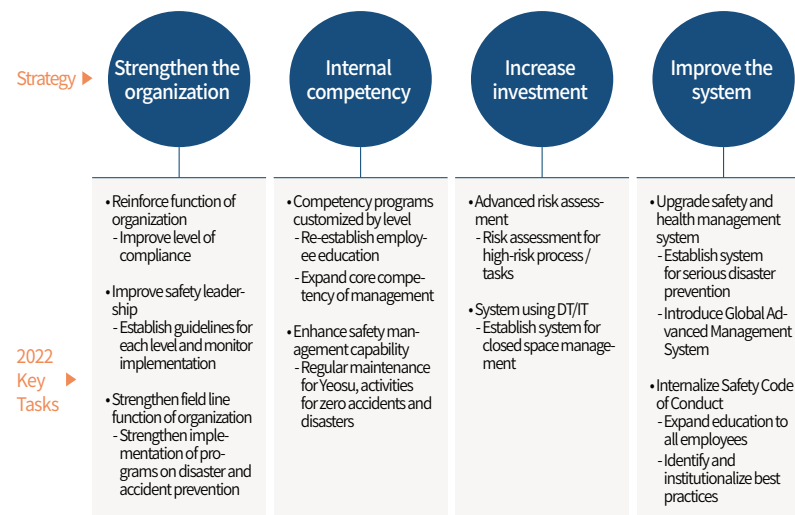
Advanced Safety and Health Management System

By introducing an advanced safety and health system, we have promoted the advancement of the safety and health management system. Our system aims to meet the requirements of ISO 45001, an international standard for safety and health management system, and to comply with laws and regulations at all business sites including the headquarters. In order to enhance the level of safety and health under ESG management, we recently introduced a global advanced management system. Accordingly, we upgraded our system through this. In 2022, we selected Daesan Plant for pilot operation, conducted inspection and consulting for the current level, and we are establishing tasks for improvement. We plan to continue to expand this to other business sites. In addition, we have established and are operating a mid- to long-term strategy to improve the level of the safety and health system as a global company.

Strategy

In 2021, LOTTE Chemical recognized that 'a safe environment is the essence of the petrochemical industry' and set a goal of 'becoming the safest chemical company in the world' by strengthening organizational and internal capabilities, improving systems, and making preemptive investments. In order to not only create a work environment where safety is considered as the top priority, but also to contribute to the advancement of safety culture in the industry, we have selected and implemented an action plan centered on four strategies.

2022 Key Tasks for Each Strategy to Promote Safety Innovation





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Enhance Safety and Health

Enactment and Internalization of Safety Code of Conduct

LOTTE Chemical enacted the Safety Code of Conduct in 2020, to establish a sustainable safety culture at the global level throughout the company. The Safety Code of Conduct is a solution to drive safety-based decisions and work performance on the basis of LOTTE's 3 core values, Challenge, Respect, and Originality. LOTTE Chemical has developed an educational content for the Safety Code of Conduct to internalize it for all employees. Rather than simply delivering the concepts or theories, the educational contents consist of four modules that combine internal and external safety success / failure cases to enable all employees to recognize, sympathize with and practice safety. The educational contents of the Safety Code of Conduct are being used for internalization education for all employees from 2023.



Accident Investigation Process

LOTTE Chemical operates an accident investigation process, where an accident investigation team is formed according to the type of accident, such as safety, environmental, or process accident, and establishes a plan for investigation, conducts the accident investigation, prepares and reports the accident investigation report, establishes measures to prevent recurrence, in a horizontal development procedure. We also carry out risk assessments to identify risk factors and high-risk accident scenarios, prepare emergency scenarios, and train and evaluate emergency drills to improve the ability to respond to such incidents.

When an accident occurs, an accident investigation team is immediately formed to identify the cause of the accident, carry out corrective action on the problem, and establish measures to prevent recurrence. Accident investigation reports, and measures to prevent recurrence are horizontally implemented at other business sites to reinforce activities for accident prevention and prevent recurrence. We also carry out prevention activities by analyzing near-miss or emergency accidents to identify potential risk factors, making improvements, and eliminating causes fundamentally.



Prevention-based Health and Safety Program

Worksite Safety Management

In 2022, LOTTE Chemical Yeosu Plant carried out regular maintenance, which is carried out every 4 years. A high level of safety management is required during regular maintenance because more work is carried out than usual. Before carrying out regular maintenance, we established safety and health management regulations and safety management plans for regular maintenance. We also prepared a Guide Book for major maintenance work safety and distributed it to all employees and focused on safety education and strengthening safety management capabilities in advance. In addition, to enhance safety awareness, we signed a business agreement with partner companies and the Korea Gas Safety Corporation for zero disasters and conducted safety campaign activities to have a new understanding of the importance of safety management and raise safety awareness. Moreover, we combined various safety management know-how, including the safe stamp system*, SGT 0810 system**, and theme inspection activities, which have been carried out as daily safety management activities. In particular, we were able to create a safe working environment by applying a smart wireless gas monitoring system for the first time in the petrochemical industry. Based on this, we will put a lot of effort into improving safety management during regular maintenance at other business sites.



* Safe Stamp System: An in-house system to additionally check work conditions and safety measures for high-risk work
** SGT 0810 system (Safety Golden Time): An in-house system to minimize the risk of safety accidents by designating the period from 8 to 10 for intensive management, which is the vulnerable hours with the high frequency of accidents over the past five years



High-risk Task Prevention Management Using New Technologies

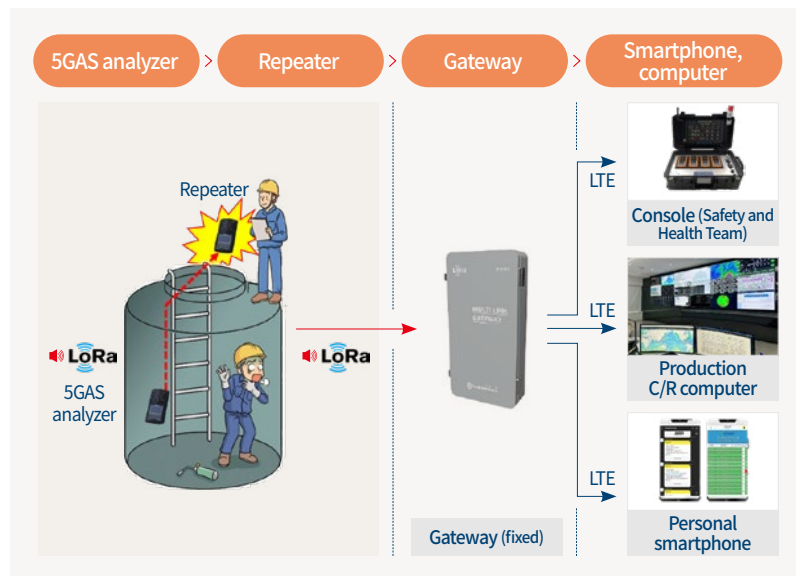
LOTTE Chemical aims to achieve field safety management and zero accidents by actively investing in introducing new IT / DT technologies. Prior to regular maintenance of Yeosu Plant in 2022, we introduced a real-time wireless gas monitoring system to strengthen safety management and supervise high-risk tasks. Through real-time gas measuring and monitoring, we could create a safe working environment by reducing safety risks such as suffocation when working in a closed space, and also preventing acute poisoning and explosion accidents that may additionally occur. Along with monitoring the gas concentration measurement results in the field workspace through the disaster prevention office console, we operated a multi-monitoring system by applying the DT method that links the PC and smartphone of the production department. We carried out horizontal implementation so that other business sites could use the same system. Furthermore, we are conducting tests to build and introduce mobile surveillance camera systems using IoT helmets and 5G to strengthen fieldwork monitoring, and we are making efforts to reinforce safety management at workplaces.



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IT / DT Technology in the Workplace



Our IT / DT Technology Use Featured in YTN Science Program

Advanced Technologies to Minimize Corporate Disasters September 2, 2022, 16:49

Corporate disasters provoke a strong response from society. In this program, we will examine the gas safety remote monitoring system and smart gas monitors that have been installed to prevent safety incidents at the petrochemical production company factory in Yeosu.

#corporatedisaster #gas #petroleum #remotemonitoring #smartgasmonitor



Special Theme Inspection

LOTTE Chemical analyzes the type of disasters by analyzing recent accident cases, and under these themes, the headquarters organize and conduct a special theme inspection. In 2022, a special theme inspection was conducted at all business sites under the theme of falls and entrapment, which were recorded as the most cases in the past 5 years. We identified 431 risk factors, improved 406 cases, and established improvement plans for the remaining 25

cases. Based on the inspection results, we carried out horizontal development throughout the business sites, including best practices of safety, and increased the improvement effect. Each business site also conducts its own safety inspection based on the same theme and other disaster cases and makes efforts to prevent accidents.

Efforts to Identify, Eliminate, and Reduce Health-related Risks

At each business site, a person who has obtained a health and medical certificate is appointed as a health manager to identify, reduce, and remove various health-related risks. First aid and CPR training are conducted, in addition to workspace assessment, which includes preliminary investigation, hazard identification, hazard analysis, and on-site measurement. In addition, we are making efforts to reduce health risks, such as identifying harmful factors in the musculoskeletal system through on-site inspections and risk assessments. We are developing new health programs to continuously improve the working conditions and health of employees.

Risk-based Safety Inspection to Prevent Serious Accidents

As part of the ESG safety management practice, we promoted electrical safety at all business sites and logistics safety inspection of partner companies by entering a risk management partnership with Samsung Fire & Marine Insurance. We were able to discover problems early through review and diagnosis of power supply reliability and insulation management status according to power facilities and circuits at each business site. Thus, we improved 14 cases (45%) and established additional improvement plans. Regarding the logistics safety inspection of partner companies, 69 risk factors were found through on-site operation monitoring at each business site and improvement measures were taken 100%. Through this, we were able to operate stable logistics and prevent accidental losses while enhancing the safety levels of partner companies at the same time.

Partner Company Logistics Inspection

(Unit: Cases)

Plant	Yeosu (Basic Chemicals)	Daesan (Basic Chemicals)	Ulsan (Basic Chemicals)	Yeosu (Advanced Materials)	Total
Improvement recommended	13	11	11	34	69
Action completed	13	11	11	34	69



Improved lashing when stuffing containers



Improved container seal (high security bolt type)

Special Theme Inspection and Improvement

406Cases



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Risk Assessment

LOTTE Chemical performs regular and non-scheduled risk assessments as part of its activities to prevent serious disasters and accidents. In 2022, we conducted the hazard and operability analysis, work risk assessment, and chemical substance risk assessment, and as a result, a total of 15,230 risk factors were analyzed, and 2,393 harmful risk factors were identified, eliminated and reduced. Accordingly, taking the Yeosu Plant as an example, the high-risk level was reduced to a 100% low-risk level, and the normal risk level was also reduced to a 90% or more low-risk level, improving safety. In addition, we conducted quantitative risk assessment (Advanced risk assessment) using statistical frequency data for all business sites through external institutions and consulting. We are currently taking improvements measures for the 197 additionally found risk factors. We plan to redefine the detailed standards and procedures of risk assessment for all business sites based on the consulting results and is making improvements to supplement the current risk assessment method and discover additional risk factors.

Yeosu Plant HAZOP* Study Results and Risk Reduction Status (Unit: Cases)

Category	2022 Performance (No. of Node)		Improvement measures
-	1,159		179
Risk classification	Before improvement	After improvement	Relaxation rate
Risk Level 1 Unacceptable risk	0	0	-
Risk Level 2 Significant risk	6	0	100%
Risk Level 3 Normal risk	23	2	91%
Risk Level 4 Acceptable risk	126	51	60%
Risk Level 5 Minor risk	24	126	-

* HAZOP (Hazard & Operability): Risk assessment that identifies risk factors in the process and operational problems that can decrease process efficiency and eliminates the cause

Health Programs for Employees

We strive to be the safest and healthiest company in the world. We offer health checkups and promotion programs for our employees, and have appointed certified health managers to monitor employees in need of observation. We also have programs to help employees quit smoking, manage obesity, blood pressure, hearing, and cardiovascular disease, all tailored to their individual health needs. We are making great efforts to improve the health of employees by continuously developing programs and also providing incentives for goal achievement regarding each program to encourage the participation of many employees and employees of partner companies.

Occupational Safety & Health Committee

At each LOTTE Chemical business site, the Occupational Safety and Health Committee holds quarterly meetings to facilitate communication between labor and management. The committee is composed of an equal number of representatives from labor and management and decides on critical safety and health issues. The resolutions of the meetings are shared with all employees. The relevant divisions in charge of the committee check whether the committee has faithfully implemented the deliberations,

resolutions, and decisions. In addition, the committee endeavors to improve the working environment by listening to the employees' opinions on safety and health. Especially in 2022, we established opinion boxes at each business site to diversify the method of listening to opinions from employees and partner companies. And as a result, we were able to listen to small opinions that were not selected as an agenda for improvement, and we could respond promptly and receive feedback.

Safety and Health Activities

Name	Target	Cycle
Safety & Health Committee	Management / labor representatives	Quarterly
Contractor Council	LOTTE Chemical and partner companies	Monthly
Team Safety Committee	All departments	Monthly
Central Safety Committee	Executives / head of departments	Monthly
PSM Subcommittee	All departments	Monthly

Safety and Health Internalization Activities

Customized Capacity Building

LOTTE Chemical provides various education programs for all employees, including legal education and job training, as well as basic courses and core competency courses to strengthen the safety and health competency. Special and safety education are provided for new employees or those who are assigned to different positions. We develop and implement core-competency strengthening programs such as introductory course, foundation course, and advanced course designed for each position. In particular, we understand relevant laws and technologies, PSM* and SMS** throughout the process safety through the core-competency course. We also internalize the process that can build each employee's capacity and improve workplace safety. We also support external education and training that meet the needs of employees of each business site and the company covers all training-related expenses.

LOTTE Chemical promotes the improvement of safety and health expertise through exchanges with external institutes. We signed an MOU with the Korea Gas Safety Corporation to secure safety of petrochemical facilities and improve safety inspection technology, and through this, the core-competency course was conducted for facility safety inspection employees at all business sites. Through training and practice on real application cases, including CCD (Corrosion Control Document) theory education, we were able to upgrade the person in charge's corrosion management and facility safety management capability. With the technical support and personnel exchange of both companies, we will continue to improve actual safety of the workplace and contribute to the development of safety technology in the domestic chemical industry.

* PSM (Process Safety Management): In accordance with the Occupational Safety and Health Act, it is a system that requires the completion and submission of a process safety report for confirmation, in order to prevent serious occupational accidents caused by hazardous substance leakage, fire, or explosion

** SMS (Safety Management System): In accordance with the High-pressure Gas Safety Control Act, it is a system that requires completion and submission of a safety enhancement plan for confirmation, after evaluating the safety of unit process facilities and equipment



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Main Safety and Health Legal Education (Occupational Safety and Health Act)*

Program Name	Participants	Cycle
Safety and Health Education for Supervisors	Supervisors	Once a year
Safety and Health Education for Employees in Production	All employees in the production department	Once a month
Safety and Health Education for Office Workers	All employees in the supporting department	Once a month
Safety and Health Education for New Employees	New employees	Before placement
Special Education	Employees in special work	Before work
Safety and Health Education for Change of Work	Employees subject to change of work	Before work
Safety and Health Education for Service Company Resident Employees	Office workers, sales staff, etc.	Every quarter
Education for Managers	New	Within 3 months from appointment date
	Maintenance	Within 3 months before and after 2 years of completion of education
Education for Safety Managers / Health Managers	New	Within 3 months from appointment date
	Maintenance	Within 3 months before and after 2 years of completion of education

* Conduct legal education in accordance with each safety and health-related laws, such as the Occupational Safety and Health Act, Safety Control of Dangerous Substances Act, and High-Pressure Gas Safety Control Act

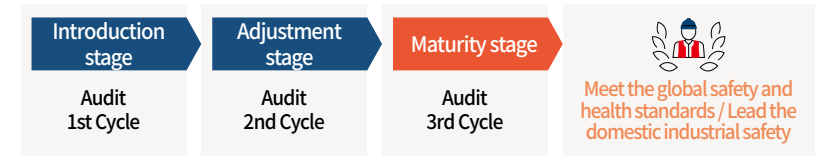
Safety and Health Self Education Programs

Program Name	Participants	Cycle
Safety Mind Education	All employees	Once a year
PSM Introductory Course	New employees	Once a year
PSM Education (results of regular assessment, review, self-audit)	All departments regarding PSM	At least once a year
Education on Near-miss Accidents	All departments	Once a month
Education on Accident Cases	All departments	Upon occurrence

Safety and Health Audit of Business Sites Organized by the Headquarters

To bring LOTTE Chemical's safety and health system to a global level by 2025 and establish a safety culture, we have been implementing our own safety and health audit program since 2019. We constantly monitor safety and health laws and in-house regulations to improve our health and safety level. In 2022, while we carried out the safety and health audit 2nd cycle (adjustment stage), we focused on upgrading the safety and health level by reexamining the implementation of improvements discovered during the 1st cycle (introduction stage) and horizontally deployed them to all business sites.

In addition, we were able to create synergy on improving the level through the implementation inspection regarding safety and health obligations which was organized by the dedicated safety and health organizations. As a result, we plan to carry out integrated operation for the 3rd cycle (maturity stage) in 2024. Through intensive audits, we will make more efforts to achieve global safety and health standards and lead domestic industrial safety by 2025.



Mutual Growth Programs to Support Safety and Health of Partner Companies

LOTTE Chemical operates mutual growth programs to support safety and health of partner companies. We selected partners that did not establish a safety and health management system, and are supporting them to obtain ISO 45001 and KOSHA MS certification with safety and health management system education and consulting. Moreover, each business site is also putting a lot of effort into safety and health management of partner companies. When a partner company is selected, we conduct prior safety assessments and motivate partner companies to improve their safety and health capabilities through regular safety competency assessments. In addition, we established a working council with the partner companies and hold monthly meetings to discuss cooperative matters and difficulties. We also implement a reward system for excellent partner companies.

Support for Safety Capability Strengthening of Partner Companies

To improve the partner companies' level of safety awareness and emergency response capabilities, we regularly conduct safety awareness enhancement education as well as training and education for emergencies by inviting instructors specializing in CPR. We also hold regular safety and health council meetings of LOTTE Chemical and partner companies and operate opinion boxes to listen to the opinions of workers and actively respond to them. In addition, we provide guidance and advice to assist partner companies in properly managing risk assessment, safety facilities, personal protective equipment, and hazardous machinery and equipment. We also operate health management rooms along with drug counseling, and provide safety and health materials and venues.

Improvement of Safety Leadership

With the aim to objectively diagnose the safety leadership level of leaders in the production and research sectors to enhance company-wide safety and health culture, we carry out safety leadership improvement programs with external experts. We bring about safety behavior by position level, and improve performance through R&R clarification of safety work. After completing the coaching in April 2023, we plan to change to a monitoring system that constantly makes improvements and expand the application to other departments besides production and research.



Social

Human Resources Management

Talent Recruitment

Securing Talents

LOTTE Chemical hires top talents in various ways, such as hiring new employees, professional and experienced talents, the disabled, veterans, and industry-academic scholarship students. By applying IT and AI technology, we are making efforts to secure talents effectively through a fair process. For some positions, we verify applicants' capabilities more effectively through AI competency tests and respond to new recruitment paradigms by expanding contact-free recruitment processes and online recruitment counseling. Also, we abolished the public employment system and expanded open recruitment to establish a flexible environment that can hire excellent talents in a timely manner. We participate in various job fairs and hold briefing sessions for major universities to secure talents and promote the company by inviting top talents and conducting field training. To recruit R&D experts, we select industry-academic scholarship students and complete recruitment counseling for researchers attending conferences such as the Polymer Society and the Chemical Engineering Society.

Desired Qualities for Employees

LOTTE Chemical puts more weight on future potential than on current achievements. Based on the four desired qualities for employees, LOTTE Chemical hires global human resources who have the passion and responsibility to mature our society with their growth.

Desired Qualities for Employees

<p>Challenger</p> <p>A top person driving execution</p> <p>A top person in their fields who takes on new opportunities and tough challenges with high energy and enthusiasm</p> <hr/> <p>Attracts Top Talent Action Oriented</p>	<p>Harmonizer</p> <p>A harmonious person respecting diversity</p> <p>A person who recognizes values of different perspective and culture to organization therefore collaborates for shared objectives</p> <hr/> <p>Collaborates Values Differences</p>
<p>Expert</p> <p>A person with business Insight and Strategic Mindset</p> <p>A person who anticipates future possibilities and builds strategies within knowledge of business and the marketplace to reach organizational goal</p> <hr/> <p>Strategic Mindset Business Insight</p>	<p>Motivator</p> <p>A person who is self-develop under responsibility</p> <p>A person who does their best to achieve organizational goal based on sense of ownership and accountability</p> <hr/> <p>Drives Engagement Ensure Accountability</p>

'Chemi Story' Cafe by Baristas with Disabilities

In 2023, LOTTE Chemical opened an in-company cafe operated by baristas with disabilities named 'Chemi Story' on the 15th floor of the Lotte World Tower, where the Jamsil headquarters is located. This was conducted with the aim to provide stable jobs while supporting the economic independence of the socially marginalized. We plan to continue to implement ways to improve awareness of the socially disadvantaged.



Opening of in-company cafe 'Chemi Story'

Open Recruitment with Respect for Diversity

LOTTE Chemical aspires for an equitable world, free of discrimination on the basis of gender, academic affiliation, disability, or origin. We believe that respecting people with diverse backgrounds is essential for the growth of an individual and a company. We recruit talents who are passionate about and have a sense of responsibility for making a more mature society. Respect for diversity is the basis of our hiring process not only for new employees, professional / experienced talents, but also for the disabled, and veterans. We found work-from-home jobs for the disabled, and opened an in-company cafe 'Chemi Story' and hired baristas with disabilities; we are constantly putting in effort to hire the disabled.

Talent Cultivation Program

Human Resource Development Strategies

We are developing and supporting various programs to cultivate human resources in effective and innovative ways. In order to transfer the knowledge and know-how of skilled workers, we have launched a production process technology program and produced online courses and lesson plans on standardization of basic process, personal work process, and know-how. For new team leaders and managers, we are providing education on leadership competencies, such as coaching, performance management, and generational understanding. Through these education programs, we are ensuring that the new leaders understand change in their roles and learn to coach and give feedback to their team members, to contribute to improvement of corporate culture in the long term. We constantly offer courses on leadership, performance management, communication, adjustment assistance, and foreign language for new and returning expatriate employees. In addition, we are requiring on-site supervisors and safety and health organizations to acquire relevant certifications and are encouraging all employees to acquire safety certification, in accordance with the strengthening of safety and health laws.

Education by Position and Job - ① Education for Field Professionals and Promoted Employees

We operate a vocational training school that teaches environment and safety, factory operation, and process for new field employees before start of work to reinforce early development of job competency.



Social

Human Resources Management

Education by Position and Job - ② Financial and DT Job Training for Experts

The financial qualification certification process, which has been conducted annually since 2013 to strengthen the expertise of employees in financial departments, consists of a total of three courses: a practical course; an in-depth course; and a strategy course for each job level and position. The courses are designed to cultivate talents in the mid- to long-term and include Fundamentals of Financial Accounting, Risk Management, Ethical Management and Compliance, and New Role of CFO. In order to expand data-based management culture and expand databased management culture, in response to rapidly changing IT technology development, we have established a detailed business upskilling education course for DT personnel and reskilling training course for non-DT personnel to cultivate DT talents.

New Employee Onboarding

LOTTE Chemical provides a positive employee experience to new employees to create trust between the organization and the individual. We assist newcomers to adjust by designing a curriculum that includes theory and practice, introducing each business department and site management status, as well as the company's vision. New employees learn about the petrochemical industry and products, and we provide them the opportunity to practice with engineers at the Yeosu Plant. Through this, new employees can obtain background knowledge and field experience in the chemical business. In addition, to help employees quickly adapt to work, we provide Excel and Power-point education and actively support them so that they can understand the meaning of given tasks and motivate themselves.



Enhancing Global Competency - ① In-company Language Courses

LOTTE Chemical offers a number of in-company language courses to cultivate the global capabilities of employees. In addition to the existing courses on English, Chinese, and Japanese, we are operating strategic language courses for Indonesian, Russian, Spanish, and French. We also support external programs, online language lessons, and microlearning contents to encourage employees to learn new languages according to their own schedules.





Enhancing Global Competency - ② Development of an Exclusive Platform for Expatriates and Buddy Program for Returning Expatriates

In order to more conveniently share information and know-how related to expatriates, we developed a bulletin board exclusively for expatriates using our online platform. Through this, new and returning expatriates can easily check relevant information, and smooth communication among the expatriates is enabled. In addition, we carried out a buddy program for returning

expatriates to assist them for early adaptation. As they are matched one-on-one with the team member of their assigned department, they can receive detailed help both inside and outside of work. Satisfaction rate from returning expatriates is high due to assistance for quick adaptation.

Online Learning Infrastructure

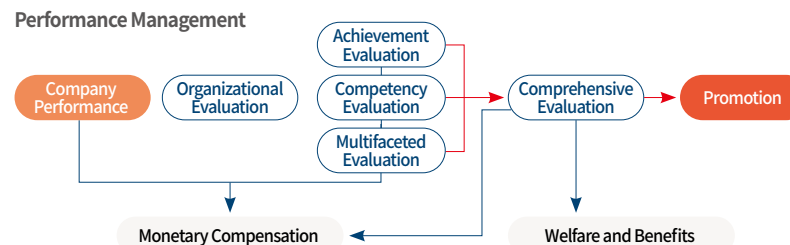
Education for new employees and expatriates was conducted in real-time, non-face-to-face using Metaverse and Zoom. We share basic competencies and group issues through Acropolis and offer the EDRC(Engineering Development Research Center, Seoul National University) course online, actively promoting online, non-face-to-face education.

 <p>Acropolis</p>	 <p>A smart learning platform to share / search / watch about business insights and issues within the LOTTE Group</p>
 <p>EDRC course</p>	 <p>DT-based convergence technology (process design, process safety simulator, etc.) education offered by Seoul National University and five other universities</p>

Employee Performance and Compensation

Fair Evaluation

LOTTE Chemical ensures the implementation of fair evaluation by reflecting various evaluation factors in a comprehensive manner. The evaluation consists of an achievement evaluation, a competency evaluation, and multifaceted evaluation which are based on the MBO (Management by Objectives). For achievement evaluation, we have established KPIs (Key Performance Indicators) in accordance with the relevant standards and assess the achievement. Competency evaluation is divided into general competencies and job competencies and evaluates the potential and capabilities of the employee. The results are used to further develop the employee's strengths and improve their weaknesses. Lastly, the multifaceted evaluation, which was launched in 2020, supplements the one-way, vertical evaluation structure between the evaluator and the person under evaluation. The multifaceted feedback provides a multifaceted perception of the employee under evaluation and enhances the objectivity of evaluation. In addition, the goal achievement progress is evaluated on an ongoing basis throughout the year to ensure a fair evaluation. This enables evaluators to provide immediate feedback & coaching, and the person under assessment can gain an objective understanding of the progress.





Social

Human Resources Management

Reasonable Compensation

LOTTE Chemical implements a fair compensation system, which guarantees that employees are rewarded according to their performance. We are constantly enhancing the duty / responsibility-based compensation, in which managers receive remuneration commensurate with their position and responsibility. Each individual receives the salary increase at the rate determined based on the evaluation results, which are also applied in determining bonuses and incentives to ensure performance-based compensation. LOTTE Chemical's compensation system ensures that employees are rewarded based on their roles and performances and not discriminated against due to gender, age, disability, and other factors to promote employee diversity.

Work and Life Balance

Work & Life Balance

Work-life balance is one of the most sought-after qualities when choosing a workplace. The balance between work and life creates a virtuous cycle that improves the quality of life, recharges daily life, and furthermore, realizing work and family balance as well as enhancing corporate competitiveness.

LOTTE Chemical introduced various measures to enhance employees' work-life balance. To increase work efficiency and create a flexible working environment, we have introduced a flexible working-hours system, selective working hour system, and a PC-OFF system. These systems are created in response to the rapidly changing environment in today's world. We are employing a smart work system and making various efforts to improve the quality of life and work efficiency of our employees. We established telecommuting as a working culture despite the easing of COVID-19, and in addition, we strongly promote the use of sabbatical (one month vacation and vacation expense support), healing vacation day (vacation expense support if five consecutive days of vacation days are used, limited to twice per year), work-life balance day (recommended vacation), and a special day (e-coupon given to people that take paid time off to celebrate anniversaries, etc.), support vacation accommodation expenses, and team-leader day off.

Work and Life Balance Culture

Organizational culture that prioritizes the happiness of employees in line with changes in the times where work and life balance is emphasized. The company can grow together only when the employees and families are happy. LOTTE Chemical actively supports programs regarding family-friendly programs lead by the industry and work systems that suit individual life cycles.

PC-OFF System

Flexible work hours

Family Month Event

Corporate Culture Enhancement Task Force Team

Work and Life Balance Day

Active implementation of childbirth and childcare policies (such as automatic parental leave for women (2 years), mandatory parental leave for men)

Team-Leader Day Off

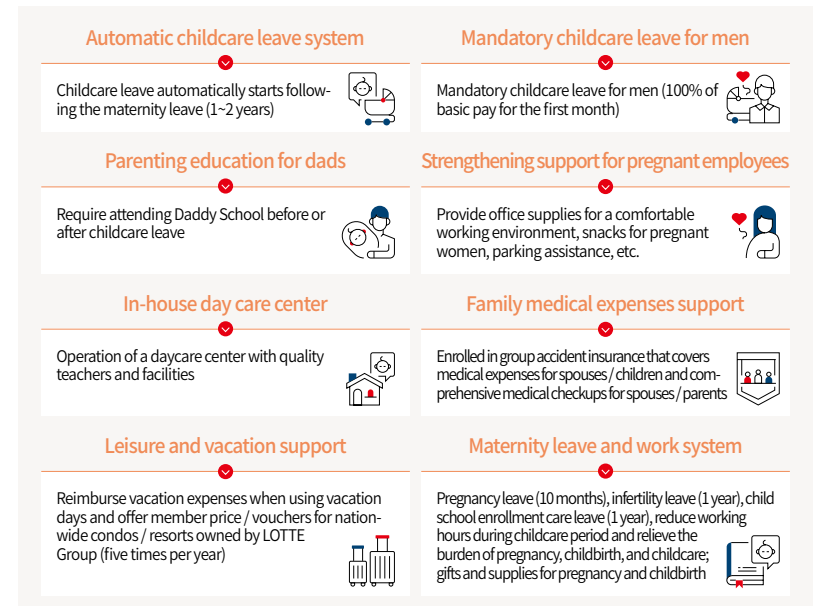
We have a monthly team leader day off for all team leaders working at the headquarters. Team leaders take paid holiday on the third Friday of every month to create a relaxing working environment for team members. The team leader is provided with an opportunity to increase work concentration and efficiency through recharging, and members to become leaders on their own taking the initiative.



Family-Friendly Management

LOTTE Chemical supports work and family balance and helps alleviate the worries about career disruption of female employees due to pregnancy, childbirth, and childcare by extending the duration of the childcare leave (maximum 2 years of parental leave for women) and implementing maternity protection policies. We also provide school expenses for preschoolers (children aged 3 to before school age, KRW 100,000 per month, for 2 years) and student funds. In Seoul, we operate an in-house daycare center in collaboration with LOTTE World and LOTTE Hotel for headquarter employees with children aged one to four years old. Furthermore, we operate a variety of family-friendly welfare programs, which include provision of family medical expenses, comprehensive checkups, and condos / resorts vouchers, to support the health and leisure activities of our employees' families.

LOTTE Chemical Family-Friendly Management System





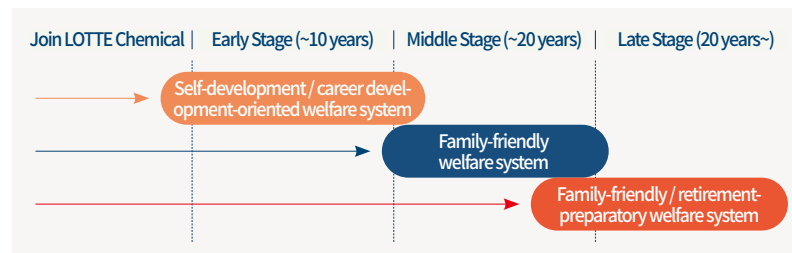
Social

Human Resources Management

Employee Welfare Program

As digital transformation and Millennials and Gen-Z generations emerge, the needs of employees are becoming more diverse. The core of the welfare program is to identify the needs and latest trends of our employees and foster the mutual growth of the company and individual members. Recognizing that the company can grow only when employees and their families are content, LOTTE Chemical operates a variety of welfare and benefits programs tailored for each stage in the life cycle of employees from the early stage of their careers to retirement. We establish a virtuous cycle in which the contentment of employees returns to the contentment of the company, by operating various welfare programs customized to the overall life cycle of employees. Through that, we create a flexible and enjoyable workplace. Self-development and career development-oriented welfare program is offered to employees in the early stage of their career (within 10 years); family-friendly welfare program is offered to those in the mid-stages of employment (10-20 years); and family-friendly program in combination with the retirement program is offered to those in the late stage of their career (more than 20 years). Moreover, we provide detailed information on all welfare benefits on the internal bulletin board so that employees can easily access the information and make the optimal use of the program.

