

# LG Chem | 2017 Sustainability Report



## | About This Report |

### Overview

LG Chem has published Sustainability Report every year since 2006. The 12<sup>th</sup> Sustainability Report outlines an in depth look of LG Chem's sustainability management and performance.

### Reporting Principles

This Sustainability Report complies with the Core Option in accordance with the GRI (Global Reporting Initiative) Standards, which is an international guideline for sustainability reporting. Also, the report complies with some of the principles and concepts provided by IIRC (International Integrated Reporting Council). In addition, the report reflects the 10 principles of the UNGC, ISO 26000, and core requirements of RBA (Responsible Business Alliance). The Financial information in this report complies with the standards of K-IFRS.

### Reporting Period

The relevant period for this report spans from January to December 2017, and some of the major achievements include progress made until June 2018. To enable time series analysis, the report includes data from the previous three years (2015~2017).

### Reporting Scope

The report covers the 13 domestic production plants in Yeosu, Daesan, Ochang, Cheongju, Osong, Iksan, Naju, Ulsan, Onsan, Gimcheon, Paju, and as well as the head office in Seoul and three technical research centers in Daejeon, Magok, and Gwacheon. Overseas subsidiaries include the following production corporations: 10 production corporations in China including LGCCI, LGCNJ, LGCNA, LGCTJ, LGCBT, LGCBH, LGCBJ, LGCGZ, LGCYX, LGCCQ, LGCHZ, etc., LGCTW in Taiwan, LGCMI in U.S.A, LGCVH in Vietnam, LGCVZ in India, and LGCWR in Poland, etc. (except corporations founded and operated recently or in preperation during 2017). Economic data covers all consolidated companies. Some social and environmental data sets of a different reporting scope are indicated separately.

### Independent Assurance and Additional Information

To secure reliability, Lloyd's Register implemented independent assurance based on the principles of AA1000AS (2008). LG Chem publishes Sustainability Reports in Korean and English. They are also available at LG Chem's Website (<http://www.lgchem.com>).

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**Polycarbonate for Light and Durable Lenses**

Polycarbonate (PC) is a high-quality engineering plastic that is mainly used for industrial products and is stronger and lighter than general plastics. It is transparent and resistant to impact and heat.

**PVC for Diary Cover**

The cover of the diary is made of synthetic leather but feels like genuine leather. Polyvinyl chloride (PVC) is one of the most widely used thermoplastics and is used to make synthetic leather. Its properties, such as robustness or durability, can be changed as necessary according to the types of additives mixed in during the polymerization process.

**Lithium-ion Battery, Extending Battery Life of Laptop**

The lithium-ion battery is a rechargeable tool which exchanges electricity between cathodes and anodes. It's used in myriad devices like smartphones and laptops because of its high energy density and output.

**Polarizer for High-definition Monitor**

A polarizer is a key material that transmits light emitted from a Liquid Crystal Display's (LCD) backlight, directioning it in a single direction while blocking light elsewhere.

**ITO Film, Actualizing Touch Screen for Smartphone**

A touch screen panel is a multi-layered input device. Users touch the screen to select options with their finger or pen. Associated hardware and software determine and send the location to the system. The Indium Tin Oxide (ITO) Film, used for tops and bottoms, is the core material in a touch panel.

**PSA for Post-it with Re-adherable Strip of Glue**

Pressure Sensitive Adhesive (PSA) is an acrylic adhesive which comes in two types: water-based for labels and advertising materials and oil-based for optical films.

# Creating New Innovation

LG Chem's products are almost ubiquitous in our daily lives. Almost all electronic goods from smartphones and lap tops to credit cards and office supplies are chemical products; these resources benefit our society by helping cultivate new ideas.

Apart from producing petrochemical products, LG Chem is dedicated to helping develop new businesses to improve the environment. We will do our best to make a better and brighter future for humanity.

# Making Smart life

Every material on earth is composed of elements: air, water, and soil. While part of the natural environment, these chemical substances also make up our bodies' proteins and nutrients. Most necessities we consider integral to our modern lives are made of chemical compounds. By employing the limited possibilities of these chemical substances, LG Chem has developed material products for children's toys, clothing, OLED TVs, and ESS, making everyday life more convenient.

### ABS for Developing Imagination of Children

Acrylonitrile-Butadiene-Styrene (ABS) is a highly functional and processable plastic known for its strong heat and impact resistance; it can be manufactured in a variety of colors.

### Base of Insulating Material

Expanded Polystyrene (EPS) contains copious layers. This makes EPS durable for thermal insulation, impact absorption, water-resistance and sound insulation.

### PVC for Silk Wallcovering

PVC wall covering can be produced in various designs. It lasts longer than synthetics, is resistant to stains, and is used for water-proofing and thermal insulation.

### Caustic Soda for Uniform Dyeing

Caustic soda, also known as sodium hydroxide, is used to eliminate impurities and brighten cotton fibers to improve the dyeing process. Its aqueous, colorless and odorless solution is highly alkaline.

### OLED, Realizing Ultra Definition TV

OLED TVs display ultra-fine picture quality with colors comparable to natural ones from any viewing angle.

**Lithium-ion Battery, Supplying Power for Drone**

Drones need batteries so that they have the power to be operated wirelessly. Lithium-ion batteries are used for drones because they are light and have a high energy density but no memory effect, which means they last a long time.



**Polyester for Sports Clothes**

Polyester is a synthetic fiber derived from petroleum. It is an absorbent resistant polymer that does not shrink or stretch out of shape.

**SBR for Shoes Material**

Styrene Butadiene Rubber (SBR) is a synthetic rubber made by performing low-temperature emulsion polymerization on styrene and butadiene. Compared to natural rubber, SBR boasts uniform quality and excellent heat/wear resistance. It is widely used to manufacture tires, shoes and industrial goods.

**PVC for Durable Soccer Ball**

PVC's high durability is one of the reasons it is used extensively in a variety of products ranging from sporting goods to household items.

**EVA for Sole of Shoes with Elasticity**

Ethylene Vinyl Acetate (EVA) is a copolymer of ethylene and vinyl acetate monomer. Its elasticity, heat sealing temperature, durability and permeability vary depending on the content of vinyl acetate monomers. It is used in a variety of areas from value-added products such as photovoltaic sheets to shoe soles, life vests, and more.

# Fostering Active Future

Today, work-life balance is an important factor in determining the quality of life. As the importance of leisure time increases, the demand for sports equipment, smart mobility, and drones has also grown. LG Chem's chemical products are drawing attention across the globe, especially our new athletic clothing and equipment line. Our smart mobility plan promotes eco-friendly means of transportation like electric bikes, wheels and scooters. Drones have also seen a rapid rise in popularity. These unmanned vehicles are being used to capture images, deliver goods, collect information and even assist agricultural activities. Said electronic goods all require light and long-lasting batteries with high power density. LG Chem's IT & New Application batteries are widely adopted for smart mobility and drones. LG Chem will continue to enrich lives by advancing its chemical technologies.

**Lithium-ion Battery, Supplying Power for Environment-friendly EV (Electric Vehicle)**

LG Chem uses medium to large-sized lithium-ion batteries to power electric vehicles. These lightweight batteries boast underfloor pack technology and apply LG Chem's patented Stand & Fold structure which increases energy density by maximizing internal space and changing shape according to design.

**Lithium-ion Battery, Key Material of Electric Bike**

Electrically powered and easy-to-use electric bicycles are eco-friendly and recognized as a next-generation vehicle. The replacement of lead storage batteries with lithium-ion batteries has enabled electric bicycles to reduce their weight and size.





## To the Stakeholders

I would like to extend my deepest gratitude to all of you for your continued interest in and support for LG Chem.

Last year, LG Chem achieved the highest performance since its foundation, with sales of KRW 25.698 trillion and an operating profit of KRW 2.929 trillion, despite uncertain environmental factors such as prolonged low growth and rising theme of conservation stemming across the globe.

In the Basic Materials & Chemicals Division, we achieved strong sales performance by reducing costs and expanding high value-added businesses. In the Energy Solutions Division, we turned a profit thanks to the sales growth of the automotive battery and ESS (Energy Storage System) battery as well as the improvement of the business structure of the IT & New Application Battery. The IT & Electronic Materials/Advanced Materials Divisions also saw an increase in sales and profitability through the enhancement of product competitiveness. In particular, the merger with LG Life Sciences following the takeover of FarmHannong has enabled us to begin the red bio business, and moving forward we will solidify its foundation by developing comprehensive future growth strategies and action plans.

In the coming years, we will have to face a lot of challenges in the business arena due to issues such as rising protectionism around the world and increasing price volatility of exchange rates and major raw materials like oil. In addition, there will be a greater need for corporate social responsibility than ever before, including mandatory disclosure of CSR information and responsible management of international supply chains.

LG Chem will overcome these challenges in the changing global business landscape by seeing them as opportunities to secure competitiveness. We will resolutely eliminate old practices and enhance our business structure. Strengthening compliance with quality, safety, and environmental management standards will allow us to fulfil our social responsibilities as a corporate citizen of the future.

**“We will provide differentiated customer value through the enhancement of our business structure.”**

We will continue to pursue the bio-growth strategy that we have been pursuing since last year and actively discover and promote new businesses in the fields of energy, water, and inorganic materials. In our core businesses, we will make thorough preparations to maintain high profits and secure fundamental competitiveness, especially as the scale of investment and number of global businesses increase. In response to the expansion of high value-added businesses and the increase in orders for automobile batteries, we will make every management decision based on value.

As we improve the capacity of R&D productivity at LG Science Park, we will aggressively expand open innovation with other organizations. Moreover, we will vigorously examine the current level of our manufacturing competitiveness and management system and will implement relevant tasks for innovation.

**“LG Chem is fully committed to growing together with society while putting customer value first.”**

**“We will comply with stringent quality standards and enhance safety and environmental management activities.”**

We will manage the quality of products, safety, and the environment, which are the basis of customer trust, without making any compromises. We understand that even a single accident can destroy the foundation of our business, and thus we will continuously foster a corporate culture of complying with established standards and principles.

**“We will become a company that grows together with society.”**

As a corporate citizen, we will strive to maximize our social contribution by raising our economic, social, and environmental value. We will establish a healthy ecosystem where mutual growth can be conducted and our efforts and achievements are transparently disclosed to our customers, shareholders, investors, suppliers, and local communities.

LG Chem has grown constantly for more than 70 years thanks to the tireless efforts of our employees and numerous economic and social players who have been with us throughout.

We will do our best to conduct business activities in a fair and transparent manner and meet the expectations of customers and society. I ask for your continued support and encouragement.

Thank you.

June 2018  
CEO and Vice Chairman of LG Chem

# Company Profile

As a global chemical company, LG Chem has established worldwide production, sales and R&D networks while also providing a market for global competitiveness. LG Chem will fulfill its social and environmental responsibility throughout the management process under this vision: 'A Global Leader Grows Together with Customers by Providing Innovative Materials and Solutions.'


## Company Status


Company Name	LG Chem, Ltd.
Headquarters	LG Twin Towers, 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, South Korea
Foundation	January 1947
Employees	29,438 (Korea 16,810, overseas 12,628)
Revenue	KRW 25,698 billion
Net Income	KRW 2,022 billion
Total Assets	KRW 25,041.2 billion (capital KRW 16,338.6 billion, liabilities KRW 8,702.6 billion)


As of December 31, 2017


## Business Areas


Our businesses consist of Basic Materials & Chemicals, Energy Solutions, IT & Electronic Materials, Advanced Materials, and Life Sciences. By selecting and promoting 'Energy/Water/Biotechnology' fields as new growth engines, we are laying the foundation for sustainable growth.

**Basic Materials & Chemicals**  Ethylene and propylene are basic raw materials of petrochemicals produced and used to manufacture plastic materials we use daily such as PE, ABS and synthetic rubber.

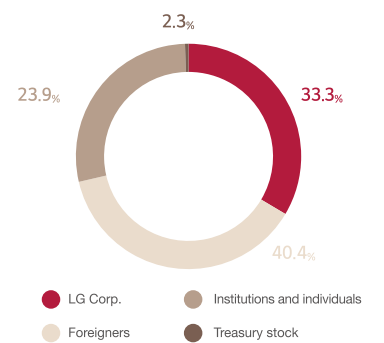
**Energy Solutions**  Automotive batteries for eco-friendly electric vehicles, ESS batteries for renewable energy storage, and IT & New Application batteries for smartphones and laptops are manufactured based on lithium-ion battery technology to provide energy solutions.

**IT & Electronic Materials**  Hidden high technology-intensive materials play a key role in completing final products like material displays, semiconductors, and automobiles. RO membrane, a water treatment filter, provides high-quality products to secure clean water.

**Advanced Materials**  Display and rechargeable battery materials come from separate business units and remain active investments. R&D carries out activities which secure this future industry.

**Life Sciences**  In 2017, LG Chem and LG Life Sciences merged to promote future, long-term growth for the company. Life Sciences alone has secured a competitive edge in the biotechnology market based on superior technology and R&D capacity with medicine, vaccines, and fine chemicals.

## Shareholder Status



As of December 31, 2017



LG Chem currently operates a global network of 21 manufacturing plants, 15 subsidiaries, 5 representative offices and 4 R&D centers in 16 countries. Key manufacturing plants are located in Korea, China, Taiwan, the U.S., Poland, India and Vietnam. R&D centers at home and abroad promote development of core technologies and next-generation products.

## | Domestic Network |

### 1 Korea

Seoul HQ	R&D Campus Daejeon	R&D Campus Magok (LG Science Park)	R&D Campus Gwacheon	Leadership Center	Yeosu Complex
Daesan Complex	Ochang 1 Plant	Cheongju Complex	Iksan Plant	Ulsan Plant	Naju Plant
Gimcheon Plant	Paju Plant	Osong Plant	Onsan Plant		

## | Global Network |

<b>2 China</b>	<b>3 Japan</b>	<b>7 Malaysia</b>	<b>10 Australia</b>	<b>13 Poland</b>	<b>16 USA</b>	<b>17 Mexico</b>
Beijing	Tokyo	Kuala Lumpur	Sydney	Wroclaw	Atlanta	Mexico City
Hongkong	<b>4 Thailand</b>	<b>8 Indonesia</b>	<b>11 Turkey</b>	<b>14 Russia</b>	Torrance	<b>18 Brazil</b>
Huizhou	Bangkok	Jakarta	Istanbul	Moscow	Holland	Sao Paulo
Tianjin	<b>5 Vietnam</b>	<b>9 India</b>	<b>12 Germany</b>	<b>15 Jordan</b>	Troy	
Guangzhou	Ho Chi Minh City	Mumbai	Frankfurt	Amman		
Chongqing	Hai Phong	Gurgaon				
Ningbo	<b>6 Taiwan</b>	New delhi				
Nanjing	Taipei					

# Our Strategy

LG Chem's sustainability management covers all management activities in alignment with corporate strategic directions. Based on its management philosophy 'LG Way', the company strives to achieve its vision and promote sustainability management.

## LG Chem's Vision and Core Values

LG Chem achieves its vision by practicing three shared values: quality for customers, strong implementation, and mutual respect. We are a global leader that grows with its consumers by providing innovative materials and solutions.

Vision

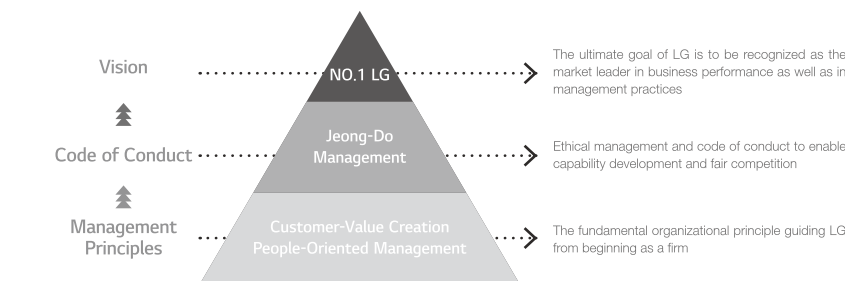


Value



## LG Way

The "LG Way" is our particular corporate philosophy, combining two fundamental management principles: Customer Value Creation and People-Oriented Management. Jeong-Do Management sets a high ethical standard for managerial practices and a strict code of conduct for all our employees. By following the "LG Way" we hope to reach our ultimate goal of becoming No. 1 LG.



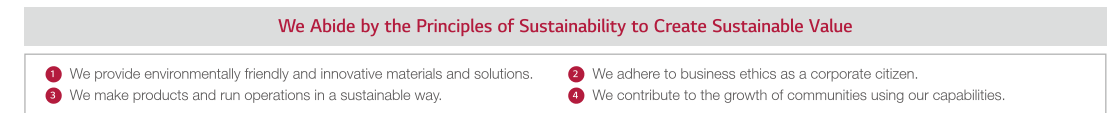
## Sustainability Management System

LG has promoted sustainability management based on four principles and ten key tasks in economy, environment, and society under the vision of the 'Sustainable Chemistry for Human and Environment.'

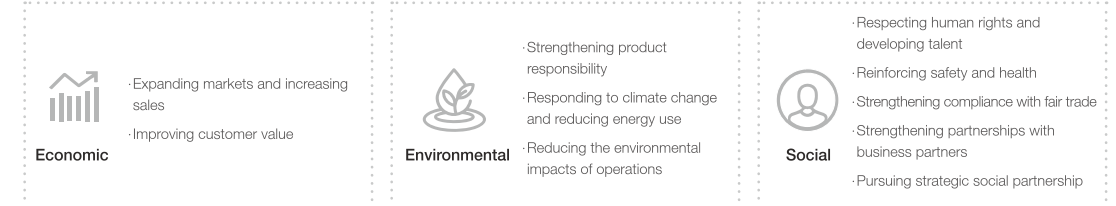
Vision



Principles of Sustainability



Tasks



## Sustainability Management Aligned with SDGs

As a member of the UN Global Compact, LG Chem actively supports the Sustainable Development Goals (SDGs). LG Chem will contribute to the sustainable development of the world by aligning its business with the SDGs.





# Our Business Models

INPUT

VALUE ADDED BY LG CHEM

OUTCOMES OF BUSINESS

Economy

- Financial Capital**
  - Domestic and overseas economic condition
  - Response to governmental regulations
  - Assets (capital)
  - M&A
- Manufactured Capital**
  - Domestic and overseas operations
  - Manufacturing facilities
- Intellectual Capital**
  - Core technologies
  - Intellectual property rights, patents

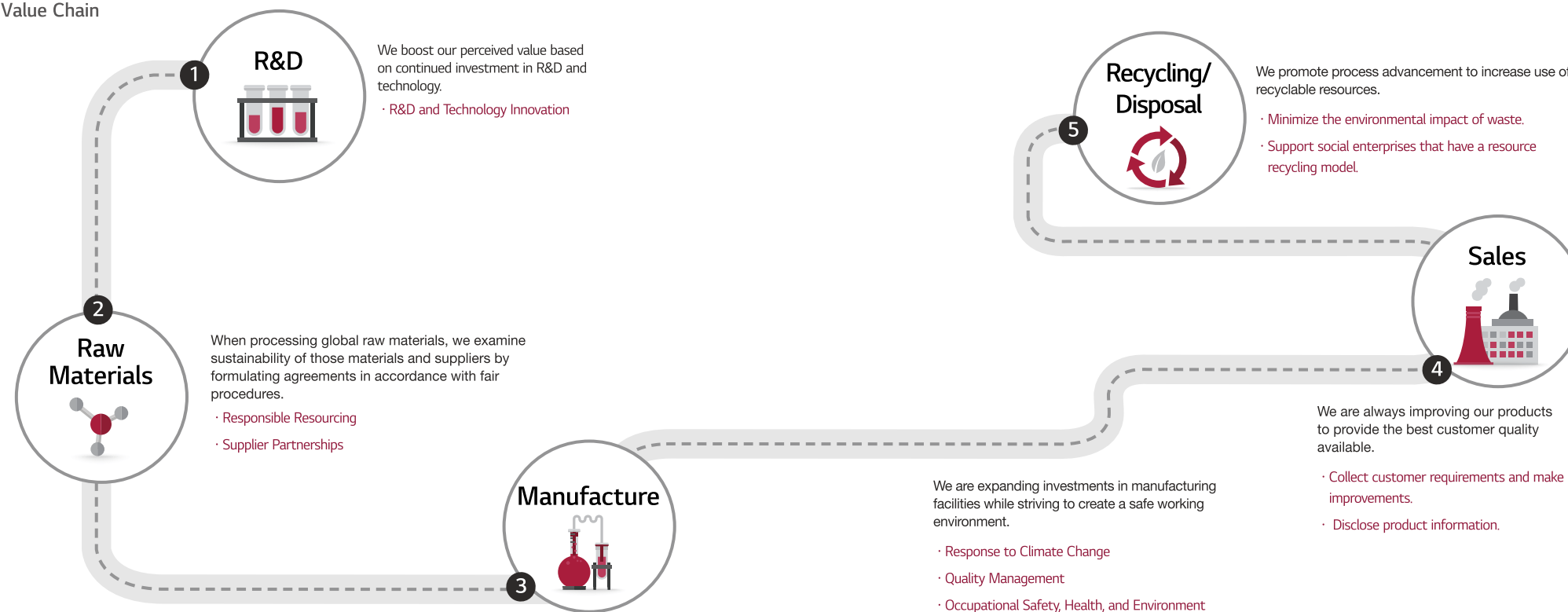
Environment

- Environmental Capital**
  - Natural environment
  - Energy, water, electric Power, etc.

Society

- Human Capital**
  - Professionalism of employees
  - Vocational experience and capabilities
  - Ethical awareness
- Social Capital**
  - Local community
  - Government
  - Customers
  - Supplier

Value Chain



Economy

- Corporate tax: KRW 541.9 billion
- Shareholder and investor dividends: KRW 460.1 billion
- Patents in Korea and overseas: 46,976
- The percentage of new products in total sales: 35.1%

Environment

- GHG emissions intensity: 0.454 tCO<sub>2</sub>-eq/product ton
- Environmental investment: KRW 41.4 billion
- Energy saving: KRW 55 billion

Society

- Community investment: KRW 36.3 billion
- Injury rate: 0.23%
- Purchase from suppliers: KRW 13,080 billion
- Annual wages of employees: KRW 1,508 billion
- 1,151 of new jobs created

Business and Product












# Stakeholder Engagement

LG Chem communicates with stakeholders through several channels. Opinions are reflected in management policies and shared with stakeholders.

## Stakeholder Communication Channel

LG Chem communicates with direct and indirect stakeholders including shareholders & investors, customers, employees, suppliers, NGOs & local communities, academia & experts, industrial associations & organizations, media, and government agencies. LG Chem listens to the objective opinions of key stakeholders (shareholders, investors, customers, employees, and suppliers) in regard to major business activities and sustainability management.

Stakeholder Groups	Expectation	Communication Channel
 <b>Shareholders &amp; Investors</b>	<ul style="list-style-type: none"> <li>Long-term growth</li> <li>Creating and distributing profits</li> <li>Transparent disclosure</li> </ul>	<ul style="list-style-type: none"> <li>Corporate presentations</li> <li>General shareholders' meetings</li> <li>Financial information disclosure</li> <li>Credit ratings</li> </ul>
 <b>Customers</b>	<ul style="list-style-type: none"> <li>Open communication</li> <li>R&amp;D capabilities</li> <li>Improving product quality and safety</li> </ul>	<ul style="list-style-type: none"> <li>Collecting customer feedback</li> <li>Product liability monitoring</li> </ul>
 <b>Employees</b>	<ul style="list-style-type: none"> <li>Improving the corporate culture</li> <li>Cooperative labor-management relationship</li> <li>Promoting employee benefits</li> <li>Reinforcing employee safety and health</li> </ul>	<ul style="list-style-type: none"> <li>Employee satisfaction survey</li> <li>Labor-Management Committee</li> <li>Company magazines</li> <li>Safety and Environmental Committee</li> <li>Employee Committee</li> <li>CSR Committee</li> </ul>
 <b>Suppliers</b>	<ul style="list-style-type: none"> <li>Supporting suppliers and providing training</li> <li>Fair sharing performance with suppliers</li> </ul>	<ul style="list-style-type: none"> <li>Shared Growth Committee</li> <li>Business and technical support programs</li> <li>Supplier presentations</li> </ul>
 <b>NGOs &amp; Local Communities</b>	<ul style="list-style-type: none"> <li>Strategic social partnerships</li> <li>Local CSR activities by overseas subsidiaries</li> <li>Investing in local communities</li> </ul>	<ul style="list-style-type: none"> <li>Listening to opinions such as survey</li> <li>Cooperation in region where CSR activity takes place</li> </ul>
 <b>Academia &amp; Experts</b>	<ul style="list-style-type: none"> <li>Industry-academic cooperation</li> <li>Technological development</li> </ul>	<ul style="list-style-type: none"> <li>Consultation</li> <li>Joint R&amp;D activities</li> </ul>
 <b>Industrial Associations &amp; Organizations</b>	<ul style="list-style-type: none"> <li>Responding to new regulations</li> <li>Chemical management</li> </ul>	<ul style="list-style-type: none"> <li>Councils and forums on sustainability</li> <li>Industry and business-related business associations</li> </ul>
 <b>Media</b>	<ul style="list-style-type: none"> <li>Creating and distributing profits</li> <li>Technological innovation</li> <li>CSR activities</li> </ul>	<ul style="list-style-type: none"> <li>Informal press meetings</li> </ul>
 <b>Government Agencies</b>	<ul style="list-style-type: none"> <li>Shared growth</li> <li>Occupational safety and health</li> <li>Fair trade and compliance</li> </ul>	<ul style="list-style-type: none"> <li>Advice on industrial policies</li> <li>Government pilot projects</li> </ul>

## Stakeholder Opinions and Responses

LG Chem listens to stakeholders' diverse opinions through meetings and surveys. Key opinions suggested during meetings mirror management activities, follow-ups, and results in sustainability reports.