Life Cycle Welfare System



Various Welfare Programs

Housing / living support	Childcare / education support	Healthcare	Self-development / leisure support
<ul style="list-style-type: none"> • Mortgage loan • Company housing / single person accommodation provided • Personal pension support • Support for family affairs 	<ul style="list-style-type: none"> • Parental leave system • In-house daycare center • Support for school expenses • Employee family event (experience activities) 	<ul style="list-style-type: none"> • Comprehensive health checkup • Regular health checkup • Group accident insurance subscription • Medical expenses support • Support for infertility care (leave and treatment expenses) 	<ul style="list-style-type: none"> • Support for in-house club activities • Language study expenses • Condo / resort membership • Welfare points • Employee LOTTE Group affiliate card (W card) • Refresh vacation policy • Sabbath (executive, employee) • Summer vacation

Mental Health Care

LOTTE Chemical operates an in-house psychological counseling room that helps employees manage their mental health so they can maintain work and life balance and have a healthy and happy work life. We provide counseling services to resolve conflicts and concerns from work or private life. Recently, employees at other worksites and expatriates are also using counseling through video counseling. As part of revitalizing the company, we also hold workshops for psychological tests, communication programs, and mindfulness meditation programs for stress management. In addition, we also regularly distribute 'healing letters' to provide psychological information, and hold events and lunch programs to increase the accessibility of counseling rooms.



Labor and Management Culture of Trust

LOTTE Chemical's Labor-Management Culture

LOTTE Chemical promotes active labor-management communication based on trust and respect to establish a two-way labor-management culture and realize a higher corporate value. We conduct wage and collective bargaining with the labor unions at each business site to improve working conditions and discuss major business and system changes to enhance understanding of the issue and establish a smooth communication system. In addition, we hold briefing sessions on new policies and changes to build consensus among employees.

Through two-way communication, we instill a sense of belonging and pride in our employees, carry out horizontal organization operations, and strengthen mutual trust. In particular, we are building a labor-management relationship of win-win and cooperation at each business site, where we hold a quarterly labor-management meeting to discuss various issues, such as improving welfare and work environment and designing a reasonable system.

Operation of Labor-Management Council

LOTTE Chemical utilizes various channels to provide a place for regular communication between labor and management. In addition to operating the labor-management council and employee council, we hold regular meetings to make decisions on major issues. Labor-management council and employee council play a central role in communication between labor and management and serve as a representative body for employees. Improvements and changes to working conditions, HR system, etc., are discussed at the labor-management council in each business site, through which we learn about the needs of employees and reflect them in the company policy after further discussion.



Social

Human Resources Management

Labor and Management Relations Based on Trust

Labor-Management Relations of Win-win Cooperation

LOTTE Chemical pursues the vision of 'Together Labor-Management Culture' to realize higher corporate value. We are creating positive outcomes based on efficiency and innovation through a creative labor-management culture. We are also raising our employees' loyalty through two-way communications, and strengthening mutual trust and horizontal management. We will continue to share important issues and enhance mutual understanding with our employees through regular consultations using various channels.

Labor-management Council / Employee Council

On-site Operations Committee

Conferences / Workshop

Fulfilling labor-management joint social responsibility

Creation Dream Team (TPM)

Employee Distress Counseling Programs

Organizational Culture Based on Communication and Respect

LOTTE Chemical devotes effort to create an organizational culture where employees can work happily. As a family member of the LOTTE Group, we carry out various team building activities to enhance pride and strengthen communication and solidarity among employees. In addition, we also operate Chemi TALK, the CEO communication channel, to improve employee communication and organizational culture.

We share issues such as management performance and future projects through Chemi TALK and two-way communication with the CEO is facilitated on various aspects, including HR system, welfare, and working environment. Chemi TALK is conducted once every other month for each business site, and we endeavor to strengthen communication between the CEO and employees through voluntary participation of employees.



Organizational Culture Activities

LOTTE Chemical has been operating the Organizational Culture TFT since 2021 with the objective to create a healthy corporate culture and stimulate communication between the company and employees. Employees participate to communicate and listen to the opinions and challenges, and based on this, we play a role to identify and implement major tasks and ideas



to improve corporate culture and working environment. In 2022, we conducted various improvement activities such as the working method, operating various communication programs, and maintenance of company housing and working environment. In accordance with the value creation culture of the LOTTE Group, we are actively seeking to establish a balanced organizational culture through systematically implementing tasks and expanding participation.

Flexible Communication Culture

LOTTE Chemical fosters communication among its employees to create a flexible corporate culture. We have created an advanced work environment and operated various programs to enable employees to communicate openly with each other. We aim to build an organization in which the employees actively communicate based on the open culture without barriers between groups and departments.

Smart office in headquarters

Casual Attire Day (headquarters)

Mentoring and Reverse Mentoring

Active CEO Communication (Chemi TALK)

Company newsletter

Leaders' Channel



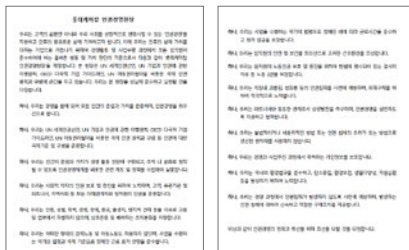
Social

Human Rights

Human Rights Management

Establishment of Human Rights Respect Policy and Management Policy

LOTTE Chemical implements human rights violation prevention program and human rights education program to internalize a culture that respects human rights. Related organizations have been installed to continuously monitor and improve human rights risk identification, impact assessment processes, and goals.

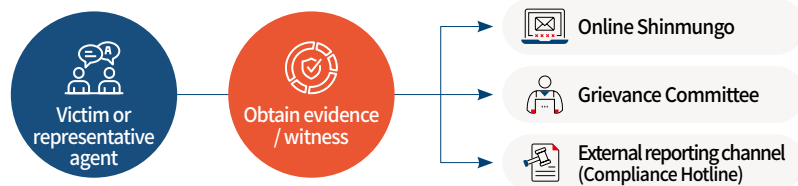


In 2022, LOTTE Chemical enacted and disclosed the LOTTE Chemical Statement on Human Rights, which is the standard for behavior and value judgement that all employees must comply with in all business activities and execution. In addition, we established the human rights management policy that includes measures and details regarding human rights management system, and thus promoting strategies for respect for human rights.

Operation of Human Rights Complaint Handling Channel

LOTTE Chemical's remedy process of human rights violation guarantees protection of the identity of victims and ensures open reporting through the channel. We resolve disputes and restore victims' rights by thoroughly investigating each case.

LOTTE Chemical Human Rights Violation Reporting Channel

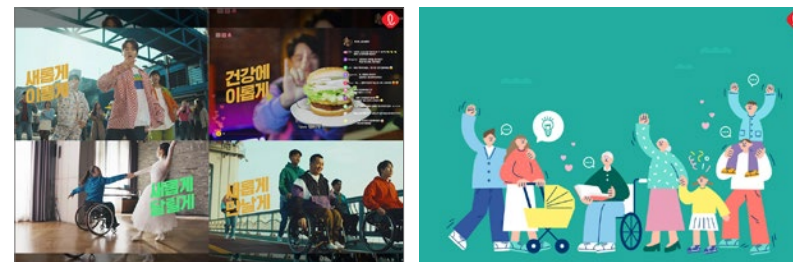


A total of 12 complaints were submitted through various channels in 2022, and the Grievance Committee investigated and took appropriate measures on all of them. We will persist in actively conducting prevention activities of such incidents as well as objective and fair investigations and actions on the submitted cases.

Internalization of Human Rights Management Culture

Human Rights Education

To internalize culture that respects human rights, LOTTE Chemical identifies and raises awareness of executives and employees in areas that can potentially have human rights violation issues. In 2022, we conducted contact-free training on preventing sexual harassment and improving awareness of the disabled to all employees, including newly hired employee. Through this, LOTTE Chemical raised awareness of gender equality in the workplace and improved awareness.



LOTTE Diversity Forum

The 2022 LOTTE Diversity Forum was held to show LOTTE Group's aim for diversity and inclusion in the workplace, in terms of generation, gender, disability, and nationality and to spread organizational culture of 'new today, better tomorrow' with diversity as the driving force for future growth.



We expanded the scope from last years' 'WOW Forum,' which focused on women talents, and during the first session, external presenters gave lectures and employees shared experiences through relay speeches. In the second session, presentations on HR strategies for strengthening diversity of LOTTE Group and 4 strategies to cultivate women talents (promoting the will to cultivate women talent, developing women talent and resolving bias, enhancing support system effectiveness, raising awareness of diversity) were held. We are also constantly making effort to establish a family-friendly system and strengthen diversity by making it mandatory for men to go on parental leave, extending the period of childcare leave for women, employing the disabled, and fostering foreigner employees.



Social

Increase Customer Satisfaction

Customer Satisfaction System

Customer Satisfaction Survey

LOTTE Chemical puts customer value realization as its top priority and makes efforts to meet customer needs by improving product and service quality. We reflect the results of the online customer satisfaction survey in improving the quality management on 5 items: quality, packaging, delivery, order, and sales. In addition, we also provide service focusing on the customer to improve customer inconveniences.

We will maintain our leadership in market trends and offer quality products through diversified communication activities.

Customer Satisfaction Survey Results

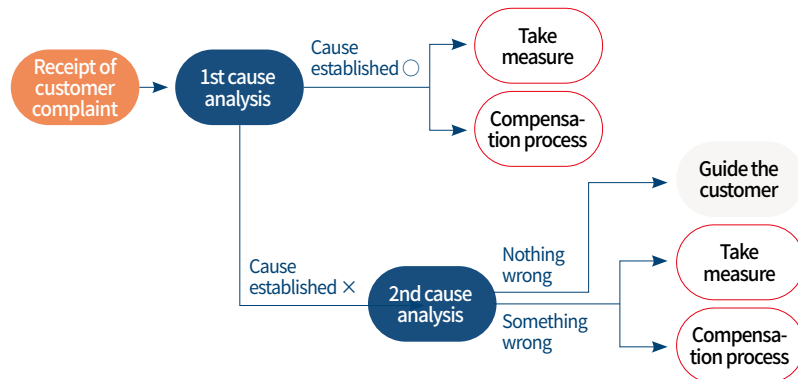
(Unit: %)

Year	2019	2020	2021	2022
Customer satisfaction rate (compared to previous year)	85.0	93.4 (8.4↑)	94.1 (0.7↑)	97.1* (3.0↑)

* Satisfaction increased in items such as bag material and loading ease (stability)

Customer Complaint Process

LOTTE Chemical has established a procedure to systematically manage VOC (Voice of Customer). Through an organization dedicated to handling VOC (Voice of Customer), we manage the entire process from receipt of customer complaints to resolution. Opinions collected from the VOC are quickly resolved by relevant departments, and they are managed to prevent recurrence through regular quality meetings.



Customer Satisfaction Program

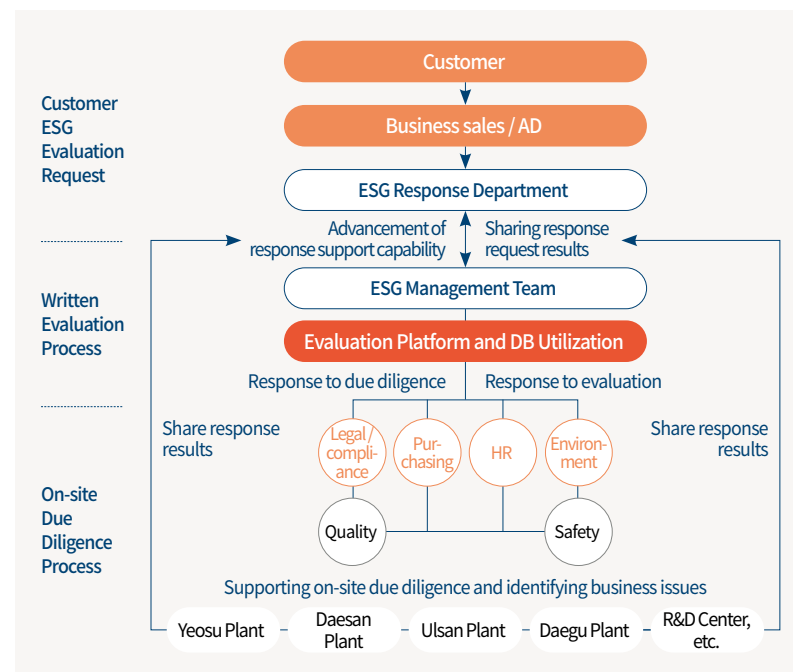


Customer ESG Evaluation Response Process

LOTTE Chemical operates a system to provide ESG information requested by customers and to respond to customer ESG surveys and evaluations in a timely manner.



Customer ESG Evaluation and Due Diligence Response Process





Social

Increase Customer Satisfaction

Enhance Product Stability

LOTTE Chemical's Product-Safety System

In cooperation with partner companies and customers, LOTTE Chemical provides high value-added products and transparent information. We respect the production of sustainable products, and communicate and cooperate with our partner companies and customers with such values. The chemical substance management policies are as follows.

<p>1 First</p> <p>Eco-friendly purchasing policies and sustainable mutual growth of partner companies</p>	<p>2 Second</p> <p>Minimizing legal risk and managing whole process of raw materials and products through LOTTE Chemical Management System (LCMS)</p>	<p>3 Third</p> <p>Providing information to customers quickly through product environmental assessment and strengthen product transparency</p>
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LOTTE Chemical continuously identifies domestic and global trends to determine the direction and level of product design, and makes sure that raw material and products are purchased and sold after registration and compliance checks. In addition, by reducing hazardous chemicals and developing alternative products, we are committed to reducing regulatory risks in advance, increasing product stability and transparency, and enhancing customer confidence, through managing the potential impact of products from the stage of using raw materials.

Furthermore, we are continuously promoting win-win cooperation through sharing legal trends and training with partner companies, such as holding a chemical substance management seminar in May 2023, and conducting education to respond to laws such as the Act on the Registration and evaluation, etc. of Chemical Substances. As interest in reinforcing ESG management and environment at home and abroad increases, the level of information requests from global customers are on the rise. We plan to expand the risk assessment of polymer mixed products instead of single substances.

Activities for Chemical Substances Management

LOTTE Chemical is reorganizing its chemical-management process and taking preemptive measures pertaining to applicable laws and regulations in order to ensure compliance with domestic and global regulations that are becoming increasingly strict. We are managing substances in major products according to the Material Safety Data Sheet (MSDS) and establishing and operating a global-level in-house chemical management system (LCMS*). We conduct life-cycle assessment of products from purchase of raw materials to sales, in order to ensure compliance with regulations and monitor their usage. In addition, we take various approaches and regularly interact with employees in development, purchasing, quality, and sales departments to discuss matters related to product management and customer feedback. In October 2021, we upgraded the existing chemical database of the chemical substances management system and improved the regulatory check items to strengthen the response to chemical substance regulations, including checking for new chemical substances. We check compliance with chemical regulations in real time when purchasing raw materials and selling products through more than 6,000 regulatory lists in about 130 countries. In line with the strengthening of

domestic and international management of Material Safety and Health Data (MSDS), we developed the MSDS generation and management system, and in 2022, we completed about 1,600 revisions of Korean MSDS. As of March 2023, we additionally completed 1,600 revisions of English MSDS of EU version and GHS** version. Furthermore, to anticipatorily respond to the strengthening of the EU CLP*** in 2023, we ensured that the customers could obtain the latest information.

By applying Robotic Process Automation (RPA) and Optical Character Recognition (OCR) technologies to simple and repetitive tasks, such as pre-evaluation and regulatory checks of chemical substances, we have not only significantly reduced work time and errors but also laid the foundation for preemptive responses to complex chemical substance regulations. Using such AI technology allowed departments to quickly check each other's work and improved the overall work speed, which resulted in improved customer satisfaction.

* LCMS (LOTTE Chemical Management System): LOTTE Management System for Chemical Substances

** (Globally Harmonized System of Classification and Labelling of Chemicals): An internationally agreed-upon standard for classification

*** CLP: Classification, Labelling and Packaging of substances and mixtures

Response to Regulations on Chemical Substances

Starting with the EU REACH* that came into effect in June 2007, laws on registration and evaluation of chemical substances are expanding globally. For example, In Korea, the Act on Registration and Evaluation of Chemical Substances, and the Chemical Substances Control Act was enacted in 2015; KKDIK in Turkey in 2019; and UK REACH in 2021. LOTTE Chemical is also proactively responding to India's BIS** certification and India's REACH, and have registered all chemicals used in the workplace in accordance with domestic and international government guidelines. Through cooperation with domestic and overseas agents, we are actively responding to customer-specific requirements and fast registration process.

* REACH : Registration, Evaluation, Authorization and Restriction of Chemicals

** India BIS (Bureau of Indian Standards): Certification system for standards of India

LOTTE Chemical's Substance Registration Status such as EU REACH

<p>EU REACH</p> <p>About 25 substances registered and subject to follow-up management</p>	<p>Act on Registration and Evaluation of Chemical Substances</p> <p>Pre-registration* for about 300 substances completed Registration for about 97 substances completed, registration exempted for 71 substances</p>
<p>Turkey KKDIK</p> <p>Pre-registration for 92 substances completed, 16 substances scheduled for registration (when implemented in 2023)</p>	<p>UK REACH</p> <p>Pre-registration for 29 substances completed 5 substances scheduled for registration (when implemented in 2023)</p>

* Pre-Registration: registering substances for registration grace period (if grace period is not granted, registration is required immediately)



Social

Increase Customer Satisfaction

LOTTE Chemical Substance Registration Performance and Plan per Act on Registration and Evaluation of Chemical Substances

	1st registration (2015~2018)	2nd registration (2019~2021)	3rd ~ 5th registration (2022~2030)
Ministry of Environment Guidelines ▶	<ul style="list-style-type: none"> Identified 510 substances subject to registration 	<ul style="list-style-type: none"> Registration of imported / manufactured chemicals over 1,000 tons 	<ul style="list-style-type: none"> Registration of 1 to 1,000 tons of imported / manufactured chemicals
LOTTE Chemical Performance (Plan) ▶	<ul style="list-style-type: none"> Registration of 21 substances (13 manufactured, 8 imported) 	<ul style="list-style-type: none"> Registration of 69 substances (38 manufactured, 31 imported) 	<ul style="list-style-type: none"> 3rd (~2024): 45 substances 4th (~2027): 73 substances 5th (~2030): 83 substances

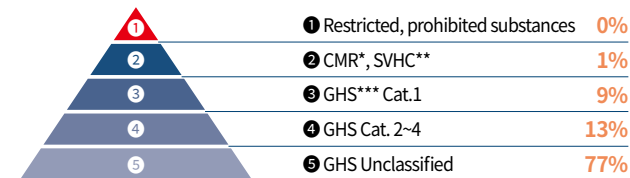
Chemical Hazard Management

There is a recent global demand for transparent information disclosure in terms of product safety. The hazard analysis focusing on consumers and products is one of them, which is used as an ESG evaluation index at home and abroad, as a tool for realizing ESG management of a company. Hazard information of chemical substances handled by LOTTE Chemical is available in the Material Safety Data Sheet (MSDS). Purchase of the raw materials with identified risk is strictly prohibited in advance. In December 2021, LOTTE Chemical restructured the hazard grade system for all chemical substances from three levels to five levels for more methodical management. By checking the impact on human health and the environment at the stage of introduction of chemical substances, regulatory risks can be detected in advance. Therefore, the system allows us to enhance the brand value, strengthen sense of responsibility for products, and gain consumer trust. LOTTE Chemical's Hazard Chemical Management Standards consist of 77% unclassified by GHS; 13% in the GHS Cat. 2~4; 9% in the GHS Cat. 1; 1% containing CMR and SVHC; and 0% of prohibited substances. Using the chemical management system, we can check the category of hazardous chemicals in real time. And hence we can reduce the content of hazardous chemicals in products and develop alternative substances to ensure the safe use of chemical substances.

In 2023, we have set activity goals for the conversion of high-risk substances regarding 8 cases, and 4 cases, including 3 cases of alternative conversion, 1 case of suspension of use, and change of content, are being implemented evenly in all business departments of basic materials and high-tech materials. By suspending the use of high-risk substances, converting into alternative substances, and changing the content, we are changing toxic substances into non-toxic substances.

Furthermore, as part of the ESG management, we will persist in making efforts to create more safe products with higher safety standards by converting substances from a category with high-risk management standard to a lower category, after conducting product risk assessment.

Our Chemical Hazard Management Standards



* CMR: Carcinogenic, Mutagenic, Reprotoxic ** SVHC: Substances of Very High Concern *** GHS: Globally Harmonized System of Classification and Labeling of Chemical (an internationally agreed-upon standard managed by the United Nations)

Product Stewardship

LOTTE Chemical is preparing to establish product management standards and publish a disclosure document on product environmental evaluation to strengthen product environment response capability. In December 2022, we selected 112 species of high-risk priority, referred to human risk and ecological risk information, and applied a scoring method for each substance to derive a hazard ranking. Based on this, we plan to publish a disclosure document on product environmental evaluation and conduct product risk assessment by selecting 3 polymer mixed products of a pilot project. After the pilot project, we will choose additional products containing hazardous substance by 2024, and conduct risk assessment. After that, we plan to promote them with the goal of implementing to all polymer products. The disclosure document on product environmental evaluation will include key product information at the global enterprise level, product environment information, regulatory information, resource circulation and carbon emission information. By comprehensively analyzing the contents such as substances contained in the product, toxicity information, exposure to the human body, air, water, soil, and the effect of residuals, we will convey product information to customers. We also expect to use it to derive measures to reduce the risk to workers and final customers that are exposed to chemical products.

Under the supervision of our Management Division, employees of relevant departments have been organizing information exchange meetings for working-level managers in development, procurement, quality, and sales teams. At the exchange meetings, environmental regulatory trends in Europe, the United States, China, etc., and global customers' requests for product environment are discussed to establish in-house policies. We promote eco-friendly audits, through which we verify our partners' compliance with regulations such as EU REACH SVHC, RoHS*, and conflict minerals regulations in advance. LOTTE Chemical immediately issues these documents through the LCMS for customers upon request to maintain trust relationship. In addition to internationally regulated RoHS substances (Cd, Pb, Hg, Cr6+, PBBs, PBDEs, BBP, DBP, DEHP, DIBP) and EU REACH SVHC, LOTTE Chemical separately manages chemicals that may have a negative impact on the environment and human body, such as halogen, antimony, and flame retardants. The use of regulated substances is strictly prohibited. When the substances already in use are newly designated as hazardous chemical substances, they are being substituted with alternate substances. In October 2021, we substituted five products, including flame retardants that are harmful to the human body, with safer and less toxic substances. Products that have been identified as hazardous are monitored and strictly managed from the raw material introduction stage.

* RoHS (Directive on the Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment): European Directive on restriction of use of certain hazardous substances in designated electronic equipment



Social

Local Community Impact

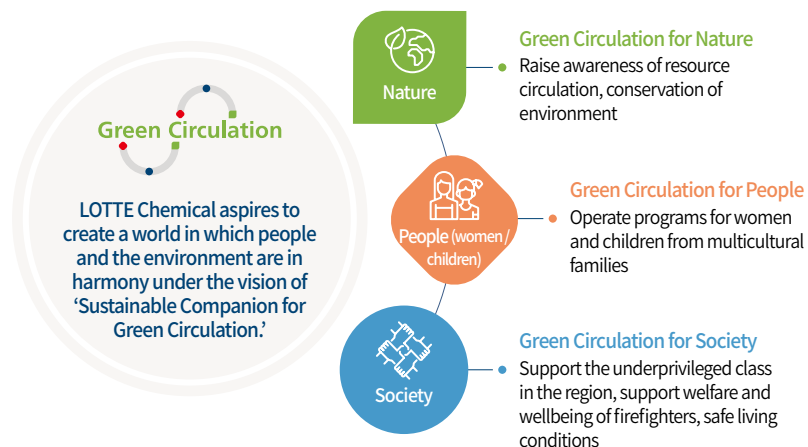
Social Contribution System

Social Contribution Vision and Strategy

LOTTE Chemical’s social contribution vision ‘Green Circulation’ contains the meaning of creating a world where people and the environment are in harmony through sustainable companionship with the local community. When carrying out social contribution activities, we focus on three areas: Nature, People (women / children), and Society. Each business site, as a member of the society, identifies issues in the community and sets up plans to resolve them.

For the theme of nature, we are organizing activities to improve social awareness of resource circulation and promote ecological conservation. For the theme of people, customized programs for women and children from multicultural families are being prepared. Lastly, for the society theme, LOTTE Chemical supports the underprivileged class in the region near each business site, promotes safety campaigns to improve living conditions, and provides support for firefighters.

LOTTE Chemical Social Contribution Vision and Theme

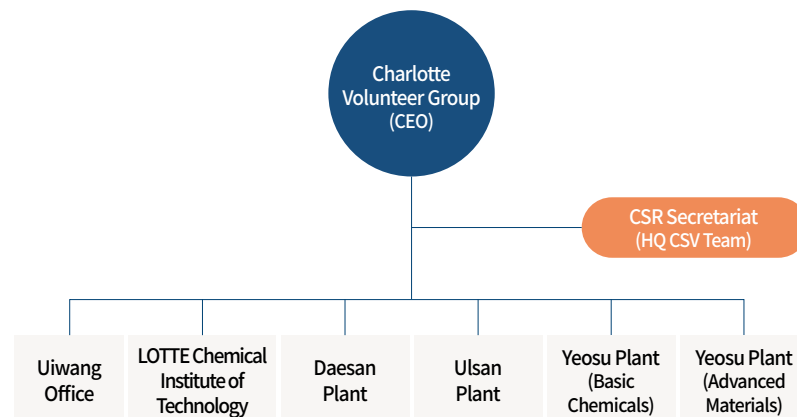


Organization for Social Contribution

LOTTE Chemical operates organizations for social contribution activities at each business site to communicate with local stakeholders. In order to practice the value of sharing with the local community, we have been operating ‘Charlotte Volunteer Group’ since 2015, through which we encourage voluntary participation of employees.

Social contribution directions and activities are submitted to the ESG committee’s agenda for review and approval. The ESG Committee members, consisting of experts, review the adequacy of specific activities to address community issues.

LOTTE Chemical Organization for Social Contribution





Social

Local
Community
Impact

Social Contribution Activity: Theme 1 – Raise awareness of resource circulation, conservation of environment

LOTTE Green School, Eco-friendly Science Camp

As a social contribution program for environmental education by the LOTTE Chemical Institute of Technology, which started in 2021, a LOTTE Chemical employee from the research center visits local children’s centers in Daejeon to give class on recycling and separation of plastics once a month. Through the experience of making a jump rope with plastic waste, children learn about the importance of resources and awareness of the virtuous cycle of plastic in the community is improved.

Project LOOP, Creates Culture of Resource Circulation for Youth

In December 2021, LOTTE Chemical signed an MOU to raise awareness of resource circulation and create a culture of proper waste separation with the Incheon Metropolitan City Office of Education and Korea Federation for Environmental Movements. In 2022, we operated waste PET collectors in about 20 schools located in the Incheon Metropolitan City. Moreover, we support the establishment of a recycling process so that the waste PET bottles can be recycled, and also operate a resource circulation education program for the youth.

Toy Sharing, Toy Donation Campaign

To participate in the spread of the resource circulation culture, we carried out a campaign to collect and donate recyclable toys. Employees collected toys that could no longer be used, disassembled the toys, and created 60 new toys. These upcycling toys created with the participation of employees were delivered to children from multicultural families at Ulsan Namgu Family Center.



Social Contribution Activity: Theme 2 - Operate programs for women and children from multicultural families

MOM Music Program, Music Play for Children with Disabilities and Their Families

Since 2018, we have been providing music therapy programs for psychological and emotional development of children with intractable diseases and for relieving the stress of caregivers, or parents, of those children. A total of 3,888 music play classroom sessions were held in 2022, and programs which were suspended due to COVID-19, such as music workshops and emotional support programs for parents, were resumed. In addition, we concluded an agreement to extend sponsorship of music therapy for continued support.

MOM Healing Camp, Healing Trip with Mom

We organized the ‘Healing Camp with Mom,’ in which working mother and their children participate together. This was designed for working mothers who have not had enough time to spend with their children, to make memories with their children and spend some healing time. For 2 days and 1 night, participants joined various programs such as a forest healing program and spent precious time with their children while relieving stress from work and childcare at a recreational forest.



Social Contribution Activity: Theme 3 - Support the underprivileged class in the region; support welfare of firefighters

Sponsoring Families from KBS Documentary, ‘Companion,’ community companionship

We have been providing housing, furniture, and goods to the underprivileged in the local community through ‘Companion,’ a documentary show that has been aired on KBS, to reinforce social safety and improve civic awareness. We have been improving the living conditions of and donating goods to the families introduced on the show and helping children in need to develop their dreams in a better environment and grow up healthy.

Supporting Mental Care for Firefighters

This is an activity to sponsor psychological counseling vehicles to each local fire department for the mental health and treatment of firefighters who are repeatedly exposed to difficult situations. We sponsored the vehicle to the fire and disaster headquarters in June 2022, and the Ulsan fire department in February 2023, in efforts to improve the welfare of firefighters and to ensure a safe environment in the region near LOTTE Chemical’s business sites.

Inviting Firefighters to Cultural Performance, Pixar in Concert

As a representative social contribution program of LOTTE Group Chemical Business, the event started since 2019. We invite firefighters and their families to encourage them and to express gratitude through sponsoring cultural performances.





Social

Local Community Impact

Social Contribution Performances

Theme	Program Name	Content	2022 Performance
Nature	LOTTE Green School	Research center employee visits a local children's center and educates on environment (2021~)	Conducted in 7 local children's center
Nature	Eco-friendly Kids' Kit	Sponsored eco-friendly bags and stationary kits to underprivileged children	Sponsored 200 children
People (women / children)	MOM Music Program	Music therapy for psychological development of children with incurable disease and for stress relieve of the parents (2018~)	Conducted 3,888 music classrooms and 238 children and parents participated
People (women / children)	MOM Healing Camp	Healing camp program with participation of working moms and children from multicultural families (2018~)	16 families (working moms and children) participated
People (women / children)	Dream Lunch Box	Sponsored lunch boxes for out-of-school teenagers who took the GED	Sponsored 300 out-of-school teenagers
People (women / children)	Book Donation – Humanities and science books	Donated books to local children's centers and out-of-school teenagers	Donated a total of 896 books
Society	'Companion' Rice Donation	Purchased rice from farms near Daesan Plant and donated to the underprivileged, such as single-parent families (2021~)	Shared 163,500kg of rice
Society	Safety Keeper for the Silver Generation	Retired fire officials with fire safety expertise visit elderly and disabled families to install fire safety products (2021~)	Sponsored 1,320 households in Gyeonggi, Jeonbuk, and Gyeongnam region
Society	Mental Care for Firefighters	Sponsored counseling vehicles equipped with facilities such as tables and chairs to help firefighters stabilize their mental health (2021~)	Sponsored 1 vehicle in Gyeonggi fire department
Society	Cultural Performance for Firefighters	Held a music performance <Pixar in Concert> (2019~)	1,450 participated
Society	KBS Companion	Improved living conditions and donated goods to families on the KBS show 'Companion' (2021~)	Sponsored 48 low-income families
Society	Art Donation	Donated art to Bobath Memorial Hospital for emotional development and stability of patients (2022)	Donated 32 pieces of art

2022 Charlotte Volunteer Group Activities

(Unit: Persons, hours)

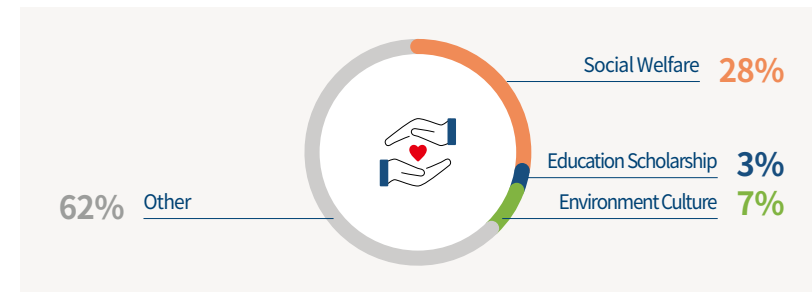
Category	No. of participants	Participation time	Average participation time per person
Performance	1,047	3,518	3.36

2022 Social Contribution Investment

(Unit: KRW million)

Category	Social Welfare Investment	Education Scholarship Investment	Environment Culture Investment	Others
Amount	3,264	311	775	7,175

2022 Social Contribution Investment Rate



Stakeholder Interview



LOTTE Chemical has been carrying out activities to improve the working environment of firefighters since 2018. From 2019, various activities have been implemented to improve the welfare of firefighters, such as holding cultural events and inviting firefighters' families, healing trips, donating PTSD precision diagnosis devices and counseling vehicles. In particular, retired firefighters provide fire safety education programs for the vulnerable in local communities, and also carry out social contribution activities that provide practical assistance such as by supporting fire safety products or installing hose reel fire hydrants in traditional markets. As such, the Korean Society of Retired Fire Officers, along with LOTTE Chemical, endeavors to provide safety to the marginalized and continue installing fire hydrants in areas where fire trucks cannot access. We thank LOTTE Chemical for its sincere interest and support, and I hope that it can become a more trusted company through social contribution activities with continuity, to realize a safe local community and a safe Korea.

Korean Society of Retired Fire Officers / General Manager Hong Jun-seong



Social

Reinforce Information Security

Information Security Management System

Information Security Governance

LOTTE Chemical is doing its best to protect the company's trade secrets, including core technologies and management strategies. In order to comply with recommended standards and ensure compliance with external recommendations, LOTTE Chemical has acquired and maintains the standard information security management system (ISO 27001) established by the International Organization for Standardization (ISO) since 2015. LOTTE Chemical's information security management system covers all areas of security management, from management to physical security and technology, rather than just one specific area; it establishes and shares fundamental security principles and detailed guidelines for all employees. In addition, the system is updated once a year in consideration of the new and revised related laws, and internal and external environmental changes. As of May 1, 2022, the organization in charge of information protection has been upgraded to a division. And it is operated under the direct control of the CEO, to meet the requirements for designation of the chief information security manager under the Act on Promotion of Information and Communications Network Utilization and Information Protection. The purpose of it is to strengthen the decision-making authority and independence related to information protection. We have appointed information security managers for domestic research centers and plants, overseas corporations, and affiliates to operate a unified information security management system through joint response in case of emergency. The group-level diagnosis for information-protection-level is also conducted once per year to identify and improve vulnerabilities in the information security management system, and to maintain a high level of security accident prevention. Through this, we periodically check our information security management system to identify and remedy vulnerabilities.



Information Security Policy

LOTTE Chemical endeavors to protect the private information of all stakeholders as well as employees by establishing an internal private-information management plan. The plan consists of the company's personal-information encryption and disposal policies that reflect the standard measures for privacy protection. We store and regularly monitor records related to personal information, including unauthorized inquiry or download of personal information through the company system and history of permission changes. We destroy unnecessary personal data by regularly checking the status of personal information stored in the personal information processing system and in the PC of the person in charge of handling personal information. In addition, we conduct annual inspections to ensure that personal information of customers managed by a third party (trustee) is safely managed and protected at the same level.

Information Security Infringement Accident Response System

LOTTE Chemical has established a monitoring system that detects external attacks and viruses in real time, and has provided timely responses in cooperation with LOTTE Group's Cyber Security Control Center. In addition, a security-threat detection system has been established to detect new and evolving security threats in advance. Our information assets are protected in accordance with Security Solution Management Policy, which provides guidelines for use of vaccines, document encryption, and media control. In response to recent increases in security threats at the production sites, we are expanding the use of vaccine solutions for production and laboratory equipment, and installing firewalls in the workplace. We also conduct periodic mock hacking / system security checks to discover and improve major system vulnerabilities. We have completed disclosure of information regarding information security investments and major human resources activities. In accordance with the personal information damage liability system implemented since 2019, we renew personal information damage compensation insurance every year to protect the rights and interests of the information subjects and respond to issues related to personal information accidents.

Our Personal Information Leakage Status

(Unit: Cases)

Category	2020	2021	2022
No. of leakage cases	0	0	0

Information Security Capacity Building Activities

Information Security Education

LOTTE Chemical offers information security education and training once a year to employees and stakeholders to raise their awareness on data security. In 2022, we provided education focusing on precautions between handling business secrets and information security accidents that may occur due to carelessness of individuals. We also conducted separate personal information security education for people in charge of handling personal information semi-annually. Every other month, we publish an information security newsletter containing the company's data protection activities and external security issues. Due to the recent increases in virus incidents through malicious e-mails, we are conducting e-mail mock virus training quarterly to prevent such incidents. Also, to prevent trade fraud accidents, we send out an official letter on our account registration and changed policy to our customers once a half-year.

LOTTE Chemical Information Security Education Status

Category	2020	2021	2022
Employee regular education	4,544 / 1 hour per person	4,541 / 1 hour per person	4,703 / 1 hour per person
Newsletter	6	6	6
Mock virus training	8	8	8

Governance

080 Ethical Management

082 Compliance

086 Sound Governance

090 Risk Management



Governance

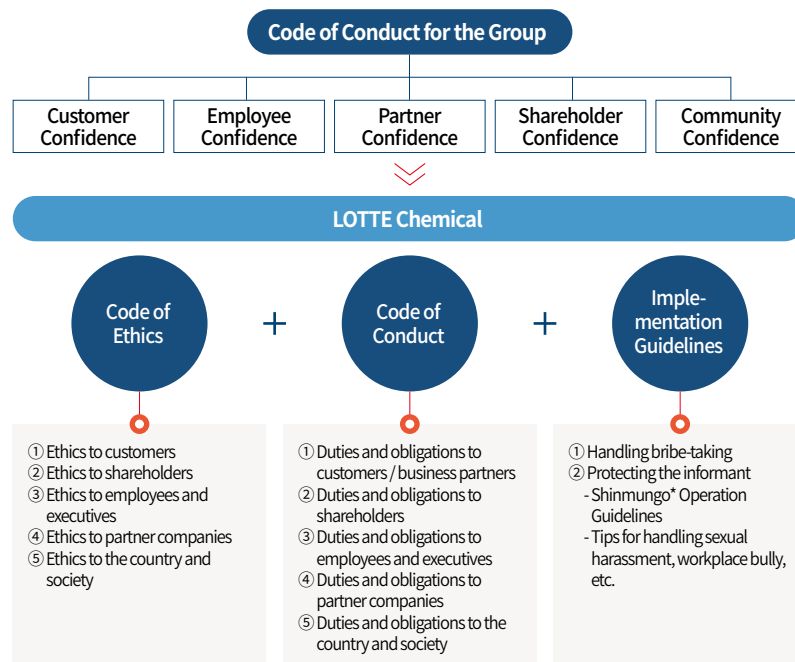
Ethical Management

Ethical Management System

Ethical Management Regulations and Implementation Organization

Based on LOTTE group's Code of Conduct, LOTTE Chemical has established an ethical management system that includes the Code of Ethics, Code of Conduct, and Implementation Guidelines in consideration of LOTTE Chemical's work and business conditions. We are achieving a transparent ethical culture throughout the company through the Compliance Management Group, established directly under the CEO, and we are carrying out activities to continuously raise ethical awareness among our employees. In addition to the Management Improvement Team in charge of ethical management within the Compliance Management Group, departments that manage legal risks, compliance issues, and internal control are working together in various aspects. We support all executives and employees to internalize the ethical management mindset and perform their work in a transparent, fair, and rational manner based on the ethical management system.

LOTTE Chemical Ethical Management System



* LOTTE Chemical internal reporting channel

Ethical Management System

Establishing and operating the ethical management system, LOTTE Chemical makes effort to share the culture of ethical management with all employees. By sharing the company-wide Code of Conduct through the ethical management website(<http://ethics.lottechem.com>), we are continuously raising employees' ethical awareness. In addition, we operate a channel through which internal and external stakeholders can report unethical practices. Through weekly online training of employees and non-regular offline training, we are trying to internalize the culture of ethical management. Furthermore, we regularly audit and monitor accounting and business processes through the Audit Committee within the BOD and Internal Accounting Management System.

LOTTE Chemical Ethical Management System

<p>Business audit</p> <p>Regular, special audits</p>	<p>Ethical management website</p> <p>Provide value of ethical management, Code of Conduct, Shinmungo, and ethical education</p>	<p>Reporting channel</p> <p>Internal reporting channel (Shinmungo), external compliance reporting channel, Grievance Committee</p>	<p>Ethical management education</p> <p>Online and off-line courses</p>	<p>Internal control</p> <p>Audit Committee, Internal Accounting Management System</p>
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Ethics Audit

LOTTE Chemical conducts regular audits, which are performed on a regular basis according to the annual audit plan, and special audits, which are conducted when deemed necessary such as when there are complaints or accusations from outside. To ensure that standardized procedure is followed, standards and procedures for audit are stipulated in the 'Internal Audit Guidelines'. In addition, we recommend taking appropriate measures in accordance with the 'Reward and Discipline Rules' and disseminate them through special training and company-wide notices to prevent the recurrence of the same problem. LOTTE Chemical will work to achieve mutual growth by building solid trust with all stakeholders including customers, partners, and shareholders.



Governance

Ethical Management

Ethical Management Diagnosis and Improvement

LOTTE Group has established the Code of Conduct, which clearly sets the direction of ethical management, and the Code of Ethics, which provides supplementary guidelines. LOTTE Chemical monitors employees and makes sure that they conduct their due diligence and comply with the specifics provided in the guidelines to improve the business processes. In particular, we discovered work inefficiency through diagnosis of domestic and overseas subsidiaries and presented supplementary improvements in 2022.

Moreover, through compliance assessments conducted once a year for the entire LOTTE Group, we examine the current level and status of ethical management awareness of employees to derive improvement directions.

Activities for Strengthening Ethical Management

Protection of Internal Reporting Channel and Informant

LOTTE Chemical operates various channels, such as e-mail, postal mail, landline, and online website, so that stakeholders can easily consult and report ethical management affairs. We introduced an additional external compliance reporting channel for employees to strengthen fairness and anonymity of the reporting process, and created an ethical management culture through facilitating reports. In addition, we conduct investigations and consultations on sexual harassment and workplace bully by operating the Grievance Committee.

Informants can report anonymously or under the real name. Reports received are processed transparently in accordance with the procedures stipulated in the Guidelines for Shinmungo Operation and External Compliance Report Channel Operation and Case Handling Guidelines. Detailed reporting procedures and contents concerning the protection of informants are always made public on the online newsletter website and internal intranet. When the investigation confirms unethical behavior, disciplinary action is taken.

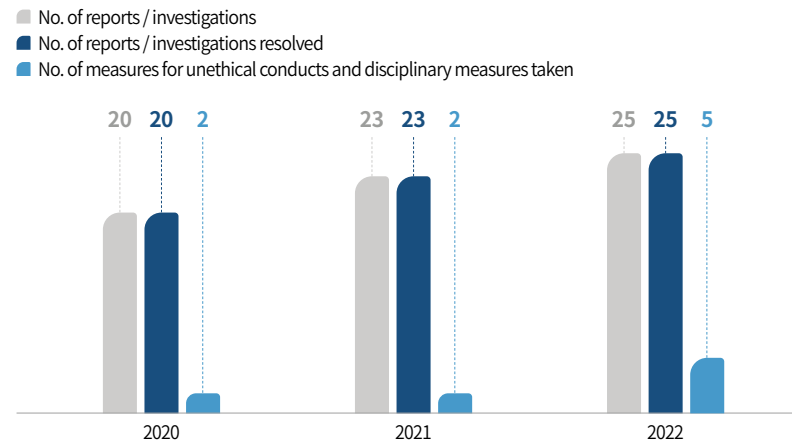
The identity of the informant is guaranteed in the course of the investigation, and provisions such as confidentiality, informant protection, and prohibition of retaliation are stipulated, so in case of violation, we strictly protect the informant through disciplinary action.

Informant Protection Regulations

Confidentiality	Protection of informants	Reduction or exemption of liability
Prohibition of disclosure or leakage of data that may be exposing the identity of the informant / agent, and in case of violation, disciplinary action is taken	Measures, such as transfer of department, change of position, etc., are taken to protect informants from inconveniences or disadvantages due to reporting; prohibition of dismissal and other adverse actions due to reporting	If the report is related to the informant or is attributable to the informant's negligence, disciplinary action is reduced or exempted

2022 Reported Cases of Unethical Conduct and Resolutions

(Unit: Cases)



Ethical Management Education

LOTTE Chemical provides education for all employees, including non-permanent employees, on ethical management through a variety of methods, including online courses and group training for internalization of the ethical management culture. The education covers a variety of topics, including ethical management at the individual / organizational level, Anti-Graft Act, information ethics, and global ethics.

Ethical management education	Item	Unit	2020	2021	2022
Group training (partner companies)	No. of courses	Courses	1	1	3
	Total training hours	Hours	2.5	0.5	1.5
Group training (employees)	No. of employees who completed training / employees subject to training (%)	Persons (%)	29/29 (100)	22/22 (100)	88/90 (98)
	Total hours of training	Hours	11	9	6
Online courses	No. of courses	Courses	52	52	52
	Total hours of training	Hours	3	3	3
	No. of employees who completed training / employees subject to training (%)	Persons (%)	3,968/4,349 (91.2)	3,807/4,311 (88.3)	3,944/4,378 (90)



Governance
Compliance

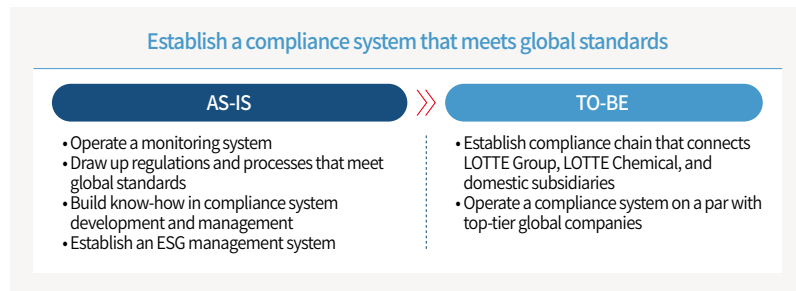
Compliance Management System

Compliance Management Regulations and Implementation Organization

LOTTE Chemical has established the Compliance Team within the Compliance Management Group, which is directly under the CEO, to manage overall compliance-related risks in business activities. To realize the compliance system that meets the global standards, we have established a mid-to long-term vision for compliance management, developed a standard model to promote the culture of compliance management in subsidiaries, and implemented action plans with a goal of creating a culture trusted by stakeholders. LOTTE Chemical has amended the Compliance Management Charter and regulations related to compliance management, anti-corruption, and fair trade, and conducted online / offline compliance education on a regular basis.

In 2019, we obtained the industry's first anti-corruption management system certification (ISO 37001), and in 2022, we obtained the compliance management system certification (ISO 37301). In addition, based on the results of our comparative analysis with global standards and taking into account the size of each subsidiary, we are working to expand our compliance system. Our goal is to ensure that our domestic subsidiaries and overseas business sites have at least a minimum level of internal control.

Mid- to Long-Term Vision for Compliance



Internal Control System

LOTTE Chemical has established an organization and process that supports systematic identification and preemptive management of economic, social, and environmental risks present in a rapidly changing business environment. We are committed to establishing an efficient risk management system that identifies such risks and implement suitable measures to respond to the identified risks.

LOTTE Chemical has introduced a compliance management system in consideration of more tightened global regulations on compliance management and ESG management, growing stakeholder examination, and increasing exposure to compliance risks. We are transitioning from the improvised /

reactive response system of the past to the preemptive monitoring and management of specific risks. Through the compliance management system, we have realized a support system for anti-corruption; anti-monopoly and fair trade; environment, health, and safety; human resources; tax and accounting; and trade secret protection. In addition, a compliance officer is appointed to make continuous improvement to the system through internal inspection and consulting.

LOTTE Chemical has enacted and operates an in-house accounting management system in accordance with the internal accounting management regulations; as per Article 8, Paragraph 4 of the Act on External Audit of Stock Companies, etc. (hereinafter referred to as the External Audit Act), the operation of the internal accounting management system is reported at the general shareholders' meeting, the Board of Directors and the Audit Committee. Furthermore, in accordance with Article 8, Paragraph 5 of the External Audit Act, the company's audit committee members evaluate the operating status of the internal accounting management system and report it to the board every business year; and in accordance with Article 8, Paragraph 7 of the External Audit Act, an external auditor audits the company's internal accounting management system and includes his / her opinions in the audit report.

Compliance Management System Certification (ISO 37301)

To lay the foundation for sustainable growth by strengthening anti-corruption management and forging a culture of compliance management, LOTTE Chemical acquired ISO 37001, an international standard for anti-corruption management system, from an accredited certification body, for the first time in Korea as a chemical company in 2019. We have maintained and managed the certification every year until 2022. In 2022, we obtained ISO 37301, an international standard for compliance management established by the International Organization for Standardization (ISO) in April 2021, which evaluates whether or not it has a systematic compliance policy and risk management system to deal with legal risks of corporate management.

LOTTE Chemical's acquisition and maintenance of this certification means that our compliance management system has a global level, as the certification is granted through strict evaluation.

In this regard, the commitment to anti-corruption of LOTTE Chemical's leadership is evidenced by the approval of the anti-corruption policy, the anti-corruption pledge by the CEO and the BOD, and education. We have appointed and trained the personnel in charge of detecting and evaluating potential corruption risks in each department and enacted the manual and regulations on anticorruption management system. In addition, we enacted the management system manual for compliance and anti-corruption and related regulations, cultivated internal auditors to conduct internal audits, and obtained the certification after external audits from the certification body.



LOTTE Chemical Compliance Management System Certification



Governance

Compliance

Anti-corruption Monitoring System Operation

With the goal of zero corruption, LOTTE Chemical constantly manages corruption-related risks in business by complying with domestic and foreign laws and internal regulations regarding anti-corruption, conducting business according to the anti-corruption policy of never engaging in any corrupt activities, and checking the occurrence of risks through an electronic monitoring system on an ongoing basis. In 2022, 816 out of 3,500 cases found as a result of the monitoring operation were requested to check for risks, and for some matters that required improvement, we conducted in-depth training for relevant employees and took supplementary measures in accordance with internal regulations. In addition, the system requires submission of a Contact Report when in contact with public officials, and for cases related to the Anti-graft Law, applications should be submitted and approved in advance to prevent related anti-corruption risks.



LOTTE Chemical Anti-corruption Policy

Compliance Program

Donation and Sponsorship Review

LOTTE Chemical established and operated the in-house standards (donation and sponsorship procedure operations), and requires that all donations and sponsorships at all business sites be reviewed by the Compliance Team in advance. By examining the purpose of the donation, the suitability of the beneficiaries, the applicability of the Anti-Graft Act, and the adequacy of quid pro quo, the relate risks are prevented in advance. We are determined to create a proper donation culture by only allowing donations and sponsorships to organizations whose eligibility has been confirmed in a lawful manner.

Compliance Education

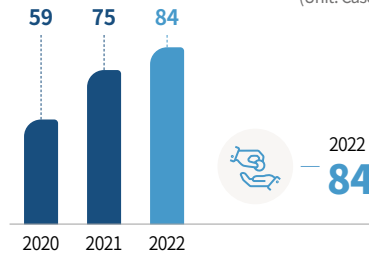
In order to raise awareness of compliance among employees, LOTTE Chemical conducts group education by job, topic, business site, and company-wide online education. In 2021 and 2022, the CEO conducted virtual education on compliance management to raise employee awareness on compliance management. The company regularly publishes a compliance newsletter and compliance management webtoon on the intranet.

Activities to Eliminate Other Compliance Risks

In order to respond promptly to the tightening internal and external regulations and laws, we are strengthening activities of the Transparent Management Committee by extending advice on fair trade and anti-corruption, introducing standard contracts, and adapting mandatory anti-corruption clauses. Regarding important business secrets, we have established and operated regulations related to business secrets to prevent infringement not only for the company but also for the customers and partners. LOTTE Chemical endeavors to comply with global standards but also to actively meet the demand for corporate social responsibility.

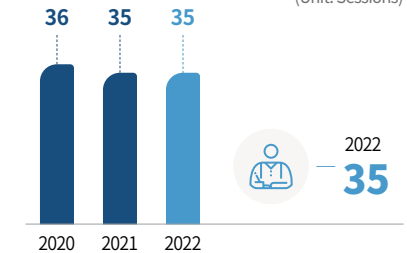
No. of Donations and Sponsorship Reviews

(Unit: Cases)



Compliance Education Status

(Unit: Sessions)



Enhancing Compliance in Supply Chain

In recent years, as companies are expanding their presence beyond Korea, the supply chain compliance management is growing in importance more than ever. LOTTE Chemical builds sustainable business and seeks to fulfill its social responsibilities by identifying, monitoring, and preventing third-party risks in domestic and overseas supply chains in advance. To ensure transparent and fair transactions with partner companies, LOTTE Chemical requires agreement to a pledge of integrity necessarily, and has been requiring the use of standard contracts and expanding the use of the Electronic Contract System (ECS).

Supply Chain Compliance Activities

2020	2021	2022
<ul style="list-style-type: none"> Required certain partner companies to obtain a compliance certificate before signing a contract, and made efforts to extend compliance management to partner companies Established management tips and guidelines for subcontracting Updated standard subcontracts and conducted compliance checks on subcontract transactions Trained employees in charge, conducted due diligence in writing, transaction risk diagnosis and guideline consulting 	<ul style="list-style-type: none"> Conducted inspections on subcontracts and took improvement measures for relevant major departments Revised standard subcontract agreement and compliance and fair trade manual according to transaction type Revised and distributed the compliance handbook, conducted various in-house training programs 	<ul style="list-style-type: none"> Fully revised the standard subcontract agreement Participated in the pilot project of Ministry of SMEs and Startups regarding adjustment to the unit price for a product, which reflects the cost of raw material fluctuations in the delivery price, and participated in regular survey of consignment transactions Acquired ISO 37301 Established a Code of Conduct for LOTTE Chemical Partner Companies



Governance

Compliance

Internalization of Fair Trade Culture

CEO's Message and Letter for Compliance Management

The CEO's message and compliance letters are sent to all employees and partners on a regular basis to show determination to practice compliance management, and to build a transparent business culture. This is to encourage fair and transparent transactions between our employees and partner companies and urge them not to exchange or request money, gifts, or entertainment from each other. LOTTE Chemical demonstrates continuous efforts to establish a fair and transparent transaction culture by announcing its commitment to compliance management to all stakeholders, including shareholders, customers, business partners, competitors, local communities, and employees.

Operation of Fair Trade Self-Compliance Program

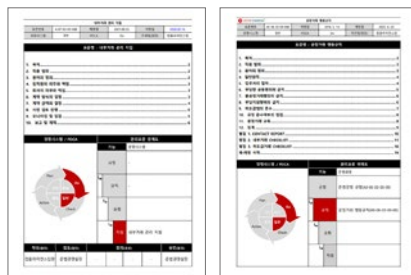
Introduced first in 2006, LOTTE Chemical's Compliance Program serves as a clear guideline for employees to prevent violations of laws and encourages voluntary compliance. LOTTE Chemical distributes the Compliance Handbook, which regularly gets updated per enactment and revision of related laws. Through an electronic monitoring system, we conduct pre-screening. In our internal SOP for fair trade (regulations, checklists, Do's & Don'ts, handbooks, guidelines, etc.), we present a clear code of conduct for each business situation to ensure compliance. In addition, we are using the standard chemical subcontract recommended by the Fair Trade Commission to strengthen voluntary compliance. In 2023, we plan to manage risks for those subject to the Win-win Cooperation Act by preparing a management plan.

Unfair Trade Management

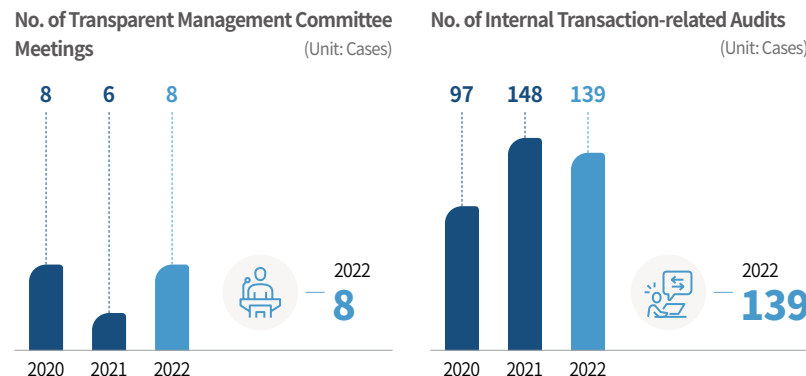
LOTTE Chemical complies with the principles of fair trade to prevent unfair trade. With the establishment of company rules and various training programs, we ensure that we do not violate fair trade laws and regulations in the course of conducting business. Accordingly, employees are aware of related contents such as prohibition of unfair common action, prohibition of unfair trade, prohibition of unfair support, and compliance with subcontracting laws. We follow the guidelines for mandatory compliance when conducting business to prevent violations.

Internal Transaction Management

The appropriateness of the selection of a transaction party, the appropriateness of trading conditions, and the reasons for concluding a contract must be reviewed in accordance with relevant laws and internal regulations. In order to prevent violations in advance, LOTTE Chemical's Transparent Management Committee, which is composed of outside directors,



reviews the possibility of fair trade law violations for internal transactions of a certain size. In addition, all tasks related to fair trade and anti-corruption undergo a preliminary review by the Compliance Team, a dedicated organization, and preliminary reviews and follow-up audits are conducted for major business units.



Compliance with Fair Trade in Partner Companies

To manage fair trade and build mutual cooperation with partners, we conduct meetings with partners by business site and offer compliance-training. In addition, we conduct case studies of unfair trade with our business partners. Through this, we are making efforts to ensure fair trade by checking the compliance of our company and partners with relevant laws, such as fair trade standards, taking improvement measures in case of non-compliance, and reviewing contracts in case of recurrence. We continue to furnish law training, such as the Subcontracting Act, to the departments that work most closely with suppliers. We have standardized the contracts since 2018 and in 2019, we offered compliance training for overseas affiliates, and the compliance standards for partners are being applied regardless of country or region. In 2020, we shared compliance guidelines with our affiliates within Korea, investigated the subcontract compliance status, and expanded the scope of fair trade inspection. Starting in 2021, we have been reviewing and inspecting the Mutual Cooperation Act for SMEs that are not subject to the Subcontracting Act. In 2022, by participating in the pilot project of the Ministry of SMEs and Startups, we introduced and operate the system of the adjustment to the unit price for a product.



Governance

Compliance

Internalization of Fair Trade Culture

Compliance with the Subcontract Act and Mutual Cooperation Act

LOTTE Chemical requires that all subcontract transactions at all business sites be reviewed by the Compliance Team in advance. By examining subcontract payment terms, checking unfair conditions, and ensuring the use of standard contracts, subcontract-related risks are mitigated in advance; through continuous monitoring, we are striving to ensure balanced development and mutual growth. Furthermore, in order to ensure abidance by the Mutual Cooperation Act, we are pursuing win-win partnerships and mutual growth with SMEs by having our Compliance Team advice and monitoring the contract / consignment transactions at all times.

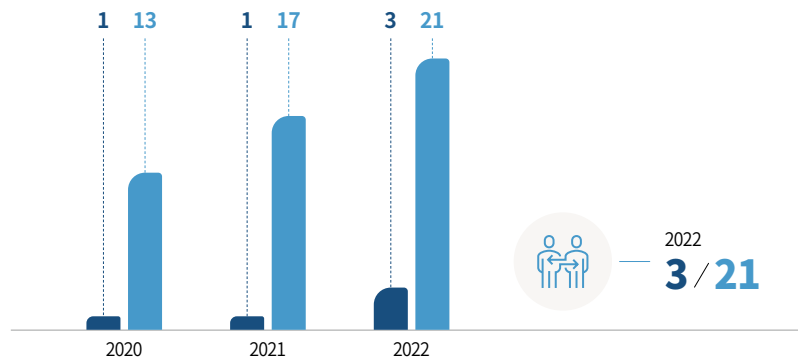
Fair Trade Education

LOTTE Chemical's Compliance Team offers fair trade training to emphasize the importance and impact of fair trade. The training program covers related laws and regulations, the latest court decisions and precedents, and internal SOPs. The program includes separate courses for executives, managers, and new employees, as well as various job-specific ones for expatriates, persons in charge of subcontract, and sales force.

Implemented Fair Trade Education Status

(Unit: Sessions)

■ Partner Companies ■ Employees



Reporting Channel for Unfair Trade

LOTTE Chemical operates an online reporting channel, Online Shinmungo, on the company's ethical management website, through which employees can report any unfair or unreasonable conduct at any time.

Stakeholder Interview



LOTTE Chemical is a company with a very strong will to practice compliance management, such as conducting compliance education for employees at least twice a month, producing and distributing webtoons and newsletters to raise compliance management awareness, and sending out compliance management letters right before holidays to guide the Shinmungo system. As a global corporate, in order for LOTTE Chemical to implement even more transparent management activities than the status quo, I think it is important to organize a system that meets

international standards that can cover not only domestic laws and regulations but also the laws of countries where the company operate, and constantly educate the employees on the related contents.

For example, education on bullying in the workplace for expatriates should include gender and racial discrimination. In addition, to minimize compliance and corruption risks, training on the Fair Trade Act and prohibition of common action (collusion) should be conducted continuously. I further recommend including the Occupational Safety and Health Act, Serious Accidents Punishment Act, and international regulations in the obligations within the compliance pledge and operate a wider scope of contents. Moreover, I hope that LOTTE Chemical creates an environment that actively encourages employees to practice internal reporting, and that all employees have awareness of ethical and compliance management, so that the company can move forward to becoming a more trusted transparent management company than it is now.

Korea Management Registrar / Kang Byung-don



Governance

Sound Governance

Board of Directors Composition

Board Composition Status

As of March 29, 2022, LOTTE Chemical's Board of Directors (BOD) consists of 11 members, including 6 outside directors and 5 inside directors. Inside directors are recommended by the BOD and outside directors are recommended by the Outside Director Candidate Recommendation Committee after careful examination of the candidate's qualifications based on the guideline upon diversity. The recommended directors are appointed through the resolution of the general shareholders' meeting. In order to be able to perform checks and balances on the management and to realize sound corporate governance, the BOD consists of more than 50% outside directors. In addition, the BOD enhances transparency, professionalism, independence, and diversity, and promotes balanced decision-making activities for the happiness of stakeholders and improvement of long-term corporate values. In particular, the Articles of Incorporation specifies that the BOD should not be composed of a specific gender. Hence, we have been appointing female outside directors since 2015.

LOTTE Chemical Board of Directors Composition (As of the end of March, 2023)

Category	Name	Gender	Area of Expertise	Role (Position)
Inside director	Shin, Dong-bin	Male	Overall business management	Current Chairman of LOTTE Group CEO of LOTTE Chemical
	Kim, Gyo-hyun	Male	Overall business management	Current Head of LOTTE Group's Chemical Unit CEO of LOTTE Chemical
	Hwang, Jin-koo	Male	Overall business management	Current CEO of LOTTE Chemical (President of LOTTE Chemical Basic Chemicals Business)
	Lee, Young-joon	Male	Overall business management	Current CEO of LOTTE Chemical (President of LOTTE Chemical Advanced Materials Business)
	Kang, Jong-won	Male	General management of finance and accounting	CFO of LOTTE Chemical Management Innovation Office
Outside director (and Audit Committee member)	Choi, Hyun-min	Male	Tax	Current Advisor of Jipyong LLC Outside director of Handsome Corp.
	Nam, Hye-jung	Female	Accounting	Current Professor of Accounting, Dongguk University Business School Non-executive director of Korea Trade Insurance Corporation
	Cho, Woon-hang	Male	Finance	Current director at Financial Scholarship Foundation Outside director of The Asia Business Daily
Outside director	Jeon, Woon-bae	Male	Labor management / employment policies	Current Advisor of Law Firm, Dentons Lee
	Kang, Jeon-won	Male	Industry / R&D	Current Professor, Department of Chemical and Biological Engineering, Korea University
	Cha, Kyung-hwan	Male	Legal	Current Representative Lawyer of Law Firm, Pyeongan Outside director of HD Hyundai Construction Equipment

In accordance with the BOD regulations, the chairman of the BOD is elected from the appointed 11 directors through resolution, and on March 29, 2023, Kim, Gyo-hyun was elected by unanimous vote.

Outside directors can be reappointed for a term of 2 years, and except for the outside director Cho, Woon-hang who was appointed in 2022, and Cha, Kyung-hwan appointed in 2023, Choi, Hyun-min, Jeon, Woon-bae, and Kang, Jeong-won directors were appointed in 2020 and reappointed in 2022. Nam, Hye-jung director was appointed in 2021 and reappointed in 2023.

Committees within the Board

5 committees, including the Audit Committee, have been established within the BOD to reinforce expertise and efficiency in decision-making. In order to increase independence, more than half of the committee members are outside directors. Especially, an outside director is appointed as the chairman of each committee to further ensure checks and balances on the BOD.

Composition and Operation of Committees within the Board (As of the end of March, 2023)

Category	Main Role	Number of Members	Members	No. of Meetings in 2022
Outside Director Candidate Nomination Committee	Outside Director Candidate Verification and Nomination	3	Cho, Woon-hang (Chairman), Jeon, Woon-bae, Hwang, Jin-koo	1
ESG Committee	Review and proposal of ESG policy	5	Jeon, Woon-bae (Chairman), Choi, Hyun-min, Nam, Hye-jung, Kang, Jeon-won, Lee, Young-joon	6
Transparent Management Committee	Deliberation on internal transactions and private contracts over a certain amount, proposal of internal policies related to fair trade	3	Nam, Hye-jung (Chairman), Cho, Woon-hang, Cha, Kyung-hwan	8
Audit Committee	Accounting and audit	3	Choi, Hyun-min (Chairman), Nam, Hye-jung, Cho, Woon-hang	4
Compensation Committee	Deliberation on remuneration limit for executives (including registered directors) and proposal of remuneration policy	3	Jeon, Woon-bae (Chairman), Choi, Hyun-min, Kang, Jeon-won	3

Spotlight

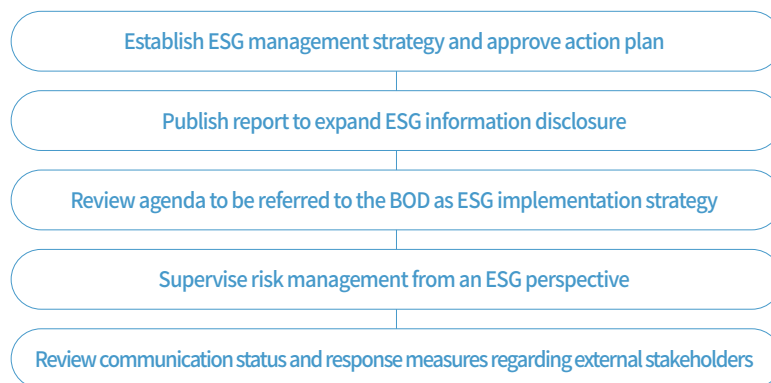


Strengthen board's ESG management system

ESG Committee

Established in September 2021, the ESG Committee consists of 4 outside directors and 1 inside director. The committee determines, deliberates on, and reviews matters related to the company's ESG management by integrating ESG perspectives into management decisions, to ensure social and corporate responsibility, transparent governance, and sustainable growth.