Listen to Stakeholders' Opinions

**“ Product sustainability is important for sustainable development.**

In recent years, product social responsibility as well as product quality have become more important than ever. Accordingly, both LG Chem and its suppliers need to have a sense of responsibility for the entire supply chain from raw material mining to finished battery products. We need to strive to reduce the environmental impact, such as carbon emissions, air pollution and water use, in all production stages, and to comply with all due diligence rules in accordance with the assessment of child labor and human rights violations in the supply chain. ”

Customer

**“ LG Chem is required to manage risk while growing its business.**

To secure future growth engines, LG Chem is implementing energy, water, bio businesses. If the diversification of LG Chem's business portfolio brings changes in the scale of profit, it will have a positive effect. When it comes to investment risks, the policy on raw materials, which are less affected by oil prices, needs to be consistently managed, and the transparency of management needs to be more enhanced to maintain trust from the public. ”

Investment Institution

**“ Supports for outstanding partners should be strengthened.**

LG Chem has been actively promoting mutual growth with its partners and programs for mutual growth are well operated. To foster cooperation culture, screening of suppliers need to be strengthened and policy for supporting the outstanding partners is needed. Also, the support program needs to be more actively promoted through communication channels such as meetings. ”

Partner

**“ We expect to see the continued CSR activity for youths and education.**

Through the Fun Chemistry Park program, we have developed a positive awareness of LG Chem's social contribution activities. Both schools and students are highly satisfied with the experiential science (chemistry) education contents that are provided in the form of outreach programs since individual schools are not capable enough to provide such contents. We hope to see the continued operation of the program with more participants in the future. ”

Local Communities

**Commentary from Vice President of Corporate Affairs Department**



“ LG Chem meets with stakeholders, identifies their expectations, and reflects them in its sustainability management activities. Also, the identified issues are systematically managed in a close cooperation with relevant departments and the results are disclosed in Sustainability Reports. These efforts for communication and internal management will lay the foundation for LG Chem to emerge as a leading global chemical company. LG Chem will continue to promote sustainability management and create sustainable values in every business activity to fulfill its social and environmental responsibilities. ”

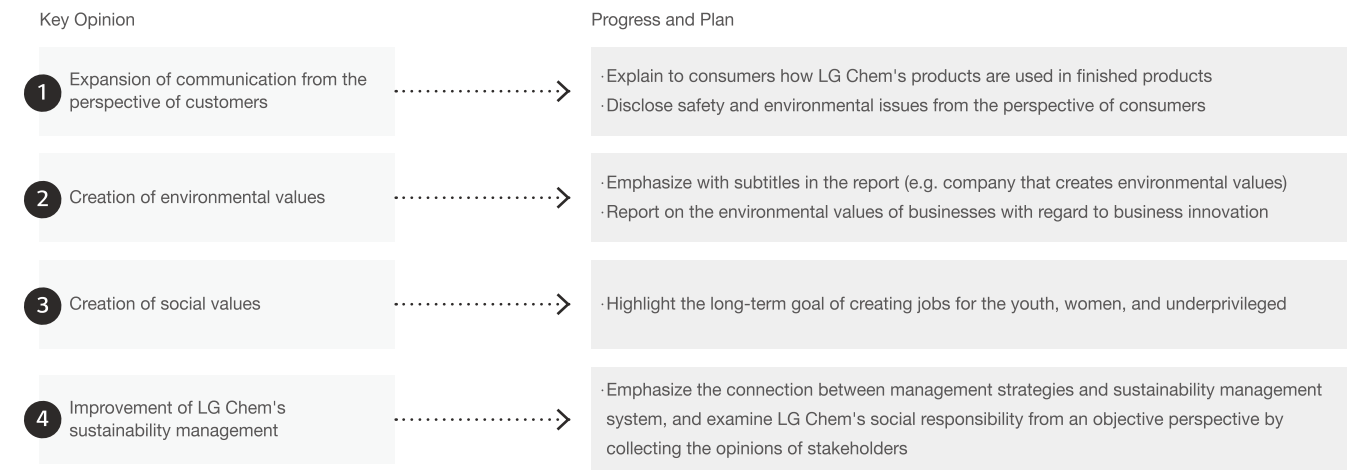
### Stakeholders Meeting

As part of the efforts to promote its sustainability management, LG Chem held 2018 LG Chem Stakeholders Meeting to identify sustainability issues which stakeholders put a priority on. Experts in economy, society and environment were invited, and their opinions regarding the trends and directions of sustainability management were collected. Those suggested by stakeholders at the meeting will be reflected in LG Chem's management strategies and operations and also in sustainability reports.

**Overview**

<b>Date</b>	March 28, 2018 (Wednesday)	
<b>Location</b>	Floor 31, Meeting hall, headquarters of LG Chem	
<b>Participants</b>	Chae-Ki Kwak, professor (Dongguk University)	Jin-Seong Kim, team leader (Korea Corporate Governance Service)
	Kyeong-Sin Kim, professor (Sungshin Women's University)	Jae-Seong Noh, research commissioner (Business Institute for Sustainable Development)
	Eun-Kyeong Lee, senior researcher (UN Global Compact Network Korea)	

### Opinions from Stakeholders Meeting and Plan for Reflecting in Management



### Subject

- Evaluation on LG Chem's sustainability management, and making up for the weak points
- Direction of LG Chem's sustainability management and the social value that LG Chem should create



**Chae-Ki Kwak, professor**

One of the emerging issues in the chemical industry is safety. Although LG Chem's products are not directly delivered to end users, the company needs to manage customer safety in a proactive manner. Along with this, the company's business portfolio has been reorganized to focus on energy, water and biotechnology and thus created various environmental values. Also, the government has recently been focusing on the creation of social values. In this regard, LG Chem needs to increase investment in new businesses to create more jobs, and improve the quality of employment through the management of supply chains.



**Kyeong-Sin Kim, professor**

Considering its business characteristics, LG Chem needs to do everything possible to ensure complete safety in workplaces. It needs to reestablish a sustainable, trustworthy management strategy for the long-term while establishing quantitative economic measurements of environmental and sustainable social performance. LG Chem should manage activities aligned with the UN SDGs. Employees should also internalize sustainability management and have loyalty to the company.



**Eun-Kyeong Lee, senior researcher**

In fact, LG Chem's sustainability reports have been significantly improved, in terms of reporting quality and system, by proactively reflecting the opinions suggested at the meetings of stakeholders. The reports would be improved even more if there were a clear explanation on how its energy, water, and biotechnology businesses are aligned with the UN SDGs. Since the UN SDGs are too comprehensive, the company does not need to deal with every issue. Most of all, LG Chem needs to minimize negative impact and maximize positive impact on its business areas. Also, regarding the SDGs, the company needs to focus on the issues with a considerable impact on its future businesses, and estimate the long-term KPI and impact.



**Jin-Seong Kim, team leader**

Although the BOD is considered as the main pillar of the company, the sustainability reports have failed to show a clear connection between the BOD and business units. Since LG Chem has a stable ownership, external investors do not have much influence, which ensures a corporate stability but also means less external stimulus. Therefore, LG Chem might lag behind others if it does not change by itself. In fact, foreign investors put much emphasis on non-financial performance, such as environment and society, as well as financial performance. In this regard, LG Chem's sustainability reports need to show that corporate strategies are well aligned with sustainability management (e.g. the BOD deals with sustainability management issues in the long term).



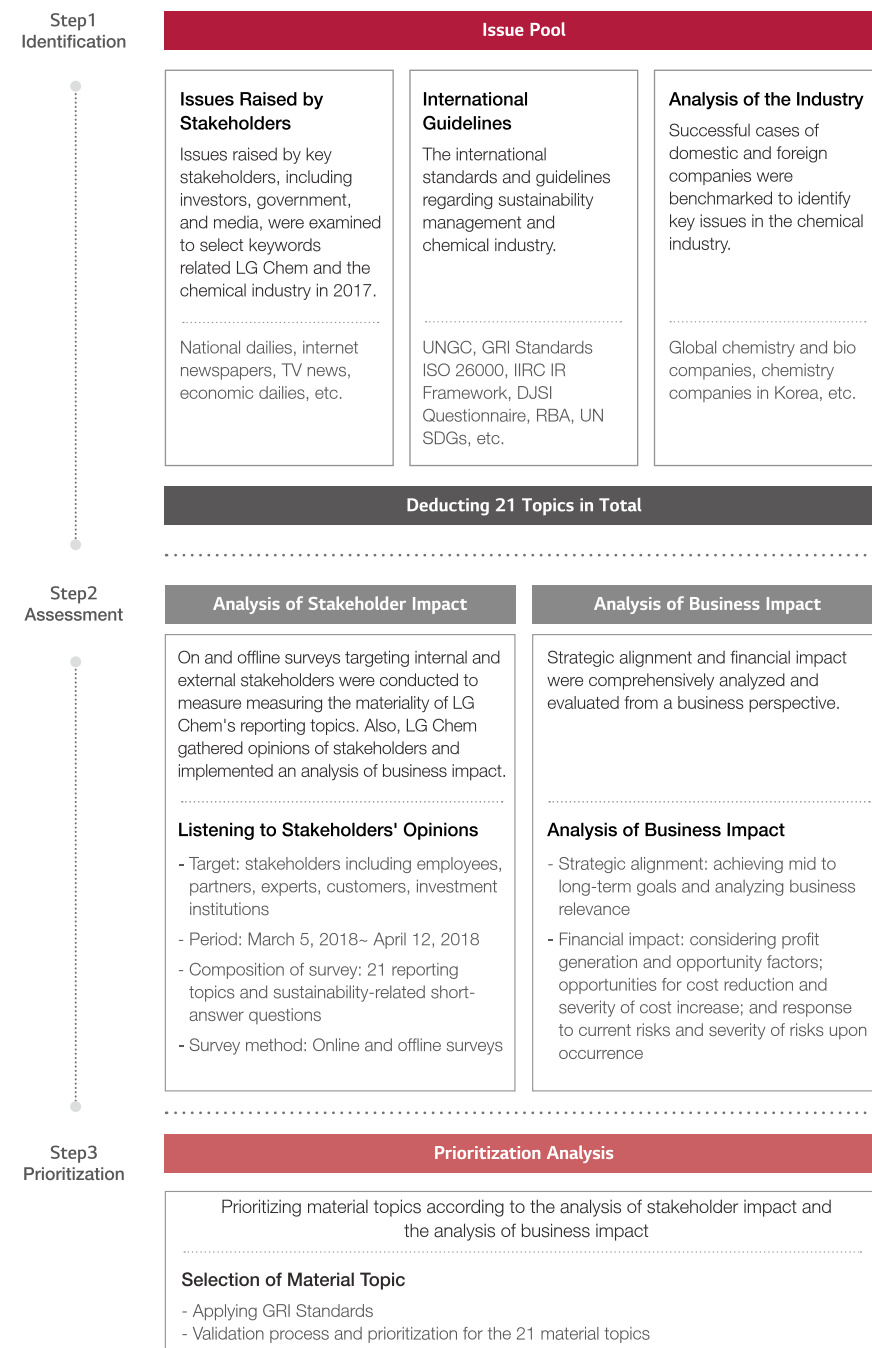
**Jae-Seong Noh, research commissioner**

Along with changes in its business portfolio, LG Chem has pursued to create environmental values by increasing energy efficiency and decreasing environmental load. In order to actively communicate with stakeholders on business directions, the sustainability reports need to be prepared in alignment with the UN SDGs and highlight not results but impacts on the society. Furthermore, LG Chem not only needs to comply with environmental laws and regulations; it also needs to take the lead in meeting non-legal requirements. Also, as a large energy user, LG Chem needs to make voluntary efforts to improve its workplace environment, such as using of renewable energy sources.

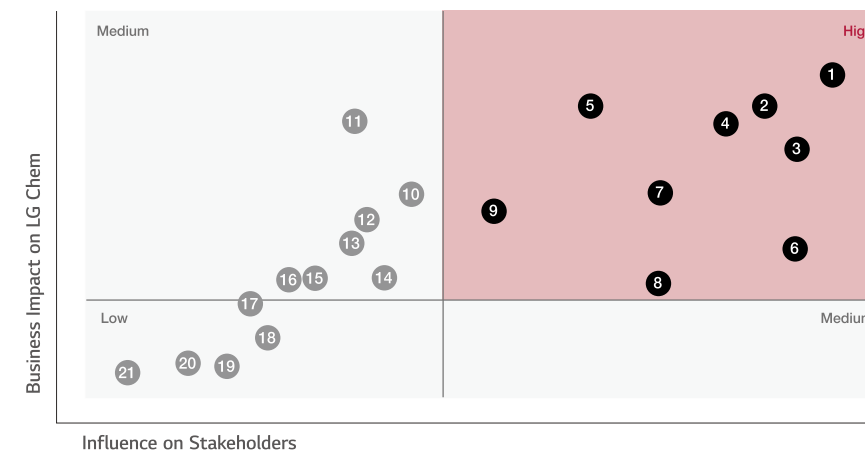
# Materiality Assessment

LG Chem conducted a materiality assessment to effectively reflect internal and external business environments, expectations and stakeholders' interests. The 2018 Sustainability Report was prepared in compliance to Global Reporting initiative (GRI) Standards. Stakeholders' assessment, influence and strategy were analyzed and they impacted the financial aspect of LG Chem's business. The process of materiality assessment is as follows:

## Materiality Assessment Process



## Result of Materiality Assessment



Twenty-one topics were deduced through a matrix analysis which considers business impact and influence on stakeholders, and nine topics were selected as LG Chem's material topics.

Topics	Report Category	Boundary		Report Page
		Internal	External	
1 Strengthening Core Capability	Innovation for a Better Future	●	●	27-29
2 Improving Business Model		●	●	26
3 Innovation in Organizational Culture		●		31-32
4 Complying with Quality Standard and Safety & Environmental Management	Back to Basics	●	●	35-43
5 Response to Climate Change	Protecting Our Planet	●	●	45-49
6 Sustainability in Supply Chain	Getting Engaged with Partners	●	●	55-57
7 Shared Growth		●	●	51-54
8 Human Rights	Respecting Human Dignity	●	●	59-63
9 Local Community	Giving Back to Communities		●	65-71
10 Business Growth and Competitive Advantage	Financial Performance	●		73-74
11 Ethics and Integrity	Business Ethics	●	●	89
12 Compliance with Laws and Regulations		●	●	89-90
13 Risk Management	Risk Management	●		92-93
14 Employment and Labor-Management Relation	Non-financial Performance	●		77
15 Training and Education		●		76
16 Corporate Governance	Corporate Governance	●	●	87-88
17 Diversity and Equal Opportunity	Respecting Human Dignity	●		61-62
18 Stakeholder Engagement	Stakeholder Engagement	●	●	16-19
19 Raw Materials Management	Non-financial Performance	●		78
20 Waste Water and Waste Management		●		78
21 Water Resource Management		●		78-79

### **INNOVATION FOR A BETTER FUTURE**

We lead a chemical industry in a rapid changing business environment while concentrating our capacity for future growth, portfolio reorganization and high-value added business.

### **BACK TO BASICS**

We prioritize product quality and comply with domestic and international regulations on chemical substances by preventing potential accidents and fostering safe working environments.

### **GETTING ENGAGED WITH PARTNERS**

We promote mutual growth throughout the entire business value chain. We support the growth and global competitiveness of our partners, and ensure the responsible procurement of resources through suppliers CSR management.

# Value Adding

### **PROTECTING OUR PLANET**

We are actively engaged in reducing GHG emissions to prevent environmental risks and manufacturing eco-friendly products to enhance our business competitiveness.

# Activities

### **RESPECTING HUMAN DIGNITY**

Based on our management philosophy 'People-Oriented Management', we fully support the international standards for human rights and labor, and strictly comply with labor laws in every country and region of our business operation.

### **GIVING BACK TO COMMUNITIES**

We make investments in local communities to increase social values. We are engaged in protecting the environment and resolving the issues of local communities, and we also calculate the SROI by measuring the effectiveness of these activities for efficient implementation.



# INNOVATION FOR A BETTER FUTURE

## Industry Trends: Change & Response

Global trade protectionism is expected to increase exponentially. The overall business environment is facing a bumpy road due to increased volatility in oil prices, exchange rates, and major raw material prices. The increased volume of North American petrochemical products based on shale gas and growth of European and Chinese battery markets will intensify competition for orders.

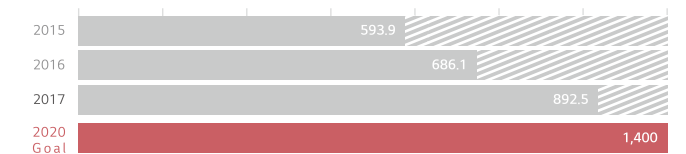
When it comes to LCD and OLED materials, global technology leaders have been leading the market expansion, and the functional film and RO membrane market is also expected to keep growing for years to come. While demographical factors are affecting the biotechnology market, red bio is expected to maintain an annual growth rate of 6.5% due to the aging population, innovative life science technologies, and consequential development of new treatments. The anticancer and immune disorders sector is leading the growth with active release of new drugs. The green bio market is continuously increasing to deal with the risk of food shortage in the future. Genetic engineering technology and precision agriculture solutions are accelerating the expansion of green bio market, and global entities are focusing on large-scale M&As, strengthening their market-leading positions and, taking the lead in industrial innovations.

## Strategy: Risk & Opportunity

LG Chem chose to fundamentally innovate its business structure and method to be a leader in the fast-changing industry, not a mere survivor. The company has concentrated on the future growth areas of energy, water, and bio, and restructured its portfolio with a focus on high value-added businesses to enhance competitiveness. We have expanded our business portfolio to include 'green bio' (seed/crop protection), 'red bio' (medicines), and 'battery materials' through M&As with FarmHannong, LG Life Sciences, and GS EM. In the long run, LG Chem is striving to be a company with strong fundamentals that can sustain a steady growth in sales and profits despite the rapidly changing and uncertain business environments.

## Evaluation

Amount of R&D Investment (Unit: KRW billion)



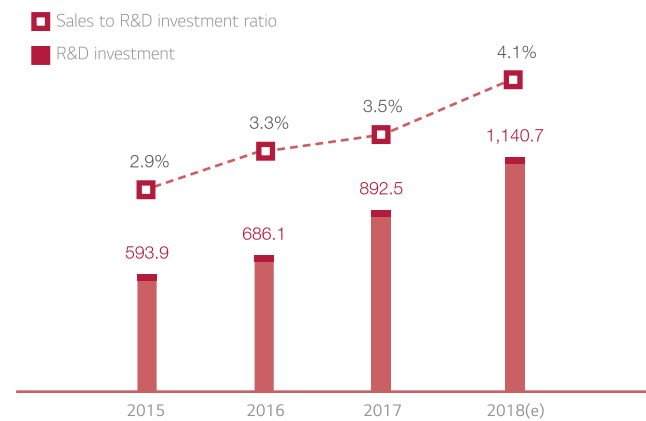
## Improving Business Structure

LG Chem has established a company-wide growth strategy by designating energy, water, and bio as core future businesses, and has raised competitiveness by restructuring its portfolio with a focus on high value-added businesses. The business portfolio has also been expanded to include green bio, red bio, and battery materials through M&As with FarmHannong, LG Life Sciences, and GS EM, respectively. We aim to be one of the 'Global Top 5 Chemical Companies' with a balanced business portfolio by 2025. To that end, we will expand new businesses to increase the sales of non-petrochemicals and batteries (including battery materials) to 40% by 2020.

### Future Business Growth Strategy

LG Chem is fostering energy, water, and bio as mid to long-term growth engines since these three areas are expected to witness an increasing demand owing to population growth in the future. We entered the green bio sector covering crop protectants, seeds, and agrichemicals, through the acquisition of FarmHannong in April 2016 and the red bio sector of medical treatments and medicines by merging with LG Life Sciences in January 2017. The red bio growth strategy is focused on developing innovative new drugs, and for green bio, we have selected Asia as our core market and are reviewing where and how to build capacity. In 2017, we have invested KRW 575.5 billion, which is 64.5% of the total R&D investment in future strategy sector including energy, water/air, bio, and next-generation new materials. We are also operating a corporate fund (strategy and open innovation) of KRW 120 billion to advance our business structure and nurture new businesses.

R&D Investment (Unit: KRW billion)



\* The performance of FarmHannong and Life Sciences division is included in data from April 2016 and January 2017 accordingly.

**Energy** LG Chem, ranked 4th in the global electric vehicle battery market with an 8% market share, has an order backlog of approximately KRW 42 trillion as of 2017. In 2018, we plan to enhance our electric vehicle battery production capacity from 18GWh (2017) to 34-35GWh. These batteries are currently supplied to Hyundai Motors, BMW, Volkswagen, Audi, GM, Renault-Nissan Alliance, Ford, Daimler, etc., and new supplies will be provided to Mahindra Group's new 2020 model. LG Chem is also focused on developing innovative batteries that exceed limits of existing ones with fuel cell materials and lightweight, high-functional materials for vehicles. By 2019, we will foster the Carbon Nanotube (CNT) business applicable for recharging batteries and semiconductors while preparing commercialization of carbon fibers that make light, eco-friendly automotive materials.

**Water** In 2017, sales of RO membranes doubled from the previous year. In the seawater desalination market, we ranked first by winning four large-scale projects. We are now developing filters that apply to ceramic separation membrane materials and next-generation water treatment technologies.

**Bio** In the red bio sector, LG Chem is focusing on the R&D of new drugs for cancers/immune disorders and diabetes/metabolic diseases. In addition to our own research, open innovation is also being utilized to speed up the expansion of new drug pipelines. As for green bio, the development of finished goods with new materials is being reviewed, and there is a plan to concentrate capacity in overseas markets. The establishment of the FarmHannong Seed Research Corporation in Thailand in 2013 will facilitate a high growth potential in Asian markets.

### Strengthening Businesses Competitiveness

Our current businesses lead a highly competitive market by encroaching on high value-added work. We invested more than KRW 1 trillion in the domestic basic materials sector for expansion of the elastomer and NCC business, the establishment of a successful, advanced material R&D center and eco-friendly plasticizer business. Investment in acrylic acid/SAP helped increase the number of valued businesses serving the basic materials sector with products like metallocene PO, high-functioning ABS and EP, next-generation SAP, and eco-friendly synthetic rubber. In the battery sector, we have secured a competitive edge in terms of cost, performance, and safety through proactive R&D activities, and we will surely be first when it comes to winning large projects on third-generation electric vehicles.

## Strengthening Core Capacity

LG Chem's competitive edge comes from differentiated R&D, and we are making large investments in R&D to exceed KRW 30 trillion in sales for the first time. In parallel, we are also providing strong support to secure talents and help them grow through self-development.

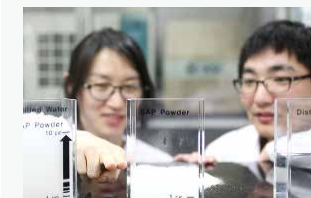
### R&D Innovation

Being the first to establish a large-scale R&D complex in the industry, LG Chem has written a history of challenges and innovations. We are continuously working to discover new businesses with strong potential by investing in R&D and securing and integrating core technologies. Our R&D activities are especially concentrated on energy, water, bio, and next-generation materials based on LG Chem's core technologies: catalyst/process, coating, organic/polymer synthesis, and optical design.

LG Chem has six domestic research institutes (Corporate R&D Center, Basic Materials & Chemicals R&D Center, Battery R&D Center, IT&E Materials R&D Center, Advanced Materials R&D Center, and Life Sciences R&D Center), and six centers (Basic Materials & Chemicals Tech Center, Automotive Battery Development Center, Small Battery Development Center, ESS Battery Development Center, OLED Development Center, and Battery Materials Development Center). LG Chem continues to bolster its global partnerships by replacing R&D organizations overseas.

**Increasing R&D Investment for the Future** Each business division has been constantly enhancing its structure and enhancing R&D activities. In 2017, we invested KRW 892.5 billion in the R&D sector, the highest amount of investment to date, but only 3.5% of total sales at the same time. R&D expenses for 2018 are set at KRW 1.1 trillion, up 22% from the previous year. Since 2015, R&D expenses have constantly increased by more than 20% every year, and higher portions

### Best Practice Key R&D Innovation Cases



#### Basic Materials & Chemicals

##### Expanding Acrylic/SAP

By 2019, LG Chem plans to invest KRW 300 billion in the expansion of the Yeosu plant. After the expansion, the Yeosu Plant will have the capacity to produce 700,000 tons of acrylic acid and 500,000 tons of SAP, and the vertical integration of the 'Propylene Chain' that connects propylene, acrylic acid, and SAP will be strengthened. SAP is a synthetic resin product made through polymerization of acrylic acid and special polymer material that has water absorbing and holding properties. 90% of the produced SAP is used for diapers and sanitary pads, and our SAP production is expected to increase the annual sales by KRW 300 billion.



#### Energy Solutions

##### Production Base in Poland

LG Chem plans to build a 41,300m<sup>2</sup> sized production base in Wroclaw, Poland, by investing USD 380 million in its Polish subsidiary, LG Chem Wroclaw Energy. When the production base is completed by the end of 2018, it will have the capacity to supply lithium-ion batteries for 100,000 electric vehicles every year, which means we can produce batteries for 280,000 electronic vehicles by leveraging our four-point production system (Korea, the U.S., China, and Poland).



#### IT&E Materials

##### Membrane

LG Chem's reverse osmosis (RO) membrane was developed with a high desalination rate and 10% higher water flux rate compared to its competitors, which led us to win four large-scale projects in Africa, etc. Our RO membrane also ranked 2nd in the 2018 Global Water Awards (Water Technology Company of the Year) hosted by GWI (Global Water Intelligence) in April 2018. In the long term, after stabilizing the RO membrane, we will review plans to expand into adjacent businesses to realize our full potential in the water treatment sector.



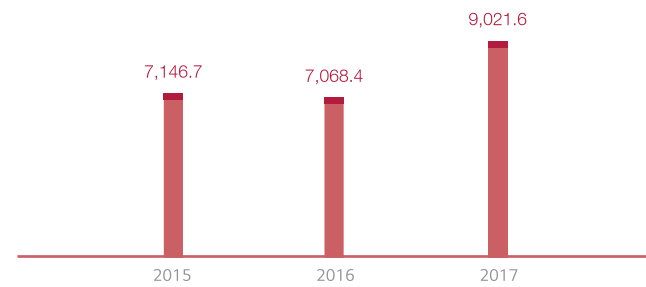
#### Life Sciences

##### Zemiglo, Diabetic Drug

Zemiglo is an oral anti-diabetic treatment that inhibits Dipeptidyl Peptidase4 (DPP-4). Zemiglo has become the top-selling new drug in the domestic market among drugs developed in Korea, recording KRW 70.5 billion in sales for 2017, and it also ranked third in Korea in terms of market share for all anti-diabetic treatments that inhibit PP4. We are aiming to achieve KRW 100 billion in sales and 20% or more market share by 2020.

of investments are allocated to businesses relevant to new growth engines, such as producing mid to large-sized batteries, securing raw materials, and raising the competitiveness of cathode material products, and basic materials.

Sales of New Products (Unit: KRW billion)



\* The performance of FarmHannong and Life Sciences division is included in data from April 2016 and January 2017 accordingly.

**Into the LG Science Park** The LG Science Park officially opened in Gangseo-gu, Seoul, in April 2018. With the R&D workforce from LG's main subsidiaries, LG intends to develop this R&D complex into a strategic base for the fourth industrial revolution. Convergence of businesses, including next-generation auto parts, energy solutions, and smart city, electronics, displays, and communications, will take place in this complex. The LG Science Park will have 16 buildings for R&D by 2020 with a total area of 170,000m<sup>2</sup> (53,000 pyeong), which is equivalent to 24 soccer fields, and a total floor space of 1,110,000m<sup>2</sup> (335,000 pyeong). LG Chem's Life Sciences Division also transferred its new drug laboratory from the Daejeon R&D Campus to the Park in late December 2017.



## Key R&D Performance

### | Basic Materials & Chemicals R&D |

**Developing Highly-modified SSBR (Solution Styrene Butadiene Rubber)** The demand for eco-friendly tires has been increasing due to the tire grading system and CO<sub>2</sub> emission control implemented in many European countries, which was followed by rising demands for the development of fuel-efficient and highly-modified SSBR that is applied to eco-friendly tires. The highly-modified SSBR developed by LG Chem has improved fuel efficiency by 20% compared to existing products by maximizing reactivity with silica through the development of denaturation technology and high-performance denaturants.

**Developing High-performance ABS** ABS is used for various purposes based on its excellent mechanical properties, superior coloring, and processability. LG Chem developed a new technology based on high-performance ABS manufacturing and applied it to PBL(Polybutadiene Latex)/ABS polymerization, coagulation, and compounding. We have increased product shock efficiency by more than 10% and enhanced surface clarity by adjusting the PBL bridge structure and applying new emulsifiers. In addition, through the development of High Graft ABS manufacturing technology, the quality of post-processing has been improved, strengthening the fundamental quality competitiveness.