Main Roles of ESG Committee



ESG Committee Composition

Category	Member
Outside director (4 persons)	Jeon, Woon-bae (Chairman), Choi, Hyun-min, Kang, Jeon-won, Nam, Hye-jung
Inside director (1 person)	Lee, Young-joon

ESG Committee Education Status

Date of education	Content
February, 2022 (1st Committee)	Net-Zero Trends and Role of Directors in the Era of ESG
June, 2022 (3rd Committee)	Impact and Implications of ESG Legislation Trends, and the Meaning of RE100 Declaration and Corporate Response Direction
September, 2022 (5th Committee)	ESG Global Trends and Current Issues, and Implications of Domestic Companies according to ESG Policy Direction of the New Government

ESG Committee Activities

Year	Session	Date	Main agenda
2021	1st	2021. 9. 23.	<ul style="list-style-type: none"> Approval on new establishment of LOTTE Chemical ESG (net-zero) Fund (tentative) Report on ESG operation system advancement consulting results
	1st	2022. 2. 8.	<ul style="list-style-type: none"> Approval on social contribution direction and annual business plan (tentative) Approval on net-zero strategy and roadmap (tentative) Deliberation on the 2022 basic chemicals and advanced materials business, and safety and health plan (tentative) Report on ESG KPI evaluation plan
	2nd	2022. 3. 22.	<ul style="list-style-type: none"> Approval on LOTTE Chemical ESG vision / strategy establishment (tentative) Approval on ESG new project strategy and roadmap (tentative) Report on 2021 environmental management performance and 2022 major plans Report on sustainability report direction and materiality assessment
2022	3rd	2022. 6. 10.	<ul style="list-style-type: none"> Approval on election of chairman (tentative) Approval on publication of 2021 Sustainability report (tentative) Report on progress review of joining RE100 Report on preliminary feasibility study on REDD+ project Report on ESG Risk management system advancement consulting
	4th	2022. 6. 28.	<ul style="list-style-type: none"> Approval on RE100 membership and achievement roadmap (tentative) Approval on introduction of the LOTTE Chemical Statement on Human Rights and establishment of the Code of Conduct for LOTTE Chemical Partner Companies (tentative) Deliberation on executing KAIST donations (tentative)
	5th	2022. 9. 2.	<ul style="list-style-type: none"> Approval on water resource risk identification results and response plan (tentative) Approval on harmful substance emission reduction plans and goals (tentative) Report on 2030 net-zero goals by business department
2023	6th	2022. 11. 18.	<ul style="list-style-type: none"> Approval on introduction of the LOTTE Chemical Statement on Environmental Management and establishment of ESG policy book (tentative) Approval on procurement limits of renewable energy (solar) (tentative) Report on completion of consulting for ESG risk management system advancement
	1st	2023. 2. 8.	<ul style="list-style-type: none"> Approval on social contribution direction and annual business plan (tentative) Report on progress of product risk assessment consulting Report on 2023 CEO ESG KPI evaluation (tentative)
	2nd	2023. 3. 7.	<ul style="list-style-type: none"> Approval on 2023 ESG focus area goals and last year's performance Stakeholder trends and future prospect ESG materiality assessment results and advancement of external communication (tentative)



Governance

Sound Governance

Board Operation

Board Activities

As the top decision-making body within the company, our board, which is comprised of 11* experts and directors, discusses various issues and determines the company’s mid- to long-term strategies. The board meeting is held once per month, and for urgent matters, an emergency meeting is convened. In 2022, a total of 13 board meetings were convened. In addition, they frequently report to the BOD on major issues that may affect the company’s sustainability across economic, social, and environmental aspects and incorporate their expertise to company policies.

* Out of a total of 11 members of the BOD, the no. of outside directors is 6, which accounts for the majority

Board Operation

Category		2020	2021	2022
No. of agenda items (Numbers)		56	66	64
No. of BOD meetings convened (Sessions)		14	11	13
Attendance rate(%)	Excluding inside directors*	90	92	90
	Outside directors	81**	97	97

* Non-executive directors are included in the attendance rate of inside directors

** The attendance rate shown here is the average for all directors who served during the period. (Excluding the retired outside directors, the attendance rate of the current outside directors is 99% for 2020, and 98% for 2022)

Board Independence and Diversity

LOTTE Chemical appoints directors based on their career and expertise. The qualifications, background of appointment, and independence of directors are disclosed through public announcements or disclosures. The areas of expertise of our outside directors include industry, accounting, tax, labor management, law, and finance. With their expert knowledge in the respective fields, the outside directors help make rational decisions. In addition, to enhance diversity and independence in the governance structure, female outside directors have been appointed since 2015 and restrictions on qualifications for the chairman position have been removed completely. We have incorporated the clause related to separate election of audit committee members stipulated the amended Commercial Act in the Articles of Incorporation to ensure the independence of outside directors and reflect shareholders’ interest in a balanced manner.

Board Expertise

LOTTE Chemical makes continuous efforts to enhance the expertise of the BOD for sustainable management and rational decision-making. Board members are nominated and appointed through recommendation and careful examination in consideration of their contributions to promoting major business activities. By doing so, we ensure that all of the board members have a high level of understanding of our business. To further reinforce outside directors’ understanding of our company and business, we frequently invite them to the plants and research centers and regularly communicate issues at hand. Moreover, 2 members of the Audit Committee are professionals of accounting or finance, and the chairman of the Audit Committee is a tax expert, and as a result, it has sufficient independence and expertise.

Education for Outside Directors

Date	Education Provider	Outside director attendants	Reason for non-attendance	Main contents of education
May 27, 2022	LOTTE Chemical	All outside directors (6 persons)	-	Introduction of advanced material business main products and business trends (Uiwang Office) Introduction of resource circulation activities and future business roadmap (LOTTE World Tower)
September 22, 2022	LOTTE Holdings Co., Ltd.	Newly appointed outside director (1 person)	-	Introduction on management status of LOTTE Group

Board Transparency

LOTTE Chemical aims to provide timely and accurate information to shareholders and stakeholders regarding the company’s overall business activities. When the board makes salient management decisions, or in the event of critical issues affecting investment decisions, we immediately inform the relevant parties. In response to the growing demand for ESG data disclosure from domestic and overseas stakeholders, we offer discretionary disclosure and disclosure in English for ESG information. English-language disclosures are posted on the website so that overseas investors receive the same level of data as domestic investors. We will continue to actively communicate with investors and stakeholders about our business activities.



Governance

Sound Governance

Performance Evaluation and Compensation of the Board

LOTTE Chemical conducts independent evaluation of outside directors and inside directors once a year for those whose terms are about to expire, and determines reappointment based on their contribution to the BOD, internal and external influence, and expertise. The remuneration of directors is transparently and fairly managed by the Compensation Committee within the BOD by a resolution of the general shareholders' meeting. The individual remuneration limit of inside directors is set by reflecting the company's major values, and is determined by a resolution of the Compensation Committee and general shareholders' meeting. The remuneration of outside directors is determined within the limit approved at the general shareholders' meeting. Compensation of the Audit Committee members is decided separately in consideration of their legal responsibilities, time, and effort.

The remuneration limit for directors approved at the 2022 general meeting of shareholders was KRW 12 billion; the total amount of remuneration paid to directors was KRW 6.4 billion. Remuneration of each director and auditor over KRW 500 million is disclosed in the business report in accordance with relevant laws.

Transparent Disclosure

Activities to Enhance Shareholder Value

LOTTE Chemical endeavors to provide timely and accurate information to shareholders and stakeholders regarding the company's overall business activities. When the Board of Directors makes important management decisions, or in the event of critical issues affecting investment decisions, we immediately inform the relevant parties. In response to the growing demand for ESG information disclosure by domestic and overseas stakeholders, we offer discretionary disclosure and disclosure in English for ESG information. English-language disclosures are posted on the website so that overseas investors receive the same level of information as domestic investors. We will continue to actively communicate with investors and stakeholders about our business activities.

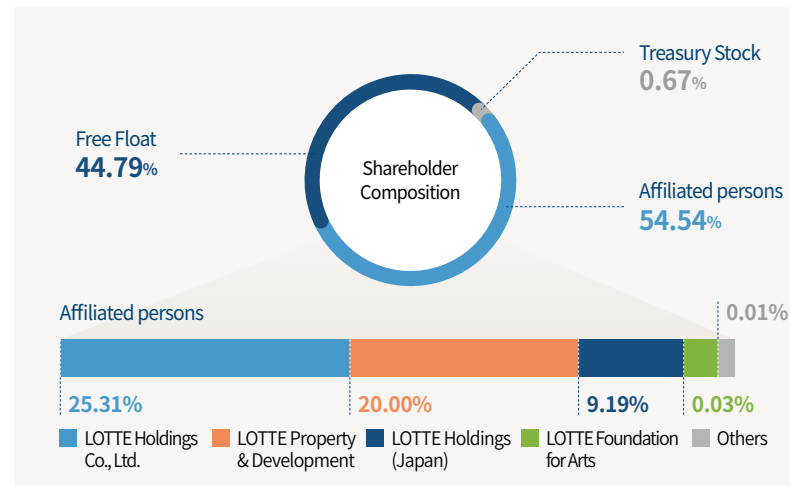
Shareholder Composition

(As of March 17, 2023)

Category		Share ratio(%)
		54.54
Affiliated persons	LOTTE Holdings Co., Ltd	25.31
	LOTTE Property & Development	20.00
	LOTTE Holdings (Japan)	9.19
	LOTTE Foundation for Arts	0.03
	Others	0.01
Free Float		44.79
Foreigners		16.46
Treasury Stock		0.67
Total		100.0

LOTTE Chemical Shareholder Composition

(As of March 17, 2023)



Establishment and Disclosure of Mid- to Long-term Dividend Policy

To strengthen the shareholders' return policy and raise possibility of dividend prediction, LOTTE Chemical set the duration of the mid-term shareholder return policy to 3 years, established and disclosed the shareholder return policy from fiscal year 2022 to 2024. We plan to achieve an annual dividend payout ratio of 30%, based on separate net profit, and to improve stability and predictability by allocating all dividend resources to shareholders 2 times a year. However, year-end dividend was carried out in 2022 according to the judgement of internal management due to worsening market conditions and increased uncertainties of external economy.

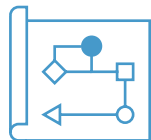
Purchasing Treasury Stock

LOTTE Chemical aims to meet shareholders' expectations by purchasing treasury stocks worth KRW 300 billion over the past 3 years from 2022 to 2024. To reinforce responsible management, we purchased a total of 284,972 shares, worth KRW 50 billion, in 2022, and this includes the purchase of 2,760 treasury stocks of 16 C-Level executives.

Selected as 2022 Excellent Corporation for Public Disclosure

Being recognized for the transparency and fulfilling the duty of public disclosure, LOTTE Chemical was selected by the Korea Exchange as an excellent corporation for public disclosure. This is selected by a combination of quantitative assessment such as disclosure performance of the previous year, and qualitative assessment such as disclosure infrastructure, briefing sessions (IR), English disclosure, and excellent work performance of person in charge. Among the 805 KOSPI-listed companies, 8 companies that were in the top 1% were selected through the quantitative and qualitative assessments.





Governance

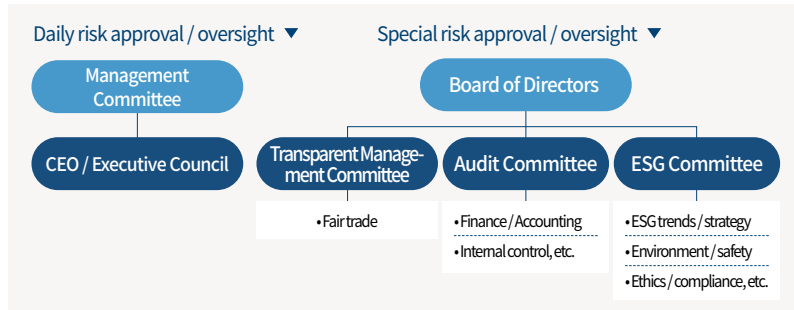
Risk Management

Integrated Risk Management System

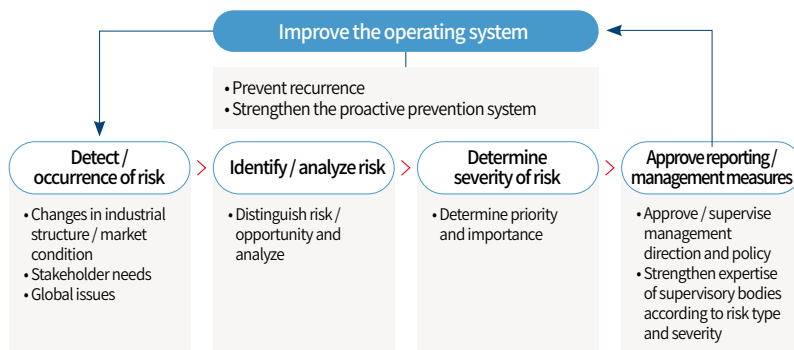
Risk Management Governance

When there are growing uncertainties, such as COVID-19 and the global economic downturn, companies must thoroughly manage risks. LOTTE Chemical identifies and responds to potential risk factors that may occur throughout its business through systematic risk management. LOTTE Chemical manages these risks by classifying them into daily risk and special risk. Daily risks are addressed at all times by forming a committee and consultative body under the leadership of the Management Committee and the CEO. Special risks have a greater impact, and hence require expert legal / technical knowledge. Relevant committees are formed within the BOD to establish a solid risk management system and prevent them in advance.

LOTTE Chemical Risk Management Governance System



LOTTE Chemical Risk Management Operation Process



Countermeasures by Risk Type

LOTTE Chemical manages risks beyond operational and financial risks, which are normally present in corporate activities, and also non-financial risks related to the environment, safety, information security, ethics and compliance in a comprehensive and systematic manner.

Category	Type	Details	Countermeasures (Solutions)
Operational risks	Management strategies	<ul style="list-style-type: none"> • Failure to upgrade business portfolio in a timely manner due to changes in industry structure / market • Reduced resource input efficiency 	<ul style="list-style-type: none"> • Reinforce periodic sensing of industry / market and company-wide portfolio inspection • Concentrate business capabilities on high value-added specialty areas • Strengthen investment deliberation, regular inspection on the progress of major investments
	Raw materials	<ul style="list-style-type: none"> • Loss of business / production due to failure in raw material acquisition 	<ul style="list-style-type: none"> • Propose long-term contracts with suppliers • Diversify raw materials such as LPG and ethane • Diversify suppliers and supply regions for raw materials
	Logistics	<ul style="list-style-type: none"> • Delivery risk due to lack of ships and accidents 	<ul style="list-style-type: none"> • Propose long-term contracts with partners • Regular monitoring by related departments • Introduce post-evaluation system for logistics companies
Financial risks	Liquidity / Credit	<ul style="list-style-type: none"> • Loss due to liquidity management failure • Risk of lowered credit due to non-compliance with trade and financial contracts 	<ul style="list-style-type: none"> • Periodic financial forecast and adjustment • Constant monitoring and management of credit rating and financial flexibility
	Internal control	<ul style="list-style-type: none"> • Company loss and damage to brand image due to misconduct 	<ul style="list-style-type: none"> • Establish internal accounting regulations and procedures • Regular monitoring and control activities by dedicated departments
	Finance	<ul style="list-style-type: none"> • Impact of exchange rate fluctuations related to global business expansion • Increased interest rate volatility due to changes in the financial market 	<ul style="list-style-type: none"> • Regular monitoring by related departments • Use of hedging tools such as SWAP of interest rate and exchange rate • Minimize financial expense by realizing an appropriate long-term and short-term borrowing structure
Non-financial risks	Environmental	<ul style="list-style-type: none"> • Violation of environmental laws • Increased expense due to lack of emission permits • Environmental pollution adversely affecting the brand image and resulting in production sanction 	<ul style="list-style-type: none"> • Reinforce law monitoring and compliance process • Establish carbon-neutral roadmap and reinforce its implementation • Reduce energy use, expand investment and secure emission rights • Expand investment in environmental facilities such as air pollution prevention facilities
	Safety	<ul style="list-style-type: none"> • Recovery cost and loss in case of safety accident • Chemical accidents and violations of laws resulting in negative brand image 	<ul style="list-style-type: none"> • Improve safety system and reinforce education for employees • Expand safety investment, such as improving inspection of high-risk facilities • Conduct regular safety inspections for all business sites and suppliers • Establish chemical substance management system
	Information security	<ul style="list-style-type: none"> • Loss / suspension of work due to information security accidents resulting in negative brand image 	<ul style="list-style-type: none"> • Regular monitoring and inspection by related departments • Education for employees
Ethics / Compliance	<ul style="list-style-type: none"> • Violations of laws and regulations such as fair trade, anti-corruption, and safety environment acts • Violation of corporate / employee ethics regulations 	<ul style="list-style-type: none"> • Establish compliance regulations and procedures • Continuous monitoring system • Education for employees 	



Spotlight

ESG Risk Management System

LOTTE Chemical established the ESG risk management system in 2022 to evaluate ESG related risks regarding the value chain surrounding the company and to respond to customers. We have developed a due diligence response framework to adjust ESG policies and standards in line with global regulations and customer requests, and to respond to strengthening of ESG evaluation procedures of customers.

LOTTE Chemical ESG Risk Management System



1 Operation of ESG Risk Management Council (Sustainability Committee)

Develop policies that reflect external trends and customer requests through the operation of the Sustainability Committee, an internal management committee, and manage and report risks of the company and supply chain and present matters to the ESG Committee for decision making based on this.

2 Policy and criteria management

- Establish and revise ESG policy book and standard documents based on customer requests and business importance

3 Risk evaluation and improvement

- Analyze major ESG risk evaluation results of HQ, affiliates, and supply chain
- Track and encourage main improvement activities

4 Respond to customer requests

- Identify customer request trends, analyze and suggest business needs
- Guide on relevant response during customer due diligence and result follow-up

5 HQ risk management

- Conduct global ESG risk management assessment with Ecovadis*
- Analyze major risk status and encourage improvement

6 Subsidiary risk management

- Select importance of affiliates according to business impact and risk level
- Establish and practice plans for assessment by importance level
- Track and encourage improvement activities

7 Supply chain risk management

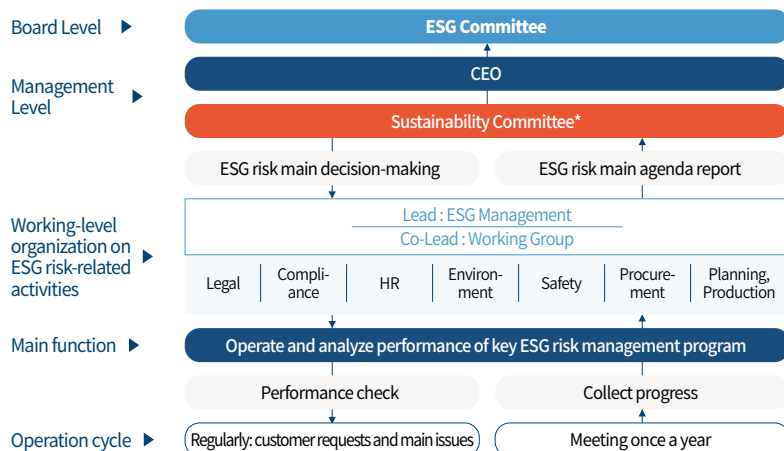
- Select importance of supply chain according to purchase impact, strategic risks, and risk level
- Establish and practice plans for assessment by importance level
- Track and encourage improvement activities

* Third-party ESG risk assessment platform with high global credibility

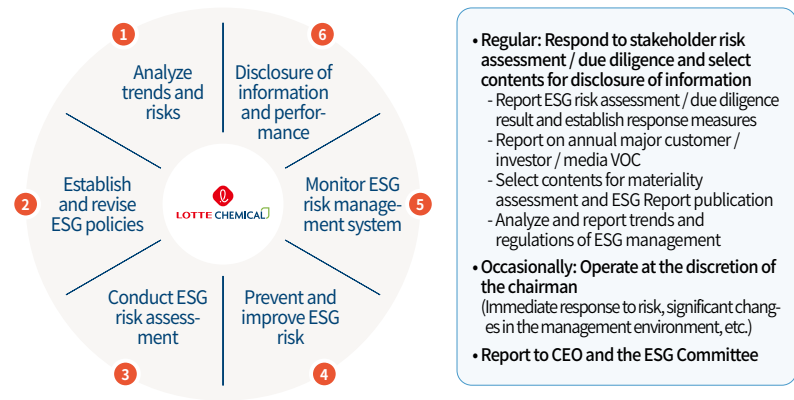
ESG Risk Management Council (Operation of Sustainability Committee)

Through the operation of the Sustainability Committee, an internal management meeting with the participation of C-Level and ESG related departments, and based on this, LOTTE Chemical develops policies that reflect external trends and customer requests, and manages overall risks of the company and supply chain and reports major risk issues to the ESG Committee.

ESG Risk Management Council



Main Functions of the Risk Management Council



* Sustainability Committee: Conducts role as an ESG risk management council, performs ESG strategic tasks and implements performance checks



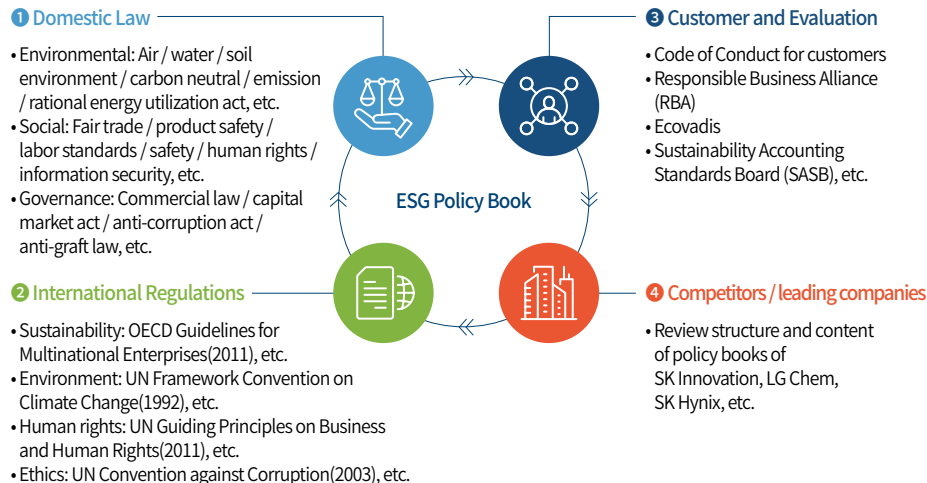
Governance

Risk Management

Risk Management through Establishment of ESG Policy Book

LOTTE Chemical's ESG policy book is a document that summarizes key standards and perspectives on major ESG risks and focuses on response to external stakeholders.

Criteria for Writing Our Policy Book



Differentiation and Advantage of Our Policy Book

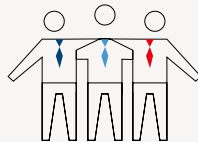
- Provide clear direction for sustainable management**

 - Internalize the Group Charter and focus on LOTTE Chemical's ESG policies
 - Implementation of the policy will be disclosed through ESG reports
- Establish systematic hierarchy**

 - Create a policy book Logic Tree in connection with internal standard documents
 - Review standard documents required to practice ESG policies in each area
- Compose policy book in preparation for response to ESG due diligence**

 - Respond to external initiatives and supply chain due diligence

Our ESG Policy Book Contents

E Environmental	S Social	G Governance	E Other (Partner companies, etc.)
<ul style="list-style-type: none"> • LOTTE Chemical Statement on Environmental Management • Environmental Management Policy <ul style="list-style-type: none"> • Establishment / operation of environmental management system • Prevention of environmental pollution <ul style="list-style-type: none"> - Reduce GHG emissions and prevent air pollution - Water resource management and prevent water pollution - Prevent soil pollution • Resource circulation • Safety management of chemical substances • Green procurement • Environment due diligence 	<ul style="list-style-type: none"> • LOTTE Chemical Statement on Human Rights • Human Rights Management Policy <ul style="list-style-type: none"> • Establishment / operation of human rights management system • Detailed policies of human rights management <ul style="list-style-type: none"> - Respect human rights - Children labor - Working hours and wages - Prohibit discrimination - Prohibit forced labor - Business site safety - Freedom of association and right to collective bargaining - Compliance with responsible minerals regulations • Safety and Health Policy • Product Safety Policy • Information Security Policy 	<ul style="list-style-type: none"> • Corporate Governance Charter • Compliance Management Charter • Ethical Management Charter <ul style="list-style-type: none"> • Establishment / operation of ethical management system <ul style="list-style-type: none"> - Ethical management system - Ethical management training - Regular and special audit • Report on violations of ethical management and protect reporters • Detailed policies on ethical management <ul style="list-style-type: none"> - Anti-corruption - Anti-trust - Fair tax policy • ESG Risk Management Policy 	<ul style="list-style-type: none"> • Code of Conduct for LOTTE Chemical Partner Companies 

APPENDICES

094 **Targets and Achievements**

102 **GRI Contents Index, TCFD Index, SASB Index, UN SDGs**

110 **Memberships**

111 **GHG Assurance Statement**

112 **Third-party Assurance Statement**

Targets and Achievements

Environmental

Achievements in 2022

Category	Key Issues	Targets for 2022	Achievement Index	Target Date	Achievement Status
Response to climate change	Implementation of Net-zero Roadmap	GHG emissions target (6.56 million tCO ₂)	Reduction compared to target (2022 performance: 6.21 million tCO ₂)	~2022	Completed
Conversion to renewable energy	Increase introduction of renewable energy	Establish RE100 roadmap and apply for global initiative membership	Establish RE100 roadmap and apply for global initiative membership	~2022	Completed
Create Green Ecosystem - for key business sites (Yeosu-basic chemicals materials / Daesan / Ulsan Plant, Yeosu Plant- advanced materials)	Water resource risk management (reduce wastewater discharge)	Wastewater discharge target: 13.74 million tons	Reduction compared to target (2022 performance: 12.88 million tons per year)	~2022	Completed
	Reduce hazardous substance emissions (air, water, waste)	Air pollutant emission target: 8,226 tons Water pollutant emission target: 1,092 tons Waste (incineration / landfill) discharge target: 22,461 tons	Reduction compared to target (air: 7,579 tons per year water: 1,209 tons per year waste: 17,170 tons per year)	~2022	Completed
					Uncompleted
Resource circulation	Establishment and management of resource circulation strategy	Recycled product sales target: 70.8 thousand tons	Additional sales compared to target	~2022	Uncompleted
High-risk chemical substance	Establishment and implementation of plan to convert high-risk chemical substances	Identify and manage implementation of high-risk chemical substances in the system	Identify and manage implementation of high-risk chemical substances in the system	~2022	Completed

Targets and Achievements

Environmental

Targets for 2023

Category	Key Issues	Targets for 2023	Achievement Index	Target Date
Response to climate change	Implementation of Net-zero Roadmap	Reduce GHG emissions (6.28 million tons per year, ▲7.6% compared to 2019)	Achieve GHG emission target	~2023
Conversion to renewable energy	Increase introduction of renewable energy	Contract at least 5% of usage	Contract achievement compared to target	~2023
Create Green Ecosystem - for key business sites (Yeosu-basic chemicals / Daesan / Ulsan Plant, Yeosu Plant-advanced materials)	Water resource risk management (reduce wastewater discharge)	Wastewater discharge target: 13.365 million tons	Reduction compared to target	~2023
	Reduce hazardous substance emission (air, water, waste)	Air pollutant emission target: 7,339 tons Water pollutant emission target: 1,231 tons Waste (incineration / landfill) discharge target: 16,529 tons	Reduction compared to target	~2023
Resource circulation	Establishment and management of resource circulation strategy	Recycled product sales target: 99.5 thousand tons	Additional sales compared to target	~2023
High-risk chemical substance	Establishment and implementation of plan to convert high-risk chemical substances	Conduct conversion of 8 types of high-risk substances	3 cases of substance replacement, 1 case of use suspension, 4 cases of content change	~2023

Targets and Achievements

Supply Chain

Achievements in 2022

Category	Key Issues	Targets for 2022	Achievement Index	Target Date	Achievement Status
Establishment of supply chain ESG risk management system	Strengthen global regulations Stakeholders and ESG assessment agency Advancement of supply chain management request	Establish supply chain ESG risk management system	<ul style="list-style-type: none"> Define supply chain and select key partner companies Establish criteria for ESG risk impact assessment Establish ESG risk management plan 	~2022	Completed
Establishment of code of conduct for supply chain	Minimize supply chain risk through spread of LOTTE Chemical ESG management	Establish code of conduct for supply chain	Establish and disclose code of conduct for supply chain	~2022	Completed

Targets for 2023

Category	Key Issues	Targets for 2023	Achievement Index	Target Date
Supply chain ESG risk assessment	Establish global supply chain due diligence act	Conduct ESG assessment for key partner companies (50 companies)	Self-assessment of partner companies (50 companies), third-party diagnosis (13 companies)	~end of June, 2023
Receipt of compliance agreement regarding supply chain code of conduct	Minimize supply chain ESG risk	Receive compliance agreement from all partner companies	Phased implementation by year (60% in 2023, 80% in 2024, and 100% after 2025)	~2023
Supply chain ESG education	Reinforce and enhance ESG management	Conduct ESG education for key partner companies	Conduct regularly (at least once a year)	~2023

Targets and Achievements

Safety and Health

Achievements in 2022

Category	Key Issues	Targets for 2022	Achievement Index	Target Date	Achievement Status
Promote safety innovation tasks	Strengthen organization and internal capabilities, system improvement, expansion of safety investment	Execute, plan and support key tasks for safety innovation	Complete safety innovation tasks (more than 8 / completed)	~2023	Completed for 8
	Expansion of investment to reinforce safety and health	Safety and health investment amount* target : KRW 17.5 billion	Achievement compared to target (2022 achievement: KRW 19.3 billion)	~2022	Completed
Promotion of 2nd cycle of business site audit (LSHEA)	Upgrading the safety and health level of domestic worksites and fostering in-house professional auditors	Organization of an audit team composed of personnel selected from each business site, inspection of improvement items from the 1st cycle and enhancing the PDCA system level	Execution of at least 16 self-inspections by the head office every year (7 plants + 9 teams)	~2023	12 teams and 3 research centers completed PJT (a total of 30)
Advanced risk assessment	Risk reduction to prevent serious accidents and disasters	Completion of risk assessment for critical processes and jobs	External consulting by the head office for domestic business sites (work + process 18 times / year)	~2022	Completed work + process 18 times Improvement rate 55% (108 / 197 cases) and established improvement plan for remaining 45%
Severe disaster prevention and management	Intensive management of hazards for serious disasters (fall, jamming)	Inspection of falling or jamming points and improvement of facilities	Rate of improvement (completion / total cases)	~2022	Discovered a total of 740 cases, completed measures for 740 cases
Securing safety and health of business partner companies	Compliance with laws and prevention of major accidents by leveling up the safety management system of partner companies	Introduction of customized safety and health management system for each type of partner companies	Partner companies assessment (completed / planned)	~2022	2 times completed compared to 2 times planned
Improvement of safety leadership	Prevention of unsafe behavior and accidents by requiring managers to safely and properly guide and manage workers	Establishment of guidelines for each position and implementation and monitoring of guidelines	Safety leadership level evaluation (once / year) • Site supervisor, general manager / head of division, etc.	~2022	<ul style="list-style-type: none"> Monitored leadership change level for key tasks (conducted 2 times) Conducted field coaching for leader, team leader, head of division (completed a total of 4 times) Currently reviewing and establishing safety leadership guidelines by position

* Costs associated with diagnosing/improving safety risks and improving employee health

Targets and Achievements

Safety and Health

Targets for 2023

Category	Key Issues	Targets for 2023	Achievement Index	Target Date
Promote safety innovation tasks	Expansion of investment to reinforce safety and health	Safety and health investment amount* target: KRW 20.5 billion	Achieve target	~2023
Advancement of partner company management system	Reduce accidents and strengthen safety capability	Reduce accidents of partner companies and enhance prevention ability	Compose council for management system improvement, establish procedures and practice improvement tasks	~2023
Upgrade of global advanced management system	Upgrade safety and health management and management system	Conduct consulting for improvement (Daesan) and expansion (Yeosu)-Conduct a new assessment	Select tasks for improvement, establish plan and execute assessment	~2023
Safety diagnosis of risk-based facilities (natural disasters)	Strengthen emergency response ability and safety management	Carry out safety diagnosis for all business sites regarding natural disasters and establish improvement plan	Safety diagnosis (5 business sites), establish improvement plan and complete improvement in preparation for natural disaster (2024)	~2024
Establish health management roadmap	Minimize health risk through enhancing health management system	Establish mid- to long-term health management roadmap	Establish health roadmap and improvement tasks	~2024
Establish response system for legal regulations	Minimize regulation response risk by understanding trends of legal and relevant authorities	Reinforce compliance monitoring of safety and health related laws and establish response system	Strengthen legal response process and identify improvement tasks	~2023
Internalize safety leadership	Establish autonomous safety culture by strengthening safety and health capability of managers for each position	Monitor safety leadership and reflect performance management policy	Key competency assessment for safety and health activities and establish process • Introduce and implement performance management indicators (KPI, MBO)	~2023

* Costs associated with diagnosing/improving safety risks and improving employee health

Targets and Achievements

Social Contribution

Achievements in 2022

Category	Key Issues	Targets for 2022	Achievement Index	Target Date	Achievement Status
Nature	<ul style="list-style-type: none"> Resource circulation 	<ul style="list-style-type: none"> Establish resource circulation system and strengthen internal and external connection Environment education to spread resource circulation culture (LOTTE Green School, etc.) 	<ul style="list-style-type: none"> Nurturing social ventures: finished 1st term, selected 3 companies for 2nd term Collectors at Incheon schools: operating 40 machines LOTTE Green School: conducted lessons at 7 local children's center Eco-friendly kids kit: donated to 200 people 	~2022	Completed
People (women / children)	<ul style="list-style-type: none"> Psychological and emotional support for children with disabilities and their parents Support for families and multi-cultural families 	<ul style="list-style-type: none"> Music therapy program for children with disabilities and their families Relieve work and child care stress for women (healing camp) 	<ul style="list-style-type: none"> MOM Music program: conducted 3,888 sessions, 238 people attended MOM Healing camp: working moms and children from 16 families participated 	~2022	Completed
Society	<ul style="list-style-type: none"> Enhance welfare of firefighters Vulnerable to fire 	<ul style="list-style-type: none"> Support counseling for firefighters Support leisure culture for families of firefighters Donate fire safety products to vulnerable people and provide safety service 	<ul style="list-style-type: none"> Supported 1 vehicle in Gyeonggi fire department Held a music performance <Pixar in Concert> and 1,450 people attended Silver generation safety keeper: sponsored 1,320 households in Gyeonggi, Jeonbuk, and Gyeongnam region 	~2022	Completed

Targets for 2023

Category	Key Issues	Targets for 2023	Achievement Index	Target Date
Nature	<ul style="list-style-type: none"> Resource circulation Ecological preservation 	<ul style="list-style-type: none"> Establish collector value chain for resource circulation Conduct environment education to spread culture of resource circulation (LOTTE Green School, etc.) Implement environment preservation activities in the local community (water quality improvement program for Seokchon lake, etc.) 	<ul style="list-style-type: none"> Operate social contribution program related to issues 	~2023
People (women / children)	<ul style="list-style-type: none"> Psychological and emotional support for children with disabilities and their parents Support for families and multi-cultural families 	<ul style="list-style-type: none"> Music therapy program for children with disabilities and their families (MOM Music program) Relieve work and child care stress for women (MOM Healing camp) 	<ul style="list-style-type: none"> Operate social contribution program related to issues 	~2023
Society	<ul style="list-style-type: none"> Enhance welfare of firefighters Vulnerable to fire 	<ul style="list-style-type: none"> Support counseling for firefighters Support leisure culture for families of firefighters Donate fire safety products to vulnerable people and provide safety service 	<ul style="list-style-type: none"> Operate social contribution program related to issues 	~2023

Targets and Achievements

Employees

Achievements in 2022

Category	Key Issues	Targets for 2022	Achievement Index	Target Date	Performance by Target	Performance by Target ●○○
Talent development	Strengthening capabilities of key talents and global competency	Establish next generation leadership course Reinforce nurturing of global talent	① Implement new team leaders / leader course ② Develop and operate information platform for expatriates ③ Develop and implement soft-landing program for returning expatriates	~2022	① Completed new team leaders / leader course ② Completed development of HI HR expatriate bulletin board ③ Completed buddy program course for returning expatriates and all eligible persons completed the program	●○○
	Strengthening job competency	Enhance job competency of production staff	① Expand education eligibility for production process technology course ② Establish Master lecturer policy (to nurture candidates)	~2022	① Completed development of production process technology course for (Daesan) business site ② Completed launch of online education platform (expansion of job positions subject to education)	●○○
Employee-friendly organizational culture	Continuing to improve corporate culture	① Operation of organizational culture TFT ② Implementation of activities to improve value creation culture evaluation result	① Expand communication channels ② Promote activities to build employee consensus	~2022	① Conducted events including publishment of monthly newsletter, establishment of organizational culture slogan, Chemi Talk, and communication exam, etc. ② Creation culture evaluation result: 75.15 points (+3.7 points compared to 2021)	●○○
	Improving workplace culture	① Psychological counseling for employees ② Implement program for improving workplace culture	① Expand employee counseling and program ② Implement program for improving workplace culture	~2022	① Conducted employee counseling program, empathy program, events and published monthly notice ② Conducted organizational culture promotion programs	●○○
HR management	Advancing workforce utilization	Reform and revitalize the new policy	① Diversify and expand positions on Job-Postings ② Expand opportunities to change departments and positions through reorganization of personnel policy	~2022	① Expanded positions on Job-Postings (transition among companies, internal transfers) ② Abolished rotational movement for all departments, reflected the need for position transfer	●○○
	Securing and retention of excellent human resources	Motivate excellent internal personnel and improve voluntary immersion	Implement research fellow system and establish excellent talent management system	~2022	Create a research-focused atmosphere through the newly established researcher fellow system, instill sense of honor	●○○

Targets and Achievements

Employees

Targets for 2023

Category	Key Issues	Targets for 2023	Achievement Index	Target Date
Human rights management	Advancing and implementing human rights management system	<ul style="list-style-type: none"> ① Establish human rights management practice regulations ② Introduce human rights impact assessment 	<ul style="list-style-type: none"> ① Established and implemented internalization of human rights management practice regulations ② Established system for human rights impact assessment 	~2023
	Establishing excellent talent management system	<ul style="list-style-type: none"> ① Implement systematic management of key talents ② Rationally improve evaluation policy 	<ul style="list-style-type: none"> ① Established criteria and management process for key talents ② Advanced evaluation policy, improved rate of positive response for evaluation 	~2023
HR management	Enhancing workforce utilization	Introduce self-directed career management system	Vitalized employee self-directed career development such as constant registering of career	~2023
	Rationalizing duties	<ul style="list-style-type: none"> ① Improve policy to effectively operate rewards ② Streamline leave and return from leave, systemize evaluation 	<ul style="list-style-type: none"> ① Strengthened employee motivation through introduction of rewards system ② Increased convenience for employees on leave, enhanced data management level, reduced burden for person in charge 	~2023
Talent development	Securing and nurturing excellent talents	Secure external excellent talent and manage key talents systematically	<ul style="list-style-type: none"> ① Secured external excellent talent ② Subdivided key talents and provided education fit for each job position level ③ Conducted education for employees in new positions 	~2023
		Promote activities to secure excellent talents	<ul style="list-style-type: none"> ① Recruitment activities for undergrad/graduate students ② Improvement activities for employer branding 	~2023
	Enhancing job capability	Expand development for production process technology course	Expanded production process technology course to other business sites	~2023

GRI Contents Index, TCFD Index, SASB Index and UN SDGs

GRI Contents Index

Statement of use	LOTTE Chemical applies the GRI standards when reporting ESG / sustainability for the period from January 1, 2022 to December 31, 2022.
GRI 1 used	GRI 1 : Foundation 2021
Applicable GRI Sector Standard(s)	We will report after disclosure of LOTTE Chemical Chemicals sector.

GRI Standard	Disclosure No.	Disclosure Indicators	Page	Reason for blank	Note
GRI 2: General Disclosures					
GRI 2 : General Disclosures 2021	2-1	Organization details	6, 8-9, DB 4		
	2-2	Entities included in the organization's sustainability reporting	2		
	2-3	Reporting period, frequency and contact point	2		
	2-4	Restatements of information	-	N/A	No significant change
	2-5	External assurance	2, 112		
	2-6	Activities, value chain and other business relations	7-10, 12-14		
	2-7	Employees	DB 19-21		
	2-8	Workers who are not employees	DB 21		
	2-9	Governance structure and composition	86-88, DB 28		
	2-10	Nomination and selection of the highest governance body	86, 88		
	2-11	Chair of highest governance body	86		
	2-12	Role of highest governance body in overseeing the management of impacts	16-18, DB 28		
	2-13	Delegation of responsibility for impact management impacts	17, 87, DB 29		
	2-14	Role of highest governance body in sustainability reporting	17-18, DB 29		
	2-15	Conflicts of interest	86, 88		
	2-16	Communication of critical concerns	17, 87, DB 29		
	2-17	Collective knowledge of the highest governance body	88		
	2-18	Evaluation of the performance of the highest governance body	89		

GRI Contents Index, TCFD Index, SASB Index and UN SDGs

GRI Contents Index

GRI Standard	Disclosure No.	Disclosure Indicators	Page	Reason for blank	Note
GRI 2 : General Disclosures 2021	2-19	Remuneration policies	89, DB 30		
	2-20	Process to determine remuneration	89		
	2-21	Annual total compensation ratio	DB 30		
	2-22	Statement on sustainable development strategy	5		
	2-23	Policy commitments	54, 59, 71, 78, 89, 92, 114-132		
	2-24	Embedding policy commitments	54, 59, 71, 78, 89, 92, 114-132		
	2-25	Process to remediate negative impacts	71-72, 78, 80-81, DB 19, 24		
	2-26	Mechanisms for seeking advice and raising concerns	70, 71-72, 80-81, DB 19, 24		
	2-27	Compliance with laws and regulations	DB 32		
	2-28	Membership associations	110		
	2-29	Approach to stakeholder engagement	19		
2-30	Collective bargaining agreements	69, DB 23			
GRI 3: Material Topics					
GRI 3 : Material Topics 2021	3-1	Process to determine material topics	20		
	3-2	List of material topics	20		
Response to Climate Change GRI 201-2, GRI 302: Energy, GRI 305: Emissions					
GRI 3 : Material Topics 2021	3-3	Management of material topics	21, 26		
GRI 201 : Economic Performance 2016	201-2	Financial implications and other risks and opportunities due to climate change	28, 36		
GRI 302 : Energy 2016	302-1	Energy consumption within the organization	DB 9		Type 2 verification
	302-3	Energy intensity	DB 9		Type 2 verification

GRI Contents Index, TCFD Index, SASB Index and UN SDGs

GRI Contents Index

GRI Standard	Disclosure No.	Disclosure Indicators	Page	Reason for blank	Note
GRI 305 : Emissions 2016	305-1	Direct GHG emissions (Scope 1)	27, 29, DB 7		Type 2 verification
	305-2	Indirect GHG emissions (Scope 2)	27, 29, DB 8		Type 2 verification
	305-3	Other indirect GHG emissions (Scope 3)	30, DB 8		Type 2 verification
	305-4	GHG emissions intensity	DB 8		Type 2 verification
	305-7	Nitrogen oxides, sulfur oxides, and other significant air emissions	57, DB 12		Type 2 verification
Create Green Ecosystem (waste / water resources / emissions substance management) GRI 303: Water and wastewater, GRI 306: Waste					
GRI 3 : Material Topics 2021	3-3	Management of material topics	21, 57-58		
GRI 303 : Water and Effluents 2018	303-1	Interactions with water resources as a shared resource	58		
	303-3	Water withdrawal	DB 10		Type 2 verification
	303-4	Wastewater discharge	58, DB 10-11		Type 2 verification
	303-5	Water consumption	DB 11		Type 2 verification
GRI 306 : Waste 2020	306-1	Waste generation and significant waste-related impacts	57, DB 13-14		Type 2 verification
	306-2	Management of significant waste-related impacts	57, DB 13-14		Type 2 verification
	306-3	Waste generated	57, DB 13		Type 2 verification
	306-4	Waste diverted from disposal	DB 13		Type 2 verification
	306-5	Waste directed to disposal	DB 13-14		Type 2 verification

GRI Contents Index, TCFD Index, SASB Index and UN SDGs

GRI Contents Index

GRI Standard	Disclosure No.	Disclosure Indicators	Page	Reason for blank	Note
Establishment and Management of Resource Circulation Strategy GRI 301: Raw Materials					
GRI 3: Material Topics 2021	3-3	Management of material topics	21, 32-35, 42-43		
GRI 301: Materials 2016	301-2	Recycled input materials used	32-35, DB 14		
Diagnosis / Improvement of Safety Risks and Enhancement of Employee Health GRI 403: Occupational Health and Safety					
GRI 3: Material Topics 2021	3-3	Management of material topics	21, 61		
GRI 403: Occupational Health & Safety 2018	403-1	Occupational health and safety management system	61, DB 17		Type 2 verification
	403-2	Hazard identification, risk assessment, and incident investigation	62, 64		Type 2 verification
	403-3	Workplace safety program	62-64		
	403-4	Employee engagement, counseling and communication regarding occupational health and safety	64		
	403-5	Worker education on occupational health and safety	65		
	403-6	Promotion of worker health	64, 69		Type 2 verification
	403-8	Workers covered by an occupational health and safety management system	61-62, DB 17		Type 2 verification
	403-9	Work-related injuries	DB 17-19		Type 2 verification
	403-10	Work-related ill health	DB 18		Type 2 verification
	Strengthen Ethics / Compliance Management GRI 205: Anti-corruption, GRI 206: Anti-competition				
GRI 3: Material Topics 2021	3-3	Management of material topics	21, 80, 82		
GRI 205: Anti-corruption 2016	205-1	Operations assessed for risks related to corruption	80, 84, DB 31		
	205-2	Announcement and education on anti-corruption policies and procedures	81, DB 32		
	205-3	Confirmed incidents of corruption and actions taken	81, DB 32		Type 2 verification
GRI 206: Anti-competitive Behavior 2016	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	82-84, DB 32		

GRI Contents Index, TCFD Index, SASB Index and UN SDGs

TCFD Index

Category	TCFD Recommendations	LOTTE Chemical Response Status	Page
Governance	a) Describe the Board's oversight of climate-related risks and opportunities	LOTTE Chemical has integrated the perspective of climate change-related risks and opportunities in the decision-making of management such as carbon neutrality strategy and roadmap, and RE100 membership, and has managed through the ESG Committee under the BOD.	17, 28, 39
	b) Describe management's role in assessing and managing climate-related risks and opportunities	LOTTE Chemical has newly established the Sustainability Committee, Net-Zero Council to regularly monitor ESG risk management including continuous strategic task management and climate change response.	17, 28, 39, 91
Strategy	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	Considering the internal and external stakeholders and impact period (short-, medium-, and long-term), LOTTE Chemical analyzes the physical / regulation transition / energy paradigm change risks related to climate change and establishes response measures and a risk management process system.	28
	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	LOTTE Chemical strives to prevent management environmental risks posed by climate crisis through establishing a mid-to-long-term plan to respond to phase 3 of the GHG emissions trade system.	29
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	Based on the government's target of 2050 net-zero and 2030 reduction of 11.4% compared to 2018 set in 2021, LOTTE Chemical analyzed the climate scenario and established plans to promote transition to hydrogen, commercialize CCUS, and purchase renewable energy and recycle plastic.	28-30
Risk Management	a) Describe the organization's processes for identifying and assessing climate-related risks	LOTTE Chemical conducted analysis on global standards, evaluation criteria, media, and leading group benchmarking, and is carrying out risk assessments by reflecting the opinions of stakeholders (employees, customers, government, investors, partner companies, local community).	28
	b) Describe the organization's processes for managing climate-related risks	LOTTE Chemical reports risk response measures and strategies to management, and establishes its risk management process system according to management's decision.	17, 28
	c) Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management	LOTTE Chemical reflects non-financial risks, including climate change, and operational and financial risks in the company's management decisions through the ESG Committee risk management governance.	87, 90-92
Metrics & Targets	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	LOTTE Chemical monitors the emission performance such as of Scope 1, stationary combustion emissions, Scope 2, and Scope 3, intensity and change rate of GHG emissions, GHG sales volume, eco-friendly investment for environmental management, and percentage of zero-emission vehicles.	DB 7-8, 15
	b) Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 GHG emissions and the related risks	Scope 1 : 4,187,489 tCO ₂ eq Scope 2 : 2,027,270 tCO ₂ eq Scope 3 : 18,005,017 tCO ₂ eq Related risks: Regulatory risk (reinforcement of emission trade policy according to national NDC reinforcement, introduction of carbon price), Energy paradigm change risk (carbon-intensive business, change in consumer and market preference of product, expansion of climate-related initiatives)	28-30, DB 7-8
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets	LOTTE Chemical will establish GHG reduction plans and set KPIs by 2030, and strive to meet achievements.	21, 29-30, 94-95

GRI Contents Index, TCFD Index, SASB Index and UN SDGs

SASB Index

Category	Topic	Unit	SASB Code	LOTTE Chemical Response Status				Note
				2022	2021	2020	Page	
GHG Emissions	Gross global Scope 1 emissions	tCO ₂ eq	RT-CH-110a.1	4,187,489	4,442,336	3,623,932	DB 7	
	Percentage covered under emissions-limiting regulations	%	RT-CH-110a.1	100.0	100.0	100.0	DB 7	
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	-	RT-CH-110a.2	Retention	Retention	Retention	27, 29	Establish Green Promise 2030 Net-zero roadmap
Air Quality	(1) Nitrogen oxide (NOx) (excluding Nitrous oxide)	Tons	RT-CH-120a.1	6,938	8,195	11,274	DB 12	
	(2) Sulfur oxide (SOx)	Tons	RT-CH-120a.1	147	210	245	DB 12	
	(3) Volatile organic compounds (VOCs)	Tons	RT-CH-120a.1	121	120	-	DB 12	Calculated since 2021
	(4) Hazardous air pollutants (HAPs)	Tons	RT-CH-120a.1	76	65	-	DB 12	Calculated since 2021
Energy Management	(1) Total energy consumed	TJ	RT-CH-130a.1	118,643	125,886	95,478	DB 9	Total energy consumption of internal organizations
	(2) Percentage renewable	%	RT-CH-130a.1	0.01 or less	0.01 or less	0.01 or less	DB 9	
	(3) Total self-generated energy	TJ	RT-CH-130a.1	9,336	16,924	13,134	DB 9	
Water Management	(1) Total water withdrawal	Thousand tons	RT-CH-140a.1	43,920	46,347	39,407	DB 10	
	(2) Total water consumed	Thousand tons	RT-CH-140a.1	28,874	31,049	24,854	DB 11	
	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	Cases	RT-CH-140a.2	2	2	0	DB 11	
	Description of water management risks and discussion of strategies and practices to mitigate those risks	-	RT-CH-140a.3	Retention	Retention	Retention	58	Water resource risk management
Hazardous Waste Management	Amount of hazardous waste generated	Tons	RT-CH-150a.1	39,249	37,819	29,956	DB 13	Designated waste discharge

GRI Contents Index, TCFD Index, SASB Index and UN SDGs









SASB Index

Category	Topic	Unit	SASB Code	LOTTE Chemical Response Status				Note
				2022	2021	2020	Page	
Community Relations	Discussion of engagement processes to manage risks and opportunities associated with community interests	-	RT-CH-210a.1	Retention	Retention	Retention	34-36, 75	Resource circulation activities such as collecting plastic waste in local communities, management of the impacts on local communities
Workforce Health & Safety	(a) Total recordable incident rate (TRIR) of direct employees	No. of cases per 200,000 working hours	RT-CH-320a.1	0.070	0.135	0.140	DB 17	
	(b) Total recordable incident rate (TRIR) of contract employees	No. of cases per 200,000 working hours	RT-CH-320a.1	0.17	0.14	0.10	DB 18	
	(a) Fatality rate of direct employees	%	RT-CH-320a.2	0.0	0.0	0.0	DB 17	
	(b) Fatality rate of contract employees	%	RT-CH-320a.2	0.0	0.0	0.0	DB 18	
Safety & Environmental Stewardship of Chemicals	(1) Percentage of products that contain Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and 2 Health and Environmental Hazardous Substances	%	RT-CH-410b.1	10.1	-	-	DB 14	
	(2) Percentage of such products that have undergone a hazard assessment	%	RT-CH-410b.1	100.0	-	-	DB 14	
Management of the Legal & Regulatory Environment	Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry	-	RT-CH-530a.1	Retention	Retention	Retention	28, 90-92	Analyze regulatory risks and opportunities
Operational Safety, Emergency Preparedness & Response	Process Safety Incidents Count (PSIC)	Cases	RT-CH-540a.1	0	3	1	DB 19	
	Process Safety Total Incident Rate (PSTIR)	No. of cases per 200,000 working hours	RT-CH-540a.1	0	0.069	0.023	DB 19	
	No. of transport incidents	Cases	RT-CH-540a.2	0	0	0	DB 19	

GRI Contents Index, TCFD Index, SASB Index and UN SDGs

UN SDGs(Sustainable Development Goals) Commitment

LOTTE Chemical promotes activities that connect the direction of ESG management with the targets of UN SDGs, and seeks to join in achieving the sustainable development goals, common goals of mankind.

UN SDGs	UN SDGs	LOTTE Chemical Main Activities	Page
	Establish Good Health and Well-Being for all ages	<ul style="list-style-type: none"> • Group accident insurance • Mental health care 	68-69
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	<ul style="list-style-type: none"> • Enhancing global competency education, talent nurturing program such as online education 	66-67
	Achieve gender equality and empower all women and girls	<ul style="list-style-type: none"> • Customized programs for women and children • Stipulation of anti-discrimination through enactment of human rights management policy 	71, 76-77
	Ensure availability and sustainable management of water and sanitation for all	<ul style="list-style-type: none"> • Reuse of process water, cleaning water, and firefighting water, and the identification of the degree of pollution of reused water • Operation of its own wastewater treatment plant (Daesan, Yeosu, Ulsan Plant) 	58
	Ensure access to affordable, reliable, sustainable and modern energy for all	<ul style="list-style-type: none"> • Introduction of an energy management system • Use of renewable energy sources in business sites at home and abroad • Introduction of zero-emission vehicles • Launch of the hydrogen energy and battery material business group 	29, 38-39
	Ensure responsible consumption and production patterns	<ul style="list-style-type: none"> • Establishment and implementation of green procurement policy • Compliance with responsible mineral regulations • Recruitment for the 2nd term of Project LOOP social venture • Eco-friendly raw material procurement • Production of 1 million tons of green recycled products • Obtainment of Global Sustainable Materials Certification 'ISCC PLUS' 	33-36, 59
	Take urgent action to combat climate change and its impacts	<ul style="list-style-type: none"> • Establishment of goals and action plan for 2030 carbon reduction and 2050 Net-Zero • Activities to reduce GHGs • Participation in CDP Climate Change information disclosure 	23, 26-30
	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	<ul style="list-style-type: none"> • Acquisition of ISO 37301 and operation of the anti-corruption monitoring system • Compliance education and activities to eliminate risks 	82-83

Memberships

Memberships of Associations

Korea Industrial Safety Association	Korea Productivity Center	Korea Fair Competition Federation	Korea Fine Chemical Industry Promotion Association
Korea Chamber of Commerce and Industry	Korea Petrochemical Industry Association	Korea Customs Logistics Association	Korea Intellectual Property Association
The Federation of Korean Industries	Korea Fire Safety Institute	Korea Management Association	Korea Plastics Pipes Research Society
Korea Business Council for Sustainable Development	Korea Hydrogen Industry Association	The Membrane Society of Korea	The Korean Institute of Chemical Engineers
Korea Responsible Care Council	Korea AEO Association	Korea International Trade Association	Korea Chemicals Management Association
Korea Enterprises Federation	Korea Engineering and Consulting Association	Korean Association for Radiation Application	Korea Chemical Industry Council
The Polymer Society of Korea	Korea Association for Exterior Insulation	Korea Listed Companies Association	Korea-Japan Economic Association
The Korean Society of Industrial and Engineering Chemistry	Korea Personnel Improvement Association	Korea Water & Wastewater Works Association	

GHG Assurance Statement



Assurance Statement on 2022 GHG Emissions

Verification Target

Korean Foundation for Quality (hereinafter “KFQ”) has conducted the verification of “2022 Report on Quantity of emitted Greenhouse gas Consumption (hereinafter “Inventory Report”) for LOTTE Chemical Corporation (hereinafter “Company”).

Verification Scope

KFQ’s verification was focused on all the facilities which emitted the greenhouse gas during the year of 2022 under Company’s operational control and organizational boundary. GHG emissions from direct and indirect emission sources (Scope 1 and 2) were calculated for all GHG emission facilities under the operational control of each company.

Verification Criteria

The verification process was based on ‘Rule for emission reporting and certification of greenhouse gas emission trading Scheme (Notification No. 2021-112 of Ministry of Environment)’, ‘Rules for verification of operating the greenhouse gas emission trading scheme (Notification No. 2022-279 of Ministry of Environment)’.

Level of Assurance

The Verification has been planned and conducted as the ‘Rules for verification of operating the greenhouse gas emission trading scheme’, and the level of assurance for verification shall be satisfied as reasonable level of assurance. And it confirmed through the internal review whether the process before the verification conducted effectively.

Verification Limitation

The verification shall contain the potential inherent limitation in the process of application of the verification criteria and methodology.

Verification Opinions

Regarding to the data of the Greenhouse Gas Emission Consumption from the report through the verification, KFQ provides our verification opinions as below;

- 1) The Inventory Report has been stated in accordance with ‘Rule for emission reporting and certification of greenhouse gas emission trading Scheme’
- 2) The result of Material discrepancy satisfied the criteria for an organization that emits less than 500,000 tCO₂eq shall not exceed 5% from total emission as per ‘Rules for verification of operating the greenhouse gas emission trading scheme’
- 3) Thus, KFQ conclude that the Greenhouse Gas Emissions of Each Company in 2022 is correctly calculated and stated in accordance with ‘Rule for emission reporting and certification of greenhouse gas emission trading Scheme’.

Emission calculation results

(Unit: tCO₂eq)

Business site	Scope 1	Scope 2	Total
Sum	4,187,489	2,027,270	6,214,753

Jul 5th , 2023

Korean Foundation for Quality CEO **Ji-Young Song**

Third-party Assurance Statement



BSI Group Korea Assurance Statement

The Stakeholders of LOTTE Chemical Corporation

Introduction and objectives of work

BSI Group Korea (hereinafter “the Assurer”) was asked to verify 2022 LOTTE Chemical ESG Report (hereinafter “the Report”). This assurance statement applies only to the relevant information contained in the scope of the assurance. LOTTE Chemical is solely responsible for all information and assertion contained in the report. The responsibility of the assurance is to provide independent assurance statement with expert opinions to LOTTE Chemical by applying the verification methodology and to provide this information to all stakeholders of LOTTE Chemical.

Assurance Standards and Levels

This assurance was based on the AA1000 AS v3(2020) Assurance Standard and confirmed that the report is prepared in accordance with the GRI Standards. The assurance level was based on the Type 1 that confirmed compliance with the four principles of AA1000 AP(2018) in accordance with the AA1000 AS and the Type 2 assurance that verified the quality and reliability of the information disclosed in the report. The Type 2 assurance was applied to the following disclosure of the GRI Topic Standards related to material topics:

Topic Standards

205-3(Anti-corruption), 302-1&3(Energy), 303-3~5(Water and Effluents), 305-1~4&7 (Emissions), 306-1~5(Effluents and Waste), 403-1,2&6~10(Occupational Health and Safety)

Scope of Assurance

The scope of assurance applied to this report is as follows;

- Based on the period from January 1st to December 31st 2022 included in the report, some data included 2023.
- Major assertion included in the report, such as sustainability management policies and strategies, goals, projects, and performance, and the report contents related to material issues determined as a result of materiality assessment.
- Conformity, appropriateness and consistency of internal processes and systems for information, data collection, analysis and review.

The following contents were not included in the scope of assurance.

- Financial information presented in the report.
- Disclosures in the international standards and initiatives index excluding GRI presented in the report.
- Other related additional information such as the website, business annual report.

Methodology

As part of its independent assurance, the assurer has used the methodology developed to collect relevant evidence to comply with the verification criteria and to reduce errors in the reporting, and has performed the following activities;

- Review of the system for sustainability management strategy process and implementation
- Review of materiality issue analysis process and verification of the result to determine verification priorities,
- Review of the evidence to support the material issues through interviews with senior managers with responsibility for them
- Verification of data generation, collection and reporting for each performance index

Limitation

The assurer performed limited verification over a limited period based on the data provided by the reporting organization. This means that no significant errors are found during the verification process, and that there are limitations associated with the inevitable risks that may exist. The assurer does not provide assurance for possible future impacts that cannot be predicted or verified during the verification process and any additional aspects related thereto.

Assurance Opinion

On the basis of our methodology and the activities described above, it is our opinion that

- The information and data included in the report are accurate and reliable and the assurer cannot point out any substantial aspects of material with mistake or misstatement.
- The report is prepared in accordance with the GRI Standards. (Reporting in accordance with the GRI standards)
- The assurance opinion on the four principles presented by the AA1000 AP(2018) is as follows.

AA1000 AP(2018)

Inclusivity: Stakeholder Engagement and Opinion

LOTTE Chemical defined customers, employees, shareholders/investors, local communities and suppliers as key stakeholder’s groups, and operates communication channels for each group for stakeholder engagement. LOTTE Chemical reflected key issues drawn through stakeholder channels in sustainability management decisions and disclosed the process in the report.

Third-party Assurance Statement

BSI Group Korea Assurance Statement

Materiality: Identification and reporting of material sustainability topics

LOTTE Chemical has established strategies related to sustainable management and built processes to derive reporting issues. Based on media research analysis, global advanced company benchmarking, analysis of major global sustainability initiatives and ESG evaluation indicators, the company identifies the financial and environmental/social impacts and derives 5 critical material issues, which are disclosed through reports.

Responsiveness: Responding to material sustainability topics and related impacts

LOTTE Chemical established the management process for key reporting issues determined by the materiality assessment. In order to respond appropriately to the expectations of stakeholders, LOTTE Chemical disclosed the process including policy, indicator, activity and response performance on key reporting issues in the report.

Impact: Impact of an organization's activities and material sustainability topics on the organization and stakeholders

LOTTE Chemical established the process to identify and evaluate the impact on organizations and stakeholders related to key reporting issues. LOTTE Chemical used impacts, risk and opportunity factor analysis results for key reporting issues to make decisions to develop response strategies for each issue, and disclosed the process in the report.

Key areas for ongoing development

To the extent that the results of the verification are not affected, the following comments were made.

- LOTTE Chemical has been selected as an major material issue for climate change response through a materiality assessment. As a result, it has reported progress in various improvement activities, such as establishing a Net-Zero goal for 2050, strengthening climate change governance, and voluntarily reducing greenhouse gas emissions. By presenting a medium to long-term strategy and a specific implementation plan, it can further enhance its responsiveness to climate change.
- LOTTE Chemical is promoting activities such as supply chain ESG risk evaluation and establishment of partner behavior guidelines for supply chain ESG risk management. If they report on major issues and measures to address them based on the results of supply chain ESG risk evaluations, they can increase the responsiveness of supply chain ESG.

- To achieve effective ESG management performance, it is recommended to establish a system for regularly collecting and managing performance data for each area of the economy, society, and environment, and regularly managing performance against goals. It is also recommended to integrate internal audit processes for managing data reliability.

Statement of independence and competence

The assurer is an independent professional institution that specializes in quality, environment, safety and health, energy and anti-bribery, compliance related ESG management with almost 120 years history in providing independent assurance services. No member of the assurance team has a business relationship with LOTTE Chemical. The assurer has conducted this verification independently, and there has been no conflict of interest. All assurers who participated in the assurance have qualifications as AA1000AS assurer, have a lot of assurance experience, and understand the BSI Group's assurance standard methodology.

Evaluation against GRI 'In Accordance' Criteria

The assurer confirmed that this report is prepared in accordance with the GRI Standards, and the disclosures related to the following Universal Standards and Topic Standards Indicators based on the data provided by LOTTE Chemical, the sector standard was not applied.

[Universal Standards]

2-1 to 2-5 (The organization and its reporting practices), 2-6 to 2-8 (Activities and workers), 2-9 to 2-21 (Governance), 2-22 to 2-28 (Strategy, policies and practices), 2-29 to 2-30 (Stakeholder engagement), 3-1 to 3-3 (Material Topics Disclosures)

[Topic-specific Standards]

201-2, 205-1~3, 206-1, 301-2, 302-1&3, 303-1,3-5, 305-1~4&7, 306-1~5, 403-1~10



27 June 2023

S. H. Lim / BSI Group Korea, Managing Director

LOTTE Chemical ESG POLICY BOOK

E	115	Environmental Management
S	117	Human Rights Management
	119	Safety and Health
	120	Product Safety, Information Security
G	121	Governance
	125	Compliance Management
	126	Ethical Management
	127	ESG Risk Management
	129	ESG Code of Conduct for Partner Companies

※ Guidelines for preparing Policy Book and references (international norms and domestic laws) are included in Page 92 of this report.

Environmental Policy

LOTTE Chemical Statement on Environmental Management

We strive to pursue the sustainable development of humanity, and contribute to the enrichment of our individuals and communities. In this regard, we set forth this “LOTTE Chemical Statement on Environmental Management” as standards of conduct, performance, and ethics all of our officers and employees must comply with in the course of business operation and management in order for LOTTE Chemical to focus on environmental values as a core element of business activities and practice environmental management. This Statement is based on the Constitution of the Republic of Korea and other applicable Korean laws, including the Framework Act on Environmental Policy, and the Framework Act on Carbon Neutrality and Green Growth for Coping with Climate Crisis, as well as international laws, including the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity. We commit to comply with this Statement and put our commitments into actions.

1. We assist individuals and general public to enjoy their right to live in a healthy and pleasant environment, and are committed to environmental preservation in the course of business operation and management.
2. We strive to prevent environmental pollution by complying with the Constitution of the Republic of Korea, as well as domestic and international environmental laws, and committing to meet internal environmental standards which are higher than those set forth by the law.
3. We establish and implement an environmental management system (the process of which may include setting goals, establishing management plans, and forming relevant organizations) to manage our business in a manner to conserve and efficiently use resources and energy, to minimize greenhouse gas emissions and environmental pollution, and to fulfill social and ethical responsibilities (hereinafter referred to as “environmental management”).
4. We, throughout the course of business activities, strive to use environmentally friendly raw materials and improve manufacturing processes, fundamentally reduce the emission of polluting substances through conservation of resources and promotion of recycling, and minimize the harmful impact to the environment caused by the use and disposal of products.
5. We, with the understanding that the climate crisis affects all mankind, proactively join the government and international society’s effort in suppressing the rise of the global average temperature, and strive to transition to a net zero carbon society.
6. We, throughout the course of business activities and with the understanding that biodiversity is important, strive to utilize elements of biodiversity in a manner and speed that does not cause a decrease in biodiversity, and reduces negative impact on biodiversity.
7. We strive to promote access to information for stakeholders by periodically and transparently disclosing information on the results of our environmental management, including greenhouse gas emissions, reductions thereof, and information on sustainable development.
8. We strive to nurture strong partnerships with our business partners and to achieve mutual growth and development by establishing and executing measures to encourage our business partners to introduce and promote an environmental management system, including providing information on environmental management systems and results.

We pledge to do our utmost in implementing and advancing environmental management as set forth above.

All officers and employees of LOTTE Chemical

Environmental Policy

Environmental Management Policy

Establishment and Operation of Environmental Management System

LOTTE Chemical Corporation (hereinafter referred to as 'LOTTE Chemical' or 'Company') is committed to management that fulfills its social and ethical responsibilities ('environmental management') while saving and efficiently using resources and energy and minimizing GHG emissions and environmental pollution. To achieve this, we will establish and execute an environmental management system, such as establishing relevant organizations to ensure the successful implementation of these goals.