### | Energy Solutions R&D |

**Developing a Free Form Battery for Smart Phones** We have developed a free form battery beyond the existing pouch/cylindrical type batteries, opening a new horizon for miniaturized/high-performance smart devices. This battery applies the Lamination & Stacking technology instead of the conventional winding method, which helps to maximize the internal space efficiency of the device and thereby allow batteries to come in the forms desired by customers.

**Developing High Energy Density ESS Standard Module with Long-life Battery** We have developed a sophisticated energy density standard module with long-life battery power. It is applied to the most miniaturized and lightest solar cell-type residential ESS products. Stand-alone battery modules are equipped with a battery management system (BMS) and designed to increase the maximum amount of power to 65kWh by easily connecting up to ten basic modules of 6.5kWh in order to meet assorted customer needs.

### | IT&E Materials R&D |

**Developing encapsulated composite metal sheets with excellent moisture barrier function for OLED panels** Encapsulation technology that protects OLED (Organic Light Emitting Diode) devices from oxygen and moisture is essential for manufacturing large-scale and flexible OLED panels. LG Chem developed a highly-reliable and heat-resistant composite metal sheet. This sealing material manufacturing technology is applied to large-area hybrid encapsulation for OLED devices. By integrating metal sheets and encapsulation materials, the manufacturing time shortens. Productivity enhances by applying the room temperature process, as heat curing is no longer required thanks to large area bonding.

### | Life Sciences R&D |

**Developing Oral Treatment for Ulcerative Colitis** LG Chem developed the nation's first oral treatment for patients with severe ulcerative colitis. The treatment completed preclinical testing, and the result of animal testing confirmed that there is no toxicity up to 30 times the effective dose (0.1mg). Currently, Phase I clinical trials are underway. We aim for Phase II clinical trials in 2019, with final approval in 2028. When we successfully develop a safe and effective best-in-class treatment, we will be able to enhance our business performance by tackling additional autoimmune diseases.

### Building Internal Capacity

**Enhancing Corporate Leadership** In 2017, LG Chem established a management strategy organization to diversify its future business portfolio and specify strategic tasks. The company is also reorganizing its overall quality management standards and nurturing quality professionals in order to consolidate the quality management system. In addition, we have formed a corporate procurement strategy organization for the purposes of establishing ideas, purchasing key items, and increasing synergy between business divisions.

**Increasing R&D Capacity** To align R&D strategies with business ones, LG Chem specifies company R&D designs and preparations for the future by adjusting and integrating goals and resource input propriety for each division. In particular, we established an organization under the control of the Chief Technology Officer (CTO) in 2017, driving business results by aligning with corporate strategies, strengthening project management, promoting open innovation, and creating synergy among affiliates. While we manage 11 key future tasks, we are striving to improve R&D performance and research capacity through the gate review of key tasks and the examination of corporate tasks.

**Securing Patent Competitiveness** LG Chem promotes strategic patent management in all stages from product development to commercialization. The company also makes efforts to secure strategic patents and to develop response strategies to other companies' patents in each stage of product development. LG Chem has built its patent portfolio by focusing on new businesses, such as bio and the advanced material field, and discovering excellent related patents through IP\* R&D. As of 2017, LG Chem holds some 46,976 intellectual properties, of which 20% belong to the future growth engine field and the information & electronics material field, and 41% belong to the battery field. In 2017, we also secured a number of bio patents thanks to the merger with LG Life Sciences, and we will continue to strengthen patent competitiveness in bio and other future business areas.

Intellectual Properties (Unit: number of intellectual properties)

	2015	2016	2017
Domestic patents and trademarks	15,423	16,739	19,480
Overseas patents and trademarks	19,997	22,250	27,496

**Strengthening Management of Intellectual Properties** LG Chem operates a company-wide intellectual property management system. Personnel in charge of IP supports each stage, from initial R&D to commercialization, to establish the strategy of application and to secure the patent in each stage. The company also strengthens the expertise of intellectual property activities by recruiting patent experts, including patent attorneys and law experts. LG Chem trains local patent experts by dispatching personnel in charge of patents to strategic areas overseas. Also, all patent-related activities, including application, analysis, and litigation, are handled by the patent management system whose processes are continuously reviewed for further system enhancement.

**Promoting Innovation** We are expanding open innovation in diverse ways to prepare for the future and secure technologies for prompt differentiation. We are engaged in joint development and equity investment with foreign start-ups and companies as well as in the operation of global open programs to craft ideas for next-generation battery technologies. We also work in cooperation with universities and research institutes to establish the foundation for green bio R&D and product development. From 2018, we will also actively promote equity investment through venture capital.

\* IP: Intellectual Property



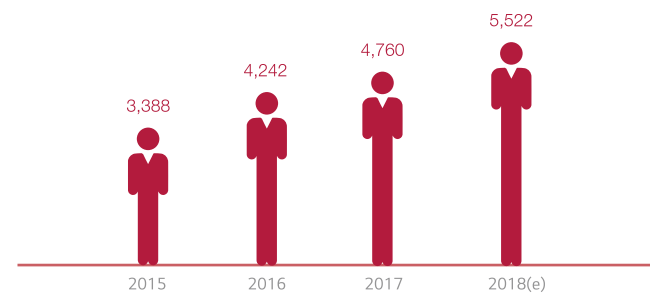
## Securing and Nurturing Talents

R&D and human talent serve as the root of corporate value creation in the chemical industry. Securing excellent talents is critical for successful business innovations, in areas such as advanced business structure, manufacturing, and R&D divisions.

### Securing Talents

**Securing R&D Talents** It is of paramount importance to secure and nurture professional R&D talents to lead future businesses, especially in the areas of rapid growth such as rechargeable batteries. LG Chem conducts various recruitment activities at home and abroad to raise competitiveness and support the early commercialization of future tasks. The company also recruits talent needed in new research fields, like bio, through industry-university cooperation program and impressive Korean universities. It conducts promotion activities about R&D back-up personnel through exchange meetings, industry-university workshops, and Lab Tour, where researchers visit major research teams in the country.

Number of R&D Employees (Unit: person)



\* The performance of FarmHannong and Life Sciences division is included in data from April 2016 and January 2017 accordingly.

**Recruiting Global Talent** LG Chem performs the BC (Business and Campus) Tour, an event where the management visits different countries and directly participates in recruiting talented local students. In 2016, the company held a recruitment event called the LG Techno Conference in China, the United States, and Japan to introduce LG's future business direction and R&D technology. In addition, the Company runs an internship program targeting foreign students studying in South Korea. By securing their talents and then sending them to work for us in their countries, we are able to strengthen our business capacity.



**Advancing Procurement of Talent** LG Chem attracts future human resources by granting talented people R&D scholarships, giving them access to the Industry-University Cooperate Program, Industry-University Cooperative Internship, global internships, etc., and providing them with job opportunities. Securing talent in this manner is a win-win as the company can evaluate the potential and capability of applicants while the applicants can experience the growth vision and organizational culture of the company.

<b>R&amp;D Scholarship</b>	Scholarship for domestic and foreign R&D masters and doctors; employment opportunities after graduation
<b>Industry-University Cooperate Program</b>	Customized education and scholarship for masters/ doctors graduating from MOU universities
<b>Global Internship</b>	Advancing cultivation and verification of global talent; mentoring in addition to employment opportunities
<b>Industry-University Cooperative Internship</b>	Long-term internship with credits during semesters (16 weeks); employment opportunities after internships

### Fostering Talents

**Fostering Talents for Leading the Market** LG Chem conducts training for the future entrepreneurs of HPI (High Potential Individuals), the next-generation global business leaders, and a pool of division leader candidates to polish the talents of those who can lead the market. In 2017, LG Chem strengthened 1:1 coaching for division head candidates and next-generation global business leaders to develop insight on organizational operations and business performance capabilities. We are also strategically fostering core talents by revising the HPI training system in accordance with the reorganization of the HR system.

**Fostering R&D Talents** LG Chem implements R&D common/profession and management capacity education in order to built R&D research scope. The company also conducts a mentoring program and orientation for new researchers. New researchers are able to develop their professional knowledge in polymer chemistry, organic chemistry, analytical chemistry, material engineering, electrochemistry, and optics

through invitation lectures by experts and e-learning courses. LG Chem also puts them in contact with the latest technology trends through seminars and academic conferences.

Furthermore, LG Chem implements patent education and methodology to solve problems and enhance R&D quantity. The company continuously educates new researchers on R&D management and commercialization to create outcomes that are connected to each division's strategy. For researchers who execute many overseas businesses, LG Chem provides them with customized language courses for easy transition.

**Fostering R&D Talent** LG Chem operates a variety of female talent development programs for each job position/grade, including HPI training for all female employees, and training for future women leaders. In addition, we provide female mentoring support inside and outside the company for the growth of female talent. Senior women who are familiar with the topics of competency, leadership building, work-family balance, and organizational life will become mentors, while younger women who are concerned about their growth will become mentees, establishing a counseling/role model/advice giving relationship for mutual growth. Mentoring is provided by in-house female superiors for staff/seniors, and by external female mentors composed of female executives from large global and domestic companies or industry experts in management and leadership. We have organized a women's community at each workplace where junior-level female employees can establish goals and achieve growth within the company. In particular, through the community, we have discussed what is necessary for the establishment and growth of a mutual network for junior-level female talent.

<b>Female HPI Group</b>	Personal development, Healing Campus
<b>Female Team Head Candidates Group</b>	Principles to be a good leader, Healing Campus
<b>Female Group above Professional Level</b>	Mentoring with an external role model about career development/work-life balance/working life
<b>Female Group at Junior Level</b>	Operating community (setting goals, sharing difficulties, forming a network)

**Increasing Leadership Capacity** LG Chem provides an annual leadership program for all employees to increase leadership capacity by rank. We have newly established training programs for managers/plant managers in 2017 in order to raise the leadership capacity of senior-level leaders. In 2018, we will be revising the training programs by rank according to the HR system reform and by adding more practical contents.

## Innovative Organizational Culture

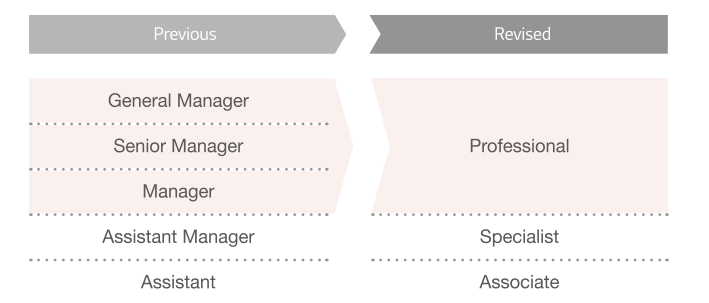
Creating an organizational culture that allows employees to work pleasantly is very important for sustainable management, as it motivates people to focus on their work. We pursue a horizontal organizational culture and open communication that enables employees to realize their full potential and enhances work efficiency through value-based decision making and business process improvements. In addition, we support the work-life balance of our employees to create a happy and healthy workplace.

### Innovative Work Method

LG Chem is pushing for work method innovation to place a greater focus on value-oriented tasks that create customer value, by providing enterprise-level guidelines and detailed activities for each business division/sector.

**Implementing Value-Oriented Tasks** LG Chem intends to put its focus on tasks that create customer value and enhance the autonomy of its employees, and it will eliminate work methods that prohibit customer value creation. In addition, various efforts to improve the culture of reporting and meetings are being made to enable employees to focus on key tasks.

**Simplifying the Job Grading System for Horizontal Organizational Culture** In 2017, a new job grading system was introduced to respond to changes in the business environment and to spread a horizontal and creative organizational culture. We have simplified the grading system for office employees, including researchers, from a 5-stage system based on position and seniority to a 3-stage system based on role. Also, in order to provide more opportunities for young and capable talent and to increase the dynamics of the organization, we expanded team leader candidates to include senior-level managers.



**Work-life Balance** In 2006, LG Chem was the first in the LG Group to introduce selective welfare policies. Since then, LG Chem has continuously strived to establish a corporate culture that promotes work-life balance. Since July 2017, the application of flex-time was extended from several divisions to all office employees in the company. When an employee applies for flex-time, he/she can choose anytime between 7-10 am to start working, and leave between 4-7 pm as long as 8 working hours are served for each day. The company is also actively reducing overtime and holiday work and encouraging employees to take leaves for refreshment and for higher productivity at work.



LG Chem introduced a selective flexible work system which allows employees to work 40 hours on average and 52 hours maximum per month. As a result, employees can focus and work more when they have work to do and work less when they are not very busy. After reorganization of the system, for the employees who work more than the basic working hours on weekdays and public holidays, LG Chem offers them 1.5 hours of holiday for each hour of extra work to enable them to take a rest. Also, LG Chem adopted Working Hour Management System on LG Chem intranet, which allows employees to systematically monitor and manage their working hours. To operate the system successfully, meetings were held for administrative and technical employees. In addition, LG Chem has put effort into eliminating the culture of overtime work to do its best to establish a system and culture for work-life balance.

**Open Communication Culture**

**Strengthening On-site Communication** LG Chem has strengthened its on-site channels for communication with the CEO to promote the downstream implementation of the corporate vision, core values and management strategies, and also to establish a horizontal communication culture. We strictly adhere to the basics and principles to earn the trust of our customers and to provide unique discipline guidelines including the Focus on Leading the Market Board and monthly letters for the executives and employees at home and abroad.

We also operate a 'Speak-Up Table' where employees freely express their opinions and the CEO, together with the Employee Council and groups of common interest, respond accordingly. Lastly, we run the Employee Council to promote organizational culture and to create a working environment where employees can share their voices and focus on their work.

**Communal Labor-management Relationship** LG Chem promotes a horizontal labor-management relationship in which the role of each employee is respected and labor and management are on equal footing. Based on the principles of customer-value creation and people-oriented management, LG Chem believes labor and management are in a partnership and participation and cooperation are valued. Through this, the company creates continuous outcomes, achieves world-level competitiveness, improves the quality of life of employees, takes the idea that communal labor management can contribute to social development as its vision. For this, LG Chem is running its own labor-management cooperation model at three levels: corporate management, the worksite, and collective bargaining. On the level of corporate management, LG Chem raises the value of the company and its members by increasing trust in management and strengthening communication. On the level of worksite, the company raises productivity by systematically training technical talent in the field and complying with basics and principles. On the level of collective bargaining, the company is building a business-oriented labor-management partnership through a reasonable and productive negotiation culture and labor-management participation and cooperation.

Management	Field Work	Collective Bargaining
Enhancing the value of members through transparent and open management	Securing the best productivity through strong teamwork and innovation	Building a business-oriented labor-management partnership through a productive negotiating culture

**Carrying Forward Manufacturing Innovation**

Utilizing and creating smart systems that apply big data to the process, ranging from raw material supply to production and consumer feedback is a global trend of manufacturing innovation. LG Chem is pursuing smart manufacturing by applying various ICT technologies to its existing production lines. Based on the information

system, facility operation technology, and automation equipment, we seek to acquire more meaningful big data by combining the core technologies of the 4th industrial revolution, including IoT, 3D, Sensor, Robot, Cloud, VR/AR, etc. Analyzing this data will lead to development in many manufacturing areas and will strengthen business competitiveness through higher productivity and quality.

**Concept of LG Chem's Smart Factory**

Measurement sensors placed strategically throughout our facilities collect and analyze data in real-time, and provide a clear picture of every situation in the plant. Analysis of our processes contributes to raising the level of productivity, quality, and safety and allows for better self-diagnosis and evaluation.

**Operating Industry 4.0 Secretariat**

For effective cooperation and communication in pursuing intelligent manufacturing at the corporate level, an integrated secretariat is utilized to collaborate with business divisions, data optimization, project teams and organizational culture and with business innovation teams. The secretariat also runs the LG Chem Info-in program to promote convergence and a culture of sharing. In addition, meetings of

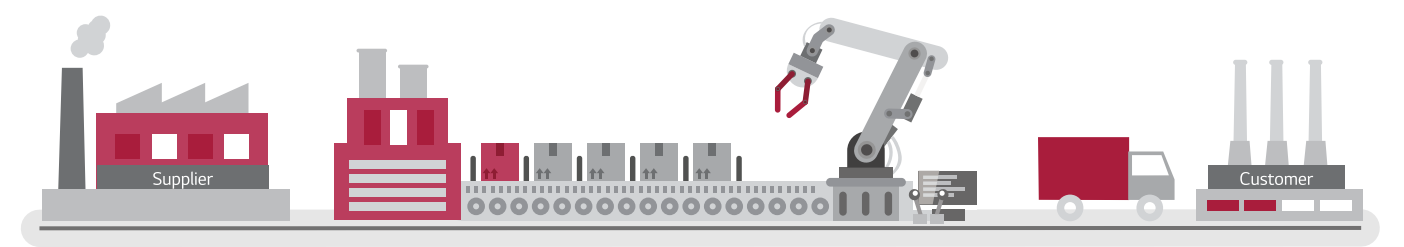
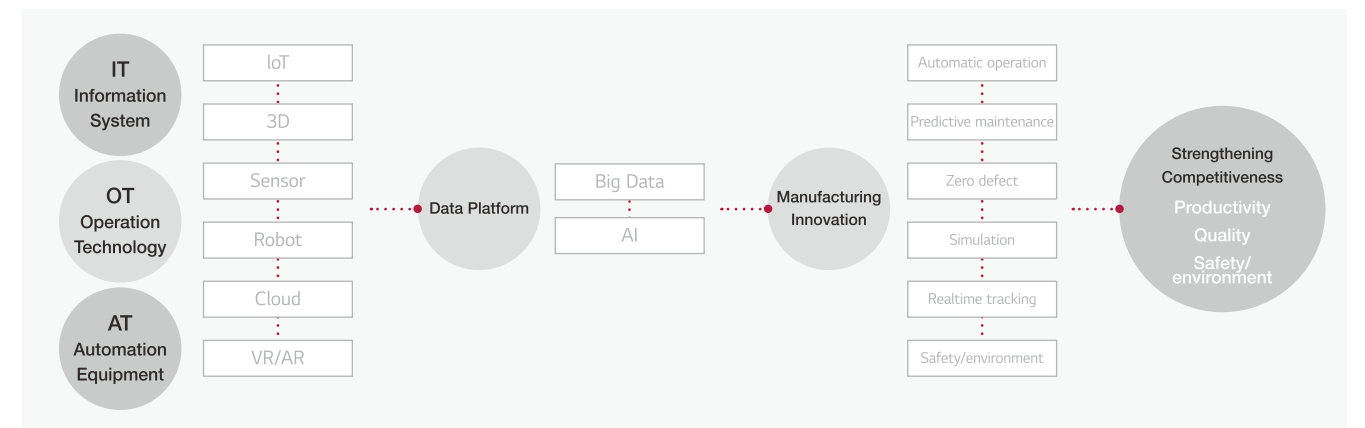
intelligent electronic manufacturing leaders are held to share the best uses for new technology and to discuss ways to promote intelligent manufacturing.

**Securing Intelligent Reference**

LG Chem has been operating 10 PoC\* tasks as a part of the company-wide implementation of intelligent manufacturing. We have set predictive maintenance of facilities, optimization of big data, and AI/deep learning as improvement areas with the use of enhanced data analytics and are collecting BP cases for each area. The introduction of a data analysis platform is also being reviewed for the effective dissemination and maintenance of best practice models.

**Supporting Efforts to Strengthen Manufacturing and Analytical Capacity**

To support the establishment and utilization of a big data platform, we are running the Data Scientist program to nurture data experts. In addition, we are promoting construction of high-efficiency design production systems that manage the KPIs for manufacturing innovation and expanding and digitizing modular designs at all business sites.



\* PoC(Proof of Concept): PoC is a demonstration process, the purpose of which is to verify that solving certain organizational problems is possible in the real-world. It is used for new products which are not introduced in market to verify in advance.



# BACK TO BASICS

## Industry Trends: Change & Response

The uncertainty of the current business environment is higher than ever before. The emergence of new technology and fierce competition has resulted in the co-existence of risks and opportunities. Under these circumstances, we need to focus more on the value of 'basics'. The basics that LG Chem should keep to are quality and safety.

Poor management of manufacturing processes in the chemical industry can result in chemical accidents or product defects. This will cause extensive damage to the environment and safety of local communities, and negatively affect the company in terms of finance and image.

Since our products are used as materials for finished goods, such as electronic products, automobiles and constructions, they can create a ripple effect throughout the industries. Accordingly, we need to double check the safety and quality of our products. The chemical industry has already entered a rapid growth period and is highly competitive. In this regard, LG Chem not only needs to meet the market expectations for high quality but also to ensure the quality of market-leading products.

Moreover, as the global market has turned its focus toward green industries, LG Chem's stakeholders including clients are demanding that the company obtain more eco-labels and comply with environmental regulations.

## Strategy: Risk & Opportunity

LG Chem has pursued fundamental innovation in its business structure and practices not to survive but to lead the industry in this rapidly changing business environment. The company is making an all-out effort to provide solutions that satisfy customers with better quality.

In addition, the international regulations on chemical substances have also been strengthened. Accordingly, LG Chem proactively responds to such regulations on chemical substances/products, and establishes safety management systems to take the lead in accountability management activities. The company strives to prevent safety accidents by promoting the culture of safety and health in our workplaces. Also, we will focus on creating a safe working environment by preventing various safety accidents, such as leakage of toxic chemical substances, fire, and explosion.

## Evaluation

Injury Rate in Domestic Worksites (Unit: %)



\* Figures are increased due to high approval rate for industrial accident in 2016

## Ensuring Product Safety

LG Chem is a manufacturer and supplier of materials and products closely related to our lives. It strives to always improve its products' health for consumers and the environment.

### Strengthening Product Safety System

For all products, LG Chem verifies substances subject to control throughout all stages according to product environmental management skills. The company classifies hazardous items into three phases according to risks associated and has organized a business system through which all materials can be purchased after their control items are verified. The company reviews the guarantee to control products through the chemicals management system. It verifies corruption and risk of materials by building a computer network through Material Safety Data Sheets (MSDS) for all material reviews, and supports the issuance of the product environmental guarantee within the system.

### Promoting Chemical Substance Management System

LG Chem established CHARMs in 2014 to prevent safety accidents and comply with regulations throughout the entire process from the purchase/warehousing to use/delivery/disuse of chemical substances, and it has improved the system to comply with regulations, ensure product safety, and strengthen accountability.

With regard to all the raw materials purchased through CHARMs, LG Chem acquires information on chemical components before a purchase order is made and examines the information on toxic properties and legal actions to prevent any possible risks. By combining the acquired information on raw materials with the Bill of Material (BOM), we conduct the integrated management of information on products that used the purchased raw materials.

In 2017, we established a system to manage the information on the composition of raw materials for articles, such as batteries, and chemical products. This helped increase trust in the safety of harmful substances in every product made by LG Chem.

### Responding to Regulations on Chemical Substances

LG Chem builds a management system to verify whether to register new and existing materials subject to registration according to the Act of Registration, Evaluation, etc. of Chemicals. It tightly examines manufactured and imported quantity according to what is registered. The company reports quantity and usage of new chemical substances and existing chemical substances to manufacture, import, and sell to

the Ministry of Environment and conducts complete enumeration of imported materials. In addition, LG Chem joined the consortium of the Korea Petrochemical Industry Association and acts as the representative of a joint registration consultative group. LG Chem plans to complete joint registration of 17 of its manufactured substances by June 2018 through the securement of data used to evaluate maleficence and risk. Furthermore, LG Chem has responded to the Chemicals Control Act by building and running a system to restrict procurement and examine the reported import quantity of toxic substances.

### Sharing Meetings to Respond to Chemical Regulations among Suppliers

LG Chem held sharing meetings to respond to chemical regulations on trends of various domestic and foreign chemical regulations in order to strengthen response and to support procurement suppliers' compliance with chemical regulations. In 2017, 207 employees from 211 suppliers met in response to chemical regulations to share their understanding of the Act on Registration, Evaluation, etc. of Chemicals, MSDS evaluation method, global product & environment regulation, and LG Chem's material ingredients system. In the future, LG Chem will actively and continuously support suppliers in their efforts to take appropriate actions in response to chemical regulations.

### Conducting Global Level Management of Chemical Substances

LG Chem responds to global regulations by preparing a response manual for worldwide product environment management. It seeks to reduce risks related to control of chemical substances in performing global business. After Development and Management of Eco-friendly Products was revised and retitled Management of Product Environment, the company now subdivides the criteria for product component management into each material and regulation, including restrictions on and the prohibition of harmful substances designated at home and abroad. LG Chem also provides the activity guidelines across product development, production and supply to efficiently respond to the demand of customers and suppliers from different countries. The company provides the latest MSDS of enterprise products in 33 languages through the IT system. This system reflects the requirements of universal client companies and the latest trends of laws which guarantee issuance. In addition, LG Chem shares global regulation trends with suppliers by holding the sharing meeting to respond to regulations on chemical substances.

### Enhancing Customers' Right to Know

As part of the efforts to enhance customers' right to know and transparency, LG Chem operates a product website (www.chemwide.co.kr) where customers can access product specifications, such as purposes of use, characteristics and material properties, Material Safety Data Sheet (MSDS) and environmental certifications. Particularly, the MSDS is a basic document that guarantees the legitimate management of chemical substances by customers and workers' right to know and provides information on the environment and health for those who might be exposed to those substances. To reduce safety, environmental and health risks that might occur due to missing information, we will continue to provide information that customers need when purchasing products through the website.

## Improving Product Quality

LG Chem's products are used as materials for finished products. Since the quality of our materials affect that of finished goods, we strive to provide products of better quality for the development and success of our customers. We are also making efforts to increase customer value through quality improvement of our products.

### Promoting Product Responsibility

LG Chem contributes to a sustainable future by providing customers with eco-friendly and competitive materials and solutions to increase customer value. For this, the company conducts various activities with its vision of becoming an Eco-Product Solution Partner to derive and provide efficient and valuable environmental and economic solutions to all manufacturing processes from R&D to product disposal.

LG Chem guarantees eco-friendly chemical products throughout all processes from the procurement of raw materials to the sale of final products. Through the Eco-friendly Supply Chain Management Guidelines including domestic and international regulations such as EU REACE Regulation, SVHC, CA Proposition 65 and conflict minerals, LG Chem has established the criteria for materials which can be used by the company and has notified suppliers of the relevant criteria with which they have to comply.

The company approves purchasing materials that have been verified by each plant and the safety environmental department at the head office as eco-friendly materials after obtaining the material component information from suppliers through the material component inspection system.

In addition, the department of procurement and the department of environmental safety directly communicate with suppliers to manage eco-friendly materials, and the department of quality and the CS team communicate with client companies to control product quality.

### Building Product Responsibility Capacity

**Training Product Responsibility for All Employees** Recognizing the importance of product responsibility among employees, LG Chem conducts various education activities to comply with the social and environmental responsibility of products in business activities. The education activities cover MSDS preparation and management for managers in related departments, such as purchase, development, and quality, and the Act on Registration, Evaluation, etc. of Chemicals, substance registration process, and response to trends in production environment regulations.

**Sharing Product Responsibility Information** Through the Safety & Environment Portal, LG Chem provides quality managers in each business sector with the newest information on global product environmental safety and hazardous substance regulations. Essential aspects of regulations by country are shared to prevent corporate and legal regulations from being violated.

Sharing Product Responsibility Information (Unit: person)

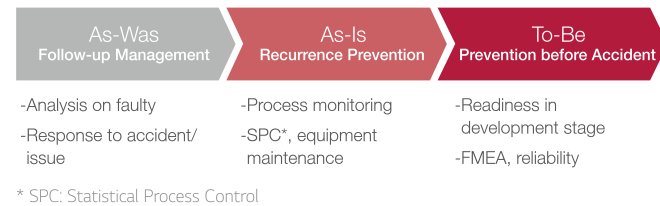
Training Course	Target	Number of Participants
Response to global regulation on product and environment and chemical substances management system	Purchases, R&D, etc. (on demand basis)	159
Chemical substances experts course	Safety and environment	68
Understanding purchase, and safety and environment	Purchase (Purchase Academy)	24
Total		251

### Creating Customer Value through Quality Innovation

**Promoting Quality Mind-set among Employees** To secure the quality management system that lives up to its status as a global company, LG Chem has made a series of company-wide efforts. The corporate level quality assurance team operated to enhance quality competitiveness from the perspective of customers. Management delivered special lectures and messages to promote quality mind-set among employees, and an online program on quality mind-set was provided for employees.

**Advancing Quality Management System** LG Chem uses the Failure Mode & Effects Analysis (FMEA) tool from the development stage to ensure product quality and safety. The use of FMEA was selected as an essential activity in the developmental process. Facilitators were nurtured and IT software was introduced for support. To advance the quality management system, a number of endeavors to manage foreign substances and data reliability were intensified.

**Quality Management Trend**



LG Chem offers a corporate level quality council bimonthly to improve the quality management system of each business unit. At a group level, the quality council consists of top management from six companies that belong to LG Group (LG Chemical, Electronics, Hausys, Dispay, Innotek, and Uplus) and operates with LG Chem as secretariat.

**Improving Role and Capacity of Quality**

As part of the efforts to improve the role and capacity of quality in the organization, the Quality Academy has provided basic, intermediate, and advanced courses on quality management to train the human resources required for quality improvement activities. The number of Master Black Belts (MBB), project leaders in key business areas, has increased from 35 to 67, and that of Black Belts (BB), sub-project leaders, has grown from 350 to 526.

In 2018, a number of quality talents will be assigned to deal with persistent quality issues. Also, a series of activities are being conducted to reduce the F-Cost by resolving those issues.

**Quality Innovation Cases by Business Sector**

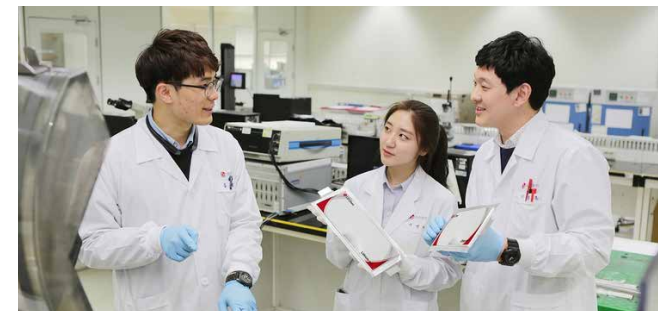
**| Basic Materials & Chemicals |**

At the Basic Materials & Chemicals Division, we have strived to increase sales of high value-added, eco-friendly products in alignment with business enhancement strategies by selecting tasks for improvement from perspective customers, applying data-based statistical technique and resolving issues in a systematic manner. In addition, we have produced a group of quality experts through the promotion of six sigma projects, assigned employees with MBB to key strategic tasks, and trained those on site to internalize quality management.

Regarding the customer solution activity, one of the most representative innovation activities of the Division, we have introduced a solution activity system to strengthen the Gate-review process from task discovery to performance verification and to increase customer value.

**| Energy Solutions |**

The Energy Solutions Division has operated a new organization for development quality and quality management organizations responsible for automotive, ESS, and IT & new application batteries, respectively, to ensure the quality of mass products. In this way, we have carried out activities to improve quality in all phases of development, from early development to mass production, and also to enhance the completeness of development. Particularly, more specialized organizations, such as Reliability Team and Analysis Team, have been formed to develop new methods of defect inspection and to enhance big data modeling and defect analysis as part of the efforts to bolster customer confidence in our products.



In order to strengthen the quality base required for global companies and keep pace with them, a number of activities have been conducted to constantly check and improve our quality system through a separate task force team (TFT). Also, a new overseas Warranty Center will be established to strengthen our global response system. By establishing a standard quality contract for each business, we clarify the quality objectives, operating environment, and warranty terms of our products to ensure product reliability and customer satisfaction.

**| IT & Electronic Materials |**

The IT & Electronic Materials Division has operated the Quality & Technology Committee to establish mid to long-term quality strategies and secure fundamental quality competitiveness. We have leveraged the Master FMEA to prevent quality issues before mass production, and also Q-Gates to bolster quality assurance by phase of development. Also, we have utilized the results of key customer surveys and VOCs in development/production/quality improvement activities, and fostered the training of quality experts: BB (Black Belt) and MBB (Master Black Belt).

**| Advanced Materials |**

At the Advanced Materials Division, we strive to improve customer satisfaction by operating a dedicated quality organization. We have upgraded the quality/innovation department under the direct control of the Division to the 'responsible' level organization by integrating quality and innovation functions. Also, on-site management is conducted by the head of the Division at production sites and laboratories once a week to increase the quality awareness of employees.

**| Life Sciences |**

Because pharmaceuticals can directly affect human life and health, they are subject to strict regulations on the quality of manufacturing, distribution, handling, and process control by the Pharmaceutical Affairs Law. The Life Sciences Division guarantees the quality of products through advanced manufacturing and quality control, which is scientifically proven at all stages from the receipt of raw materials for pharmaceuticals to the shipment of finished products.

We have developed and sold the quinolone antibiotic Factive, which is the first of its kind in Korea to be approved by the U.S. FDA, through scientific and advanced quality control. We have also exported hepatitis B and pentavalent vaccines certified by WHO to about 70 countries all over the world.

Recently, Zemiglo, the nation's first new diabetes drug, has been licensed for sale in Mexico. Eucept, a biosimilar product, has successfully met the quality control standards of advanced countries by obtaining approval from the Japanese Pharmaceuticals and Medical Devices Agency (PMDA).

**Improving Workplace Safety**

**Safety accidents in the chemical industry require extra care and attention since they can result in casualties, tarnish corporate image, and lead to financial loss. LG Chem is doing its best to maintain a safe and healthy environment for its employees.**

**Safety, Health, and Environment System**

**Safety, Health, and Environment Management System** LG Chem operates the systematic Safety, Health, and Environment System based on strategies and goals in accordance with ISO 14001, OHSAS 18001 and KOSHA 18001. In addition, the company announces its intention of the Safety, Health and Environment Management publicly and establishes the Safety, Health and Environment Policy to demonstrate the company's steadfast commitment. Based on this, LG Chem makes company-wide regulations and work guides for each of its business sites and implements safety and environment tasks. Also, the leader's on-site oversight and the field management activities of each organization are on progress to prevent accidents. When a safety and environment accident takes place, the incident is reflected on the employee's evaluation.

**Safety, Health, and Environment Policy**

LG Chem recognizes that safety, health, and environment (SH&E) are fundamental elements for securing differentiated competitiveness and will implement the following principles to continuously improve performance in safety, health, and environment based on clear goals and strong executive ability.

- We will comply with laws and regulations and establish SH&E rules leading the industry at home and abroad.
- We will drive continuous innovation throughout the entire life cycle of the product to supply environment-friendly products and services.
- We will provide a safe and healthy work environment and ensure the principle-adhering corporate culture.
- We will support our suppliers and local communities in improving the SH&E practices based on our social responsibility.
- We will share information transparently and communicate with stakeholders.

**Safety, Health and Environmental Governance** The Corporate Safety and Environment Committee is composed of chief executives who manage personnel and environmental security at each plant. The committee is held twice a year and discusses the main issues related to safety and environment, major promotion results, and future plans. LG Chem organized a labor-management Occupational Health and Safety Committee at each plant, which consists of an equal number of employees and management, and conducts an inquiry of and decides

the main issues related to safety and environment. Through this, LG Chem prevents accidents that can occur at plants and manages the health of employees. Furthermore, LG Chem discusses safety and environment improvements and shares excellent cases among plants through the Corporate Safety and Environment Working Committee, meetings of managers, and workshops for managers.

### Establishing Safety Culture

**Building Safety and Environmental Capacity** At LG Chem, a number of safety and environmental capacity building programs are provided for employees who are in relevant positions, safety engineers on site, and safety and environment managers. They consist of Process Safety Management (PSM) expert program, chemical substance expert program, and electrical safety capacity building program. A capacity building program on working environment management will be established to deal with fire accidents/hazardous materials and improve the working environment.

Category	Description	Number of Participants in 2017
PSM Expert Program	Business practices and practical training related to process safety management strategy and HAZOP (Hazard & Operability Review) are carried out, through which process safety management capability is strengthened.	32
Chemical Substance Expert Program	Identification of the management standards and inspection methods for chemical substance handling facilities and practical training on external impact assessment (safety confirmation for third party damage outside the workplace from the design and establishment of toxic chemical substance handling facilities) are conducted, through which the safety environmental management capability of chemical substance handling facilities is strengthened.	68
Electrical Safety Capacity Building Program	Preventive measures for fires caused by electrical ignition are enhanced through practical training on the management of explosion-proof equipment, static electricity, and grounding.	49

**Strengthening Management Competency in Safety and Environment through SH&E Performance Conference** LG Chem held a SH&E Performance Conference in November 2017 to share performance and activities to prevent safety and environment accidents in plants at home and abroad. 230 LG Chem employees and suppliers from around the world participated in the meeting. Also, best practices in safety and environment and excellent supplier cases were presented. LG Chem contributes to establishing a safety culture by providing

opportunities to benchmark best practices, and enhancing pride for safety and environment tasks.

### Conducting Safety Inspection and Management

LG Chem's safety and environment inspection system consists of regular inspection, project inspection, and special inspection. Regular inspection checks the management system process safety, the facility and work safety, occupational health, firefighting and dangerous substances, and the environment. Project inspection is conducted for items required by the management and safety and environment issues. Planned inspections are conducted on accident reduction, facility safety management, emergency response, and implementation check. Special inspections are performed at the workplaces where serious accidents occurred or are likely to occur. In 2017, a total of 51 safety & environment inspections were made (including 7 regular, 39 planned, and 5 special inspections). In addition, LG Chem plans to conduct regular inspections but also in-depth inspections on plants with many accidents. It also plans to inspect the facility management system of small plants and the systems of newly established plants. LG Chem will continuously inspect the emergency response system without advance notice to optimize emergency response at plants.

Category	Description
Korea	Management system, plant safety, facility/work safety, firefighting and dangerous substances, review of follow-up actions from the previous inspection
Regular Inspection	Management system, compliance with safety and environment regulations, plant safety, facility/work safety, firefighting and dangerous substances, review of follow-up actions from the previous inspection
Overseas	Management system, compliance with safety and environment regulations, plant safety, facility/work safety, firefighting and dangerous substances, review of follow-up actions from the previous inspection
Planned Inspection	Reduction in accident rate
	Management of facility safety
	Inspecting follow-up action
Special Inspection	Emergency response system
	Critical disaster, critical industrial accident, frequent accident business spot

### Promoting Employee Hygiene and Health Management

LG Chem is implementing activities to prevent diseases and promote health-care by eliminating health related hazards and creating a pleasant working environment. Employee health offices operate at each workplace to provide customized health-care services for employees and provide individual counseling and information to employees through regular check-ups. In addition, mental health care programs for employees are also available to diagnose, consult about, and treat depressive disorders. Counseling offices, in connection with special hospitals, are operated by professional therapists to provide proper assistance for employees in need of help. Also, a variety of health promotion programs are offered to spread the culture of health care among employees.

LG Chem not only minimizes potential health-related risks, but goes beyond simply complying with legal standards for a working environment. We have improved our workplace to the maximum by establishing internal standards stricter than legal ones. We are committed to ensuring an environment with the highest safety level in the industry.

### Spreading Safety Culture

LG Chem, in cooperation with a consulting organization specializing in global safety and environment, has been conducting a safety culture improvement project since October 2016 in order to minimize the possibility of incidents caused by poor conditions and the unstable behavior of employees who may exist in the field.

This project consists of the advancement of accident investigation methods, the development of a quantitative evaluation method for the safety and environment management system, and the establishment of a behavior-based safety (BBS) program. After the completion of the first phase in June 2018, we will promote the project across the company to improve the level of safety management and ultimately achieve zero accidents.

**Establishing Quantitative Assessment System for Safety and Environment Management** LG Chem has established LG CSRS (LG Chem Safety Rating System), which is a quantitative assessment system for safety and environment management to evaluate and identify tasks for improvement. This system is designed to quantitatively evaluate the status of the in-house management system, which is organically linked to safety, environment and health, according to 720 evaluation items in each field. By establishing an advanced quantitative evaluation method for safety and environment, management system, we will identify and improve the safety and environment management weaknesses at domestic and overseas sites, and thus raise our system to a global level.

**Advancement in Accident Investigation Method** LG Chem identifies the root causes of accidents and makes improvements. Advancements in the accident investigation methodology are made to prevent similar accidents. LG Chem has adopted the global cause of accident analysis method, operates a program to nurture professional accident investigators, and upgrades the internal and external expert verification system for results of investigations. In 2018, we will extend the scope of accident investigations to overseas workplaces, and continue to monitor the results of investigations, nurture professional accident investigators, and share accident cases.

Advanced Analysis of Causes of Accidents



**Promoting Behavior Based Safety Program** LG Chem has introduced Behavior Based Safety (BBS) program to promote safe behavior and create a culture of voluntary safety management in the workplace by complying with safety standards and procedures. The purpose of this program is to promote safe behavior through praise and change unsafe behavior, the main cause of accidents, into safe behavior through observation and coaching by co-workers. In 2018, we will promote this program throughout the basic materials & chemicals division. In 2019, we plan to spread the BBS program across the company.

# Innovation for Safety, Health, and Environment

## Safety

### Securing Safety for Outdoor Pipes through Preventative Inspection

At the Yeosu Plant, there are outdoor pipes reaching approximately 300km. The pipes were checked using Short Guided Wave equipment. Buried pipes were checked using the Intelligent PIG, and damage to sheaths was managed with an electric anti-corrosion system. Also, an early leak detection system that includes wide infrared cameras, fiber-optic hybrid sensors, and wireless gas detectors was established based on the IoT technology, allowing us to reduce the cost and time of outdoor pipe inspections and to ensure the soundness and management of facilities by eliminating the blind spots of inspection.

#### 1 Above Ground

Short Guided Wave

Check outdoor pipes with the Short Guided Wave equipment. It allows us to measure the thickness of pipes and check whether pipes are rusty or not by counting the time it takes for a wave to travel from the ground to the pipes.

#### 2 Underground

Intelligent PIG

- It has 100 sensors including GPS
- It travels through pipes and checks whether pipes are damaged or not



#### 3 'Realtime Monitoring System' through IoT

Infrared Camera  
Detecting Heat



Optical Fiber Sensor  
Detecting Chemical  
Substances



Gas Detector



LTE within the  
Company

Main  
Server



Realtime  
Monitoring

- Email
- SMS
- Smartphone
- Application

### Preventing Accidents of the Same Type and Establishing a Safety Culture by Making Cuts by Blade Zero

The Cheongju Plant has recorded the highest accident rate in terms of cuts by a blade for the past 3 years (from 2014 to 2016) due to the heavy use of blades at the plant. To resolve this issue, operation methods and equipment at the plant were improved to eliminate or replace the jobs using blades, and workers were offered safety gloves and blades. In addition, safety experience training and cases of improvement were promoted to enhance the safety awareness of employees. As a result of these prevention activities, zero cases of being cut by a blade were reported in 2017.

### Ensuring the Safety of Fieldwork by Developing Customized Tools

The intensive observation of high-risk work at the Daesan Plant showed that workers were exposed to a number of potential safety risks, such as fires, explosions, and accidents. Therefore, a customized tool was developed considering the field situations and operational convenience to make substantial safety improvements. Also, innovative improvement plans were suggested, such as applying for two patents, which were shared with other plants.

**De-plugging Work** Developing a 3- Type De-plugging Tool considering field situations

**Cutting Work** Developing/applying a potable water jet cutter for cutting pipes/steel frames

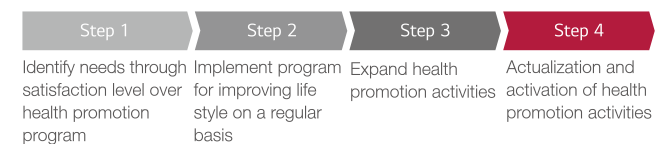
**Welding Work** Developing headgear with a welding visor to protect against fall/impact

## Health

### Operating Employee Health Promotion Programs

The glass substrate safety and environment team at the Paju Plant introduced employee health promotion programs. LG Chem has improved upon them in several ways to increase the employee participation rate and to diversify the programs. First, a survey takes place to identify needs and then an improvement of lifestyle (obesity and smoking) program is implemented with the local community for more systematic health promotion activities. Also, LG Chem started operating a variety of health promotion programs including prevention of cardiovascular diseases, musculoskeletal disorders, and the management of job stress. As a result, more employees have paid attention to their health and participated in health promotion activities.

Health Promotion Programs in Paju Plant



## Environment

### Reinforcing Pollution Control System to Ensure Air Quality

The Ochang Plant has made various efforts to improve air quality. The Plant strengthened the management of air pollutants by expanding the coverage of facilities under control, and it conducted an objective evaluation of the effects on air quality by operating a real-time monitoring system. Also, to deal with civil complaints from local residents and NGOs, it analyzed odor-causing substances, conducted monitoring on odors, identified odor types, and made improvements.

### Responding to Stricter Environmental Regulations through Process Optimization and System Improvement

Recently, the Chinese government has strengthened environmental regulations, such as higher standards for PVC and caustic soda emissions and charges for VOCs emissions. Accordingly, LGCBH cooperated with Tianjin Environmental Protection Agency and applied the LDAR (Leak Detection and Repair). Applying the LDAR as a trial lead to the establishment of a quantitative control system for VOCs and cost reduction for VOCs.



# PROTECTING OUR PLANET

## Industry Trends: Change & Response

GHG emissions from human activities have a significant impact on climate change. As the amount of greenhouse gases, such as carbon dioxide and methane, has increased in the air, earth's temperature has gradually risen. Climate change due to global warming brings about natural disasters, such as droughts, floods, heat waves and super typhoons, and causes damage to crops, ecosystems, and industrial facilities.

After the 2015 Paris Climate Conference, many countries around the world have put a lot of effort into reducing GHG emissions and limiting the rise in global average temperature to 2 degrees Celsius. Korea has finalized its 2030 target of reducing GHG emissions by 37 percent from business-as-usual (BAU) levels and implemented various policies to reduce GHG emissions, such as the GHG emissions trading system.

Meanwhile, companies can be affected by the direct investment in greenhouse gas reduction and the cost of purchasing emission credits, and there may be physical risks that affect product production due to climate change, such as droughts, typhoons and natural disasters.

LG Chem recognizes these changes not only as a risk, but also as an opportunity, and it continues to deal with climate change with a focus on greenhouse gas and energy management.

## Strategy: Risk & Opportunity

LG Chem actively responds to climate change around the globe by exploring important issues and seizing opportunities to make positive changes. We are conserving energy by reducing GHG emissions and producing high value, low-energy consumption products. We apply our company resources to facilitate myriad problems associated with climate change. This has allowed us to expand our business portfolio through R&D projects. LG Chem's business portfolio is expanding to include energy, water and biotechnology. Already, our electric vehicle batteries and energy storage systems (ESS) are subsidizing a sustainable ecosystem.

## Evaluation

GHG Reduction Compared to BAU (Unit: %)





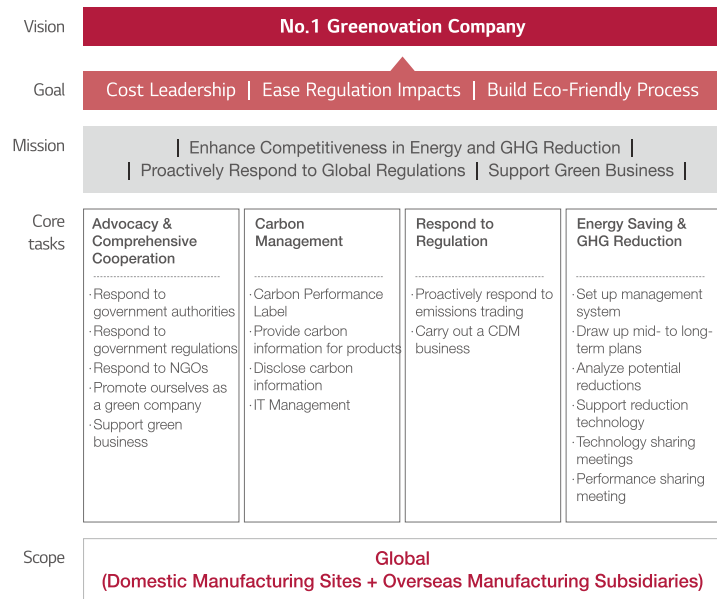
## Tackling Climate Change

LG Chem has identified climate change as a major issue and implemented a variety of activities while it responds to domestic and foreign regulations on energy and GHG reduction in a proactive manner.

### Climate Change Response System

LG Chem's continued effort to sustain energy and reduce GHG can be seen throughout the global workplace. The company actively participates and supports the government's climate change policies while minimizing impact of domestic and international energy tactics.

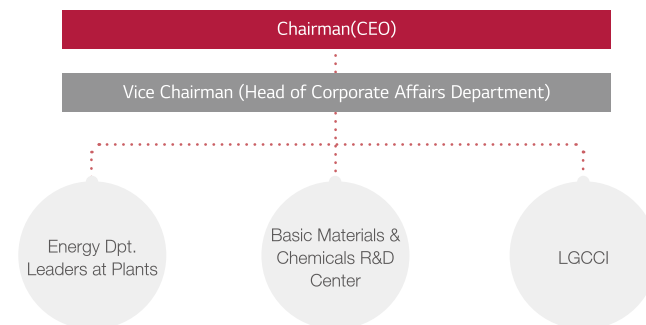
Through this effort, we intend to contribute to the achievement of the GHG reduction targets of the industry as a whole by strengthening our corporate competitiveness and supporting the energy saving investments of our partner companies.



**Organization for Climate Change Response** LG Chem has established and implemented an enterprise-wide energy management policy through the Corporate Energy Committee. Consisting of the CEO and plant managers, the Committee shares the year's activities, plans next years ventures, and decides on important company matters. In addition, subcommittees operate at each workplace to report annual reduction targets and energy management status on a monthly basis. We also share energy conservation cases from each workplace through energy technology exchange meetings, and promote energy conservation by giving awards for the best practices. We are also actively responding to regulations on GHG emissions

at home and abroad and are operating the Corporate Energy and Climate Team, a specialized organization for the management of energy use and reduction targets. Through the Team, we support the management of energy use and reduction and the operation of a GHG emissions trading system. We also respond to customers' climate change information inquiries and the government's energy policies in cooperation with relevant departments.

#### Energy Committee



**Energy** LG Chem is making efforts to improve its energy management by establishing an energy management system (ISO 50001) at domestic and overseas business sites. By doing so, we manage the energy intensity of our workplaces every month. We also set an energy saving target every year and continue efforts to improve the process and introduce new technologies. In addition, we share examples of energy conservation at our workplaces through workplace exchange meetings and energy portals, and encourage employees to reduce GHG emissions through energy conservation. Furthermore, we offer a reward for the best practices of energy saving.

#### Energy Use (Unit: TJ, GJ/product ton)

		2015	2016	2017
Korea	Direct	90,257	97,622	98,896
	Indirect	49,793	50,565	54,462
	<b>Total</b>	<b>140,035</b>	<b>148,187</b>	<b>153,358</b>
	Intensity	9.343	8.968	9.081
Overseas	Direct	1,783	1,868	3,103
	Indirect	9,286	8,608	8,399
	<b>Total</b>	<b>11,069</b>	<b>10,476</b>	<b>11,502</b>
	Intensity	5.199	4.921	5.048

**Greenhouse Gas** LG Chem has established the Greenhouse Gas & Energy System (GEMS) to deal with government regulations and financial risks resulting from the introduction of emissions trading system. We have come up with procedures and strategies for operational emission credits. The cost of purchasing emission credits

is positively reflected in production costs each month to gain a positive response to associated risks. In response to the volatility of the market, we have established a strategy for purchasing emission credits according to marketing conditions. We have also prepared a manual to train those in charge of each workplace on the emission trading system, and to share important issues related to energy and climate change at worksites, home and abroad.

#### Scope 1, Scope 2 Greenhouse Gas Emissions (Unit: tCO<sub>2</sub>-eq, tCO<sub>2</sub>-eq/product ton)

		2015	2016	2017
Korea	Direct	4,815,354	5,119,076	5,116,711
	Indirect	2,385,513	2,319,920	2,547,469
	<b>Total</b>	<b>7,200,851</b>	<b>7,438,996</b>	<b>7,664,180</b>
	Intensity	0.480	0.450	0.454
Overseas	Direct	110,394	129,587	142,109
	Indirect	1,407,502	1,574,172	1,549,883
	<b>Total</b>	<b>1,517,896</b>	<b>1,703,759</b>	<b>1,691,992</b>
	Intensity	0.713	0.828	0.743

#### Scope 3 Greenhouse Gas Emissions (Korea) (Unit: tCO<sub>2</sub>-eq)

	2015	2016	2017
Wastewater discharge	18,313	20,491	19,259
Waste disposal	12,354	13,524	12,686
Water use	5,595	5,836	6,127
Employee business trip	2,188	2,478	2,640

\* Date of scope 3 greenhouse gas emissions is limited to domestic sites

\* Amount of wastewater discharged: Multiplying GHG emission factor for disposal (source: Korea Environment Corporation)

\* Waste generation: Multiplying GHG emission factor per waste type (source: Korea Environment Corporation)

\* Water usage (industrial and municipal water): Multiplying GHG emission factor for consuming water (source: Korea Environment Corporation)

\* Business trip: Multiplying GHG emission factor for travel distances by motor vehicle (source: Korea Environment Corporation)

**Green Business** LG Chem strives to research and develop high-efficiency electric vehicle batteries and energy storage system batteries (ESS). This will reduce greenhouse gas emissions by consumers and contribute to the nation's energy demand and supply management. We are also working to expand solar and ESS facilities at domestic and overseas worksites.

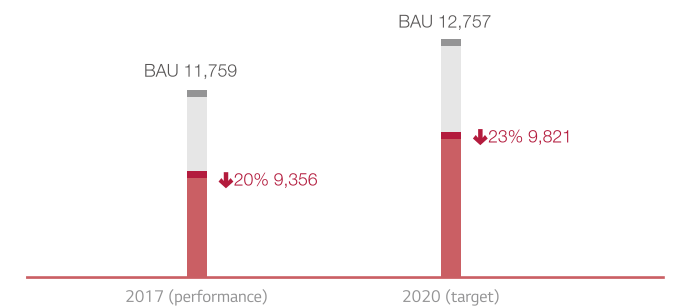
## Responding to Climate Change in Manufacturing Process

LG Chem has conducted a series of activities to cope with climate change by minimizing greenhouse gas emissions from the manufacturing process. We seek to increase energy efficiency by improving the manufacturing process, and by introducing new and renewable energy and ESS facilities.