Prevention of Environmental Pollution

LOTTE Chemical uses raw materials with minimal environmental pollution throughout its business operations, enhances processes, and fundamentally curtails the release of pollutants by promoting resource conservation and recycling. Additionally, we aim to mitigate the environmental impact resulting from product usage and disposal. To achieve this, we have implemented the following policies.

Reduction of GHG Emissions and Prevention of Air Pollution

LOTTE Chemical is fully committed to minimizing GHG emissions caused by its business operations and taking proactive measures to prevent air pollution. To achieve these goals, we have established and enforced internal environmental standards that surpass the legal emission thresholds.

Water Resource Management and Prevention of Water Pollution

LOTTE Chemical strives to efficiently manage and utilize water resources through practices like water conservation and recycling. In operating wastewater treatment facilities within the workplace, we establish and implement internal environmental standards that are more stringent than the legal discharge limits, aiming to proactively prevent water pollution.

Prevention of Soil Pollution

LOTTE Chemical takes utmost care to prevent soil contamination. This includes not only compliance with legal requirements but also conducting regular inspections of facilities that could potentially cause soil pollution, following the company's internal guidelines for soil contamination prevention.

Resource Circulation

LOTTE Chemical strives to minimize waste generation by efficiently utilizing resources and energy, optimizing the material and structure of processes and products, and minimizing the conversion of essential items like products, raw materials, materials, and containers into waste during business activities. LOTTE Chemical endeavors to facilitate the circular utilization by either reusing waste materials internally or sorting wastes based on their types and intended applications for more efficient disposal.

Chemical Safety Management

LOTTE Chemical recognizes that the impact of chemicals on human health and the environment during their usage can influence the competitiveness of our products and the company as a whole. In line with this awareness, we (i) strive to reduce the use of hazardous and harmful chemicals to prevent or minimize risks to public health and the environment; (ii) embrace innovative approaches like developing substitute materials or new technologies; and (iii) diligently implement necessary measures such as maintaining appropriate facilities and equipment, employee training, technology development, and information exchange to prevent any potential harm to public health or the environment caused by chemical usage.

Green Purchase

LOTTE Chemical aims to prevent resource waste and environmental pollution while contributing to GHG reduction. This is achieved by promoting and popularizing the usage and consumption of products (referred to as 'green products') that minimize energy and resource input as well as the generation of GHG emissions and pollutants. LOTTE Chemical may adopt and implement internal guidelines concerning green product procurement policies to achieve this objective.

Environmental Due Diligence

LOTTE Chemical conducts preemptive environmental due diligence when examining new businesses and investments to assess their impact on values aligned with LOTTE Chemical Statement on Environmental Management, including climate crisis, biodiversity, and water resources, with a commitment to reducing any negative consequences.

Social Policy

LOTTE Chemical Statement on Human Rights

We pursue “human rights management” which can have a positive impact on not only our customers but also our society as a whole, and aims to contribute to the enrichment of individuals and communities. In this regard, we set forth this “LOTTE Chemical Statement on Human Rights” as standards of conduct, performance, and ethics all of our officers and employees must comply with in the course of business operation and management in order for LOTTE Chemical to become a corporation advancing human wellbeing. This Statement is based on international human rights principles and standards, including the UN Universal Declaration of Human Rights, the UN Guiding Principles on Business and Human Rights, the OECD Guidelines for Multinational Enterprises, and the UN Convention on the Rights of the Child. We commit to comply with this Charter and to put our commitments into actions.

1. We respect all human dignity and value, and prioritize human rights management in managing our business.
2. We respect international human rights principles and covenants, including the UN Universal Declaration of Human Rights, the UN Guiding Principles on Business and Human Rights, the OECD Guidelines for Multinational Enterprises, and the UN Convention on the Rights of the Child.
3. We establish and implement systems and policies, including human rights management system, to embed a respect for human dignity and value across our corporate culture and across the spectrum of business management activities.
4. We strive to protect and advance human rights of marginalized communities, and respect human rights of everyone whose lives we touch, including our employees, customers, government authorities, partners, and local communities.
5. We do not discriminate based on race, gender, education, age, disability, religion, place of birth, political stance, or any other grounds when hiring or in the workplace, and pursue an organizational culture of mutual respect and understanding.
6. We do not condone forced labor or child labor in any shape or form, and comply with the minimum working age established by international standards and local laws of the jurisdictions in which we conduct business.
7. We comply with the working-hour and minimum wage regulations of the jurisdictions in which we conduct business.
8. We foster working conditions which put the health and safety of our officers and employees first.
9. We uphold the constitutional right to freedom of assembly and association and the right to collective bargaining to protect and advance the human rights of our officers and employees.
10. We endeavor to prevent human rights violations in the workplace, such as workplace harassment or sexual harassment, and to provide remedial measures.
11. We aim to nurture strong partnerships with our business partners on an equal footing for mutual growth and development, and support, and cooperate with, their implementation of human rights management.
12. We do not use raw materials, products, etc. produced in an illegal and unethical manner or in a manner involving possible human rights violations.
13. We protect personal information acquired in the course of business.
14. We comply with domestic and international environmental regulations, and strive to achieve net-zero carbon emissions, environmental preservation, biological diversity, resource circulation, and other environmental goals.
15. We prevent human rights violations in the course of business, and timely provide adequate remedial measures.

We pledge to do our utmost in implementing and advancing human rights management as set forth above.

All officers and employees of LOTTE Chemical

Social Policy

Human Rights Management Policy


Development and Execution of Human Rights Management System

LOTTE Chemical’s top management is required to make their utmost efforts in (i) respecting the human rights of all stakeholders impacted by business activities, including employees, supply chains, local communities, and consumers; (ii) avoiding any involvement in human rights violations by third parties or the infringement of stakeholders’ rights through domestic and international business operations; and (iii) proactively providing suitable remedies, including pre-established victim relief procedures, in response to any human rights violations resulting from corporate activities.

LOTTE Chemical is dedicated to safeguarding the human rights of all stakeholders. To ensure this commitment, we may (i) conduct due diligence of human rights risks in accordance with international guidelines, such as the OECD Guidelines for Multinational Enterprises; (ii) take proactive measures to prevent adverse impacts on human rights; and (iii) promptly offer suitable remedies for any human rights violations that may occur. To facilitate these endeavors, LOTTE Chemical may establish policies and directions pertaining to human rights management, seek advice and engage in consultations, and designates an organization responsible for overseeing remedy procedures.

LOTTE Chemical recommends that both partner companies and suppliers in the supply chain adopt and implement human rights management policies. To facilitate this, LOTTE Chemical may provide necessary support, such as offering the Code of Conduct for LOTTE Chemical Partner Companies.

In case of human rights violations or related concerns arising from LOTTE Chemical’s business activities, a reporting channel is in place for anyone, including stakeholders, to make reports.

- **Website:** 
- **E-mail address:** LCC_HOTLINE@lotte.net
- **Postal address:** Person in charge of Shinmungo, 14th floor, Management Improvement Team, Lotte World Tower, 300 Olympic-ro, Songpa-gu, Seoul, Republic of Korea, 05551

Detailed Policy of Human Rights Management

In addition to the provisions stipulated in the LOTTE Chemical Statement on Human Rights, LOTTE Chemical is committed to protecting the human rights of local residents (ensuring the protection of human rights for residents in areas where overseas corporations and factories are located) and safeguarding consumers’ rights (ensuring various consumer rights and interests, such as product safety). LOTTE Chemical will conduct regular reviews and improvements on the specific policies concerning human rights management that must be protected and respected.

Respect for Human Rights

We treat all individuals affected by our business activities, including our employees and partner companies, with respect as fellow human beings, and we ensure that no actions violating human rights occur. We strictly prohibit any acts of harsh or inhuman treatment, such as verbal abuse, physical assault, sexual abuse, and mental or physical coercion, and we have clear guidelines in place to address and enforce appropriate sanctions.

Child and Minor Labor

We refrain from employing children and youth who do not meet the minimum employment age set by the regulations of the country in which our business operates, as well as those who have not completed compulsory education or are under the age of 15. When employing individuals under the age of 18, we adhere to the laws of the country where our business operates and ensure that they do not undertake hazardous tasks, including night shifts and overtime work.

Working Hours and Wages

We adhere to the working hour regulations set forth by the labor laws of the country where our business operates. We ensure proper remuneration for any overtime work performed, following the guidelines established by labor laws and regulations. We provide wages that go beyond the minimum level prescribed by the labor laws of the country where our business operates.

Anti-discrimination

At our workplace, we ensure equal treatment of employees in hiring and work conditions, irrespective of factors such as race, skin color, gender, education, age, disability, religion, nationality, birthplace, or political views.

Prohibition of Forced Labor

We do not force employees to work against their free will through mental or physical restraint, including slavery and human trafficking. We make efforts to eliminate all forms of forced labor and implement appropriate measures to ensure that forced labor does not occur in our business operations.

Workplace Safety

We strive to establish a comfortable working environment by adhering to international standards, relevant laws, and internal regulations related to the working environment. Additionally, we implement necessary measures to prevent safety accidents. We supply essential protective gear to employees for their job tasks and ensure they receive comprehensive training on industrial safety. We also offer periodic health assessments to safeguard and preserve the well-being of our employees, along with implementing programs to assist workers in case of any workplace accidents.

Freedom of Association and the Right to Collective Bargaining

We ensure the freedom of association and the right to collective bargaining as prescribed by the labor laws of the country where our business operates. We respect the workers’ right to form or join labor unions or organizations representing workers and to participate in negotiations regarding employment conditions through these unions or organizations. We do not discriminate against workers based on grounds such as their membership, activity, or formation of labor unions.

Compliance with Responsible Mineral Regulations

In recognition of the serious issues related to human rights violations and environmental destruction caused by mineral mining in conflict and high-risk areas, we do not utilize conflict minerals such as tin, tantalum, tungsten, gold, and responsible minerals like cobalt that are illicitly extracted in these regions. To this end, if necessary, we may enforce due diligence and disclosure obligations on partner companies within the supply chain in accordance with relevant regulations.

Social Policy

Safety and Health Policy

LOTTE Chemical strives to protect employees and stakeholders from safety and health accidents by building a healthy and safe workplace through strengthening organizational and internal capabilities, improving systems, and making proactive investments. To create a work environment where safety and health are guaranteed, LOTTE Chemical has established and operated a strategic system that includes key measures, mid- to long-term strategies, and action items.

Industrial Safety

LOTTE Chemical proactively identifies potential hazards, including the risk of chemical spills, fires, and equipment malfunctions, and implements suitable safety measures to prevent or mitigate any resulting damages. We offer all members relevant safety and health information in their native language or in a language they comprehend, and display this information within the facility for easy access, and we also conduct regular training sessions. In particular, LOTTE Chemical provides instructions and training on work procedures to ensure the safety of members who may be exposed to hazardous elements, and supplies sufficient protective equipment.

Occupational Accidents and Diseases

LOTTE Chemical proactively identifies the potential for industrial accidents and occupational diseases, and has implemented a system to prevent and manage them. This includes reporting procedures for industrial accidents and occupational diseases, analysis and tracking procedures for such incidents, as well as corrective actions for affected members and stakeholders.

Hygiene and Health

LOTTE Chemical offers our members clean restroom facilities, safe drinking water, and sanitary spaces for food preparation, storage, and dining. LOTTE Chemical takes care to maintain dormitory facilities for our members in a clean and safe condition, complete with proper entrances, emergency exits, lighting, heating, and ventilation systems.

Risk Assessment

LOTTE Chemical analyzes potential risk factors that may arise in the workplace and conducts regular risk assessments to remove or reduce these risks, thereby minimizing accidents.

Accident Response

LOTTE Chemical maintains an emergency response system to proactively identify the potential for accidents in the workplace and respond swiftly in the event of an accident, aiming to minimize any harm to human life, the environment, and property. LOTTE Chemical organizes an emergency response organization at each business site, installs safety facilities considering the business environment, and conducts education and training for employees on a regular basis to respond to accidents.

Safety Inspection

LOTTE Chemical fosters a self-directed safety culture by conducting autonomous safety inspections at each business site. To enhance the safety and health management system, third-party assessments are utilized to verify compliance with safety and health-related regulations and to assess safety and health performance levels.

Strengthening Organizations

LOTTE Chemical develops a workplace safety and health management system in line with applicable regulations and appoints qualified professionals to establish and operate a dedicated department.

Social Policy

Product Safety Policy

LOTTE Chemical faithfully fulfills its responsibility to manufacture and distribute products by complying with the standards or specifications for manufacturing and use of products (hereinafter 'product safety standards') to verify product safety and the safety of manufactured and distributed products. By doing so, we ensure product safety and strive to minimize the damage in the event of product harm. If LOTTE Chemical determines that existing domestic and international product safety standards are not sufficient to secure product safety, we may establish and implement enhanced in-house product safety standards.

LOTTE Chemical may establish and implement regulations on product safety management systems to minimize potential hazards to people and the environment that may arise during the process of product manufacturing and distribution.

To ensure the effective functioning of the product safety management system, LOTTE Chemical conducts regular education for our members, engages in open communication with stakeholders, including consumers, shares product safety information with partner companies, and conducts comprehensive training throughout the supply chain. Our continuous efforts aim to elevate the standard of our product safety management system across the supply chain.

LOTTE Chemical makes every effort to enhance customer trust by proactively managing potential impacts that products may have on people and the environment, starting from the use of raw materials. We disclose this information transparently, thereby increasing product safety and minimizing regulatory risks in advance.

Information Security Policy

LOTTE Chemical establishes and operates an information security management system to comply with international standards for information protection and related domestic and international laws and to effectively protect information assets. The information security management system is comprehensively applied to all aspects of security management, includes basic principles and detailed guidelines for security for all executives and employees, and undergoes annual updates by reflecting the enactment and revision of related laws.

LOTTE Chemical conducts regular assessments of our information protection level to improve the information security management system and elevate the overall information security standard. These efforts are directed towards preventing potential security incidents in the future. Furthermore, we strive to obtain and maintain certification for our information security management system from the International Organization for Standardization. LOTTE Chemical regularly conducts inspections of personal information trustees to ensure the safe management of personal information.

LOTTE Chemical strives to maintain a high level of information protection by organizing a systematic information security organization and preparing reasonable policies and standards for information protection, and designating a person in charge of information protection at each business site to operate a cohesive and unified information security management system.

LOTTE Chemical establishes a regular security monitoring system and cooperates with LOTTE Group's cyber security control center to build a response system against cyber-attacks. Our information assets are protected through essential security solution management policies such as document encryption.

LOTTE Chemical develops and implements an internal management plan to ensure the protection of employees' and stakeholders' personal information in compliance with relevant laws and standards for safeguarding personal data. The internal management plan for personal information stipulates procedures concerning collection, use, encryption and disposal of personal data as well as monitoring personal information inquiries and modification history through our system.

LOTTE Chemical makes continuous efforts to enhance the security consciousness of our employees and stakeholders by regularly providing information protection education and training.

Governance Policy

Corporate Governance Charter

LOTTE Chemical Corporation (hereinafter Company) strives to contribute to the abundant lives of humanity by providing trusted and loved products and services. Company shall aim for continuous of corporate value as a company that is loved by citizens and fulfills its social responsibilities. Company shall enact a corporate governance charter to construct a healthy governance that will serve as the platform for continuous growth, and shall procure fair, transparent and independent governance to operate an inter-checking and balanced governance structure.

Chapter 1 Stockholders

Article 1 Rights of Stockholders

- ① Stockholders shall have basic rights prescribed by the Commercial Act and relevant laws such as rights to profit distribution participation, attending general meeting of stockholders, voting rights, etc.
- ② Matters that can result in major changes of the existence of Company or stockholder rights shall be determined in a way that will provide maximum guarantee of stockholder rights.
- ③ Company shall choose the time and place of the general meeting of stockholders so that as many stockholders as possible can attend, and provide stockholders with information such as the time, place and agenda of the general meeting of stockholders ahead of time.
- ④ Stockholders may propose agendas for the general meeting of stockholders according to the relevant laws such as the Commercial Act and ask questions or request explanations on the agenda of the general meeting of stockholders.

Article 2 Fair Treatment of Stockholders

- ① Stockholders shall have one voting right per common stock. However, voting rights for certain stockholders may be restricted as prescribed by law.
- ② Company shall provide fair and sufficient information necessary for stockholders in a timely fashion. Also, when disclosing information not having duty for public announcement, it must be provided fairly to all stockholders.
- ③ Company shall protect stockholders from unfair internal trading or self-trading of controlling stockholders.

Article 3 Responsibility of Stockholders

- ① Stockholders must recognize that exercising their voting rights can affect company management and strive to assertively exercise voting rights for the development of Company.
- ② Controlling stockholders exercising influence over Company management must act for the interests of all stockholders, and must strive not to cause damages to Company or other stockholders by behaving in a manner contrasting to it.

Chapter 2 Board of Directors

Article 4 Functions of Board of Directors

- ① The board of directors shall have comprehensive authority over the management of Company and shall perform management decision-making functions and management supervision functions.
- ② The board of directors can delegate authorities to the CEO or a committee in the board of directors. However, major issues prescribed by laws, articles of incorporation, or regulations of the board of directors shall be excluded.

Governance Policy

Corporate Governance Charter

Article 5 Composition of Board of Directors and Appointment of Directors

- ① The board of directors shall be of a scale allowing effective and prudent discussions and decision-making, and it shall be composed of a sufficient number of persons for the committee to be activated within the board of directors.
- ② The board of directors shall have outside directors who can perform functions independently from the executives and controlling stockholders and the number of outside directors shall be three or more so that they may maintain practical independence from the board of directors and more than half of all directors.
- ③ The board of directors shall be composed of competent persons having expertise that can make practical contributions to the management of Company, and the term of the appointed directors shall be guaranteed unless there is a reason not to.
- ④ Company shall strive to enhance diversity of the board of directors to flexibly respond to changes in the business environment based on various perspectives and experiences.
- ⑤ Company shall allow stockholders to exercise voting rights with sufficient information and time to make a decision on candidates for directors.

Article 6 Operation of Board of Directors

- ① Board of director meetings shall, by principle, be held regularly at least once every three months, and special board of director meetings shall be held as necessary.
- ② There shall be board of director regulations that prescribe the authorities, responsibilities, operation procedures, etc. of the board of directors for the smooth operation of board of director meetings.
- ③ Company shall draft, maintain and store meeting records for each meeting.
- ④ Company shall disclose the attendance rate of individual directors and the activities of individual directors such as their voting history, etc. for major agendas subject to public announcement.
- ⑤ Directors may participate in board of director meetings by using remote communication tools.

Article 7 Committee within Board of Directors

- ① The board of directors can install a committee within the board of directors to perform certain functions and roles for prompt and efficient decision-making.
- ② Composition, operation and authority of all committees shall be in accordance to the regulations of each committee separately prescribed.
- ③ The committee shall report the resolutions to the board of directors and the board of directors can once again vote on the resolutions of the committee.

Article 8 (Responsibility for Ethical Compliance)

- ① Directors shall complete their duties according to the duties of care and good faith as good managers.
- ② Directors shall not exercise his or her authorities for self-interests or the interests of third persons, and must also pursue results the best interests to Company and stockholders.
- ③ Directors may not disclose corporate secrets that have become known while carrying out duties, and may not use it for self-interests or interests of third persons.

Article 9 Responsibility of Directors

- ① Should a director violate laws or the articles of association or negligent his/her duties causing damage to Company, that director shall be liable for compensation of damages to Company. Should there be malicious intent or gross negligence by a director, that director shall be liable for compensation of damages to third parties as well.
- ② During the course of making management judgments, directors shall collect sufficient reliable data and information in a reasonable manner, review such data and information, and perform duties in a method deemed to be of the best interest of Company according to the diligent and rational judgment, then such management judgment of the director must be respected.
- ③ Company may subscribe to liability insurance for directors at the cost of Company to procure effectiveness to call directors into account for liabilities and to recruit competent persons as directors.

Governance Policy

Corporate Governance Charter

Article 10 Outside Directors

- ① Outside directors shall independently participate in major decision-making of Company through board of director activities and make up the board of directors to supervise and support management.
- ② Outside directors shall be appointed at the general meeting of stockholders at the recommendation of the outside director candidate recommendation committee, and the committee shall be composed in a manner to procure fairness and independence of director candidates.
- ③ Outside directors may request provision of information needed for carrying out duties. Furthermore, consultation from outside experts can be received through appropriate procedures when necessary, and Company shall pay for such expenses.
- ④ Company shall regularly report or provide management information such as Company work situations for accurate and timely identification of management status of Company for outside directors, and shall establish and operate continuous education and training programs for outside directors.

Article 11 Evaluation and Compensation

- ① Management activities of the board of directors must be evaluated fairly and the results shall be appropriately reflected in compensation.
- ② Evaluations on the board of directors and outside directors shall be performed regularly to enhance the efficiency of the board of directors.
- ③ Compensation of directors or work-related expenses shall be determined by the board of directors regarding payment and the amount of payment within the scope of payment determined by the resolution of the board of directors.
- ④ Compensation for directors shall maintain reasonable proportionality with his or her duties, and it shall be determined at an appropriate level considering the financial status of Company, and it must be in accordance with the regular profit enhancement of Company and stockholders.
- ⑤ Company may delegate matters related to compensation such as wage ceilings, etc. of registered directors to the compensation committee.

Chapter 3 Audit Organization

Article 12 Audit Committee

- ① All members of the audit committee shall be outside directors in order to maintain independence, and at least one auditor must be an expert on accounting or finances
- ② The audit committee shall perform duties such as legality inspections on the work activities of directors and management, integrity and feasibility inspections on the financial activities of Company, review on the accuracy of financial reports, authorization of appointment and dismissal of outside auditors, and follow-up reports, etc. at general meetings of stockholders.
- ③ The audit committee can read or copy ledger records and documents related to auditing at any time, and it may request reports on sales to directors or investigate the work and assets of Company.
- ④ When necessary, the audit committee may request consulting to outside institutes or experts at the cost of Company.

Article 13 Outside Auditor

- ① Company shall maintain legal and practical independence for outside auditors from Company, management, and controlling stockholders, etc.
- ② Outside auditors shall attend the general meeting of stockholders, and if there are questions from stockholders regarding audit reports, the outside auditor shall provide explanation.
- ③ Outside auditors shall check whether there is information that is inconsistent with audit results from the audited financial statements and regular publicly announced information.
- ④ Outside auditors shall strive to check for corrupt or illegal activities of Company during audits.
- ⑤ Outside auditors shall consider the sustainability of Company according to that prescribed by relevant laws such as the Act on External Audit of Stock Companies.
- ⑥ Outside auditors shall report important matters checked during outside audit activities to the audit committee.

Governance Policy

Corporate Governance Charter

Chapter 4 Stakeholders

Article 14 Protection of Rights of Stakeholders

- ① Company shall strive to develop while sharing greater value with various stakeholders such as customers, employees, partners, etc.
- ② Company shall respect the rights of laborers and improve the quality of life of laborers.
- ③ Company shall value cooperative relationships with partners promote the establishment of a fair market order through compliance with laws related to fair trade, and seek balanced development of the national economy.
- ④ Company shall observe protective procedures of creditors regarding mergers, capital decrease, splits, etc. that have major impact on the status of creditors.
- ⑤ When a stakeholder is also a stockholder, the rights of both stakeholder and stockholder shall be protected.
- ⑥ Company shall provide information necessary for protecting the rights of stakeholders within the scope permitted by law and contracts with third parties, and it shall support access to the relevant information of stakeholders.

Chapter 5 Management Monitoring by Market

Article 15 Public Announcement

- ① Company shall draft and make public regular business reports, quarterly reports, and half-year reports, and shall diligently, promptly, and honestly make public information related to Company to stockholders and stakeholders.
- ② In addition to public announcements required by law, Company shall announce matters that may have a major impact on the decision-making of stockholders and stakeholders in detail and accurately.
- ③ Company shall draft public announcements in an easy-to-understand manner, and shall strive to make it easily usable by stakeholders.
- ④ Company shall designate a supervisor of public announcements, and shall establish an internal information delivery system so that important information of Company can be delivered to the public announcement supervisor promptly.
- ⑤ Company shall not provide preferential or discriminatory treatment to specific persons in terms of the scope or time of disclosing important corporate information, and it shall be publicly announced so that all stakeholders can access the information simultaneously.

Article 16 Corporate Management Rights Market

- ① All actions that can result in change in Company management rights such as acquisition, merger and splitting of Company or transfer of major businesses must be performed according to a transparent and fair process.
- ② Defending Company management rights should not be performed in a manner that sacrifices the interests of Company and stockholders to maintain the management rights of partial stockholders or management.
- ③ Company shall allow a stockholder who opposes major structural changes such as mergers, transfer of major operations, etc. to exercise stock purchase rights according to a fair value reflecting the actual value of his/her share as prescribed by law.

Governance Policy

LOTTE Chemical's Compliance Management Charter

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

Article 1 (Course of Action by Employees)

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

Article 2 (Duties and Responsibilities of Employees)

- ① We must be the role model for the most stringent ethical standards and create and maintain a culture in which reliability, honesty, morality, and mutual respect are valued.
- ② We should be thoroughly familiar with and understand related laws, company policies, and internal regulations (hereinafter referred to as "Related Regulations") applied to the business process and continuously check compliance with Related Regulations when conducting daily business.
- ③ If we are not sure of what kind of response is appropriate in a specific situation, we should consult with a senior person, corporate legal team, and compliance support organization such as Compliance Team to draw the legal and best ethical conclusion.
- ④ In case of being aware of the violation of Related Regulations, we should promptly take the appropriate measures to identify and prevent the wrongful act. If a situation arises to make it difficult to act ethically on behalf of the Company or if we are aware of such situation, we should consult with the support department.

Article 3 (Duties and Responsibilities of the Company)

- ① The Company should thoroughly inform all employees about Related Regulations to ensure fair and transparent work performance and regularly conduct compliance training.
- ② The Company should establish a management system that allows employees to audit or check compliance with Related Regulations autonomously and supervise whether it is implemented regularly.
- ③ The Company should protect employees who report cases of violation or suspected violation of Related Regulations and should not impose any disadvantage.
- ④ If the Company is aware of the violation of Related Regulations by an employee, the Company should take measures and bring the employee to account for the wrongful action.

Governance Policy

Ethical Management Policy

Establishment and Operation of Ethical Management System

Ethical Management System

LOTTE Chemical declares our dedication to ethical management within and beyond the organization making ongoing efforts to establish an ethical culture of transparency and to enhance ethical consciousness among executives and employees.

LOTTE Chemical operates our ethical management system based on LOTTE Group's Code of Conduct. We provide guidelines on ethical issues through a code of ethics, code of conduct, and action guidelines tailored to LOTTE Chemical's business characteristics and specific situations. Additionally, we establish dedicated organizational structures to support the implementation of these ethical practices. LOTTE Chemical conducts continuous monitoring to assess whether employees are carrying out their duties in a fair and rational manner, adhering to ethical management norms. The findings of these evaluations are used to enhance work processes. LOTTE Chemical strengthens the monitoring and management of ethical management practices by running communication channels, including the online reporting center, Online Shinmungo. Through this platform, reports and consultations regarding unethical behavior are received, investigated, and, if necessary, forwarded to the relevant departments for appropriate action.

Education on Ethical Management

LOTTE Chemical conducts various education programs such as online education and group education on ethical management to instill ethical management among all executives and employees. Education on ethical management may include subjects related to international norms, foreign laws and/or various soft laws in addition to compliance education on domestic regulations, and education topics and target audience are continuously updated to reflect current developments.

Regular and Special Audits

LOTTE Chemical conducts audits, distinguishing between regular audits and special audits. LOTTE Chemical follows a standardized approach in performing its audit activities, which are governed by well-documented internal regulations outlining the criteria and procedures. Based on the audit findings, appropriate actions are taken in accordance with internal regulations governing rewards and disciplinary measures, ensuring efforts are made to prevent any recurrence of similar cases.

Reporting Ethical Management Violations and Protection of Whistleblowers

Reporting Ethical Management Violations

If an employee becomes aware of any breach of ethical management, he or she is required to report it to either the organization's leader or the department responsible for ethics management. Subsequently, the leader receiving the report promptly notifies the department in charge of ethics management and collaboratively addresses the issue

through consultation. When the department responsible for ethical management identifies information related to illegal or unfair conduct in the performance of duties by employees or executives, including violations of relevant laws and/or internal regulations, they receive the report following the 5W1H principle, which includes the reporter's personal information. Subsequently, an internal investigation is carried out after the internal report has been received.

According to the investigation results, LOTTE Chemical takes appropriate measures, including disciplinary actions based on the company's internal regulations. The results of these actions are notified to the reporter in an appropriate manner.

Whistleblower Protection

LOTTE Chemical ensures that the reporter will not face any adverse consequences for making factually legitimate reports and providing related statements or evidence. Furthermore, the identity of the reporter and the content of the report will be kept confidential throughout the investigation process and other related procedures in accordance with the reporter's desire for confidentiality.

Detailed Policy for Ethical Management

Anti-corruption Policy

In recognition of the importance of ensuring fair performance of duties by public officials and others, LOTTE Chemical prohibits improper solicitation and the acceptance of money or valuables from public officials. This commitment aligns with our dedication to compliance management and ethical practices. We adhere to various anti-corruption international norms and domestic and foreign laws, including the UN Convention against Corruption, OECD Anti-Bribery Convention, South Korea's Act on Preventing Bribery of Foreign Public Officials in International Business Transactions, and the Improper Solicitation and Graft Act.

Employees of LOTTE Chemical shall refrain from providing, accepting, demanding, promising, or delivering bribes (including financial gains) in any situation. They are also prohibited from allowing other employees or executives to engage in such practices. Furthermore, employees shall not engage in improper solicitation with public officials or others, nor shall they offer money, goods, or any form of compensation beyond the legal boundaries applicable to their job duties.

LOTTE Chemical strictly prohibits any donations or sponsorships intended for purposes unrelated to charity or public interest, including political objectives. Our donations and sponsorships are subject to strict approval procedures and shall adhere to the limits prescribed by relevant laws and social norms. Prior authorization is mandatory for such actions. LOTTE Chemical takes preventive measures against corruption risks that may arise from donations and sponsorships by carefully evaluating the legitimacy of the donation's purpose, the eligibility of the donating organization, and the fairness of benefits provided in return for sponsorships. We make every effort to ensure that only eligible organizations provide donations and sponsorships through appropriate and lawful means.

Governance Policy

Ethical Management Policy

Antitrust Policy

By promoting fair and free competition, LOTTE Chemical fosters innovative business practices, protects consumers, and strives to achieve balanced growth of the national economy. We comply with domestic and international antitrust laws, including Monopoly Regulation and Fair Trade Act recognizing the need to regulate unjust collusion and unfair trade practices and to prevent the abuse of market dominance and excessive concentration of economic power.

LOTTE Chemical does not engage in prohibited actions under relevant laws, such as abusing its dominant market position, engaging in practices that could undermine fair trade by leveraging its trading status, or making agreements with other business operators concerning prices, supply volume, transaction area, and other transaction conditions of products or services for the purpose of unfairly restricting competition. LOTTE Chemical refrains from participating in information-sharing practices prohibited by relevant laws and regulations, whether through direct contact with competitors or intermediaries. Information shall be collected through publicly available sources or other lawful methods.

Fair Tax Policy

LOTTE Chemical diligently complies with tax reporting and payment obligations in accordance with the laws of each country where business activities are conducted. We faithfully fulfill taxpayer duties, including the obligation to submit required data, and appropriately evaluate and manage tax risks that may arise during business operations.

LOTTE Chemical adopts a transfer pricing policy based on the arm's length price calculation method, following the OECD guidelines, which are widely recognized across all tax jurisdictions. We ensure that all taxes are lawfully calculated and paid in every region where our income is generated.

LOTTE Chemical shall not engage in transactions or contracts that transfer income between countries by exploiting unfair advantages in tax laws or deficiencies in the international tax system. Furthermore, we shall not use tax havens to illegally or unfairly reduce tax burdens.

ESG Risk Management Policy

LOTTE Chemical strives to fulfill our corporate social responsibility by establishing and implementing an 'ESG Risk Management Policy' focused on conducting due diligence on potential negative impacts on human rights and the environment that may arise from our business activities, subsidiaries, and/or supply chain. The ESG Risk Management Policy is regularly updated, taking into consideration relevant international norms such as the UN Guiding Principles on Business and Human Rights (UNGPs) and the OECD Guidelines for Multinational Enterprises, as well as applicable domestic and foreign laws.

LOTTE Chemical's ESG Risk Management Policy aims to (i) identify and assess both current and potential impacts that may have adverse effects on human rights and the environment, and (ii) implement measures to address, mitigate, and prevent any identified issues, while documenting the progress of the response process. Additionally, the policy includes procedures for engaging with stakeholders and providing a platform for stakeholders to express their opinions.

LOTTE Chemical strives to ensure that the ESG risk management system is embedded in our organizational culture by integrating and operating the ESG Risk Management Policy into our decision-making process and organizational system, preparing internal regulations and educating employees if necessary.

Identification of Negative Impacts

LOTTE Chemical builds and implements a process to identify potential adverse effects on human rights and the environment arising from both domestic and international business operations. Negative impacts subject to identification include both specific cases that have already occurred and potential occurrences in the future cases. We acknowledge that the scope of negative impacts subject to identification may vary based on changes in LOTTE Chemical's business activities and the business environment, and we ensure that such changes are continually taken into account.

The scope of due diligence on negative impacts includes not only domestic and foreign major business sites of LOTTE Chemical and our subsidiaries but also the supply chain, including major partner companies. The specific methods for conducting due diligence may involve written assessments, on-site inspections, and stakeholder interviews. As a principle, due diligence should be carried out by the internal organization; however, if required, external experts or stakeholders may be sought for advice and support.