### GHG Reduction

**Setting GHG Reduction Target** LG Chem continues improvement activities to achieve these goals and has consequently accomplished its annual reduction mark every year. We are establishing long-term plans for greenhouse gas reduction and energy use after 2020 and are considering plans to introduce new, renewable energy to eco-friendly energy sources. LG Chem will continue to reduce greenhouse gas emissions and save energy according to the 2030 national roadmap for greenhouse gas reduction.

#### GHG Emission (Unit: thousand tons)



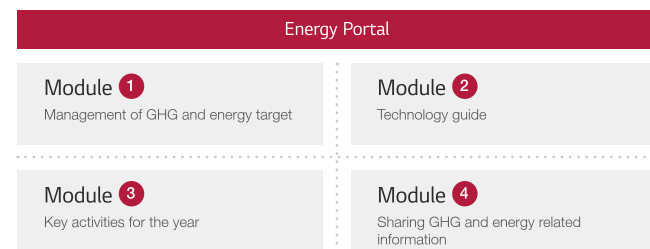
**Enhancing Portfolio for Carbon Emission Trading** Since the implementation of the 2015 emission trading scheme, LG Chem has made various efforts to reduce operating risks due to regulatory compliance. First, we are minimizing financial risk by introducing a system that analyzes monthly GHG emissions compared to the allocated emission allowances; this reflects estimated costs in advance. Next, we are operating the 'Council on Emission Credit Purchasing' regularly to make professional decisions. Each purchase strategy per period is based on the 'Purchase Guidelines'. In 2018, we established eight guidelines for climate change management including Response to the Regulations on Climate Change. We reestablished a systematic business process and the internal role and responsibilities for the second phase of the emission trading scheme, which will begin in 2018.

### Saving Energy

**Expanding ESS at Workplaces** The introduction of Energy Storage System (ESS) contributes to stabilizing the national power demand and the supply of renewable energy, thereby restraining further construction of power plants. LG Chem is promoting the spread of ESS in order to increase energy efficiency of its business sites and to reduce electric power costs. The ESS of 50.2MWh in total has been installed at the Iksan, Ochang, and Yeosu plants and the ESS of 83MWh will be added to five worksites by the second half of 2018. Going forward, LG Chem will strive to improve energy efficiency through the expansion of ESS facilities and the introduction of photovoltaic facilities.



**Improving Energy Technology Database** LG Chem supports the activities for energy/GHG reduction at its workplaces by operating an energy portal system. We manage energy and GHG target indicators through the energy portal, and share key activities and issues for the year. In addition, we manage the cases of energy-saving technologies at each workplace in a database. In particular, we upgraded our technology database in 2017 and uploaded about 1,000 energy-saving technologies. In addition, to increase the utilization of the database by those in charge of each workplace, we have assigned a rating to each energy reduction technology and subdivided the technical classification. At the same time, we have added the internal and external audit function to the ISO 50001 energy management system in order to support the efficient operation of the energy management system at workplaces. LG Chem publishes the Energy/Greenhouse Gas News Letters and shares key issues with work sites to help those in charge to identify and respond to energy and greenhouse gas relevant issues.



**Awarded Energy Champion Certificate** LG Chem's Cheongju Plant and Yeosu PC Plant were certified as Korea's first energy champions by Korea Energy Agency in 2017. KEA objectively measures the energy-saving performance of workplaces and certifies the companies that voluntarily made efforts to improve energy efficiency as energy champions. The Cheongju Plant and Yeosu PC Plant were awarded their certification by achieving a 6.14% reduction in energy intensity for four years and a 3.17% reduction in energy consumption for 2016, respectively. LG Chem will continue to expand its business sites that receive energy champion certification through continuous efforts to conserve energy and engagement in relevant projects.

Ceremony of Energy Champion Certificate



**Expanding Energy Diagnosis** LG Chem's engineers aim to increase energy efficiency through process improvement. The analysis of the process enables them to discover and apply various ideas for improvement including recovery of waste heat, introduction of energy saving technologies, and improvement of facilities. Also, a number of energy diagnoses are made to reduce energy consumption.

In 2017, a comprehensive diagnosis of electric power equipment was conducted for the first time. In the past, our energy saving efforts used to focus on the reduction of fuel and steam consumption, but now have moved to the improvement of power efficiency. As a result of the diagnosis, we could discover power saving items worth about 900 million won. The specifications and operation status of power facilities at workplaces were measured and the results were stored in a database so that the efficiency of each facility can be systematically analyzed and managed. Through these efforts, we developed improvement plans, such as replacement of low-efficiency equipment and enhancement of power quality, and established investment plans. LG Chem will continue to carry out varied energy diagnoses and reduce energy consumption at its workplaces by strengthening its engineers' capabilities.

### Developing Products to Respond to Climate Change

LG Chem makes a positive impact on climate change by saving energy through product manufacturing and the usage of eco-friendly products. In addition, we analyze and disclose the carbon information of our products so customers who manufacture our raw materials can effectively respond to climate change. Also, we transparently disclose the environmental information requested by our customers.

#### Communicating with Customers

The efforts of companies to respond to climate change have emerged as an important evaluation index for investors and customers. LG Chem reports on greenhouse emissions, emissions trading transactions, and energy consumption through its sustainability and annual reports. Every year, it discloses LG Chem's response system to climate change and current status through DJSI and CDP for domestic and overseas investors. In addition, upon the request of customers, we publish the Life Cycle Assessment (LCA) reports by analyzing the greenhouse gases emitted throughout the manufacturing process-from raw materials to disposal; we contend to expand carbon footprint-certified products. In cooperation with government agencies, we are actively engaged in GHG and energy policies, such as the emissions trading system, energy diagnosis, and joint projects with SMEs.

#### Developing Sustainable Products

LG Chem contributes to the corporate and social response to climate change by developing products for the sustainable development of society. We are concentrating our research and development capabilities on developing products that can protect the environment and our planet by creating sustainable automotive and ESS batteries, water treatment filters, and, overall, improving their performance.



Automotive Battery

LG Chem contributes to the spread of eco-friendly electric vehicles through the production of automotive batteries. Our automotive batteries have gained a competitive edge in the EV battery market with major Supplier Awards by global automakers and secured orders for key electric vehicle projects.



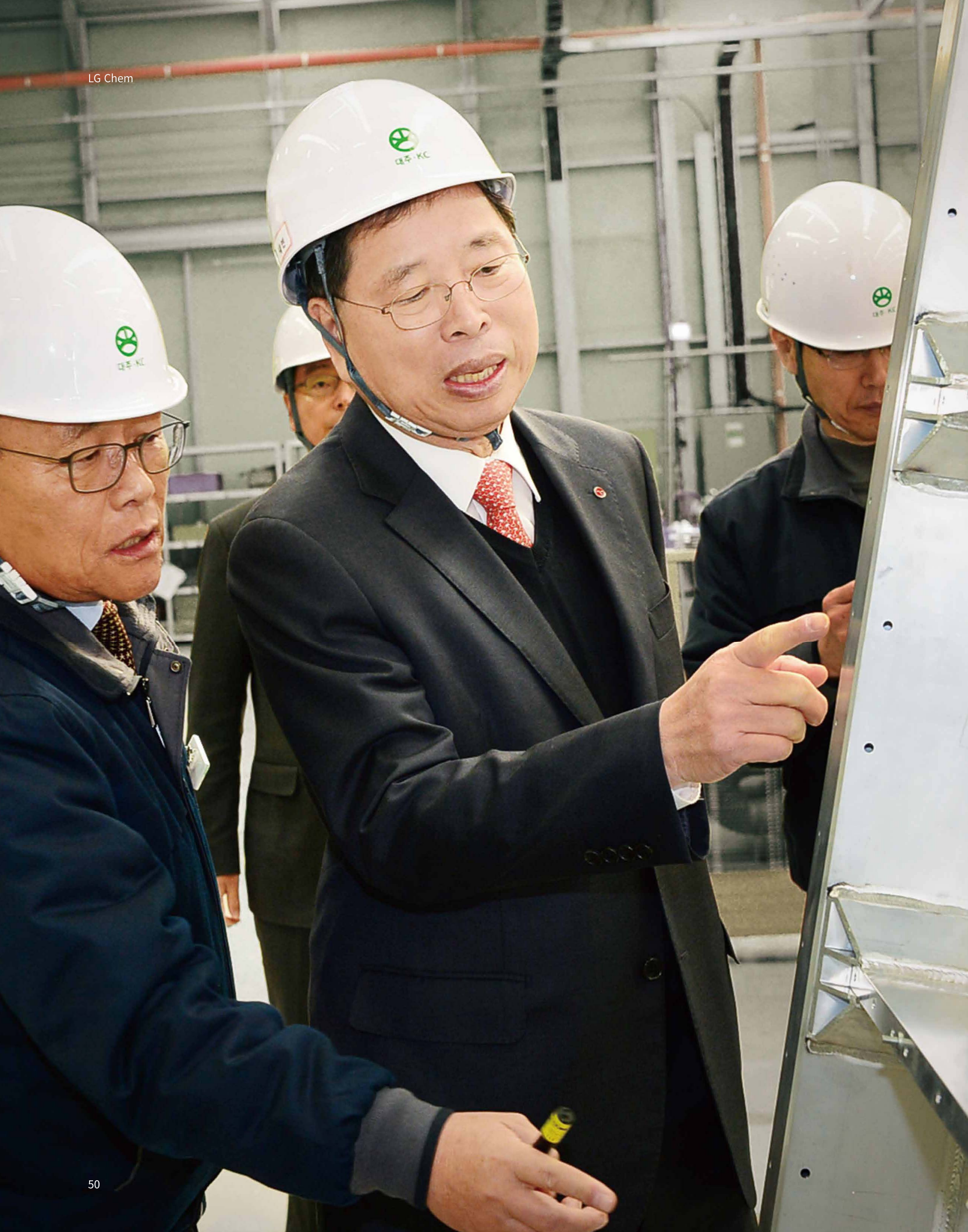
ESS Battery

Our ESS batteries maintain a strong global partnership by expanding orders for large-scale power grid projects and entering into a long-term supply contract with major power generation companies, and contribute to the efficient use of renewable energy sources.



RO Membrane (Water Treatment Membrane)

Through the water treatment business, we contribute to overcoming the shortage of water at the global level and strive to make everyone drink clean water.



# GETTING ENGAGED WITH PARTNERS

## Industry Trends: Change & Response

Global companies operate business in a complicated supply chain from raw materials to final product. In the past, business management activities were considered when a company's sustainability was evaluated. However, taking responsibility for the economic, social, and environmental impact in the overall supply chain is required today.

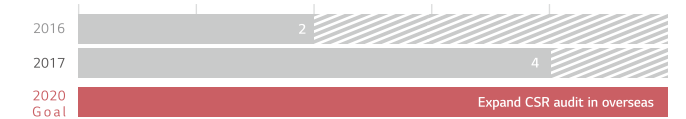
Stakeholders require transparent disclosures of information in regard to the overall supply chain and a company's sustainability cannot be guaranteed without the existence of responsible supply chain management and shared growth with its suppliers. In particular, in 2016 Amnesty International raised the issue of using child labor to mine for cobalt, which is a key material for EV's battery, in the Democratic Republic of the Congo, and it required global companies to actively respond. Now, global companies are required to manage risks, human rights, safety, health, and environment while fostering a supply chain that supports mutual growth.

## Strategy: Risk & Opportunity

As the competitive chemical industry landscape expands among corporate supply chains, mutual cooperation and growth are imperative for success and growth of market competition and sustainability management. LG Chem strives to build strategic partnerships with its suppliers based on mutual trust. In addition to making mutual growth agreements with our primary and secondary suppliers, we are also committed to creating a fair trade culture. We are operating support and cooperation programs in various fields, including finance, environment, capacity building, and communication. In addition, we are fulfilling our social responsibilities in the overall supply chain.

## Evaluation

CSR Audit on Suppliers (Unit: case)



\* Operating CSR audit on suppliers since 2016

## Strengthening Suppliers for their Sustainable Growth

To achieve a balanced development of the corporate ecosystem, LG Chem is strengthening the basis for mutual and sustainable growth with its partners, beyond providing mere support.

### System for Supplier Partnership Promotion

**Shared Growth Strategy** LG Chem actively promotes a culture of shared growth and cooperation with its suppliers based five major strategies. Our shared growth activities are conducted in various sectors: fair trade, financial support, safe environment and energy, capacity building of suppliers, and communication. We believe that our supplier's competitiveness is our competitiveness, and we are working hard to ultimately enhance their sustainability economically, socially, and environmentally by extending support to secondary suppliers.

#### Five Strategies



**Shared Growth Organization** LG Chem has organized the Shared Growth Steering Committee, which is a company-wide supreme resolution body under the CFO, to systematically practice shared growth and support suppliers. In 2017, four members were added to the Shared Growth Steering Committee, including the executives in

charge of logistics and IT, to review LG Chem's shared growth activities and expand the range of support. The Committee discusses important issues related to shared growth and examines detailed activities by participating in fair trade, finance and economy, and R&D. In addition, the corporate CSR team plans and manages company-wide shared growth activities such as supporting suppliers and managing the CSR risk of suppliers and workplaces.

**Communication with Suppliers** LG Chem regularly holds meetings with suppliers to share business status and issues and to listen to their opinions. In 2017, the Yeosu Plant held a Mutually Beneficial Hanmadang for construction partners, expanding the scale of meetings held in the past to create a venue for mutual communication. LG Chem's management visits suppliers' production sites to resolve difficulties with collaboration and trade. In order to strengthen the rechargeable battery business in 2017, the CEO visited two partner companies of the Energy Solutions Division. He inspected all production sites and met with staff. LG Chem determines to cultivate a healthy relationship with its partners.



**External Activities** LG Chem's CFO is a participating member in the Mutual Growth Committee and chemical industry. He is working with the government to discuss mutual growth issues and to spread mutual growth culture.

### Financial Support

**Funding** LG Chem conducts financial support activities such as direct financial support, shared growth fund, network and family loan, and shared growth investment resources to help suppliers fund their operations. The direct financial support, which is a loan program to support new investment of suppliers, directly grants no-interest loans through recommendation of an applying supplier and two examinations by the department of finance and economy.

The shared growth fund is a low interest loan fund designed to solve financial difficulty of suppliers. LG Chem has raised a fund of KRW 62.9 billion and provided financial support for its partners with the benefit of in interest rate cut of 2.35%p which is an increase from

1.0%p. In 2017, we expanded financial support to secondary suppliers by 20% from the previous year and will further increase the amount to strengthen the competency of our supply chain. The company also supports research and development, development of human resources, productivity increases, overseas markets. LG Chem also saves energy by creating shared growth investment resources to strengthen suppliers' capabilities.

Status of Financial Support to Suppliers (accumulated) (Unit: KRW billion)

	2016	2017	2018 target
Direct Financial Support	5	6	7
Shared Growth Fund	69.8	81	90
Investment Resources	0.3	0.4	0.5

**Operating the Shared Growth Payment System** LG Chem introduced the Shared Growth Payment System to reduce suppliers' financial burden. This system is a safety payment method with no recourse where secondary and tertiary suppliers can cash bonds issued by large companies with credit equal to large companies. Primary suppliers can pay for delivered goods by issuing shared growth bonds to secondary suppliers. Because interest rates for large companies are applied, suppliers' financial expenses are saved. In 2017, we increased the amount used in the Shared Growth Payment System about 25%. We supported additional monetary flow to secondary suppliers and encouraged primary suppliers to take part as well.



**Operating Procurement Portal** LG Chem operates the Procurement Portal, which computerizes the entire purchasing process including suppliers' registrations, orders, bids, and contracts. It simplifies reception transmission and preservation of necessary trade documents. Through this, LG Chem provides a transaction environment that suppliers can trust by increasing transparency in transaction procedures and convenience of work.

### Eco-friendly Manufacturing Process

**Promoting Mutual Growth Business in the Energy Sector** LG Chem signed an MOU with Korea Energy Agency to provide different forms of support to customers and suppliers. They are able to build their own management systems through this education on saving energy and investment in performance management. Every year, selected client companies and suppliers are provided with support for

the development of the greenhouse gas inventory and management tools. The Energy Shared Growth Fund, currently amounting to KRW 4 billion, has been formed to create financial support for such projects. In 2017, we selected 10 small to medium-sized clients and suppliers for energy diagnosis, and found 50 energy saving technologies, which led to a reduction of 1,573 tons of greenhouse gas per year and KRW 400 million worth of energy cost savings. Excellent energy saving technologies were selected and directly/indirectly supported through investments, contributing to their reduction of GHG emissions and creation of profits.

**Support for the Greenhouse Gas Reduction of Small/Medium-Sized Companies** LG Chem implements 'Green Credit' businesses to support the greenhouse gas reduction of small/medium-sized companies. The Green Credit businesses facilitate greenhouse gas reduction of small/medium-sized companies by cooperation with larger companies which have financial resources and technology, but low reduction potential for greenhouse gases. These smaller companies have a higher reduction potential, but lack funds and technology. LG Chem contributes to achieving the national greenhouse gas reduction goal by finding small/medium-sized companies which have high reduction potential for greenhouse gas and introducing facilities to improve process efficiency. Such efforts are recognized as LG Chem's greenhouse gas reduction so that the company relieves the burden to reduce greenhouse gas emissions. LG Chem provides technical and financial support for small/medium-sized companies' emission reduction to contribute to the reduction of greenhouse gas emissions and mutual cooperation among large and small/ medium-sized companies.

## Enhancing Global Competitiveness of Suppliers

The enhancement of our suppliers' global competitiveness naturally leads to the enhancement of our own competitiveness. In this regard, we consider our suppliers business partners who grow with us to enhance our competitiveness and value.

### Recruiting and Training Support for Suppliers

**Supporting Talent Recruitment** LG Chem supports suppliers by helping recruit excellent talent, thereby enhancing competitiveness. By helping suppliers take advantage of LG Chem's brand image in job fairs. We also provide a certain amount of subsidies to the SMEs in need of recruitment funding. In 2017, the amount of subsidies increased over 300% compared to 2016, and LG Chem will contribute to remove wage disparity by increasing the amount of subsidies each year.

**Training Suppliers' Employees** LG Chem operates 'Polymer Processing School' to deliver its technical know-how on designing and developing products to employees of suppliers. In order to enhance expertise of suppliers' employees, the training course covers basics of plastics processing, including basic knowledge on plastic and injection molding. Online training sessions on language, professional duties, and general management are also available at the LG Academy, a training institute designated by the Korean Ministry of Labor. In 2017, liberal arts classes were added to the sessions, and a total of 218 employees from 47 suppliers have received training.

### Strengthening Suppliers' Technical Capacity

**Supporting technology and overseas markets** LG Chem raises competitiveness with small/medium-sized suppliers by helping them respond to foreign export regulations. We participate in overseas exhibitions with our suppliers to allow them to experience technology trends and an opportunity to promote themselves. R&D and production and technology divisions are leading the transfer of technical through many services and tailored solutions to strengthen suppliers' technical capacity. We provide a window through which our partners can suggest their own development and commercialization in cooperation with us to achieve mutual growth.

Patent in 2017

Co-ownership of Patent	Transferred Patent
<b>81</b> cases	<b>5</b> cases

\* 2 cases of patent transfer in 2016 became business activity.

## Supporting Suppliers' Productivity Improvement and Exports

**Participation in Production Innovation Partnership** LG Chem is participating in the production innovation partnership held by the Ministry of Trade, Industry and Energy, and the Large & Small Business Cooperation Foundation to support suppliers' export competitiveness and increase their productivity. We are enhancing the competitiveness and self-sufficiency of our partners by providing consultation on productivity improvement and supporting the incidental costs of export. We provide innovative solutions for productivity improvement in the management and manufacturing fields by finding productivity improvement tasks suited to the characteristics of each partner, and support the direct costs of exporting (tariffs, logistics agents, etc.).

Performance in 2017

Total Funds	<b>KRW 112.3 million</b>	Financial Impact	<b>KRW 53 million/company</b>
Number of Participating Company	<b>5 companies</b>	Increase in Sale	<b>32.6%</b>
Productivity	<b>213% improved</b>	Increase in Export	<b>27.3%</b>
Quality	<b>333% improved</b>	Productivity of Added Value	<b>11.7%</b>
Man Moral	<b>125% improved</b>		

### Best Practice Case of Technology Cooperation with Supplier

#### Daejoo Kores

Daejoo Kores manufactures box-shaped 'Lower Case Housings' for electric vehicle battery packs. Through technology cooperation with LG Chem, we have developed the world's first aluminum-based large-capacity battery pack housing product. Compared to iron, aluminum is 3 times lighter and has 9 times higher thermal conductivity, which means the weight of aluminum products can be reduced 1/3 (300kg → 100kg) of that of conventional iron products. It also boasts higher battery efficiency thanks to faster cooling speed during battery recharge or discharge. Daejoo Kores's welding technology and LG Chem's technology to control precision processes developed a synergy, resulting in the introduction of a new aluminum product in December 2017.

LG Chem will continuously put effort into future businesses with partners, and it plans to secure a growth engine that allows us to grow together through the development of new technology and new products.

## Managing CSR Risk in Supply Chain

Major stakeholders, customers, NGOs and investors have been paying more attention to the ethical purchase of raw materials. They demand a comprehensive resolution of the CSR issues surrounding specific raw materials, including human rights and environment issues.

LG Chem's Sustainable Supply Chain Management Process



**Establishing Code of Conduct for Suppliers** In 2016, LG Chem established a Code of Conduct for Suppliers that consists of 10 items, including human rights and labor, ethical management, safety environment, and ethical purchasing. In 2017, the use of conflict minerals and raw materials sourced through unethical methods that involved illegal and serious human rights violations was prohibited. In addition, we have established a due diligence policy to strengthen the monitoring of the concerned raw materials.

**Conducting CSR Evaluation on Suppliers** To build a sustainable supply chain management system, LG Chem is conducting CSR evaluations on suppliers in line with their purchase evaluations (regular evaluation, new company evaluation for registration). The regular evaluations are performed on about 240 raw material manufacturers for 52 evaluation items, including prohibition of child labor, protection of workers, compliance with working hours, management of conflict minerals, and the assessment and elimination of safety and health risks. New company evaluation for registration is undertaken on new raw material manufacturers for 10 items in the CSR field, which is reflected in the overall company evaluation. For regular evaluations, suppliers perform a self-evaluation with their own CSR checklist, and high-risk entities are selected for on-site inspections. On-site inspections were conducted for two companies in 2016, three companies in 2017, and six companies in the first half of 2018. In the future, we plan to strengthen the CSR risk management in our supply chain by expanding the coverage to China and other regions.

**Analyzing Evaluation Results** The results of CSR evaluations on suppliers showed that they mostly have high compliance with domestic laws, including the Labor Standards Act and Occupational Safety and Health Act, but have poor CSR management processes (evaluation, management of conflict minerals). To be specific, key improvement

areas included compliance with working hours, elimination of discrimination factors, provision of protective gear, identification of prohibited work for the protected workers, and establishment of a process to respond to chemical leaks. LG Chem will continuously encourage its suppliers to comply with domestic and international CSR standards.

Evaluation Results of Supplier CSR Inspection by Sector (Unit: point)

Working Environment and Human Rights	Ethical Management	Supplier CSR	Safety, Health, Environment	Total
81.3	72.7	52.9	94.5	85.4

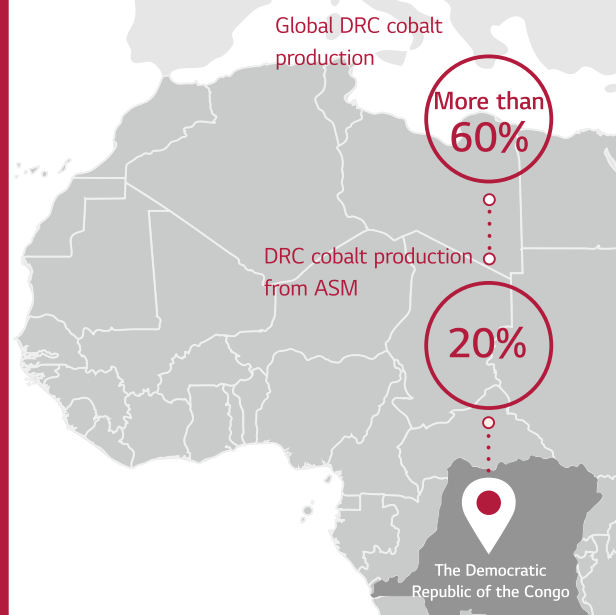
\* As of the first half year of 2018

\* On a scale of 100

**Monitoring Improvements** LG Chem includes a clause on social responsibility in the standard purchase agreement so that suppliers can recognize the importance of CSR from the contract phase and be committed to making improvements whenever major CSR risks are found. Based on the purchase agreement and Code of Conduct, we will require them to make continuous improvements and monitor their social responsibilities.

### Purchasing Risk-free Raw Materials

**Making Efforts for Responsible Procurement of Minerals** Various stakeholders including customers, investors and NGOs are demanding a responsible mineral supply chain and a response to the issue of conflict minerals. Conflict minerals include four minerals (tin, tantalum, tungsten and gold) mined in conflict areas such as the Democratic Republic of the Congo (DRC) and its neighboring countries. LG Chem has established a policy to prohibit the use of conflict minerals during procurement of raw materials in order to prevent any human rights violation, exploitation of labor, loss of life and environmental pollution. As part of such efforts, we are monitoring suppliers who handle the four minerals above, and check whether they use conflict minerals. Also, we collect and manage refinery information for these minerals and use the IT system to monitor the ingredients of the materials procured by our suppliers. LG Chem's suppliers are also given the Green SCM Guideline that prohibits in principle the use of conflict minerals. Furthermore, four companies within the LG group (LG Chem, LG Electronics, LG Display, and LG Innotek) formed a council to share policies on conflict minerals management every year, and are carrying out activities to encourage all of their partner companies to prohibit the use of conflict minerals.



### Cobalt Issue at a Glance

Cobalt is the raw material of lithium-ion batteries used in mobile devices and electric vehicles. Due to the recent rise in demand for electric vehicles, the price of cobalt has also been increasing. More than 60% of the global cobalt production comes from the Katanga area, located in the southern part of the Democratic Republic of the Congo (DRC).

In January 2016, Amnesty International published a report to raise the issue of child labor being used in the mining of cobalt, which has eventually put the raw material at the center of global attention as being equivalent to a conflict mineral. In November 2017, the organization published a follow-up report to disclose the improvements made with regard to the human rights issues in the supply chain. LG Chem received a positive evaluation for taking proper measures, and the cobalt supply chain issue is no longer conflicted with child labor. Now, it's expanded by overall social responsibility, including the safety and health of workers and environmental pollution.

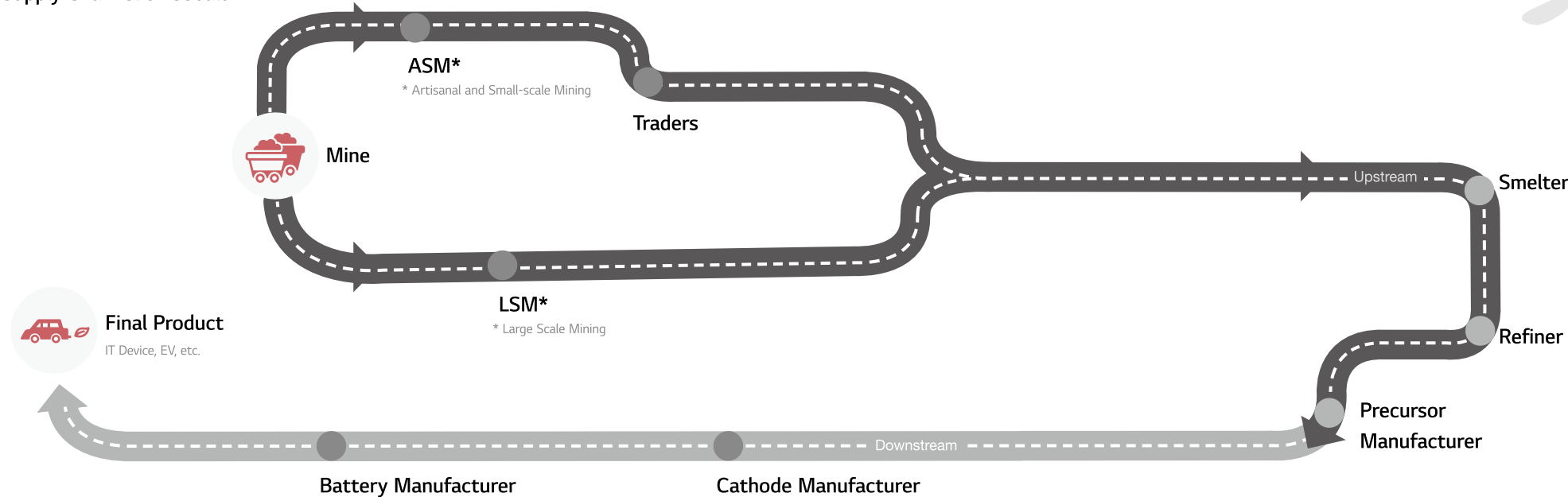
### Establishing Policies and Participating in the Initiatives

LG Chem recognizes that the issue raised by the Amnesty International report regarding child labor in the cobalt mining process in the Democratic Republic of the Congo (DRC) is a significant global human rights issue in a conflict area, and it has established a Due Diligence Policy by revising the Code of Conduct for Suppliers and Eco-friendly SCM Guidelines. LG Chem's due diligence policy defines a five-step framework according to the 'OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas,' and designates cobalt as a material under control, which is equivalent to a conflict mineral. LG Chem is also participating in the Responsible Cobalt Initiative (RCI), which is organized by the China Chamber of Commerce of Minerals, Metals and Chemicals (CCCMC) and is sponsored by the OECD with the participation of the DRC, NGOs, and upstream/downstream business entities related to cobalt production. Together with these related organizations, we will make our best efforts to fundamentally resolve the child labor issue.

### Sustainable Supply Chain Management

# Cobalt in the Supply Chains

### Supply Channel of Cobalt



### Conducting On-site Inspections

LG Chem conducted a CSR Audit on its primary suppliers (cathode material manufacturers) to confirm whether they change the country of origin and also how they respond to secondary suppliers with regard to the cobalt issue. We have also uploaded a cobalt supply chain map on our website for stakeholders. A third party audit was conducted on the cobalt refineries and precursor suppliers, which are at the center of the cobalt child labor issue. In July 2017, the headquarters conducted its due diligence to review the policies and action plans meant to resolve the issues of mass balance and child labor, and in April 2018 another due diligence was completed to check the status of child labor in the ASM of the DRC. The issue was initiated by cobalt but has been spreading to other core raw materials for batteries, such as lithium, nickel, manganese, and graphite, which means responsible procurement of minerals has become more important. In this regard, we are closely cooperating with our stakeholders, automotive battery companies in particular, to establish a sustainable supply chain for cobalt and other core raw materials used for batteries.

Please refer to the homepage for details



# RESPECTING HUMAN DIGNITY

## Industry Trends: Change & Response

As companies expand their influence on society, demand is growing for the protection of human rights in the workplace. Respect for human rights in companies is becoming internationally standardized, and various moves are being made to enhance the value of employees.

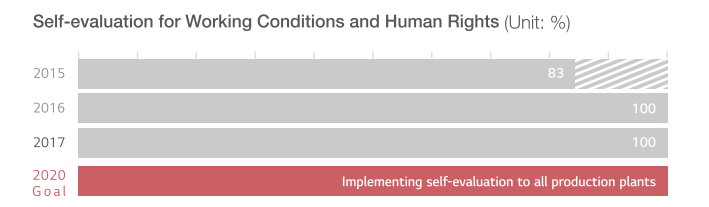
For LG Chem, which operates a number of global business sites, complying with international conventions and standards on human rights stipulated by the Universal Declaration of Human Rights, the Ten Principles of the UNGC, the UNGP, and the ILO Core Conventions is an integral part of its business operations. The corporate responsibility for human rights is also clearly stated in the draft of the third national human rights policy. Companies must fulfill their responsibility for respecting human rights in accordance with international standards; partners or suppliers should prevent violations of human rights in supply chains; the government needs to improve relevant support, laws, policies and systems.

Given the nature of the chemical industry, which has a manufacturing process, the management of employees' working conditions and human rights is crucial to ensure business competitiveness. The occurrence of human rights risks affects financial performance, brand image, and consumer confidence. For LG Chem, it's important to enhance corporate sustainability while caring for human rights issues as part of risk management and protecting said rights of employees is crucial.

## Strategy: Risk & Opportunity

The LG Chem Global Human Rights & Labor Policy was established in 2016 as part of the efforts to promote its management philosophy of People-oriented Management. Also, according to a human rights management process, a CSR self-diagnostic tool is used to assess human rights issues and risks related to employees and to identify potential human rights risks in advance.

## Evaluation



\* Evaluation implemented for overseas sites include only China plants in 2015

## Human Rights Management System

LG Chem respects the human rights of its employees, and supports the human rights protection and labor standards of international organizations in order to fulfil its responsibility to respect human rights throughout its management activities.

### Human Rights Policy

LG Chem actively supports international standards related to human rights and labor, including the Universal Declaration of Human Rights, the UN Global Compact, the ILO Labor Conventions, and the UN Guiding Principles on Business and Human Rights, and strictly complies with labor laws in all countries and regions of its business operation. Based on its management philosophy of People-oriented Management, LG Chem promotes respect for human dignity, freedom, and happiness as fundamental values. In 2016, the LG Chem Global Human Rights & Labor Policy was enacted. This policy applies to all workplaces at home and abroad and is posted on the LG Chem website.

### Human Rights Management Process

Every year, LG Chem identifies risks related to working conditions and human rights by using a CSR self-evaluation tool and develops improvement tasks.


Inspections are conducted on the following areas: the operation of the Grievance Handling System, the prohibition of child labor and forced labor and the protection of underage workers, the prevention of discrimination and sexual harassment, compliance with legal working hours, the implementation of weekly holidays, the payment of fair compensation, the reduction of wages, and the retention of employment after childcare leave. Self-evaluations are made at all domestic and overseas production sites including the head office and the Daejeon Technical Research Institute.

After the self-evaluation, on-site inspections are conducted together with a third-party organization. The on-site inspections aim at identifying the best practices and improvement tasks by sector and performing improvement activities. The results are monitored and complemented with the self-evaluations the following year.


#### Risk Management Process of Working Conditions and Human Rights




### LG Chem Global Human Rights & Labor Policy

- 


**Humane Treatment**

We strive to create a safe working environment without any inhumane treatment or threat, such as mental or physical coercion and verbal abuse, and to treat all employees respectfully.
- 


**Prohibition of Forced Labor**

We do not unfairly restrict physical freedom or force labor against the will of employees. The terms of employment do not require the submission of the original copies of identity cards, passports, or work permits.
- 


**Prohibition of Child Labor**

We abide by the minimum age of employment set forth by local law, and prohibit child labor under 16 years of age. We do not assign hazardous work to youth under 18 years of age.
- 


**Prohibition of Discrimination**

We provide employees with equal opportunities for recruitment, promotion, compensation, and training, and we prohibit discrimination based on gender, age, race, religion, union activity, disability, pregnancy, marital status, and social status.
- 

**Working Hours**

We comply with the regular, overtime and non-working hours regulations set forth by local law, and we do not force employees to work beyond the regular working hours. For overtime work, overtime pay based on relevant laws is paid.
- 

**Wage and Welfare**

We pay all employees a salary equal to or exceeding the minimum wage set forth by local law.
- 

**Freedom of Association**

We recognize freedom of association and collective bargaining guaranteed by local law, and create an environment where employees can communicate with the company without fear of threats or retaliation. In addition, we ensure employees are not unfairly treated for reasons such as the formation of or membership in a labor union.

## Those Vulnerable to Human Rights Violations and Improvement Plans

LG Chem identifies groups vulnerable to human rights violations based on major human rights risks defined within LG Chem's Global Human Rights & Labor Policy, Employment Rules, and Labor Standards Act, and implements various measures to mitigate those risks.

### Groups Vulnerable to Human Rights Violations

- 1 Production and Technical Employees**
  - Due to the nature of the manufacturing process, repetitive work over a long period of time can pose a threat to the health and safety of employees.
- 2 Pregnant Employees**
  - Pregnant employees, including employees who have given birth less than one year ago, should be protected for their health and safety.
- 3 Child/Underage Workers**
  - Child labor must be forbidden for the growth and health of the children, and the work of underage workers must be restricted by law.

### Mitigation Measures

- 1** Discussing various issues of working conditions and preparing improvement plans through quarterly labor-management council and annual collective bargaining
- 2** Implementing various maternity protection programs; determining the retention rate after returning from parental leave; prohibiting pregnant employees from night/overtime/holiday work
- 3** Identifying and prohibiting child labor; excluding minor workers from legally designated dangerous/hazardous work; restricting underage workers from night/holiday work

## Human Rights Assessment

The results of the self-evaluations in 2017 showed that there were no violations in regard to child or under-age workers at all domestic and overseas production sites. With regards to working time, which is the most important human rights issue in Korea as well as in the global society, we sampled the number of working people per workplace\* to determine the working hours of production and technical employees. In 2017, we observed compliance with working hours at all of our global production sites and achieved a compliance rate of over 90%.

\* Sampling method: Depending on the size of the production staff, samples were selected with similar proportions by section/process (10 people from 1 to 100 people, 15 people from 501 to 1,000 people, 20 people from 1,001 to 2,000 people, 25 people from 2,001 to 3,000 people, and 30 people from over 3,000 people).

Evaluation of Working Conditions and Human Rights (Unit: %, case)

	2016	2017
Compliance with child labor standard	100	100
Compliance with working hour standard (60 hours per week)	85	94
Reduction of wages status	0	0

## Major Human Rights Protection System and Culture

As part of the efforts to protect the human rights of its employees, LG Chem regularly identifies factors that have a negative impact on human rights and makes continuous improvements.

### Prohibition of Employee Discrimination and Respect for Diversity

LG Chem provides opportunities for recruitment, promotion, compensation, and training equally to all employees through the prohibition of discrimination in its global human rights and labor policy. It also prohibits discrimination based on gender, age, race, religion, union activity, disability, pregnancy, marital status and social status. In addition, HR policies and employment rules also specify recruitment without discrimination based on race, nationality, gender, religion, disability, region, affiliated groups, etc.

LG Chem conducts various programs to train talented people and allow them to join the company to contribute to the balanced development of the local economy. In 2016, the company established the LG Smart Convergence Engineering Department in Pusan National University and Chonnam National University to train professional personnel who seem to be suitable to work in the industry. In addition, it signed the Battery Customized Track Agreement with Chungbuk National University to train engineers in natural sciences or engineering specialized in battery business in the Chungbuk area.

Ratio of local talents\* among new administrative and technical employees in 2017

**31 %**

\* Local talents: excluding talents from Seoul, Gyeonggi-do, Incheon, and overseas universities



LG Chem provides equal opportunities to every employee and promotes employee diversity so that we can contribute to social development. One way we are doing this is by creating jobs for people with disabilities and through the operation of Happy Nuri and Love Nuri, which are the disabled-oriented subsidiaries of the company. As of 2017, a total of 137 disabled workers are carrying out tasks ranging from beautification, steam washing, packing, and management of stalls, cafes and welfare facilities to providing assistance at animal rooms at the Ochang, Cheongju, Daejeon, Osong, and Magok plants. We will continue to fulfill our social responsibility by maintaining a diverse workforce that includes women, the disabled, and social minorities.

Diversity in Employment (Unit: %, person)

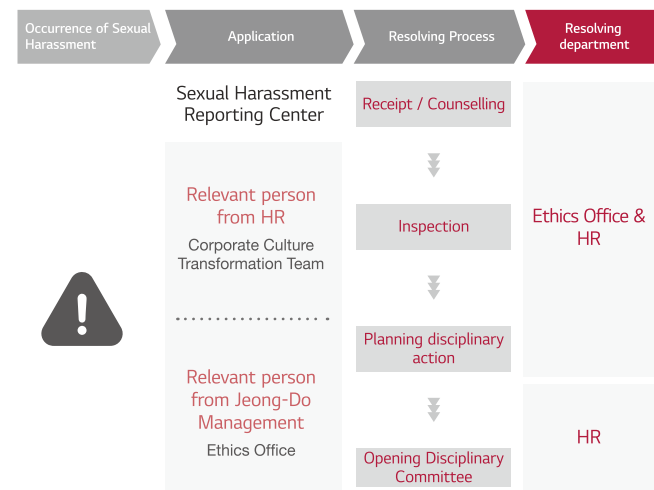
	2015	2016	2017
The ratio of female employment among job creation	12.3	16.9	20.6
Percentage of female employees in management position	4.73	5.58	7.22
Disability Employment	125	137	137
Veterans	303	334	376

\* Data is based on domestic operation

### Employee Grievance Program

LG Chem has a variety of employee grievance resolution programs. The HR Q&A system is operated on the intranet to receive employee grievances by section, and staff in the relevant departments review and respond to the received reports.

#### Sexual Harassment Reporting Center



The Labor Management Council has placed provisions for handling grievances in operation regulations. The Grievance Handling Committee, which consists of three or less members representing labor and management, notifies workers of the results within 10 days of receipt.

Also, employees are allowed to submit their grievances through the ombudsman system on the corporate website, which is operated in three languages: Korean, English, and Chinese. In particular, upon the occurrence of sexual harassment, employees can submit a report through the Sexual Harassment Reporting Center. Such reports are handled according to legal procedures based on the investigation of relevant facts in cooperation with the HR related departments as necessary.

### Welfare Policy

The company provides various welfare programs to support the healthy and happy lives of employees, to enhance the level of satisfaction with their work, and to help them maintain a work-life balance. In addition, we operate a retirement pension system to enable employees to have old age income security after retirement. The retirement pension system is operated in two types: defined benefit (DB) and defined contribution (DC) according to legal standards.

#### Employee Welfare

Area of Supports	List of Supports	Description
Family Support	Housing loan	Loan for employees of one year+ service; company house and dormitory
	Children's school expenses	Supporting tuition fees for children attending middle/high schools and universities
	Family events/emergencies	Supporting expenses and leaves for family events
	Childbirth and maternity Support	A workplace nursery and a feeding room, programs to support family psychological counselling
Health Support	Medical expenses	Medical expenses for employees, spouses, and children
	Health examination	Regular health examination
	Health/psychological consultation	Consultation with specialists such as health managers and psychologists
Leisure Support	Recreation center	3 recreation centers
	Company club	Supporting more than 150 clubs at different workplaces
	Prize for long-term service	Souvenirs and trips in commemoration of long-term service
	Selective welfare	Support self-development, health improvement, use of personal points for the purpose of leisure and E-Shop

### Education on Human Rights

At LG Chem, a two-hour training on LG Code of Ethics is provided for employees every year, with a focus on employee rights based on case studies. We provide one hour mandatory training to prevent sexual harassment every year as part of education on human rights by the Global Academy.

### Maternity and Child-care Leave

LG Chem actively implements support policies to reduce the burden of childbirth and childcare for employees. In addition, the rate of return after parental leave, which is a key indicator of job security for employees using parental leave, is 98.4%, which is a 6.3%p increase from the previous year.

Maternity and Child Care Leave (Unit: person, %)

	2015	2016	2017
Number of maternity leave beneficiaries	90	149	124
Number of child-care leave beneficiaries	75	126	183
No. of employees who have not returned since child-care leave	7	10	3
Ratio of those returning to work	90.7	92.1	98.4
Number of employees working for 12 months or more after a maternity leave	69	88	96
Ratio of employees working for 12 months or more after a maternity leave	89.6	93.6	93.2

\* Data is based on domestic operation

#### Best Practice Programs for Supporting Employees



#### Employee Counseling Center

LG Chem operates a psychological counseling center at its headquarters and major workplaces and assigns professional counselors to resolve employee grievances. A number of psychological tests, such as a character test, personality test, stress test, and aptitude test, are provided, and psychological counseling programs for individuals or teams are available to help employees deal with the stress factors that interfere with their work flow. In addition, Heart Green Letter is regularly sent to employees to give information on psychological counseling programs and personal stress and emotion management.



#### Employee Growth Support

We have introduced and implemented wellness programs to improve employee work engagement through the enhancement of their physical and mental health. For those who get tired or need stress management, we are conducting programs to boost their physical and mental energy in the open-air (Gonjiam Resort) for two nights and three days. Also, for executives who suffer from excessive stress from intensive work and organization management, we provide individual counseling by psychiatrists to contribute to continuous performance improvement.



# GIVING BACK TO COMMUNITIES

### Industry Trends: Change & Response

The era of economic value creation, profit generation and efficiency has ended. Now, we have entered a place where companies can create their own social value. It's becoming more important for businesses to communicate locally and achieve mutual growth through social contribution activities.

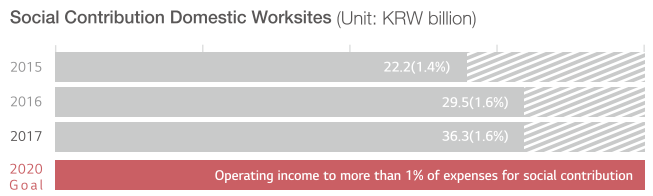
Since its inauguration, the new government has discussed legislation on social value. Companies are encouraged to prioritize human and community values, such as human rights, labor rights, safety, the ecosystem, consideration of the disadvantaged, quality jobs and mutual cooperation, over pursuing economic profits and efficiency. In accordance with this trend of legislation, stakeholders are raising their voices, calling for increased corporate interest in social values and social responsibility. Corporate social responsibility is now an important indicator of corporate competitiveness.

For LG Chem, which operates its business across the globe, local communities are one of the most important stakeholders. Beyond providing token support, we need to build close relationships with local communities through active engagement. LG Chem strives to share the difficulties of and grow together with local communities that serve as the base of our employees and businesses.

### Strategy: Risk & Opportunity

Chemical companies build and grow manufacturing facilities in their local communities. Accordingly, neglecting the development of and engagement in local communities can result in battered consumer confidence and crisis of existence. The efforts to develop and communicate with local communities will grow the communities and lay the foundation for the solid growth of the company. LG Chem is conducting strategic social contribution activities that reflect the social contribution policies of LG Group and the characteristics of the chemical industry. In particular, we are pursuing social contributions in line with the UN's SDGs, and we are making efforts to create social values through education programs for future generations, support for the environment, and sharing with local communities.

### Evaluation



\* Operating income on sperate financial statements

## CSR Promotion System

To ensure the authenticity of social contribution activities, LG Chem has established its CSR programs in line with the SDGs by reflecting the corporate capabilities and social requirements, and we have pursued activities that provide substantial benefits to local communities.

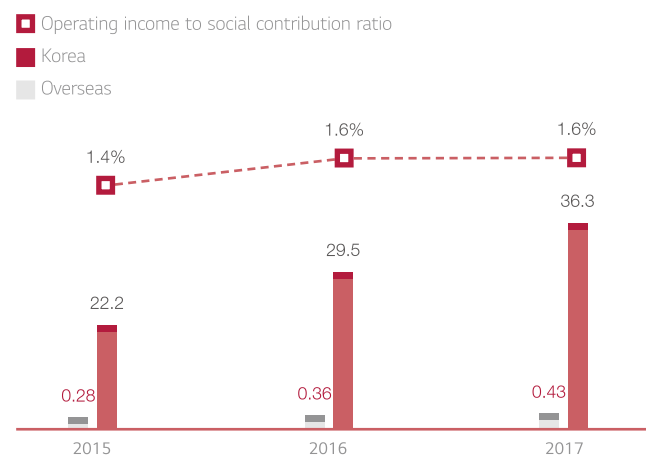
### CSR Promotion Direction

LG Chem was established with a unanimous agreement of 193 UN member states in September 2015. The SDGs are a collection of 17 goals the UN and international community much achieve from 2016 to 2030 to realize sustainable development around the world. As a member of the international community and a global corporate citizen, LG Chem intends to contribute to the achievement of the SDGs by aligning its corporate strategies and activities with the goals. We are continuing to discover and implement activities related to the SDGs with a focus on four goals in the youth education and green/energy sectors.

### CSR Promotion Organization

LG Chem operates a corporate CSR team as a CSR-dedicated organization, and promotes enterprise-wide CSR activities and new business planning. In addition, the business support team at each workplace conducts social contribution activities on its own. The CSR committee with the CEO as the president approves new businesses and reports about the current status of main social contribution activities.

Total Expenses of Social Contribution (Unit: KRW billion)








\* Operating income from separate financial statement

## Sharing for Social Value

LG Chem, as a global corporate citizen, shares social value with local communities through social contribution activities that reflected by the characteristics of the business.

### UN Sustainable Development Goals

LG Chem regards the UN SDGs as a new business opportunity and is actively participating in the implementation of the goals with its technological capability to enhance the value of society and the environment. We reviewed the goal alignment reflecting social contribution activities and corporate code of conduct presented by the SDGs. As a result, we will continuously carry out our social contribution activities in alignment with the SDGs, such as Quality Education (Goal 4), Affordable and Clean Energy (Goal 7), Decent Work & Economic Growth (Goal 8), Reduced Inequalities (Goal 10), and Life on Land (Goal 15).

- Chemistry Camp**  
 4 times, around 400 participants (as of January 2018)  
 Quality Education
- Fun Chemistry Park**  
 8 times, 1,500 participants  
 Reduced Inequalities
- Innovative and Creative Motor Vehicle Battery Contest for University Students**  
 Opening ceremony and recruit university students (LGCCI)
- Love School Project**  
 Repairing library of Moon-Young Middle School, Ganzhou (LGCCI)
- Green Partnership Project**  
 Building 'Power Plant for Green Hope' in Jungnang Water recycling center/14,049m<sup>2</sup> of space, facility with 620kW of capacity  
 Affordable and Clean Energy
- LG Social Campus**  
 Financial support (accumulated): 130 companies  
 Offering space for working, etc.  
 Supporting growth, benchmarking overseas cases, running seminars  
 Decent Work and Economic Growth
- Brighter Future, LG Chem's Green World**  
 4 times, 200 employees participated  
 Life on Land

## Sharing for the Next Generation

**LG Chem Chemistry Camp** Based on its social contribution motto LG that makes young dreams come true, LG Chem promotes social contribution activities that focus on youth education.

LG Chem Chemistry Camp is a representative social contribution program for youth consisting of three-day camp for middle school students neighboring the company plants. The Chemistry Camp helps students get familiar with chemistry through interesting chemical games and creative experiments, and it provides an education in vision and safety. Students also learn the value of living together and community life. In January 2018, the camp was held over four times, with a total of 400 youth participants, under the theme of Chemistry that Makes Tomorrow. Since its inception in 2005, the camp has attracted more than 6,800 young students.

**LG Chem Fun Chemistry Park** LG Chem has operated the LG Chem Fun Chemistry Park, a chemistry class for elementary schools, in neighborhoods surrounding its plants since 2015. LG Chem Fun Chemistry Park is an experience-based learning program where student participants in four experience booths test and experience various themes such as chemistry, the environment, and energy. In addition, a magic show using chemistry is presented to inspire students to take interest in chemistry. LG Chem Fun Chemistry Park was held over eight times in the first/second half of 2017. A total of 1,500 elementary school students from Yeosu, Iksan, and four other regions (two times in Naju, two times in Seosan, Cheongju, Gwacheon) participated in the program.

In particular, career-interrupted women were hired as instructors for the entire programs, indirectly creating jobs for the underprivileged.

In September 2017, we held the Fun Chemistry Park program at the outdoor exhibition hall of Gwacheon National Science Museum in conjunction with the Young Maker Festival hosted by the LG Yonam Cultural Foundation. We promoted the Fun Chemistry Park to many participants by running various programs at the festival where a number of booths for experience/workshop/exhibition/event were operated.

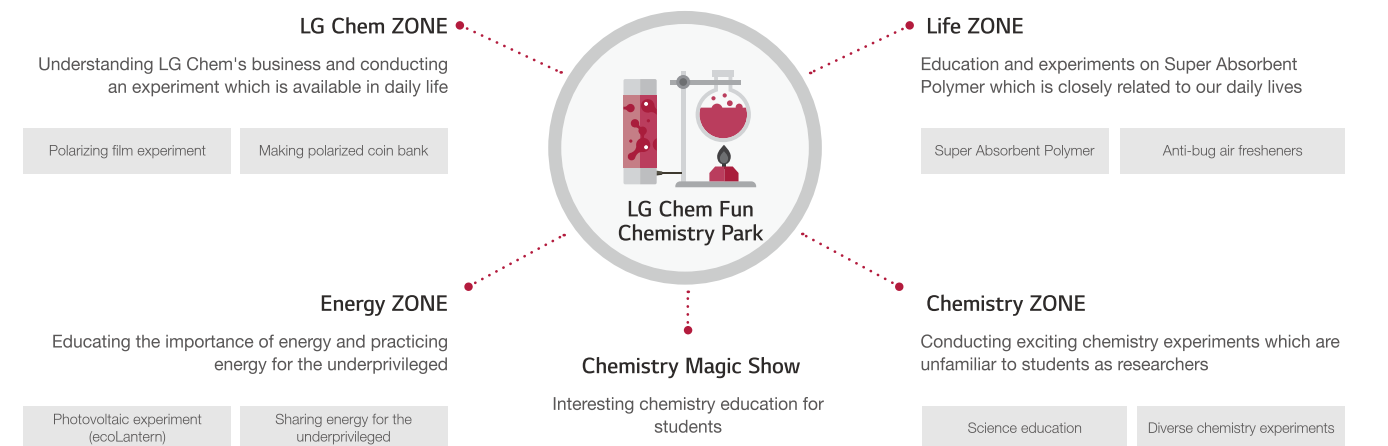
### “ Please tell us why you volunteered

I participated in the camp in 2007, and now even 10 years later, the experience is still a good memory in my mind. I joined the chemistry camp as a volunteer to help students as a major in chemistry. As a mentor, I did my best to create precious memories for my mentees, as I had experienced with my mentor before, and was very happy to see the voluntary participation and creativity of the children. I think it will be good to extend the time for communication between mentees and mentors so that the children can demonstrate their creativity to the fullest.”



College student volunteer, Bae Jin-Young

### LG Chem Fun Chemistry Park Programs



**Sharing for the Earth**

**A Brighter Future, LG Chem's Green World** The Green Maker, a volunteer group that protects Bamseom Islet located in Yeouido, was launched in connection with the 'International Day for Biological Diversity (22 of May)'. Bamseom was once destroyed by an explosion during the development of Yeouido, but has recovered naturally by Han River sediments over time. It was designed as an ecological landscape conservation area in 1999 and a Ramsar wetland in 2012. It's value as an urban habitat for migratory is undebatable. LG Chem and the Han River Business Division of the Seoul Metropolitan Government planned a series of CSR activities for biodiversity conservation with the official title "Brighter Future, LG Chem's Green World". The activities were held over four times in 2017, with the participation of about 200 employees including the CEO. In the first half of the year, we took out hazardous plants, including *Sicyos angulatus*, which threaten the ecological environment with their excessive fertilization. In the second half of the year, we cleaned up the garbage that has accumulated on the islet during the rainy season. We will plan and implement various CSR activities related to biodiversity in the years to come.