Governance Policy

ESG Risk Management Policy

Actions against Negative Impacts

Once potential or actual negative impacts are identified, LOTTE Chemical develops and executes action plans to prevent, terminate, or mitigate them. LOTTE Chemical formulates action plans to prevent, terminate, and mitigate identified negative impacts within a reasonable scope, even if they are not directly caused by our business activities.

LOTTE Chemical thoroughly considers and evaluates all possible measures within a reasonable scope when determining specific actions, taking into account the potential social and economic impacts that may arise in relation to these measures. When establishing an action plan, LOTTE Chemical takes into account various factors, including the location and size of the business site, the degree of risk to stakeholders, the characteristics and content of the business, and the political, economic, and cultural conditions of the region where the business operates.

Action plans aimed at preventing, mitigating, and terminating negative impacts shall include the following elements: ① a reasonable and clearly defined timeline, ② a detailed list of specific improvements, and ③ quantitative and qualitative indicators to measure the implementation of the improvements. If deemed necessary for the execution of the aforementioned action plans, LOTTE Chemical may request the conclusion of a contract or guarantee from partner companies with a direct business relationship, outlining the required measures.

Communication with Stakeholders

LOTTE Chemical shall offer responsible explanations regarding key information, including the results of our due diligence, so that stakeholders can assess our response to any negative impact. Specifically, LOTTE Chemical ensures that stakeholders can easily access information through various means, such as interviews, publication of reports, and utilization of online channels. Additionally, if necessary, LOTTE Chemical enables stakeholders to participate in the due diligence process through meetings and public hearings.

Feedback Gathering Process

LOTTE Chemical implements a process to receive opinions and obtain information from stakeholders to identify negative impacts on human rights and the environment and develop appropriate action plans. The above process shall be operated in a manner that allows LOTTE Chemical to promptly identify negative impacts on human rights and the environment, provides affected stakeholders with a pathway to raise concerns, and ensures timely and effective remedies for victims.

The process for submitting opinions shall be accessible to stakeholders without spending a lot of time and money, and the method for sending feedback and subsequent procedures shall be predictable. LOTTE Chemical can cooperate with external organizations, including stakeholder groups, if necessary for the effective operation of procedures.

Reference | Code of Conduct for LOTTE Chemical Partner Companies

Introduction

LOTTE Chemical fulfills its corporate economic, social, and environmental responsibilities, and creates future value and carries out its social responsibilities by achieving its sustainability management vision. Recognizing that addressing climate change and establishing a sustainable ecosystem are shared challenges of humanity, we strive to evolve into a company that enhances the quality of human life through ESG (Environmental, Social, and Governance) management. We look forward to having LOTTE Chemical's partner companies joining us on the journey towards a sustainable future for humanity.

This Code has been developed under the principles of ESG management, with the goal of promoting LOTTE Chemical's sustainable growth and creating social value. This Code outlines LOTTE Chemical's expectations from our partner companies in terms of environmental protection, respect for human rights, safety management, and compliance and ethical practices. We hope that all of LOTTE Chemical's partner companies will adhere to this Code and join us in practicing ESG management. Furthermore, we anticipate that not only our partner companies but also all sub-supply chain companies supplying various parts and raw materials to our partner companies and providing services such as packaging, toll processing, and transportation will adhere to this Code of Conduct, and achieve sustainable development together.

This Code has been developed with reference to the UN Universal Declaration of Human Rights, UN Guiding Principles on Business and Human Rights, OECD Guidelines for Multinational Enterprises, UN Convention on the Rights of the Child, Core Conventions of International Labor Organization (ILO), and Responsible Business Alliance (RBA) Code of Conduct. In case of any conflict between this Code and the laws and regulations of the country where we operate business, we will adhere to the stricter standards.

1. Environmental Protection

LOTTE Chemical's partner companies shall make diligent efforts to comply with LOTTE Chemical's established environmental management policy. Partner companies are expected to actively participate in improvement actions based on LOTTE Chemical's environmental management assessment and cooperate proactively to establish a data-driven environmental management system.

A. Legal Compliance

- (1) Partner companies shall acquire and maintain environmental licenses necessary for business operations, and be familiar with and comply with environmental laws and regulations of the country in which the businesses operate.
- (2) Partner companies shall periodically identify changes in environmental regulations and strive to comply with the evolving trends.
- (3) Partner companies shall provide continuous education for their employees regarding the contents of environmental laws and regulations, and evolving trends.

B. Compliance with Substance Regulations

If there are substance-related regulations, such as prohibiting the use of a specific substance in the country where our partner companies conduct business, restricting the usage of the substance, or requiring the display of substance information, the partner companies shall abide by such restrictions.

C. Environmental Impact Review

- (1) Partner companies shall pay sufficient attention to potential environmental impacts that may occur in the process of producing and distributing products and providing services, and strive to reduce them.
- (2) Partner companies shall conduct regular assessments of environmental impacts and devise plans to mitigate them.
- (3) Partner companies shall endeavor to use green products with reduced environmental impact in the process of producing and distributing products and providing services.

D. Response to Climate Crisis

- (1) Partner companies shall join LOTTE Chemical's efforts to achieve carbon neutrality.
- (2) Partner companies shall record GHG emissions and develop plans to reduce them.
- (3) Partner companies shall establish a plan to reduce energy consumption.
- (4) Partner companies shall make endeavors to develop and apply innovative technologies, such as process enhancements, substitution of raw materials and fuels, and resource recycling and reuse, to reduce GHG emissions and energy consumption.

E. Resource Circulation

- (1) Partner companies shall systematically identify and manage waste emissions and establish and implement plans to minimize them.
- (2) Partner companies shall strive to find ways to cut down on plastic consumption and recycle plastic waste in the process of producing and distributing products and providing services.

F. Water Resource Management

Partner companies shall systematically identify and manage water consumption, and develop and implement plans to reduce the usage.

G. Pollutant Management

- (1) Partner companies shall identify the source of pollutants, and constantly identify and manage pollutant emissions.
- (2) Partner companies shall identify the characteristics of pollutants and prepare management plans tailored to the characteristics. Substances that are harmful to humans or the environment shall be marked to identify them, and measures for safe handling, storage, use, and disposal shall be established.
- (3) Partner companies shall prepare measures to remove pollutants or minimize emissions.

Reference | Code of Conduct for LOTTE Chemical Partner Companies

2. Respect for Human Rights

LOTTE Chemical's partner companies shall endorse and respect the internationally recognized 'UN Guiding Principles on Business and Human Rights (UNGPs)' at all their business premises and guarantee the protection of human rights. Partner companies shall make every effort to foster an organizational culture that allows members to realize their full potential and fosters mutual respect without any bias or unlawful discrimination.

A. Anti-discrimination

- (1) Partner companies shall not discriminate against executives and employees in personnel management, such as employment, promotion, compensation, education and training, and job placement on the grounds of gender, race, religion, disability, age, social status, region of origin, country of origin, physical condition, marital status, pregnancy and childbirth, family type and family status, and ideology and political orientation.
- (2) Partner companies shall not demand conditions that are not necessary for job performance when hiring executives and employees.
- (3) Partner companies shall respect the diversity of their executives and employees and prepare policies to consider them.

B. Compliance with Labor Laws

- (1) Partner companies shall be familiar with and comply with labor laws and regulations of the country where they operate their business.
- (2) Partner companies shall pay their executives and employees wages, including the minimum wage, overtime pay, and welfare benefits set by the laws of the country in which they operate business.
- (3) Partner companies shall ensure that the working hours of their executives and employees do not exceed the maximum working hours set by the laws of the country where they operate. Overtime work shall be conducted based on the voluntary consent of executives and employees.
- (4) Partner companies shall pay wages on a fixed date, and in particular, when hiring foreign workers, the workers shall retain original documents related to work (such as passport, work permit).
- (5) Partner companies shall issue pay statements or documents containing wage payment details in a language that is understandable to their executives and employees.
- (6) Partner companies shall provide mandatory training for their employees as stipulated in the laws of the country in which they conduct business.

C. Humane Treatment

- (1) Partner companies shall make efforts to prevent inhumane treatment such as sexual harassment, sexual abuse, physical punishment, mental or physical coercion, and the use of abusive language from occurring against workers.

- (2) Partner companies shall make efforts to ensure that they do not engage in actions, taking advantage of their position or relationship in the workplace, which go beyond the appropriate scope for work and cause physical or mental suffering to other workers or deteriorate the working environment.
- (3) Partner companies shall develop a policy to ensure the humane treatment of their executives and employees and provide sufficient notice and education to them regarding this policy.
- (4) Partner companies shall implement appropriate procedures for addressing instances of inhumane treatment or workplace harassment towards their executives and employees. When such cases arise, they shall take suitable actions, giving full consideration to the requests and circumstances of their executives and employees.

D. Guarantee of Three Fundamental Labor Rights

- (1) Partner companies shall ensure the three labor rights, as guaranteed by the laws of the country where the business is conducted, including the right of executives and employees to form and join labor unions and engage in their activities.
- (2) Partner companies shall take measures to prevent any form of disadvantage, such as discrimination, retaliation, or harassment, from occurring as a result of executives and employees organizing, joining, and participating in labor unions.
- (3) Partner companies shall make efforts to foster an environment where executives and employees can freely communicate about working conditions, management policies, and other related matters.

E. Protection of Underage Workers

- (1) Child labor is strictly forbidden in any manner. Partner companies shall adhere to the minimum age of employment set by the laws of the country where they operate and adhere to international agreements on child labor.
- (2) When a partner company needs to employ individuals under the age of 18, the company shall consult with the personnel responsible for compliance management and confirm the minimum age requirements in accordance with the applicable laws and regulations.
- (3) When hiring employees under the age of 18, partner companies shall specify protective measures for working conditions and ensure that they are not engaged in high-risk tasks. Moreover, necessary steps shall be taken to ensure that their educational opportunities are not limited due to their work.
- (4) Partner companies shall not receive goods and services from companies involving in child labor or violating relevant laws.

F. Prohibition of Forced Labor

- (1) Coercion, detention, or any other form of forced labor is strictly prohibited. Partner companies shall not use physical violence, threats, confinement, or other coercive measures, or impose mental pressure based on economic circumstances or debt relationships to force labor.
- (2) Partner companies shall not receive goods and services from companies that force labor through acts of violence, intimidation, confinement, or mental pressure.

Reference | Code of Conduct for LOTTE Chemical Partner Companies

3. Safety Management

LOTTE Chemical's partner companies shall make efforts to ensure the safety of their employees throughout all stages of product manufacturing, distribution, and service provision. Partner companies shall establish a management system to prevent safety accidents and collaborate in the company's workplace safety evaluation.

A. Legal Compliance

- (1) Partner companies shall obtain and maintain the necessary safety-related licenses or permits for their business operations, and they shall be familiar with and comply with safety-related laws and regulations of the country in which they conduct business.
- (2) Partner companies shall regularly monitor and be updated on the contents and developments of safety-related laws and regulations in the country where they conduct their business. They shall make efforts to comply with these regulations and provide ongoing education for their employees.

B. Safety Assessment

- (1) Partner companies shall perform regular safety inspections of their facilities, identify risk factors based on the characteristics of the workplaces, and reflect them in safety assessments.
- (2) Partner companies shall assess the safety of machinery, equipment, and facilities that may harm individuals in the workplace and inspect them regularly.
- (3) Partner companies shall install essential equipment, such as safety devices and protective barriers, within the workplace to prevent safety accidents and conduct regular inspections.
- (4) Partner companies shall identify employees engaged in prolonged repetitive tasks, handling heavy loads, or exposed to physically demanding work environments. They shall develop regular strategies to minimize these risks and manage the physical strain on employees.
- (5) Partner companies shall ensure the safety and health of local residents throughout all stages, including the storage and transportation of raw materials, product manufacturing, packaging, and transportation.

C. Establishment of Safety Management System

- (1) Partner companies shall establish an autonomous safety management system by appointing a dedicated department for safety management directly under the responsibility of the individual in charge of the business site, ensuring its operational independence.
- (2) Partner companies shall prepare a response manual for safety accidents, which shall include immediate action steps, evacuation procedures, reporting system, and follow-up measures.
- (3) Partner companies shall adequately educate their employees about the safety accident response manual and regularly conduct preparedness training in compliance with the laws of the country in which they conduct business.

- (4) Partner companies shall conduct an investigation into the cause of any safety accident and make diligent efforts to develop appropriate improvement measures.

E. Safety Education

- (1) Partner companies shall provide regular safety education for their employees, following the policy set by LOTTE Chemical. The above safety education shall include content aimed at enhancing employees' safety awareness and developing their safety management capabilities.
- (2) Partner companies shall display essential information regarding safety management within the workplace in a prominent location.

F. Restaurant Sanitation and Accommodation Management

Partner companies shall regularly manage the safety and hygiene of food and restaurants to provide clean meals to workers, and also manage the accommodations for workers in a safe and clean condition. Additionally, the accommodation shall be equipped with emergency exits and fire-fighting devices.

4. Legal Compliance and Ethical Management

Partner companies of LOTTE Chemical shall practice law-abiding and ethical management and work towards proper company governance. Partner companies shall enhance management transparency, comply with the laws and regulations of the country where they conduct business, and maintain the highest ethical standards. For this purpose, a corporate compliance management system (Compliance System) shall be implemented, and relevant education shall be provided to employees and executives.

A. Prohibition of Illegal Profits

- (1) Employees of partner companies shall not offer or promise monetary or non-monetary benefits to third parties, including public officials and personnel of public institutions, for unlawful or improper purposes.
- (2) Employees of partner companies shall not receive or promise to receive monetary or non-monetary benefits from third parties for illegal or inappropriate purposes.
- (3) Partner companies shall continually monitor the offering or acceptance of illegal or inappropriate benefits by their employees and executives, and if any such occurrences are detected, appropriate measures shall be taken.

B. Improving Transparency in Management

- (1) All business activities of partner companies shall be conducted transparently, and all transactions of partners shall be accurately recorded in internal data such as accounting books.
- (2) Information on business activities, financial status, safety management status, environmental preservation status, and performance of partner companies shall be disclosed in accordance with the laws and practices of the country where the business is conducted.

Reference | Code of Conduct for LOTTE Chemical Partner Companies

C. Prevention of Unfair Trade

- (1) Partner companies shall adhere to the laws and regulations concerning fair trade and monopoly regulations of the country where they conduct their business.
- (2) Partner companies shall not engage in actions that may harm fair trade by abusing their dominant market position or exploiting their trading position.
- (3) Partner companies shall not enter into agreements with other business operators to restrict competition unfairly, such as colluding on prices, controlling supply volumes, limiting transaction areas, or imposing other unfair trade conditions.

D. Personal Information Protection

- (1) Partner companies are obligated to follow the personal information protection laws of the country where they conduct business when it comes to the collection and processing of personal information.
- (2) Partner companies shall make legitimate and sufficient efforts to protect personal information acquired in relation to business.
- (3) Partner companies shall make sufficient efforts to maintain the confidentiality of trade secrets or sensitive information obtained in the course of their business.

E. Intellectual Property Protection

- (1) Partner companies shall make sufficient efforts not to infringe on the intellectual property rights of others in conducting their business.
- (2) Partner companies shall not engage in acts that unfairly infringe on the trade secrets of competitors in conducting business.

F. Identity Protection and Prohibition on Retaliatory Measures

- (1) Partner companies shall establish and maintain an anonymous reporting channel to protect the identity of employees raising concerns and shall pursue institutional measures to prevent any retaliatory actions.
- (2) Partner companies shall ensure the confidentiality of the worker's identity who raises the concern.

5. Prohibition on Use of Conflict Minerals

Partner companies shall prohibit the use of minerals mined in conflict zones or acquired through illegal, unethical, or methods that may pose a risk to the environment and safety, and shall establish a system to ensure compliance with this prohibition.

6. Management System

LOTTE Chemical's partner companies shall acknowledge the significance of sustainable business practices and implement a management system to achieve this objective. Partner companies shall establish long-term objectives to fulfill their social responsibilities and conduct regular evaluations to enhance their performance accordingly.

A. Declaration on Sustainable Management

- (1) Partner companies shall establish goals for sustainable management and outline the execution plan in written form, and make it accessible to the public.
- (2) Partner companies shall provide regular education to executives and employees regarding the objectives and implementation plans for sustainable management, and periodically assess and evaluate the progress towards achieving these goals.

B. Risk Management

- (1) Partner companies shall make efforts to identify risks related to the environment, human rights, labor, safety, legal compliance and ethics that have occurred or are likely to occur during the course of conducting business.
- (2) Partner companies shall take appropriate actions to eliminate and mitigate risks related to the environment, human rights, labor, safety, legal compliance, and ethics if they arise.
- (3) Partner companies shall take appropriate measures to prevent potential risks related to the environment, human rights and labor, safety, legal compliance, and ethics.



2022 LOTTE Chemical ESG Data Book

EVERY
STEP FOR
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ESG_Report



Homepage




Interactive PDF

This report is published in both Korean and English for communication with global stakeholders in the form of an interactive PDF.

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General and Economic Data

ESG Data

General Data

Organizational Sustainability Reporting Scope

Indicator	Unit	2022	2021	2020
Environmental reporting data coverage rate*	%	100.0	100.0	100.0
Social reporting data coverage rate*	%	100.0	100.0	100.0

* Based on a LOTTE Chemical's separate financial statements, and main financial statements' sales based coverage will be disclosed in the future

Reporting Period and Cycle

Indicator	Unit	2022	2021	2020
Cumulative no. of ESG Report* publications	Numbers	16	15	14
No. of disclosures of tentative sales performance / sales performance forecast / future business and management plan	Numbers	4	4	4

* It has been published since 2007, and was published in a name of 'Sustainability Report' until 2021

Economic Data

Organization's Supplier Status*

Indicator	Category	Unit	2022	2021	2020
Total no. of suppliers		Numbers	2,406	-	-
No. of key suppliers	Total no. of key suppliers	Numbers	349	-	-
	No. of key tier-1 suppliers	Numbers	46	-	-
	No. of key tier-2 suppliers	Numbers	303	-	-
Rate of purchase cost from key suppliers to the total purchase cost	Total purchase cost	KRW 100 million	103,889	-	-
	Amount of purchase from key suppliers	KRW 100 million	97,095	-	-
	Rate of purchase from key suppliers	%	93.0	-	-

* Supply chain management was initiated from 2022 by establishing an ESG risk management system

ESG Data

Economic Data

Direct Economic Value Generation and Distribution*

Indicator	Category	Unit	2022	2021	2020	
Economic value distribution	Shareholder and investor	Dividend and interest expense	KRW 100 million	2,670	3,679	2,311
	Employee	Salary and retirement benefit	KRW 100 million	7,552	7,038	5,999
	Government	Corporate tax	KRW 100 million	△4,560	4,609	714
	Local community	Donations	KRW 100 million	123	79	88
	Total		KRW 100 million	5,785	15,405	9,112
Net profit before tax		KRW 100 million	△4,923	18,419	2,467	
Nominal tax amount**		KRW 100 million	-	3,000	453	
Actual tax amount**		KRW 100 million	-	2,484	936	
Nominal tax rate**		%	27.5	27.5	27.5	
Actual tax rate**		%	0.0	22.8	56.9	
Total R&D investment expenditure		KRW 100 million	1,024	925	800	

* Based on the main financial statements

** Tax amount and tax rate are based on the separate financial statements

Governments' Financial Support

Indicator	Category	Unit	2022	2021	2020
Total monetary value of the financial support received from the government during the reporting period*	Basic Chemicals	KRW 1 million	301		
	Advanced Materials	KRW 1 million	87	215	240
Tax exemption and deduction		KRW 1 million	912	419	389

* Performance by division is disclosed from 2022

※ For detailed financial information, refer to the business report on the website (https://dev7.lottechem.com/en/ir/notify_info.do)

Environmental

ESG Data

Environmental

GHG Emission Goal*

Indicator	Category	Unit	2022	2021	2020
GHG emission target		tCO ₂ eq	6,563,035	-	-
GHG emissions performance		tCO ₂ eq	6,214,759		
Performance against GHG emission targets		%	△5.3	-	-
GHG reduction goal (comparing to the base year emissions)	Rate of emissions within the scope	%	100.0	-	-
	Base year of emissions	Base year	2019	-	-
	Emissions of the base year	tCO ₂ eq	6,804,469	-	-
	Year when target was established	-	2022	-	-
	Target reduction ratio against base year emissions	%	3.5	-	-
Total no. of projects related to GHG reduction efforts		Numbers	58	54	60

* Target management was initiated from 2022

Direct GHG (Scope 1) Emissions

Indicator	Category	Unit	2022	2021	2020
Scope of data collection for Scope 1 emissions		%	100.0	100.0	100.0
Direct GHG (Scope 1) emissions	Yeosu Plant (Basic Chemicals)	tCO ₂ eq	2,012,983	2,335,929	2,421,598
	Yeosu Plant (Advanced Materials)	tCO ₂ eq	47,145	49,689	103,816
	Daesan Plant	tCO ₂ eq	1,627,256	1,546,392	592,272
	Ulsan Plant	tCO ₂ eq	496,537	507,390	505,536
	Others*	tCO ₂ eq	3,568	2,936	710
	(Total) domestic business sites	tCO₂eq	4,187,489	4,442,336	3,623,932
Scope 1 stationary combustion emissions	CO ₂	tCO ₂ eq	4,167,922	4,422,663	3,611,121
	N ₂ O	tCO ₂ eq	15,166	15,005	8,742
	CH ₄	tCO ₂ eq	4,401	4,668	4,069
Percentage of Scope 1 emissions subject to emission limit regulations (e.g. K-ETS)		%	100.0	100.0	100.0

* Seoul headquarters, Innovation Center, Uiwang Office, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

※ Criteria for reporting GHG emissions

- 2020 : Emissions based on the allowances for the next planned year in the final submitted statement

- 2021~2022 : Based on the emissions in the first submitted statement

ESG Data

Environmental

Indirect GHG (Scope 2) Emissions

Indicator	Category	Unit	2022	2021	2020
Scope of data collection for Scope 2 emissions		%	100.0	100.0	100.0
Indirect GHG (Scope 2) emissions	Yeosu Plant (Basic Chemicals)	tCO ₂ eq	790,063	777,471	669,486
	Yeosu Plant (Advanced Materials)	tCO ₂ eq	330,000	339,791	357,677
	Daesan Plant	tCO ₂ eq	644,813	739,041	632,747
	Ulsan Plant	tCO ₂ eq	252,140	233,828	280,872
	Others*	tCO ₂ eq	10,254	9,645	9,559
	(Total) domestic business sites	tCO₂eq	2,027,270	2,099,776	1,950,341

* Seoul headquarters, Innovation Center, Uiwang Office, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

Other Indirect GHG (Scope 3) Emissions*

Indicator	Unit	2022	2021	2020
Other indirect GHG (Scope 3) emissions	tCO ₂ eq	18,005,017	-	-
Scope 3 upstream emissions	tCO ₂ eq	8,777,714	-	-
Scope 3 downstream emissions	tCO ₂ eq	9,227,303	-	-
Scope 3 emission ratio calculated with the data collected by suppliers	%	0.0	-	-

* Data collected from 2022

GHG Intensity

Indicator	Unit	2022	2021	2020
Scope 1, Scope 2 GHG intensity	tCO ₂ eq / KRW 1 billion*	287.2	370.7	456.0
Scope 3 GHG intensity	tCO ₂ eq / KRW 1 billion*	832.0	-	-
Changes of Scope 1, Scope 2 GHG intensity from the previous year	%	△29.1	△18.7	-

* Based on the sales of the main financial statements

GHG Emission Comparison (comparing to the base year*)

Indicator	Unit	2022	2021	2020
Scope 1 emission changes (comparing to the base year)	tCO ₂ eq	△557,627	△302,780	△1,121,184
Scope 2 emission changes (comparing to the base year)	tCO ₂ eq	△32,083	40,423	△109,012

* 2019

GHG Sales

Indicator	Unit	2022	2021	2020
GHG sales	Tons	137,266	161,343	123,205

※ Criteria for reporting GHG emissions

- 2020 : Emissions based on the allowances for the next planned year in the final submitted statement

- 2021~2022 : Based on the emissions in the first submitted statement

ESG Data

Environmental

Energy Consumption within the Organization

Indicator	Category	Unit	2022	2021	2020
Total consumption of non-renewable energy	Diesel	MWh	7,784	10,804	7,979
	Biogas	MWh	44,104	62,928	35,392
	LNG	MWh	799,825	668,979	775,980
	Methanol	MWh	17,531	23,790	24,522
	Total	MWh	869,244	766,501	843,873
Total energy consumption		TJ	118,643	125,886	95,478
Consumption by item, including electricity, fuel, and steam	Electricity	TJ	23,092	24,188	23,213
	Fuel	TJ	81,116	87,310	64,792
	Steam	TJ	14,434	14,391	7,477
	Total consumption	TJ	118,642	125,889	95,482
Sales by item, including electricity, fuel, and steam	Electricity	TJ	2,147	2,147	2,360
	Steam	TJ	3,044	3,202	2,476
	Total Sales	TJ	5,191	5,349	4,836
Rate of renewable energy usage		%	0.01 or less	0.01 or less	0.01 or less

Energy Intensity

Indicator	Unit	2022	2021	2020
Energy intensity within the organization	TJ / KRW 1 billion*	5.5	7.1	7.8

* Based on the sales of the main financial statements

Reduction of Energy Consumption

Indicator	Unit	2022	2021	2020
Reduced amount of energy consumption*	TJ	962	900	982

* Reduction of energy consumption derived from energy saving technologies (fuel, electricity, heating, air conditioning, steam, etc.) at each business site

Energy Generation

Indicator	Unit	2022	2021	2020
Total self-generated energy	TJ	9,336	16,924	13,134

ESG Data

Environmental

Water Intake

Indicator	Category	Unit	2022	2021	2020
Amount of water intake (by business site)	Yeosu Plant (Basic Chemicals)	1,000 tons	19,928	22,797	21,703
	Yeosu Plant (Advanced Materials)	1,000 tons	2,826	2,972	2,988
	Daesan Plant	1,000 tons	12,740	12,653	6,495
	Ulsan Plant	1,000 tons	8,329	7,835	8,133
	Others*	1,000 tons	97	90	88
	(Total) domestic business sites	1,000 tons	43,920	46,347	39,407
Amount of water intake (by water source)	Underground water	1,000 tons	15	21	6
	Third-party industrial water	1,000 tons	43,905	46,326	39,401

* Uiwang Office, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

Wastewater Discharge

Indicator	Category	Unit	2022	2021	2020
Wastewater discharge (by business site)*	Yeosu Plant (Basic Chemicals)	1,000 tons	3,467	3,780	3,756
	Yeosu Plant (Advanced Materials)	1,000 tons	2,120	2,331	2,280
	Daesan Plant	1,000 tons	2,452	2,686	1,859
	Ulsan Plant	1,000 tons	4,841	4,272	4,963
	Others**	1,000 tons	82	77	79
	(Total) domestic business sites	1,000 tons	12,962	13,146	12,937
Wastewater discharge (by discharge site)	Surface water	1,000 tons	4,841	4,277	4,710
	Seawater	1,000 tons	2,452	2,686	1,859
	Third-party drainage	1,000 tons	2	2	0
	Total discharge	1,000 tons	7,295	6,965	6,569
The amount of wastewater discharged back to the water source with the same or similar water quality as the surface water and groundwater	Coolant discharge	1,000 tons	1,353	1,380	1,283
Total amount of pollutant discharged with wastewater	Tons	1,072	832	721	
Treatment amount when wastewater is finally discharged	1,000 tons	15,045	15,298	14,553	
Rate of business sites regularly measuring total wastewater discharge to total business sites	%	100.0	100.0	100.0	
Rate of business sites regularly measuring total wastewater discharge by releasing site to total business sites	%	100.0	100.0	100.0	

* Daesan Plant (discharging wastewater to seawater after treatment at the internal wastewater treatment plant), other business sites (discharging wastewater to the terminal treatment plant after going through the internal wastewater treatment plant)

** Innovation Center, Uiwang Office, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

ESG Data

Environmental

Wastewater Discharge

Indicator	Unit	2022	2021	2020
Rate of business sites subject to treatment when discharging wastewater at the final stage	%	100.0	100.0	100.0
Rate of business sites regularly measuring treatment amount when discharging wastewater at the final stage to total number of business sites	%	100.0	100.0	100.0
Rate of business sites regularly measuring wastewater quality to total number of business sites	%	100.0	100.0	100.0
Rate of business sites regularly measuring wastewater temperature to total number of business sites	%	100.0	100.0	100.0
No. of violations against the allowance limits of discharging treatment priority substances*	Cases	0	0	1
No. of violations against regulations regarding water quality criteria and standards**	Cases	2	2	0

* The number of cases exceeding the standards for permissible discharge from the result of the water pollution level test,

** Number of cases violating regulations other than exceeding the standards for permissible discharge (non-compliance with facility management standards, non-recording of operation diary, etc.)

Water Pollutant Discharge

Indicator	Unit	2022	2021	2020
Total discharge amount of water pollutants*	Tons	1,211	833	722
TOC discharge amount	Tons	585	253	212
SS discharge amount	Tons	372	276	225
TOC discharge comparing to the previous year**	%	131.2	19.3	-
SS discharge comparing to the previous year	%	34.8	22.7	18.2

* A total of 19 types including TOC, SS, TN, TP, etc.