**Green Partnership Project** LG Chem promotes the 'Green Partnership Project' for local communities where its business divisions and plants are located. In 2017, we signed a MOU with the Community Chest of Korea, Seoul City, and Energy Peace Foundation to promote green partnership projects. The Power Plant for Green Hope, which is based on photovoltaic power generation, will be constructed at a public site (Jungnang Sewage Treatment Center) provided by Seoul City by 2018. We plan to sell the power generated by the power plant to KEPCO and donate the proceeds to the children and youth in Seongdong-gu and Dongdaemun-gu, Seoul City. The Green Remodeling project, as a sub-project, will reduce energy costs for summer cooling and winter heating by installing greening systems and insulation materials at youth welfare facilities and energy-vulnerable facilities. We will expand our project by entering into partnership with other local governments in the coming years.

**LG Social Campus** LG Chem and LG Electronics are jointly operating the LG Social Campus (formerly LG Social Fund), a platform that supports social-economic integration. Since 2011, we have been supporting the growth of social economic organizations in the green sector by investing annually in this multilateral cooperation model that utilized the expertise of the government ministries, academia, and NGOs for the first time in Korea. From 2011 to now, we have provided financial support (interest-free loans and free grants) for a total of 130 companies (including duplicates). Since 2015, we have also provided spaces for offices and other purposes (for 21 companies) at the industry-university cooperation hall in Korea University. In addition, we provide various forms of support to help them attain greater business growth, including consulting on productivity improvement, overseas

training in advanced countries, networking workshops, promotion, and education. Through these efforts, we are creating an environment for the sustainable growth of social economic organizations and are pursuing innovation that will bring about a better life for the next generation.

**“What is the environmental and social value that Reum creates through its business?”**

Reum is a social enterprise founded in 2011, which reduces the negative environmental impact by making products with recycled plastics. Globally, 300 million tons of plastic are produced each year, with only 10% of them being recycled and the remaining 90% being estimated to be discarded and incinerated. Reum utilizes resin, a recycled plastic, to make USB, OTG, and cradles, so consumption is naturally linked to the virtuous cycle of resources. The recycled plastic resin used for the virtuous cycle of waste plastics in 2016 amounts to about 12 tons. With the supports of LG Social Campus, Reum is expanding its business. Direct employment increased by 50%, and indirect employment also increased in the process of assembly, sales and distribution to create 10 senior jobs. Also, we strive to solve domestic and international social problems by preparing parcel and delivery services to create jobs for the youth of Myanmar in 2018.”



Dong-Hoon Lee, CEO of Reum

**“What is the environmental and social value that Mr. Battery pursues?”**

Mr. Battery is dealing with a variety of batteries for industrial and power use through on-site battery replacement and O2O platform operation. Batteries are usually made of lead and sulfuric acid, and lead causes enormous environmental pollution during processing. Using a battery as long as possible is the way to reduce the environmental impact, but the battery may be replaced for reasons such as discharge despite its remaining life. This early disposal of batteries has reached 20% of the total replacement. Mr. Battery has professional equipment to accurately determine whether or not to replace the battery, thereby reducing costs and battery waste. In addition, reusable waste batteries are recharged and distributed free of charge through the Eco-Sharing Campaign. Mr. Battery received financial support from LG Social Campus. Based on the support, sales in 2017 increased by 120% from the previous year and direct employment increased by 75%.”



Han-Sem Park, CEO of Mr. Battery

**Social Contributions in Communities (Domestic)**

**One Company for One Army Campaign** Since entering into a sisterhood relationship with the 1st Infantry Division in 2011, LG Chem has provided comfort articles and presents of money every year. LG Chem participated in the 2nd anniversary event of 'Remember 804', which is related to the North Korean provocation of burying PMD series mines in DMZ, held at the Imjingak DMZ Ecotourism Support Center on August 4, 2017. In December 2017, the CEO personally visited the JSA security battalion. He encouraged the personnel who carried out operations on the spot to rescue the North Korean soldiers who defected through the JSA on November 13, and he delivered financial support as well as daily necessities and snacks to the 1st Division and the JSA security battalion, respectively.

**Genie Day at Local Childcare Centers Program - Yeosu Plant** The Yeosu Plant has organized Genie Day every year since 2010 primarily through the support of volunteer clubs to solve the difficulties of local childcare centers. It has supported 85 local childcare centers so far. In 2017, personal support goods and joint support goods, such as an air purifier that protects children from fine dust, and other home appliances were donated to 14 childcare centers with an aim to aid children.

**Dong-go-dongrak Program - Daesan Plant** The Daesan Plant has conducted the Dong-go-dongrak Program for high school students

since 2014 to train local talents. Various programs are in place to assist students in planning their academic future: a mentorship program providing students with opportunities to explore career choices creatively; a college entrance briefing session helping bridge the information gap between cities and agricultural regions; a chemical analysis experience which increases interest in and understanding of chemistry; cultural courses for youth that provide various cultural benefits. In particular, the project's mentorship program matches three to four students and one employee at the Daesan Plant and contributes to enhancing students' fulfillment and practically helping them prepare for the college entrance examination. Daesan Plant, aware of the partnership between company and community, will operate more diverse and sincere win-win programs to contribute to local communities.

**Junior Science Class – Daejeon R&D Campus** Since 2004, the LG Chem Daejeon R&D Campus has operated the Junior Science Class as a way to donate LG Chem's talent to elementary and middle school students. Researchers with professional degrees at the Daejeon R&D Campus visit nearby schools and participate in science classes to provide children with opportunities to learn more about life science. In 2017, the Research Center developed textbooks that provided students with opportunities to absorb and experience science.

LG Chem Chemistry Camp



Brighter Future, LG Chem's Green World



LG Chem Fun Chemistry Park



LG Social Campus



These characteristics emulated LG Chem's products: ESS, SAP and polarizing places. An experience study was conducted for more than 400 students from 3 schools and 4 local childcare centers. More than 1,900 students have participated since 2004.

**Musim Stream Keeper – Ochang Plant** The Musim Stream Keeper is a new CSR activity that the Ochang Plant has implemented to preserve the local stream as a representative of the local community. The Ochang Plant will continue to carry out various activities to preserve the ecosystem in urban areas and enhance the convenience of local residents, such as eliminating harmful plants to preserve biodiversity, creating rest areas for residents, and performing environmental cleanup activities.

**Social Contributions in Communities (Overseas)**

**The Love School Project - LGCCI** LGCCI, a Chinese regional holding company of LG Chem, is engaged in activities to promote youth education and welfare and to clean up the environment in local communities. Since 2010, we have promoted the Love School Project with the China Youth Development Foundation, the China Women's Development Foundation, and the China Environmental Protection Foundation for the eighth consecutive year. Through this project, we are improving the school environment so young students can grow healthily and are building a society in harmony with the development of local communities. As of 2017, we have supported a total of 16 schools: toilets, water purification facilities, and libraries have been improved, and our employees regularly visit the schools to conduct volunteer activities.

LGCCI selected Taepyeongjang Elementary School as the 15th beneficiary of LG Chem China Love School Project. In September 2016, we donated a multimedia room which includes a computer room, a library, and a music room. The multimedia room is currently

Love School Project



used as a place for children to use computers and read books. In May 2017, we donated badminton, basketball and soccer equipment, and five pianos. In addition, our employees provided customized chemistry classes to the children.

**College Student Contest on Creativity & Innovation for Automotive Batteries - LGCCI** In cooperation with the China Automobile Newspaper, LGCCI hosted the 1st Chinese College Student Contest on Innovation and Creativity for Automotive Batteries in 2017. This contest was designed to discover and cultivate college students who are interested in the application of automotive batteries as well as human resources in the automotive battery and material field. This kind of event provides students with an opportunity to network other peers, professionals, and companies; it facilitates in their knowledge and skills as future leaders of the automotive battery industry.

**Youth Invitation Program - LGCTW** LG Chem's Taiwan corporation has been operating the Taichung Plant in the central region since 2007. It has selected five high schools near the plant, and supported seven students from the schools to visit Korea every year since 2015. Those selected are sent to LG Chem's Ochang Plant, Daejeon Research Center, LG Twin Towers, and LG Science Hall to experience LG Chem's products and to have dreams and hopes through cultural experiences in Seoul. The operating funds for this activity are managed through a matching fund system in which individual employee contributions are matched by the same amount by the company.

1st College Student Contest on Creativity & Innovation for Automotive Batteries

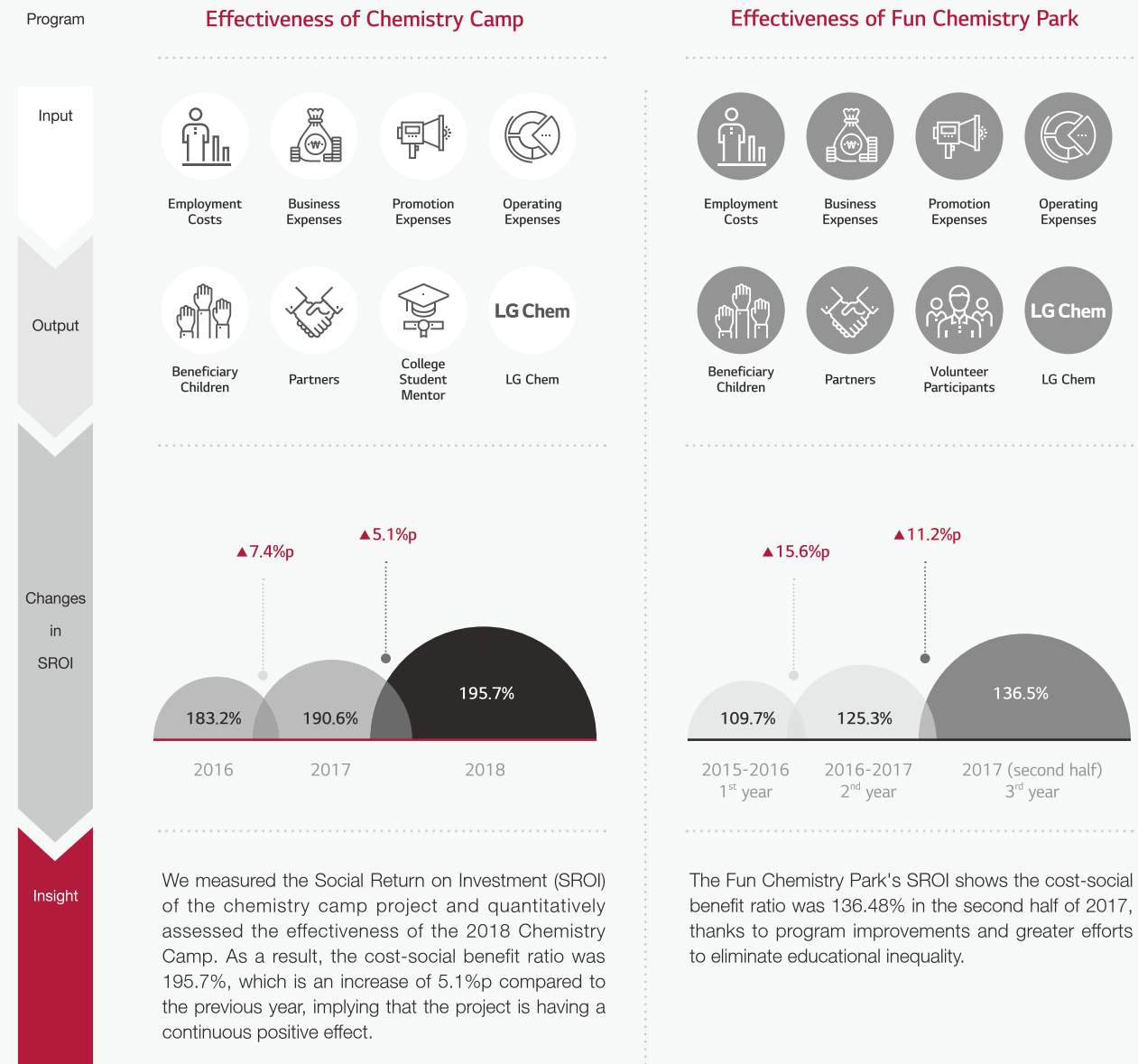


Best Practice **Analysis on CSR Program Effectiveness**

**Measurement of CSR Program Effectiveness**

LG Chem measures SROI (Social Return on Investment), which is for promoting the effectiveness of a CSR activity. SROI is an improved method to apply the ROI (Return on Investment) concept in social and environmental sectors. LG Chem monetizes the input-output of programs and measures their social and economic effects. In 2017, Fun Chemistry Park and Chemistry Camp were evaluated.

**SROI (Social Return on Investment) Evaluation\***



\* The socioeconomic value is a ratio of output to input

# PERFORMANCE

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## Financial Performance

### Diagnosing and Analyzing Business Performance

#### Business Highlights in 2017

In 2017, LG Chem achieved KRW 25.698 trillion in sales and 2.929 trillion in operating profits. The sales and operating profits grew by 24% and 47%, respectively, compared to the previous year, resulting in the best performance since the foundation of the company. We merged with LG Life Sciences on January 1, 2017, and officially launched our red bio business, while specifying and implementing the future growth strategies and action plans for the biotechnology business including FarmHannong.

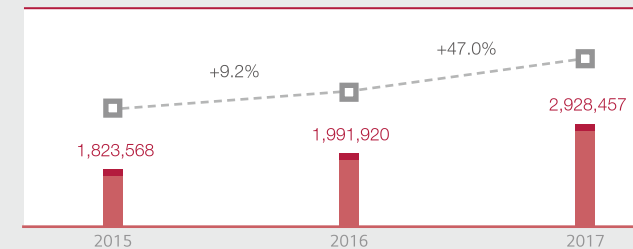
#### Business Performance by Division

Our Basic Materials & Chemicals Division made outstanding achievements by strengthening its sales capacity, expanding high value-added businesses, and reducing costs. The Energy Solutions Division successfully turned a profit thanks to the increased sales of automotive batteries and ESS and it improved the business structure of small cells. The IT & Electronic Materials Division and Advanced Materials Division also achieved higher sales and profitability with improved products.

#### Business Prospect in 2018

Going forward, LG Chem will push for the creation of high-added value in its existing businesses and actively enter into new material businesses. At the same time, we will intensively promote the future growth areas of energy, water, and biotechnology, and grow into a world-class company that provides differentiated materials and solutions.

Operating Income (Unit: KRW million)



#### Financial Status

As of the end of 2017, LG Chem's total assets were KRW 25.412 trillion, up KRW 4.554 trillion from the previous year, thanks to the

overall expansion of sales in all business divisions as well as the increase in accounts receivable, cash flows from operating activities, and tangible and intangible assets from the merger with LG Life Sciences. Liabilities also increased by 35.2% from the previous year to reach KRW 8.703 trillion due to the impact of the merger and the issuance of corporate bonds. The total amount of capital also grew by 16.3% to a record KRW 16.339 trillion.

Consolidated Financial Statement (Unit: KRW million)

	2015	2016	2017
Current assets	8,655,605	9,226,934	11,205,581
Non-current assets	9,923,123	11,260,126	13,835,640
<b>Total assets</b>	<b>18,578,728</b>	<b>20,487,060</b>	<b>25,041,221</b>
Current liability	4,798,981	5,446,851	6,644,689
Non-current liability	676,225	989,242	2,057,955
<b>Total liability</b>	<b>5,475,206</b>	<b>6,436,093</b>	<b>8,702,644</b>
Owners of the parent	12,991,465	13,937,352	16,168,527
Non-controlling interests	112,057	113,615	170,050
<b>Total equity</b>	<b>13,103,522</b>	<b>14,050,967</b>	<b>16,338,577</b>

Consolidated Income Statement (Unit: KRW million)

	2015	2016	2017
Sales	20,206,583	20,659,296	25,698,014
Operating income	1,823,568	1,991,920	2,928,457
Net income	1,148,531	1,280,994	2,021,973
Owners of the parent	1,152,987	1,281,124	1,945,280

Financial Ratio (Unit: %)

		2015	2016	2017
Stability Indicators	Current ratio	180.4	169.4	168.6
	Debt-to-equity ratio	41.8	45.8	53.3
	Dependency on borrowing	20.3	20.6	18.6
Profitability Indicators	Operating income margin	9	9.6	11.4
	Net income margin	5.7	6.2	7.9
	ROA	6.3	6.6	8.9
	ROE	9.1	9.4	13.3
Growth Indicators	Sales growth	-10.5	2.2	24.4
	Operating income growth	39.1	9.2	47.0
	Net income growth	34.5	11.5	57.8
	Total assets growth	2.5	10.3	22.2

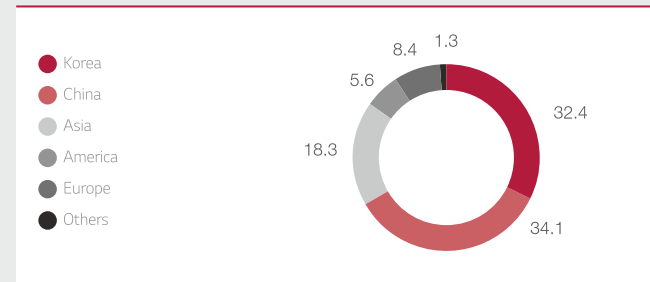
\* Based on consolidated financial performance

**Business Results by Business Area** (Unit: KRW million)

		2015	2016	2017
Basic Materials & Chemicals	Sales	14,463,487	14,281,574	17,245,735
	Operating income	1,676,940	2,138,625	2,808,142
Operating income	Sales	3,147,106	3,561,601	4,560,546
	Operating income	520	-49,337	28,875
IT&E Materials, Advanced Materials	Sales	2,595,990	2,490,794	2,742,327
	Operating income	146,348	-54,965	111,443
Life Sciences	Sales	-	-	548,457
	Operating income	-	-	53,522
Others	Sales	-	325,327	600,949
	Operating income	-240	-42,403	-73,525
Total	Sales	20,206,583	20,659,296	25,698,014
	Operating income	1,823,568	1,991,920	2,928,457

\* Others: FarmHannong, etc.

**Sales Ratio by Region** (Unit: %)



\* Domestic sales include export totals according to local LC conditions

\* Asia: excluding Korea and China

**Raw Material Purchase** (Unit: KRW million)

Business Sector	Purchase	Item	Use
Basic Materials & Chemicals	8,825,147	Naphtha, EDC, etc.	PE/PVC materials
Energy Solutions	2,258,436	Cathode, Anode materials, separation membranes, etc.	Battery materials
IT & Electronic Materials / Advanced Materials	1,612,145	TAC film, cobalt, surfactant	Polarizer, LCD materials, Intermediates for pharmaceuticals
Life Sciences	95,418	Medical material, organic compound	Medicine, medicine of animals, material for agricultural chemicals
Others	288,809	Granule, etc.	Chemical fertilizer materials

**Distribution of Economic Achievement** (Unit: KRW million)

		2015	2016	2017
Employees	Total annual wage	1,215,543	1,248,273	1,508,012
	Average wage per head	85	83	90
Government	Income tax expense	401,112	378,834	541,922
Suppliers	Purchase of raw materials	9,337,722	10,158,175	13,079,956
Shareholders & Investors	Total dividends	331,287	368,055	460,058
Community	Expenses for social contribution (KRW billion)	22.2	29.5	36.3

\* Total wages: excluding employee benefits and retiring allowance reserve; excluding registered officers; applying the Korean standard

\* Social contribution expenses are based on domestic activity, and include promotion expenses, direct business expenses, etc.

**Tax Policy**

LG Chem is aware that compliance with tax laws and tax risk management including the maximizing of shareholder value are important factors that contribute to the national finance. LG Chem has established and henceforth operated strict principles and regulations related to taxes. For the international transaction with overseas corporations, the company has implemented the reasonable transfer price policy suitable for the OECD guidelines on transfer prices and domestic tax laws. LG Chem has local corporations and branch offices in China, the USA, Poland, India, etc. The company fulfills its duty to submit the various documents required by the relevant country's tax authorities and to pay taxes including the corporation tax according to the relevant country's tax laws. Detailed information regarding taxes is notified publicly. Also, LG Chem is taking a variety of measures to respond to the pending anti-dumping lawsuits while it conducts a number of preliminary risk management activities.

\* Activities related to anti-dumping duty: Risk management activities are being conducted by monitoring products subject to anti-dumping lawsuits, responding to anti-dumping lawsuits, and conducting due diligence regarding the field cases

**Total Value of Political Contributions** (Unit: KRW thousand)

	2015	2016	2017
Total	2,651,346	3,434,531	1,725,168

**Top 5 Groups for Policy Contributions** (Unit: KRW thousand)

Name	Amount
Korea Employers Federation	261,070
Korea Petrochemical Industry Association	239,621
Korea PC-BPA Council	235,089
Korea Battery Industry Association	90,000
Korea Vinyl Environmental Council	79,200

# Non-financial Performance

## Employee

### Employment Status

As of the end of 2017, the total number of LG Chem employees was 29,438, and among these, employees in foreign workplaces accounted for 42.9% (12,628 employees).

We strive to secure a diverse pool of employees. The number of female employees in Korea is 2,149, which is 27.2% higher than the previous year, and the percentage of full-time workers is 98.4%.

Employment of social minorities has been steadily increasing. The term refers to people with disabilities and national veterans in the domestic market, and people with disabilities, ethnic minorities, and national veterans in overseas markets.

**Employees Status** (Unit: person)

		2015	2016	2017
By region	Korea	14,221	14,897	16,810
	China	10,448	10,104	10,447
	Europe	495	495	773
	Asia	445	397	655
	America	527	689	753
	<b>Total</b>	<b>26,136</b>	<b>26,582</b>	<b>29,438</b>
Regular employees (Korea)	Male	12,734	13,230	14,566
	Female	1,487	1,667	2,115
Non-regular employees (Korea)	Male	45	55	95
	Female	14	22	34
Overseas	Male	6,822	6,861	7,812
	Female	4,207	3,861	3,942
The disabled	Korea	125	137	137
	Overseas	11	9	10
Ethnic minority	Overseas	419	510	603
National veteran	Korea	303	334	376
	Overseas	8	3	3

\* For employment status by region, the number of domestic employees includes both regular and non-regular employees, and the overseas one includes only regular employees

\* Excluding Korea and China for Asia

\* For the non-regular employee group, male/female employees overseas only covers data of LGCCI

**Female Employees** (Unit: person, %)

		2015	2016	2017
Number of female office worker	Korea	1,384	1,558	2,000
	Overseas	873	940	1,080
Ratio of female office worker	Korea	17.8	19.1	20.9
	Overseas	33.2	32.3	32.5
Number of female employees in management positions	Korea	367	454	690
	Overseas	120	137	181
Ratio of female employees in management positions	Korea	4.7	5.6	7.2
	Overseas	4.5	4.7	5.6

\* Overseas data for the number of female office workers is limited to China (LGCCI) and overseas manufacturing facilities.

\* Percentage of female employees in management positions = Number of female employees in management positions / Total office workers \*100

\* Overseas data for the number of female employees in management position is limited to China (LGCCI) and overseas manufacturing facilities.

### Recruitment and Retirement

Thanks to its outstanding economic performance, LG Chem created many jobs through active new recruitments in 2017. The company had 6,048 new hires in 2017, which is a 55.4% increase from the previous year. The number of managers employed from the local communities around business sites is 586 and the ratio is 67%.

**New Recruitment** (Unit: person)

		2015	2016	2017
Korea	Male	973	1315	914
	Female	137	267	237
	<b>Total</b>	<b>1,110</b>	<b>1,582</b>	<b>1,151</b>
Overseas	Male	2,835	1,576	3,597
	Female	1,418	733	1,300
	<b>Total</b>	<b>4,253</b>	<b>2,309</b>	<b>4,897</b>

\* Overseas data for the amount of new employment is limited to China (LGCCI) and overseas manufacturing facilities.

**New Employment by Age** (Unit: person)

	2015	2016	2017
10s	1	5	-
20s	653	920	596
30s	336	475	431
40s	78	130	69
50s	27	39	33
60s	15	13	22
<b>Total</b>	<b>1,110</b>	<b>1,582</b>	<b>1,151</b>

\* Data is limited to sites in Korea

**Manager from Local Community of Business Sites** (Unit: person, %)

	2015	2016	2017
Locally hired employees in management position	459	475	586
Percentage of locally hired employees in management position	72.4	66.0	67.0

\* Data is limited to China (LGCCI) and overseas manufacturing facilities

**Turnover Rate** (Unit: person, %)

		2015	2016	2017
Number of retirement	Male	328	389	533
	Female	63	75	128
	Total	391	464	661
Turnover rate	Male	2.3	2.6	3.6
	Female	0.4	0.5	0.9
	Total	2.7	3.1	4.4
Number of retirement (voluntary)	Male	190	232	355
	Female	55	68	98
	Total	245	300	453
Turnover rate (voluntary)	Male	1.3	1.5	2.1
	Female	0.4	0.5	0.6
	Total	1.7	2.0	2.7

\* Data for retirement and turnover is limited to workplaces in Korea

\* Voluntary retirement: Excluding involuntary cases such as disciplinary dismissal, retirement, etc.

**Employee Training**

LG Chem provides its employees with training sessions that advance their job skills and opportunities for self-development. In 2017, the average training time per employee was 44 hours and training cost per person was KRW 1.09 million. The year-on-year decline was due to a reduction in actual training hours thanks to the application of various training methods.

**Training for Employees** (Unit: hour; KRW 10 thousand, KRW billion)

	2015	2016	2017
Average training hour	41.3	50.2	43.7
Average training cost	100	112	109
Total training hour	590,698	751,467	738,634
Total training cost	14.2	16.8	18.4

\* Data is limited to workplaces in Korea

**Strengthening Job Competency by Occupational Group**

In addition to its leadership training program, LG Chem also runs training sessions on sales/marketing, purchase, and quality at the LG Chem Academy to strengthen the competencies required for each occupational group. LG Chem has continued to improve each program every year in order to provide the most adequate training for its employees and to enhance training effectiveness. From 2017, we applied the Flipped Learning technique to occupational group training courses. This is a technique that requires employees to do more than simply complete a course. They also have to discuss on-site tasks through preparations and collective training, which helps them strengthen their competency in business practices. In 2017, a total of 685 employees participated in occupational group training, and all the training courses received a satisfaction score of 4.5 out of 5.

**Nurturing On-site Experts**

LG Chem provides a systematic know-how delivery program and training for on-site talents that meet certain qualifications. For individuals, this is an opportunity to become experts, and for the organization, it is a way to raise competitiveness in production. Unlike the past, we no longer confine the operation of the on-site expert development program to large business sites, but have extended it to small to mid-sized business sites since 2017, which resulted in an increase in the number of training participants from 217 to 381 year-on-year.

**Nurturing Global Talent**

To expand its overseas businesses, LG Chem is striving to nurture global talents by enhancing the capabilities of expatriate employees and local employees in overseas markets. Training programs for expatriate employees are operated systematically from pre-training before their dispatch to post-training after their return. Furthermore, LG Chem provides on-site training courses for expatriate employees to support their local adaptation and capability enhancement.