** Organic material measurement index applied for TOC in 2022 and COD applied in 2020-2021

Water Pollutant Discharge

Indicator	Unit	2022	2021	2020
BOD discharge amount	Tons	326	247	260
BOD discharge comparing to the previous year	%	32.0	△5.0	17.7

Water Consumption

Indicator	Category	Unit	2022	2021	2020
Water consumption (by business site)	Yeosu Plant (Basic Chemicals)	1,000 tons	14,377	16,868	16,078
	Yeosu Plant (Advanced Materials)	1,000 tons	706	641	708
	Daesan Plant	1,000 tons	10,288	9,967	4,636
	Ulsan Plant	1,000 tons	3,488	3,559	3,423
	Others*	1,000 tons	15	14	9
	(Total) domestic business sites	1,000 tons	28,874	31,049	24,854
Consumption of alternative water resources	Grey water	1,000 tons	14	21	6
Amount of water reuse	Yeosu Plant (Basic Chemicals)	1,000 tons	105	108	127
	Yeosu Plant (Advanced Materials)	1,000 tons	885	1,105	1,378
	Daesan Plant	1,000 tons	-	-	-
	Ulsan Plant	1,000 tons	-	-	-
	Others*	1,000 tons	-	-	-
	(Total) domestic business sites	1,000 tons	990	1,213	1,505

* Uiwang Office, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

ESG Data

Environmental

Nitrogen Oxides, Sulfur Oxides and Other Major Air Emissions

Indicator	Category	Unit	2022	2021	2020
NOx emissions (by business site)	Yeosu Plant (Basic Chemicals)	Tons	2,312	3,057	5,575
	Yeosu Plant (Advanced Materials)	Tons	36	38	39
	Daesan Plant	Tons	4,354	4,703	5,197
	Ulsan Plant	Tons	234	384	449
	Others*	Tons	2	13	14
	(Total) domestic business sites	Tons	6,938	8,195	11,274
NOx emissions comparing to the level of previous year		Tons	△1,257	△3,079	△1,453
NOx emission intensity		Tons / KRW 1 billion**	0.3	0.5	0.9
SOx emissions (by business site)	Yeosu Plant (Basic Chemicals)	Tons	33	44	39
	Yeosu Plant (Advanced Materials)	Tons	7	7	7
	Daesan Plant	Tons	16	14	36
	Ulsan Plant	Tons	91	145	163
	Others*	Tons	-	-	-
	(Total) domestic business sites	Tons	147	210	245
SOx emissions comparing to the level of previous year		Tons	△63	△35	△58
SOx emission intensity		Tons / KRW 1 billion**	0.01	0.01	0.02

* Uiwang Office, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

** Based on the sales of the main financial statements

Indicator	Category	Unit	2022	2021	2020
Total VOC emissions*	Yeosu Plant (Basic Chemicals)	Tons	50	61	-
	Yeosu Plant (Advanced Materials)	Tons	23	22	-
	Daesan Plant	Tons	31	22	-
	Ulsan Plant	Tons	17	15	-
	(Total) domestic business sites	Tons	121	120	-
Total HAPs emissions*	Yeosu Plant (Basic Chemicals)	Tons	21	21	-
	Yeosu Plant (Advanced Materials)	Tons	23	20	-
	Daesan Plant	Tons	23	15	-
	Ulsan Plant	Tons	9	9	-
	(Total) domestic business sites	Tons	76	65	-
Total PM emissions	Yeosu Plant (Basic Chemicals)	Tons	30	52	32
	Yeosu Plant (Advanced Materials)	Tons	8	12	6
	Daesan Plant	Tons	8	18	24
	Ulsan Plant	Tons	5	5	6
	Others**	Tons	1	1	1
	(Total) domestic business sites	Tons	52	88	69
	Dust emissions comparing to the level of previous year		Tons	△36	19
Other major air pollutant emissions		Tons	39,986	58,410	46,492

* VOC and HAPs emissions are calculated from 2021

** Uiwang Office, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

ESG Data

Environmental

Waste Discharge

Indicator	Category	Unit	2022	2021	2020
Scope of data collection for waste		%	100.0	100.0	100.0
Waste discharge (by business site)	Yeosu Plant (Basic Chemicals)	Tons	36,290	32,735	29,871
	Yeosu Plant (Advanced Materials)	Tons	35,007	37,103	36,786
	Daesan Plant	Tons	18,936	24,926	15,025
	Ulsan Plant	Tons	19,610	19,860	21,693
	Others*	Tons	2,603	2,415	2,096
	(Total) domestic business sites	Tons	112,446	117,039	105,471
Designated waste discharge	Yeosu Plant (Basic Chemicals)	Tons	22,643	19,084	15,850
	Yeosu Plant (Advanced Materials)	Tons	2,077	2,635	2,455
	Daesan Plant	Tons	11,851	14,312	10,442
	Ulsan Plant	Tons	1,079	513	280
	Others**	Tons	1,599	1,275	929
	(Total) domestic business sites	Tons	39,249	37,819	29,956
General industrial waste discharge	Yeosu Plant (Basic Chemicals)	Tons	13,647	13,651	14,020
	Yeosu Plant (Advanced Materials)	Tons	32,930	34,468	34,331
	Daesan Plant	Tons	7,085	10,615	4,582
	Ulsan Plant	Tons	18,531	19,347	21,414
	Others*	Tons	1,004	1,139	1,168
	(Total) domestic business sites	Tons	73,197	79,220	75,515

* Seoul headquarters, Innovation Center, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

** Uiwang Office, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

Waste Intensity

Indicator	Unit	2022	2021	2020
General industrial waste intensity	Tons / KRW 1 billion*	5.2	6.6	8.6

* Based on the sales of the main financial statements

Waste Recycle and Treatment

Indicator	Unit	2022	2021	2020
Total weight of recycled waste	Tons	94,914	93,885	83,602
Total weight of recycled waste comparing to the previous year	Tons	1,029	10,283	-
Total weight of landfilled waste	Tons	7,421	10,517	9,921
Total weight of incinerated waste	Tons	9,934	12,580	11,918
Total weight of waste treated in other ways or ways that are not identified	Tons	127	55	29

ESG Data

Environmental

Directly Disposed Waste

Indicator	Category	Unit	2022	2021	2020
Designated waste treated	Landfill	Tons	713	502	254
	Incineration	Tons	4,736	4,810	4,995
	Other ways	Tons	114	40	20
General industrial waste treated	Landfill	Tons	6,758	10,016	9,668
	Incineration	Tons	5,198	7,771	6,923
	Other ways	Tons	12	16	10
Total amount of designated waste and general industrial waste treated		Tons	17,532	23,155	21,869

Usage of Hazardous Chemicals

Indicator	Unit	2022	2021	2020
Amount of hazardous chemicals used	Tons	2,661,661	2,900,378	1,992,843

Products Registered to Chemical Substance Management System

Indicator	Category	Unit	2022	2021	2020
Category 1 and 2 (substances harmful to health and the environment) in the Globally Harmonized System (GHS) of Classification and Labelling of Chemicals	No. of products containing the ingredient	Numbers	195	-	-
	Rate of products containing the ingredient to total products	%	10.1	-	-
	Rate of products containing the ingredient that received harmfulness evaluation	%	100.0	-	-

Usage of Recycled Raw Materials

Indicator	Unit	2022	2021	2020
Rate of recycled (recycled and reused) raw materials out of all raw materials used in the entire business*	%	0.21	0.13	0.14

* Input ratio of recycled raw materials used = (total recycled and reused raw material purchase) / (total product production) * 100

Product Impact Assessment

Indicator	Category	Unit	2022	2021	2020
Products that have identified the environmental impact of the entire product life cycle through LCA among the total products	No. of products undergone LCA	Numbers	203	71	1
	Rate of products undergone LCA to total products	%	10.0	4.0	0.0

ESG Data

Environmental

Development of Green Products and Services*

Indicator	Unit	2022	2021	2020
No. of products recycled	Numbers	356	209	-

* Data collected from 2021

Purchasing of Green Products and Services

Indicator	Unit	2022	2021	2020
Green products and services purchasing performance	Tons	20,549	12,618	14,635
	KRW 100 million	180	190	174

Environmental Technology Development and Investment

Indicator	Category	Unit	2022	2021	2020
No. of patented clean technologies		Numbers	38	61	44
Eco-friendly investment expenditure for environmental management	Capital expenditure (a)	KRW 100 million	0.4	0.2	0.4
	Operating expenditure (b)	KRW 100 million	0.7	0.8	0.6
	Investment expenditure (a)+(b)	KRW 100 million	1.1	1.0	1.0

Ownership and Rate of Zero Emission Vehicles

Indicator	Unit	2022	2021	2020
Rate of zero emission vehicles*	%	5.0	4.0	-

* Based on K-EV100 (Korean transition project towards zero-emission cars)

Violation of Environmental Laws

Indicator	Category	Unit	2022	2021	2020
Disclosure of violations of environmental laws and regulations	Total monetary value of the significant penalty	KRW 10,000	160	630	208
	Total no. of non-monetary sanctions	Cases	5	8	6
	Cases brought through the dispute resolution mechanism	Cases	0	0	0
Fines related to environment or ecology resulting from non-compliance with environmental laws and regulations		KRW	0	0	0
Non-monetary sanctions related to environment or ecology resulting from non-compliance with environmental laws and regulations		Cases	0	0	0
Environmental compensation resulting from non-compliance with environmental laws and regulations		KRW	0	0	0

Social

ESG Data

Social

Risk Assessment

Indicator	Category	Unit	2022	2021	2020
Description of the process for operation related to occupational safety and health: frequency and scope of usual processes	Frequency	Times / Year	1	1	1
	Scope	%	100.0	100.0	100.0

Occupational Safety and Health Management System

Indicator	Category	Unit	2022	2021	2020
Rate of business sites acquiring ISO 45001 (health and safety management system certification)		%	100.0	100.0	100.0
Rate of total employees represented by the Labor-Management Joint Safety and Health Committee consisting of representatives of employers and employees	No. of employees	Persons	4,724	4,647	4,543
	Rate of employees represented by the Labor-Management Joint Safety and Health Committee	%	79.2	81.5	82.0

Work-related injuries

Indicator	Unit	2022	2021	2020
Total working hours of employees	Hours	8,547,429	8,856,132	8,587,260
No. of industrial accidents*	Cases	3	6	5
No. of deaths due to work-related injuries	Cases	0	0	0
Death rate due to work-related injuries	%	0.0	0.0	0.0
No. of work-related serious injuries**	Cases	0	0	1
Rate of work-related serious injuries	%	0.0	0.0	0.02
No. of recordable work-related injuries	Cases	3	6	6
Total Recordable Incident Rate (TRIR)	No. of cases per 200,000 working hours	0.070	0.135	0.140
Scope of data collection for TRIR	%	100.0	100.0	100.0
Other additional indicator to analyze work-related injuries or illness: Lost Time Injury Frequency Rate (LTIFR)	No. of cases per 1 million working hours	0.351	0.677	0.699

* Work-related accidents excluding accidents during normal commute

** Based on the criteria of counting disability as serious injury

ESG Data

Social

Occupational Injury of Workers Who are not Employees

Indicator	Unit	2022	2021	2020
Total working hours of workers who are not employees but whose work and/or workplace is controlled by the organization	Hours	4,632,804	4,314,478	3,975,366
No. of deaths due to work-related injuries	Cases	0	0	0
Death rate due to work-related injuries	%	0.0	0.0	0.0
No. of work-related serious injuries*	Cases	0	0	0
Rate of work-related serious injuries	No. of cases per 200,000 working hours	0.0	0.0	0.0
No. of recordable work-related injuries	Cases	4	3	2
Total Recordable Incident Rate (TRIR)	No. of cases per 200,000 working hours	0.17	0.14	0.10

* Based on the criteria of counting disability as serious injury

Work-related Illness of Employees

Indicator	Unit	2022	2021	2020
No. of deaths due to work-related illnesses	Cases	0	0	0
No. of recordable cases of work-related illnesses	Cases	0	0	0

Work-related Illness of Workers Who are not Employees

Indicator	Unit	2022	2021	2020
No. of deaths due to work-related illnesses	Cases	0	0	0
No. of recordable cases of work-related illnesses	Cases	0	0	0

Lost Time Injury Rate (LTIR) of Employees

Indicator	Unit	2022	2021	2020
Severity rate of lost time due to direct injury of employees	Lost time / 1,000 working hours	0.012	0.016	0.083
Scope of data collection for LTIR of employees	%	100.0	100.0	100.0
Lost Time Injury Rate (LTIR) of employees	No. of cases per 200,000 working hours	0.070	0.135	0.140

Lost Time Injury Rate (LTIR) in Supply Chain*

Indicator	Unit	2022	2021	2020
Annual target for LTIR of suppliers	No. of cases per 200,000 working hours	0.080	-	-
Lost Time Injury Rate (LTIR) of suppliers	No. of cases per 200,000 working hours	0.130	0.139	0.101

* LTIR of workers within the supply chain other than employees

ESG Data

Social

Transport Accident

Indicator	Unit	2022	2021	2020
No. of transport accidents	Cases	0	0	0

Process Safety Incidents

Indicator	Category	Unit	2022	2021	2020
No. of Process Safety Incidents Count (PSIC)		Cases	0	3	1
	Total working hours of employees and workers of partner companies	Hours	13,180,233	8,658,720	8,516,088
Process Safety Total Incident Rate (PSTIR)	Process safety incident rate	No. of cases per 200,000 working hours	0	0.069	0.023

Sustainability Management in Supply Chain

Indicator	Category	Unit	2022	2021	2020
No. of suppliers receiving education on sustainable procurement*	Environmental	Numbers	60	-	-
	Purchasing	Numbers	105	18	22
	Safety and health	Numbers	261	119	66
No. of education on Code of Conduct / anti-corruption / fair trade		Numbers	10	0	88

* Data collected from 2022 for the supply chain management by establishing an ESG risk management system

Grievance Handling Mechanism

Indicator	Category	Unit	2022	2021	2020
Operation record of the channels for handling human rights grievances of stakeholders	Grievances handled	Cases	11	7	0
	External channel	Cases	1	1	0
	Online Shinmungo	Cases	25	23	20
Operation and introduction of a grievance-handling process regarding sustainability within the supply chain		Cases	25	23	20
Operation record of the channels for handling safety and health grievances of the workers within the supply chain		Cases	25	23	20

Employees

Indicator	Category	Unit	2022	2021	2020
Total no. of employees (by business site)	Yeosu Plant (Basic Chemicals)	Persons	1,068	1,139	1,091
	Yeosu Plant (Advanced Materials)	Persons	573	558	526
	Daesan Plant	Persons	620	634	634
	Ulsan Plant	Persons	455	435	415
	Others*	Persons	1,891	1,763	1,747
	(Total) domestic business sites	Persons	4,607	4,529	4,413
(Total) overseas business sites	Persons	117	118	128	

* Seoul headquarters, Innovation Center, Uiwang Office, LOTTE Chemical Institute of Technology (LCIT), Daegu Water Treatment Plant

ESG Data

Social

Employees

Indicator	Category	Unit	2022	2021	2020
(By gender) Total no. of employees	Female	Persons	770	734	712
	Male	Persons	3,954	3,913	3,829
(By gender) Regular employees	Female	Persons	734	697	667
	Male	Persons	3,822	3,788	3,765
(By gender) Contractor employees	Female	Persons	36	37	45
	Male	Persons	132	125	64
(By gender) Non-regular employees	Female	Persons	-	-	-
	Male	Persons	-	-	-
(By gender) Full-time employees	Female	Persons	754	722	693
	Male	Persons	3,932	3,897	3,813
(By gender) Part-time employees	Female	Persons	16	12	19
	Male	Persons	22	16	16
(By position) Total no. of employees	Manager - Executive	Persons	105	96	91
	Manager- S	Persons	650	609	595
	Staff - M	Persons	761	756	745
	Staff - SA, A	Persons	768	780	803
	Staff - Others	Persons	2,440	2,406	2,307
(By age) Total no. of employees	Below 30	Persons	707	696	590
	30~50	Persons	2,831	2,826	2,860
	Above 50	Persons	1,186	1,125	1,091

Indicator	Category	Unit	2022	2021	2020
(By region) Total no. of employees	Domestic	Persons	4,607	4,529	4,413
	Overseas	Persons	117	118	128
(By region) Regular employees	Yeosu Plant (Basic Chemicals)	Persons	1,045	1,110	1,077
	Yeosu Plant (Advanced Materials)	Persons	552	536	521
	Daesan Plant	Persons	603	618	618
	Ulsan Plant	Persons	440	427	410
	Others	Persons	1,810	1,677	1,679
	Total no. of domestic employees	Persons	4,450	4,368	4,305
	Total no. of overseas employees	Persons	106	117	127
(By region) Contract employees	Yeosu Plant (Basic Chemicals)	Persons	23	29	14
	Yeosu Plant (Advanced Materials)	Persons	21	22	5
	Daesan Plant	Persons	17	16	16
	Ulsan Plant	Persons	15	8	5
	Others	Persons	81	86	68
	Total no. of domestic employees	Persons	157	161	108
	Total no. of overseas employees	Persons	11	1	1

ESG Data

Social

Employees

Indicator	Category	Unit	2022	2021	2020
(By region) Full-time employees	Yeosu Plant (Basic Chemicals)	Persons	1,063	1,135	1,087
	Yeosu Plant (Advanced Materials)	Persons	573	558	526
	Daesan Plant	Persons	619	634	630
	Ulsan Plant	Persons	452	433	410
	Others	Persons	1,862	1,741	1,725
	Total no. of domestic employees	Persons	4,569	4,501	4,378
	Total no of overseas employees	Persons	117	118	128
Average years of service of all employees		Years	29	30	31

Workers Who are not Employees

Indicator	Unit	2022	2021	2020
(By type and contract) No. of workers who are not employees but whose work and/or workplace is controlled by the organization	Persons	36	24	8

New Hires

Indicator	Category	Unit	2022	2021	2020
Total no. of new hires		Persons	459	443	221
(By age) No. of new hires	Below 30	Persons	306	357	167
	30-50	Persons	94	63	29
	Above 50	Persons	59	23	25
(By gender) No. of new hires	Female	Persons	93	67	60
	Male	Persons	366	376	161
(By position) No. of new hires	Manager - Executive	Persons	4	3	3
	Manager- S	Persons	19	8	15
	Staff - M	Persons	28	14	11
	Staff - SA, A	Persons	408	418	192
(By minority group) No. of new hires	Employee with disabilities	Persons	13	15	5

Employee Turnover

Indicator	Category	Unit	2022	2021	2020
Total no. of employee turnover		Persons	389	300	322
(By age) Total no. of employee turnover	Below 30	Persons	136	88	61
	30-50	Persons	119	103	113
	Above 50	Persons	134	109	148
(By gender) Total no. of employee turnover	Female	Persons	57	40	33
	Male	Persons	332	260	289

ESG Data

Social

Childcare Leave

Indicator	Category	Unit	2022	2021	2020
No. of employees subject to childcare leave		Persons	148	148	142
(By gender) No. of employees subject to childcare leave	Female	Persons	44	31	23
	Male	Persons	104	117	119
No. of employees who used (received) childcare leave		Persons	163	162	148
(By gender) No. of employees who used (received) childcare leave	Female	Persons	53	55	46
	Male	Persons	110	107	102
No. of employees who returned to work after childcare leave		Persons	163	159	146
(By gender) No. of employees who returned to work after childcare leave	Female	Persons	53	53	46
	Male	Persons	110	106	100
Rate of employees who returned to work after childcare leave		%	100.0	98.1	98.6
No. of employees who worked more than 12 months after childcare leave		Persons	161	152	140
(By gender) No. of employees who worked more than 12 months after childcare leave	Female	Persons	53	52	46
	Male	Persons	108	100	94
Rate of employees who continuously work after childcare leave		%	98.8	95.6	95.9

Average Educational Hours per Capita and Other Related Performance

Indicator	Category	Unit	2022	2021	2020
(Total) Average educational hours per capita		Hours	61	39	27
(Total) Total educational expenses per capita		KRW	1,685,180	732,916	819,519
(By gender) Average educational hours per capita	Female	Hours	53	58	33
	Male	Hours	35	35	26

Employee Regular Performance and Career Development Reviews

Indicator	Category	Unit	2022	2021	2020
No. of employees subject to regular performance and career development reviews	Employees subject to MBO(Management By Objectives)	Persons	2,366	2,315	2,314
	Employees subject to 360-degree	Persons	1,702	2,269	2,223
Rate of employees subject to regular performance and career development reviews	Employees subject to MBO(Management By Objectives)	%	50.1	49.8	51.0
	Employees subject to 360-degree	%	36.0	48.8	49.0

ESG Data

Social

Regular Assessment and Feedback on Job Performance and Career Development

Indicator	Category	Unit	2022	2021	2020
(By gender) No. of employees who received regular assessment of their performance and career development	Female	Persons	494	480	460
	Male	Persons	1,872	1,860	1,854
(By gender) Rate of employees who received regular assessment of their performance and career development	Female	%	64.2	65.4	64.6
	Male	%	47.3	47.5	48.4
(By position) No. of employees who received regular assessment of their performance and career development	Manager - Executive	Persons	105	96	91
	Manager- S	Persons	643	605	581
	Staff - M	Persons	745	747	737
	Staff - SA, A	Persons	723	745	788
	Staff - Others	Persons	118	108	78
(By position) Rate of employees who received regular assessment of their performance and career development	Manager - Executive	%	100.0	100.0	100.0
	Manager- S	%	98.9	99.3	97.6
	Staff - M	%	97.9	98.8	98.9
	Staff - SA, A	%	94.1	95.5	98.1
	Staff - Others	%	4.8	4.5	3.4

Labor-Management Relations

Indicator	Unit	2022	2021	2020
No. of labor union members	Persons	1,840	1,662	1,680
Rate of labor union members	%	39.5	35.8	37.0

Collective Bargaining

Indicator	Unit	2022	2021	2020
No. of employees subject to collective bargaining	Persons	1,788	1,708	1,775
Rate of employees subject to collective bargaining	%	38.4	36.4	37.0

Living Wage Monitoring

Indicator	Unit	2022	2021	2020
Scope of employees subject to minimum living wage	%	100.0	100.0	100.0
Rate of employees subject to living wage benchmarking analysis	%	100.0	100.0	100.0

Employee Basic Salary and Remuneration

Indicator	Unit	2022	2021	2020
Average pay per capita	KRW 1 million	94	107	88

Rate of Basic Salary and Remuneration of Female to Male and Gap

Indicator	Unit	2022	2021	2020
Rate of basic salary for female employees to male employees	%	65.7	62.8	61.3

ESG Data

Social

Diversity of Governance Bodies and Employees

Indicator	Category	Unit	2022	2021	2020
Rate of female employees to total employees		%	16.3	15.8	15.7
Rate of male employees to total employees		%	83.7	84.2	84.3
No. of female managers*		Persons	54	47	40
Rate of female managers to total managers*		%	7.2	6.7	5.8
Total no. of chief managers**		Persons	10	11	11
No. of female chief managers		Persons	1	1	1
No. of male chief managers		Persons	9	10	10
Rate of female managers to chief managers		%	10.0	9.1	9.1
Rate of male managers to chief managers		%	90.0	90.9	90.9
(By age) Employee composition	Below 30	%	15.0	15.0	13.0
	30-50	%	59.9	60.8	63.0
	Above 50	%	25.1	24.2	24.0
(By minority group) No. of employees	Employees with disabilities	Persons	82	71	79
(By minority group) Rate of employee composition	Employees with disabilities	%	1.7	1.5	1.7

* Manager : Executives or S-rated employees

** Chief Manager : CEO or employees whose position is at the same level of CEO or governance members

Human Rights and Employee Training Pursuant to Procedures

Indicator	Unit	2022	2021	2020
No. of employees who received education / train on human rights policies and related procedures associated with business	Persons	4,720	4,667	4,446
Rate of employees who received education / train on human rights policies and related procedures associated with business	%	99.9	100.4	97.9
Total hours of education on human rights policies and related procedures associated with business	Hours	9,440	12,625	11,630

Customer Satisfaction

Indicator	Unit	2022	2021	2020
Quantitative targets established for enhanced customer satisfaction	%	81.0	83.0	85.0
Results of customer satisfaction survey	%	97.0	94.0	93.0
Consumers' opinions or complaints handled	Cases	5	2	2

Product and Service Management System

Indicator	Unit	2022	2021	2020
Rate of certified business sites in terms of quality management system (ISO 9001, etc.)	%	100.0	100.0	100.0

ESG Data

Social

Assessment of the Health and Safety Impacts of Product and Service Categories

Indicator	Unit	2022	2021	2020
Rate of significant product and service categories assessed in terms of safety impact for the purpose of improvement	%	100.0	100.0	100.0

Incidents of Non-compliance Concerning the Health and Safety Impacts of Products and Services

Indicator	Unit	2022	2021	2020
No. of incidents of non-compliance with regulations resulting in a fine or penalty	Cases	0	0	0
No. of incidents of non-compliance with regulations resulting in a warning	Cases	0	0	0
No. of incidents of non-compliance with voluntary codes	Cases	0	0	0

Incidents of Non-compliance Concerning Product and Service Information and Labelling

Indicator	Unit	2022	2021	2020
No. of incidents of non-compliance with regulations resulting in a fine or penalty	Cases	0	0	0
No. of incidents of non-compliance with regulations resulting in a warning	Cases	0	0	0
No. of incidents of non-compliance with voluntary codes	Cases	0	0	0

Incidents of Non-compliance Concerning Marketing Communications

Indicator	Unit	2022	2021	2020
No. of incidents of non-compliance with regulations resulting in a fine or penalty related to marketing communication (advertising, promotion, sponsorship, etc.)	Cases	0	0	0
No. of incidents of non-compliance with regulations resulting in a warning related to marketing communication (advertising, promotion, sponsorship, etc.)	Cases	0	0	0
No. of incidents of non-compliance with voluntary codes related to marketing communication (advertising, promotion, sponsorship, etc.)	Cases	0	0	0

Information Security Management System

Indicator	Unit	2022	2021	2020
No. of executives responsible for information security	Persons	1	1	1
Frequency of inspection on the cyber attack response system	Times / Month	1	1	1
Frequency of audit on information security policies and system	Times / Year	2	2	2

ESG Data

Social

Substantiated Complaints Concerning Breaches of Customer Privacy and Losses of Customer Data

Indicator	Category	Unit	2022	2021	2020
No. of information security-related issues		Cases	0	0	0
Customer data loss	No. of leaks of customer data	Cases	0	0	0
	No. of thefts of customer data	Cases	0	0	0
	No. of losses of customer data	Cases	0	0	0
No. of complaints regarding confirmed customer personal data breaches	No. of breaches confirmed by external parties	Cases	0	0	0
	No. of breaches confirmed by the regulatory authorities	Cases	0	0	0

Contribution to Local Communities, Impact Assessment, and Development Programs

Indicator	Category	Unit	2022	2021	2020
Spending on local community contribution activities	Voluntary donations	KRW 1 million	3,264	2,122	2,262
	Investments in local communities (social contribution apart from voluntary donations)	KRW 1 million	8,261	5,930	6,241
	Total spendings	KRW 1 million	11,525	8,052	8,503
Rate of spendings on local community contribution activities	Voluntary donations	%	28.3	26.4	26.6
	Investments in local communities (social contribution apart from voluntary donations)	%	71.7	73.6	73.4
Measurement of financial and non-financial values created by activities to achieve mutual growth with local communities	Total monetary donations	KRW 1 million	729	764	520
	Total non-monetary donations	KRW 1 million	10,796	7,288	7,983

Governance

ESG Data

Governance

Governance Structure and Composition (Board of Directors and Committees)

Indicator	Category	Unit	2022	2021	2020
No. of board meetings		Times	13	11	14
Total no. of directors		Persons	10	11	9
Tenure of members belonging to the top decision-making body (BOD) and its committees	Shin, Dong-bin	Years	18	17	16
	Kim, Gyo-hyun	Years	6	5	4
	Hwang, Jin-koo	Years	2	1	0
	Lee, Young-jun	Years	3	2	1
	Lee, Hun-ki	Years	2	1	0
	Choi, Hyon-min	Years	3	2	1
	Jeon, Woon-bae	Years	3	2	1
	Kang, Jeong-won	Years	3	2	1
	Nam, Hye-jeong	Years	2	1	0
	Cho, Woon-haeng	Years	1	0	-
Average tenure of members belonging to the top decision-making body (BOD) and its committees	Outside directors (inside directors excluded)	Years	4	4	4
Member composition of the top decision making body (BOD) and its committees	Male inside directors	Persons	4	4	3
	Female inside directors	Persons	0	0	0
	Male outside directors	Persons	4	5	4
	Female outside directors	Persons	1	1	1
	Male non-executive directors	Persons	1	1	1
	Female non-executive directors	Persons	0	0	0
Rate of outside directors within the board		%	50.0	45.0	56.0
No. of long serving outside directors		Persons	0	0	0
No. of outside directors exceeding the legal minimum standard		Persons	0	0	0

Indicator	Unit	2022	2021	2020
No. of Compensation Committee meetings	Times	3	4	4
Rate of outside directors within the Compensation Committee	%	100.0	100.0	100.0
No. of Audit Committee meetings	Times	4	4	4
No. of Audit Committee members that meet the requirements for accounting or financial experts according to laws	Persons	2	1	1
Rate of long serving auditors or Audit Committee members	%	0.0	0.0	0.0
Rate of non-audit services provided by external auditors	%	4.0	1.0	0.0
No. of ESG Committee meetings convened	Times	6	1	-

Director Appointment and Selection for Top Decision-making Body

Indicator	Unit	2022	2021	2020
No. of female directors within the board	Persons	1	1	1
Rate of female directors within the board	%	10.0	9.0	11.0
No. of female registered directors who are not controlling shareholders and their relatives	Persons	1	1	-
No. of executives who has a track record of undermining corporate value and shareholders' rights and interests	Persons	0	0	0

Top Decision-making Body's Role in Supervising Impacts

Indicator	Unit	2022	2021	2020
Frequency of key environmental issues (resource circulation, water / soil / biodiversity, pollutants / chemicals, etc.) being reported to the board	Times / every half year	More than once	-	-

ESG Data

Governance

Delegation of Responsibility for Managing Impacts

Indicator	Unit	2022	2021	2020
Frequency of the impacts on the economy, environment, and people being reported to the board	Times / quarter	More than once	-	-

Top Decision-making Body's Role in Reporting Sustainability

Indicator	Unit	2022	2021	2020
Frequency of climate issues being reported to the board	Times / every half year	More than once	-	-

Conflict of Interests

Indicator	Category	Unit	2022	2021	2020	
No. of concurrent positions assumed by directors and allowed no. of concurrent positions*	No. of concurrent positions assumed by directors	Numbers	Shin, Dong-bin: 4 in addition to LOTTE Chemical Kim, Gyo-hyun: 4 in addition to LOTTE Chemical (1 in Korea, 3 in overseas) Hwang, Jin-koo: 3 in addition to LOTTE Chemical (3 in overseas) Lee, Young-jun: 1 in addition to LOTTE Chemical (1 in overseas) Lee, Hun-ki: 2 in addition to LOTTE Chemical (2 in Korea) Choi, Hyon-min: Handsome Corp. Cho, Woon-haeng: Asia Economy Nam, Hye-jeong: Korea Trade Insurance Corporation	Inside directors: Same as the left Outside directors: Same as the left (Jeong Jung-won: Jin Air) (Lee Geum-ro: TY Holdings)	Inside directors: Same as the left Outside directors: Same as the left	
No. of inside directors who hold undue concurrent positions		Persons	0	0	0	

* It does not apply to other job duties

Key Issue Communication

Indicator	Category	Unit	2022	2021	2020
Minimum notice date specified in the bylaws for notice of a board meeting		Days	1	1	1
Total no. and nature of critical concerns communicated to the highest governance body during the reporting period		Numbers	22	2	-
No. of agenda items objected or asked to revise by outside directors within the board		Cases	0	0	1
Average attendance rate	Total average attendance rate	%	95.0	95.0	84.0
	Outside director attendance rate	%	98.0	97.0	81.0
	Inside director attendance rate	%	92.0	92.0	90.0
Minimum required attendance rate		%	75.0	75.0	75.0

ESG Data

Governance

Remuneration Policy

Indicator	Category	Unit	2022	2021	2020
Annual remuneration for inside directors	Shin, Dong-bin	KRW 1 million	3,830	5,950	3,500
	Kim, Gyo-hyun	KRW 1 million	1,015	1,231	723
	Hwang, Jin-koo	KRW 1 million	531	759	-
	Lee, Young-jun	KRW 1 million	590	737	557
Annual remuneration for outside directors	Members apart from Audit Committee members	KRW 1 million	198	216	204
	Audit Committee members	KRW 1 million	230	230	229
	Total	KRW 1 million	428	446	433
Average remuneration per inside director over the recent two years		KRW 1 million	1,830	1,922	1,703
Maximum ceiling for director's remuneration		KRW 100 million	120	100	102
Total remuneration paid to directors		KRW 100 million	63	91	56
Rate of maximum remuneration being paid		%	52.5	91.0	54.9

Annual Total Compensation Ratio

Indicator	Unit	2022	2021	2020
Annual total compensation for the organization's highest paid-individual (a)	KRW 1 million	1,015	1,231	723
Percentage increase in annual total compensation for the organization's highest-paid individual (b)	%	△0.2	0.7	△0.1
Median annual total compensation for all employees (c)	KRW 1 million	81	92	78
Percentage increase in annual total compensation for all employees (d)	%	△0.1	0.2	-
Rate of the annual total compensation for the organization's highest-paid individual to the median annual total compensation for all employees (a) / (c)	%	12.5	13.4	9.3
Median value of Percentage increase in annual total compensation for the organization's highest-paid individual and for all employees	%	△0.1	0.4	△0.1

ESG Data

Governance

Company Ownership and Operation (Voting Right Status, Regulations on General Shareholders' Meetings, and Internal Transactions)

Indicator	Unit	2022	2021	2020
Stock holdings status of the executive	Shares	1,280	0	0
Stock holdings status of the largest shareholder and related party	Shares	18,827,107	18,825,749	18,824,201
Shareholding percentage of the largest shareholder and related party	%	54.9	54.9	54.9
Stock holdings status of the employee stockholders association	Shares	0	0	0
Shareholding percentage of the employee stockholders association	%	0.0	0.0	0.0
Stock holdings status of treasury stock	Shares	284,972	0	0
Shareholding percentage of treasury stock	%	0.8	0.0	0.0
Stock holdings status of others (National Pension Service, government-run bank, etc.)	Shares	2,446,307	2,645,805	3,216,945
Shareholding percentage of others (National Pension Service, government-run bank, etc.)	%	7.1	7.7	9.4
Total shareholding percentage of controlling shareholders and relatives	%	54.9	54.9	54.9
Total shareholding percentage of registered officers, excluding controlling shareholders and relatives	%	0.0	0.0	0.0
Total shareholding percentage of affiliates	%	54.7	54.9	54.9
Shareholding percentage of shareholders who hold more than 5% except for the largest shareholder and related party (executives and affiliates included)	%	7.1	7.7	9.4
Purchasing amount of treasury stocks	KRW	49,728,425,500	0	0
Rate of shareholder value return	%	606.4	20.0	70.4
Notification day of the venue and agenda for general shareholders' meetings	Day	2022-03-03	2021-03-03	2020-03-04
No. of illegal intra-group transactions over the recent three years	Cases	0	0	0
No. of violations of large-scale intra-group transaction disclosure over the recent three years	Cases	0	0	0

Establishing a Code of Conduct

Indicator	Unit	2022	2021	2020
Code of Conduct coverage rate	%	100.0	100.0	100.0

Business Site Corruption Risk Evaluation*

Indicator	Unit	2022	2021	2020
No. of business sites assessed on corruption risk	Numbers	8	8	7
Rate of business sites assessed on corruption risk	%	100.0	100.0	100.0

* Based on the obtainment of ISO 37301

ESG Data

Governance

Notification and Training on Anti-corruption Policy and Procedures

Indicator	Category	Unit	2022	2021	2020
No. of governance members notified of the organization's anti-corruption policy and procedures		Persons	10	11	11
Rate of governance members notified of the organization's anti-corruption policy and procedures		%	100.0	100.0	100.0
No. of employees notified of the organization's anti-corruption policy and procedures	Female	Persons	770	734	712
	Male	Persons	3,954	3,913	3,829
Rate of employees notified of the organization's anti-corruption policy and procedures	Female	%	100.0	100.0	100.0
	Male	%	100.0	100.0	100.0
No. of partners notified of the organization's anti-corruption policy and procedures	Partner type	Numbers	2,348	2,301	2,945
Rate of partners notified of the organization's anti-corruption policy and procedures	Partner type	%	98.0	Not managed	Not managed
No. of governance members trained on anti-corruption		Persons	5	5	5
Rate of governance members trained on anti-corruption		%	50.0	45.0	45.0
No. of employees trained on anti-corruption		Persons	3,944	3,807	4,541
Rate of employees trained on anti-corruption		%	90.0	88.0	91.0

Confirmed Corruption Cases and Measures Taken

Indicator	Unit	2022	2021	2020
Total no. of corruptions and bribe-takings	Cases	5	2	2

Compliance

Indicators	Category	Unit	2022	2021	2020
Total no. of non-compliance (significant instances) with main laws and regulations during the reporting period	No. of cases handled according to the dispute settlement system	Cases	0	0	0
	No. of cases that incurred fines	Cases	2	4	5
	No. of cases that incurred non-financial sanctions	Cases	0	3	0
	No. of legal breaches	Cases	3	1	1
	Amount of fines due to legal violence	KRW 1 million	11	3	3

Legal Action for anti-competitive behavior, anti-trust, and monopoly practices

Indicator	Unit	2022	2021	2020
No. of legal actions pending or completed during the reporting period regarding anti-competitive behavior and violations of anti-trust and monopoly legislation	Cases	0	0	0
Total fines and settlement money incurred by the non-compliance with regulations related to anti-competitive behavior, anti-trust, and monopoly practices	KRW	0	0	0
Rate of fines incurred by non-compliance with regulations related to anti-competitive behavior, anti-trust, and monopoly practices	%	0.0	0.0	0.0

Approach to Tax

Indicator	Unit	2022	2021	2020
Frequency of the governance body or executive-level position within the organization that formally reviews and approves the tax strategy	Times / year	4	4	4