In 2017, we clarified the roles of LG Academy, the group's training institute, and LG Chem's corporate and business divisions, allowing a more systematic training of expatriate employees. In addition, we run local expert courses for different overseas regions to foster expatriate candidates for their future positions in strategic areas. This program has been operated since 1995 to cultivate experts for various regions of the world through domestic and overseas training courses. Moreover, LG Chem is focusing on nurturing experts not only in China but also Central and South America, the Middle East, India, etc., which are strategic regions for the future.

**Evaluation on Performance and Reward**

Through a fair performance evaluation system, LG Chem is raising the level of employee satisfaction and motivating them to perform better. The performance evaluation system reflects individual ability, teamwork, and changes in the environment both inside and outside the company through the evaluation of achievements, work difficulty, contributions, and attainment of business goals. In addition, we are evaluating individual job performance by job grade and family, and also attitudes that represent the LG Way. In 2017, all employees subject to performance evaluation were evaluated. All employees are given equal opportunities and the same basic salaries regardless of gender.

**Equal Salary** (Unit: %)

	2015	2016	2017
Management position	1.12	1.13	1.10
Non-management position	1.11	1.16	1.11

\* The data is a ratio of average male salary compared to average female salary

**Employee Safety and Health**

We are committed to providing a safe and healthy working environment to our employees. In particular, we are strengthening education on safety environment to spread the culture of safety throughout all business sites at home and abroad. The rate of industrial accidents in 2017 is 0.23% in Korea and 0.28% overseas.

**Injury and Severity Rate** (Unit: %, day)

		2015	2016	2017	
Employee	Injury rate	Korea	0.20	0.19	0.23
		Overseas	0.21	0.13	0.28
	Severity rate	Korea	0.03	0.04	0.06
		Overseas	0.06	0.03	0.02
	LTIFR	Korea	0.68	0.66	0.79
		Overseas	0.55	0.47	1.42
OIFR	Korea	0.00	0.05	0.02	
	Overseas	0.00	0.00	0.00	
Contractors	Injury rate	Korea	0.38	0.42	0.29
		Overseas	0.04	0.00	0.41
	LTIFR	Korea	1.31	1.43	0.98
		Overseas	1.85	0.00	0.76

\* The number of injured in 2016 changed to reflect two additional industrial diseases from the Yeosu Plant

\* The number of employees for 2016 changed because the number of regular employees at the Naju Plant increased by eight

\* The number of employees in 2015 changed to reflect the omission of 57 employees from the Naju Plant

\* Data for injury rate and severity rate are limited to China(LGCCI) and overseas manufacturing facilities

\* Data for CTW for 2015 and 2016 changed

**Major Management System Certification**

Worksite		
OHSAS 18001	Korea	Yeosu Plant, Ochang 1 Plant, Paju Plant, Gimcheon Plant, Daesan Plant, Iksan plant (Life Sciences), Cheongju Plant, Osong Plant, Research Center in Daejeon
	Overseas	LGCBH, LGCBT, LGCGZ, LGCTJ, LGCBJ, LGCTW, LGCMI, LGCWR_EP, LGCWR_OP, LGCVZ, LGCVH, LGCYX, LGCNJ, LGCNA
ISO 14001	Korea	Yeosu Plant, Naju Plant, Ochang 1 Plant, Paju Plant, Gimcheon Plant, Daesan Plant, Ulsan Plant, Iksan Plant (EP) , Iksan Plant (Life Sciences), Cheongju Plant, Onsan Plant, Osong Plant, Research Center in Daejeon
	Overseas	LGCTJ, LGCMI, LGCWR_EP, LGCVH, LGCNA, LGCHZ
KOSHA 18001	Korea	Naju Plant, Ochang 1 Plant, Daesan Plant, Ulsan Plant, Iksan Plant (EP), Iksan Plant (Life Sciences), Onsan Plant, Osong Plant
PSM	Korea	Daesan Plant
ISO 50001	Korea	Yeosu Plant, Daesan Plant, Ochang 1 Plant, Cheongju Plant, Naju Plant, Iksan Plant, Paju Plant, Gimcheon Plant, Ulsan Plant, Research Center in Daejeon

**Labor Practices**

LG Chem's employees have voluntarily established a labor union based on freedom of association, and are joining the labor union of their own free will. In 2017, the labor union membership was 76% in Korea and 89% in overseas. Employees are immediately informed of any changes made by the Labor Management Committee.

**Labor Union** (Unit: person, %)

		2015	2016	2017
Number of members	Korea	6,065	6,437	6,889
	Overseas	9,114	8,736	9,105
Rate	Korea	77	75	76
	Overseas	96	95	89



## Suppliers and Customers

### Supplier Management (Unit: company, %)

	2015	2016	2017
Number of new suppliers among the primary suppliers	298	290	564
Total number of registered suppliers	3,764	3,673	5,780
Number of suppliers to conduct document investigation (audit)	795	843	1,146
Number of suppliers to conduct visit survey (audit)	273	316	450
Number of suppliers to take corrective action	4	22	33
Number of suppliers to be suspended transaction temporarily or permanently	4	2	11

### Customer Satisfaction (Unit: point, %)

	2015	2016	2017
NPS score	60	64.9	64.3
Data coverage	76.1	93.3	94.7

## Environment

### Raw Materials Management

LG Chem's products use naphtha produced from crude oil and minerals. As these raw materials are limited resources, we strive to produce as many products as possible with the same amount of materials. In 2017, the domestic consumption of raw materials has increased by 13.7% year-on-year to reach 1.16 tons/product tons. In addition, we have used 20,526 tons of regenerated raw materials at domestic worksites.

### Raw Materials (Unit: ton, ton/product ton)

		2015	2016	2017
Korea	Total amount raw material use	15,185,371	16,894,226	19,672,312
	Intensity	1.01	1.02	1.16
	Total amount of recycled raw materials	22,666	22,984	20,526
Overseas	Total amount raw material use	2,637,702	2,260,488	2,497,083
	Intensity	1.24	1.10	1.10

\* Data changed in 2015 and 2016 to reflect a correction to the amount of recycled raw materials used by Paju Plant

\* Data of LGCBH and LGCTJ in 2015 and 2016 changed

\* Overseas data for raw materia use is limited to China (LGCCI) and overseas manufacturing facilities

### Wastewater and Waste Management

In 2017, the total amount of waste water was 15,045,938m<sup>3</sup> at domestic worksites, and the recycling ratio was 7.4% (1,194,080m<sup>3</sup>).

LG Chem strives to increase the rate of waste recycling and decrease the intensity of waste discharge to deal with the continued waste generation. In 2017, the domestic waste discharge was 221,698 tons, which was an increase of 5% from the previous year, and the recycling rate was 71.7%.

### Wastewater Management (Unit: m<sup>3</sup>, m<sup>3</sup>/product ton, %)

		2015	2016	2017
Korea	Amount of wastewater discharged	13,383,269	14,956,833	15,045,938
	Amount of wastewater recycled	923,446	1,051,806	1,194,080
	Recycling rate	6.5	6.6	7.4
	Intensity	0.89	0.91	0.89
	Overseas	Amount of wastewater discharged	3,898,912	4,089,292
	Amount of wastewater recycled	1,683,179	1,805,663	3,038,429
	Recycling rate	30.2	30.6	39.1
	Intensity	1.83	1.99	2.08

\* The amount of wastewater recycled of LGCTW in 2016 has been changed

\* Overseas recycling rate data from 2016 has been changed

\* Data for wastewater management is limited to China (LGCCI) and overseas manufacturing facilities

### Waste Management (Unit: ton, %, ton/product ton)

		2015	2016	2017	
Korea	Waste generation	General waste	109,770	111,686	110,504
		Hazardous waste	67,631	91,443	111,194
	Recycling amount	129,916	135,529	158,865	
	Recycling rate	73.2	66.7	71.7	
	Total amount of waste generated	177,401	203,129	221,698	
	Intensity	0.012	0.012	0.013	
Overseas	Waste generation	General waste	43,821	33,900	44,683
		Hazardous waste	13,305	14,621	15,940
	Recycling amount	16,488	20,397	29,930	
	Recycling rate	28.9	42.0	49.4	
	Total amount of waste generated	60,623	48,521	57,126	
	Intensity	0.033	0.024	0.027	

\* Overseas Intensity data from 2015 has changed

\* The amount of waste generation of LGCTW in 2016 has been changed

\* Overseas data for waste generation is limited to China (LGCCI) and overseas manufacturing facilities

### Water Resource Management

LG Chem has responded to water resource risks by systematically managing water resources to ensure stability of supply. It also takes into consideration the influence of discharged water on adjacent eco

systems and water-intake areas. In 2015, The total amount of LG Chem water used at domestic worksites amounts to 57,196,025m<sup>3</sup>.

### Water Usage by Source (Unit: m<sup>3</sup>, m<sup>3</sup>/product ton)

		2015	2016	2017
Korea	Ground water	427,008	427,020	396,376
	Industrial water	51,934,077	54,146,262	55,349,317
	Municipal water	898,251	941,563	1,450,332
	Surface water	2,199,537	977,777	-
	Rainwater collected directly and stored by the organization	-	8	27,448
	Others	-	-	-
	Total	55,458,873	56,492,622	57,196,025
	Intensity	3.39	3.42	3.70
Overseas	Ground water	29,234	-	-
	Industrial water	3,026,612	5,821,406	6,371,467
	Municipal water	3,766,256	1,499,533	1,985,482
	Surface water	581,331	607,027	601,509
	Others	676,721	632,731	169,605
	Total	9,128,063	8,560,697	8,080,154
	Intensity	3.8	4.2	4.4

\* Data changed in 2015 and 2016 to reflect a correction to the amount of water usage by source of Cheongju Plant

\* LGCBH data in 2015 and 2016 has been changed

\* Data for water usage by source is limited to China (LGCCI) and overseas manufacturing facilities

### Pollutants Management

LG Chem strives to minimize the release of pollutants. Eco-friendly facilities have been introduced to reduce the amount of air and water pollutants generated during the manufacturing process. We are also making various efforts to minimize impact on water quality, such as developing wastewater concentration technology for each business site, improving existing wastewater treatment systems, and strengthening the management of water pollutants. Also, efforts are being put forth into reducing emissions by installing supplementary boiler burner facilities, and improving existing related systems.

### Discharge of Water Pollutants (Unit: ton, kg/product ton)

		2015		2016		2017	
		Amount	Intensity	Amount	Intensity	Amount	Intensity
Korea	COD	689	0.046	679	0.041	755	0.045
	T-N	243	0.016	276	0.017	284	0.017
Overseas	COD	390	0.183	385	0.187	387	0.170

\* Overseas data from 2015 and 2016 of LGCGZ COD amount has been changed

\* Overseas data for discharge of water pollutants is limited to China(LGCCI) and overseas manufacturing facilities

### Emission of Air Pollutants (Unit: ton, kg/product ton)

		2015		2016		2017	
		Amount	Intensity	Amount	Intensity	Amount	Intensity
Korea	Dust	141	0.009	152	0.009	143	0.008
	NOx	991	0.066	1,008	0.061	953	0.056
	SOx	285	0.019	119	0.007	106	0.006
Overseas	Dust	60	0.028	18	0.009	59	0.026
	NOx	235	0.110	164	0.079	213	0.094
	SOx	17	0.008	14	0.007	25	0.011

\* The amount of emission of air pollutants for 2016 has been changed

\* Overseas data for Emission of Air Pollutants is limited to China (LGCCI) and overseas manufacturing facilities

### Hazardous Waste Management

LG Chem actively responds to domestic and international regulations on chemical substances and prohibits the use of hazardous chemical substances. Through its material element analysis system and IT system, LG Chem thoroughly manages hazardous chemical contents to decrease the total amount of hazardous chemicals found at worksites and to improve product stability and eco-friendliness.

### Total Use of Toxic Substances (Unit: ton, ton/product ton)

		2015	2016	2017
Korea	Amount	5,623,781	6,651,512	6314478
	Intensity	0.375	0.403	0.374
Overseas	Amount	1,996,695	1,335,662	1,563,341
	Intensity	0.938	0.649	0.686

\* The amount of toxic substances use at Cheongju Plant in 2016 has been changed

\* The amount of toxic substances use at LGCGZ in 2015 and 2016 has been changed

\* The amount of toxic substances use at LGCYX in 2015 and 2016 has been changed

\* The amount of toxic substances use at LGCVH in 2015 has been changed

\* Data for toxic substances in overseas is limited to China (LGCCI) and overseas manufacturing facilities

### Environmental Investment

LG Chem continuously makes environmental investment to improve and manage environment. In 2017, the amount of environmental investment was KRW 41.4 billion.

### Environmental Investment (Unit: KRW thousand)

	2015	2016	2017
Korea	25,821,718	39,926,074	41,372,304
Overseas	10,998,055	1,602,429	19,366,513

\* Amount of environmental investment by LGCTJ and LGCNA for 2016 has been changed

\* Data for environmental investment is limited to China (LGCCI) and overseas manufacturing facilities

# Business Performance and Strategy by Division

## Basic Materials & Chemicals

### Business Overview

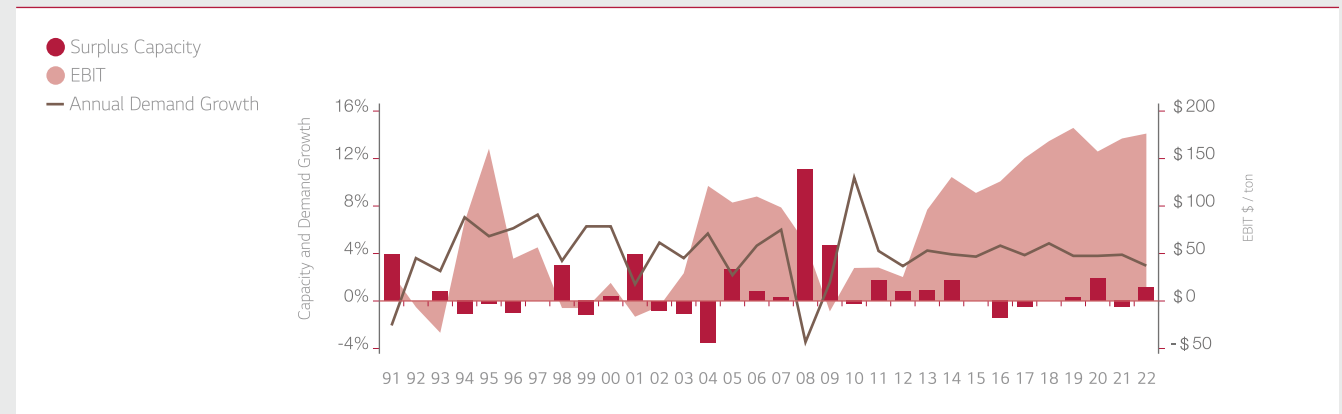
LG Chem's Basic Materials & Chemicals business has characteristics of large scale industries, including production and basic materials like ethylene, propylene, butadiene, and benzene. Naphtha and other synthetic resins are also used for production from these basic raw materials. We are contributing to the development of the industry through various high quality petrochemical products. Our key products include PE, PVC, plasticizer, ABS, EP, Acrylic, SAP, synthetic rubber, and special resin.

### Market Prospects

The recent growth in the global petrochemical industry is forecast to continue until 2022. Other than those in North America, supplies are expected to tighten as the expansion of global production fell short of expectations due to volatility oil prices. At the same time demand has increased in line with the global economic recovery.

From a long-term perspective, demand for highly functional/new materials is expected to grow, along with the enhancement in the structure of consumption/industry. Global companies are therefore diversifying their business portfolios with a focus on highly functional products while they pursue stronger business competitiveness through proactive responses to new demands.

Oversupply of Basic Petrochemicals/Average Profitability



Source: IHS (2018 WPC)

### Business Strategy

The Basic Materials & Chemicals Division is building a future business structure by promoting high value-added businesses and launching into new promising materials, which will lead to growth with profits. As part of these efforts, we are pursuing the expansion of elastomers and SAP, and converting the existing ABS and rubber production lines to high-value added ones. We are also expanding our overseas EPC business to Southeast Asia and India to strengthen the local response to the markets and customers. Moreover, to internalize core raw materials for the growth of high-value added businesses, we are continuously pursuing the expansion of ethylene production. In addition, we began to expand the production of acrylic acid and invest in basic petrochemicals that apply independent new process technologies. To prepare for the future, we will foster new and promising materials, such as adhesives and carbon/lightweight materials, to accelerate their commercialization, and continuously strengthen the R&D capacity by establishing an R&D center specialized in our key generic technologies: catalysts and processes.

## Energy Solutions

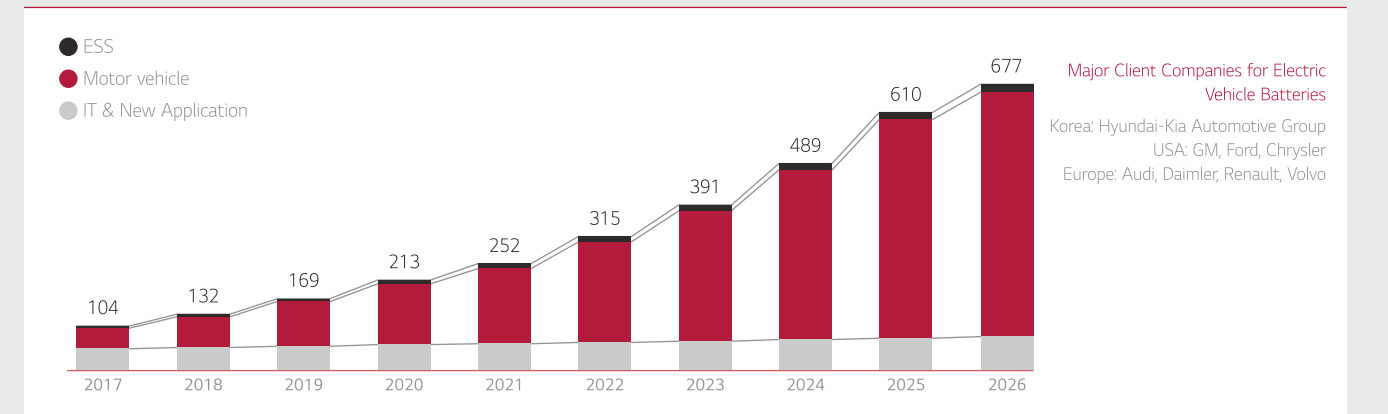
### Business Overview

Since becoming the first mass producer of lithium-ion batteries in Korea, LG Chem has been leading the global market for automotive batteries, ESS (Energy Storage System) batteries, and small cells based on its world leading technology. Automotive batteries are medium to large-sized lithium-ion batteries used as the driving force of electric vehicles. They also refer to rechargeable batteries that can be repeatedly charged and discharged as lithium-ions move from the cathode to the anode and store and release electricity. ESS batteries are a device that stores energy to increase energy efficiency, improve quality of renewable energy, and stabilize the power supply system. Small cells come in three types: cylindrical, prismatic, and pouch, which are applied to mobile devices, power tools, and power driven devices.

### Market Prospects

Production of electric vehicles has increased due to strengthened environmental regulations worldwide, consequently raising demand for automotive batteries. Governments are strengthening their policy support for ESS throughout the world, and the ESS market for electric grids and homes is also growing at an accelerated pace due to the improved efficiency of the ESS battery system. The small cell market is expected to expand into new areas, thanks to the growth of cylindrical batteries used in power tools, electric bikes, vacuum cleaners, laptops, etc., and the increased application of small cells in wireless products.

Prospect of the Lithium Rechargeable Battery Market by Main Field (Unit: GWh)



Source: B3 report (January 2018)

### Business Strategy

LG Chem aims to achieve the global top position in the battery market and to effectively respond to the change of business environments based on differentiated products, strengthening technology capability, and price innovation. Our business strategies for automotive batteries are as follows: to win orders for large electric vehicle projects through differentiated products based on material innovation, to ensure competitive prices to compete with internal combustion engine vehicles, and to strengthen production, quality, procurement, and marketing divisions in preparation for rapid business expansions. As for ESS batteries, we are creating a barrier to entry with a longer battery life and differentiated customer services, strengthening the business portfolio with a focus on core markets, securing the top position in the electric grid and home market, and raising price competitiveness by maximizing development and production efficiency. The business strategies for small cells areas follows: for pouch batteries, to enhance profitability by improving premium products in the IT market, and for cylindrical batteries, to respond to the extended application in wireless products (power tools, vacuum cleaners) and power-driven devices (electric bikes, electric scooters, etc.) and to find new growth opportunities, such as drones, AR/VR and robots.

## Information Technology & Electronic Materials

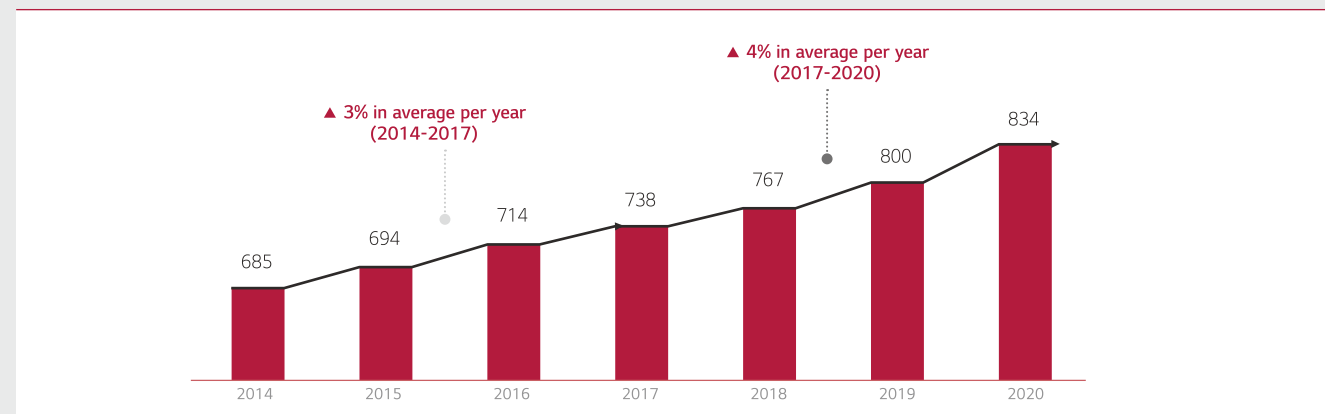
### Business Overview

LG Chem's IT&E Materials Division both produces and sells various IT materials used in displays, semiconductors, and automotives, as well as water treatment materials that will serve as the growth engine for the next generation. Polarizer, one of the core businesses in the division and the first commercialized material in Korea, is a core material for LCDs, for which LG Chem holds the world's top competitiveness. Furthermore, the company is continuing its growth by producing RO membranes, which are the key to water treatment, manufacturing functional films, and developing materials that can be applied to OLED displays for smartphones and TVs and plastic OLEDs.

### Market Prospects

The growth of the LCD market is expected to continue in China where large-scale investments, such as 10.5-generation production lines, are being made. The growth of the OLED market is mainly led by technology-leading companies. The demand for functional films is expanding according to market and technology changes. In addition, along with the increasing interest in water resources, the global water market is expected to grow steadily and reach USD 800 billion in 2019.

Size and Prospect of the Global Water Industry Market (Unit: billion USD)



Source: GWI (Global Water Intelligence)

### Business Strategy

For polarizers, we have invested in a local production base in China, the largest growth market for the material, ahead of our competitors, and are currently operating four production lines. We plan to enhance profitability through raw material internalization and productivity improvement. For functional films, we will strengthen our product and customer base by establishing development, production, and quality systems fit for small quantity batch production. For RO filters, we will become the top manufacturer in the industry with the goal to make it our No.1 global business based on product competitiveness. Functional films and RO filters are especially nurtured by our headquarters, with the input of resources to promote the expansion of the businesses. Also, we will continue activities to improve the productivity and quality of glass substrates.

## Advanced Materials

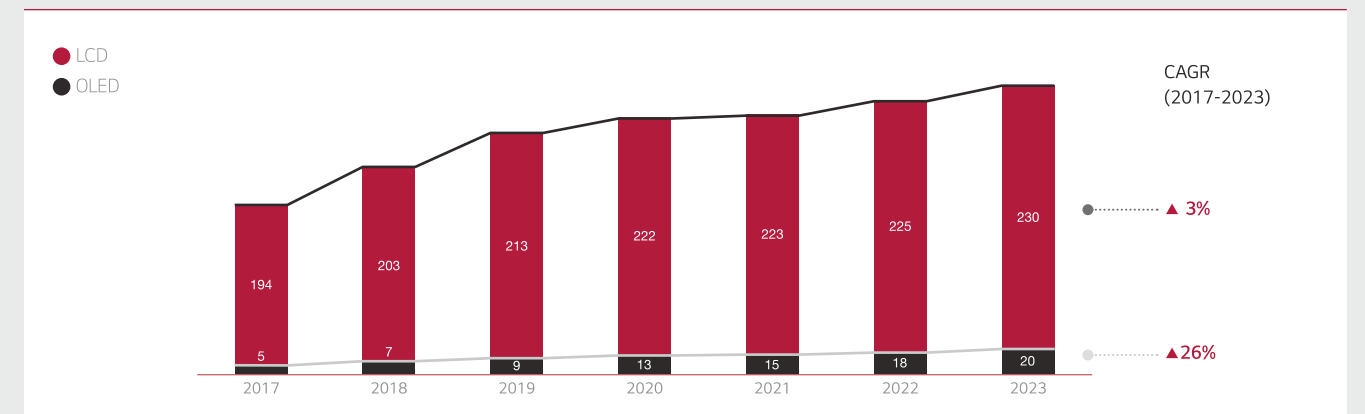
### Business Overview

The Advanced Materials Division has been promoting future material businesses in order to secure growth engines. Its main business is the production and sales of materials for displays and batteries. One of the display materials is LCD photoresist, which is a core material for LCD color filters. The LCD photoresist was developed by using LG Chem's independent technology, followed by a successful mass production for the first time in Korea. In addition, the OLED panel for smartphones, which was adopted by Apple for the first time in the world, also uses LG Chem's materials. The Division continues to grow steadily by creating new customers and building synergy with other divisions in LG Chem and affiliates in the LG Group.

### Market Prospects

With the establishment of large TV plants by the Chinese display manufacturers, the LCD materials market is growing mainly in China and this trend is expected to continue for years to come. Demand for OLED materials is projected to increase significantly due to investment in new lines by domestic display companies and the expansion of OLED production facilities by the Chinese display makers. Regarding cathode materials, the electric vehicle market will be facilitated further, increasing demand for high-capacity cathode materials that can extend battery life. As the price of cobalt, its core material, is expected to go up due to the instability of supply and demand, active technological developments will be made to reduce the cost of cathode materials.

Size of the Display Market (Unit: million m<sup>2</sup>)



Source: IHS (2018. 4)

### Business Strategy

LG Display, one of the major clients of the LCD Materials Division, has increased the number of products applying LG Chem's high-color and high-intensity materials, and is striving to enter the fast-growing Chinese market. The OLED Materials Division is making efforts to increase the number of materials applicable to the products of its clients, such as increasing the number of products applying light-emitting materials for LG Display's OLED TV in 2017. Moreover, as the demand for cathode materials used in electric vehicles is expected to grow, we are expanding plants at home and making investments in new overseas plants in the form of joint ventures. In addition, we are investing in the shares of core material suppliers and facilitating joint ventures to secure a stable supply of metal and cobalt, which are the core materials of cathode materials.

## Life Sciences

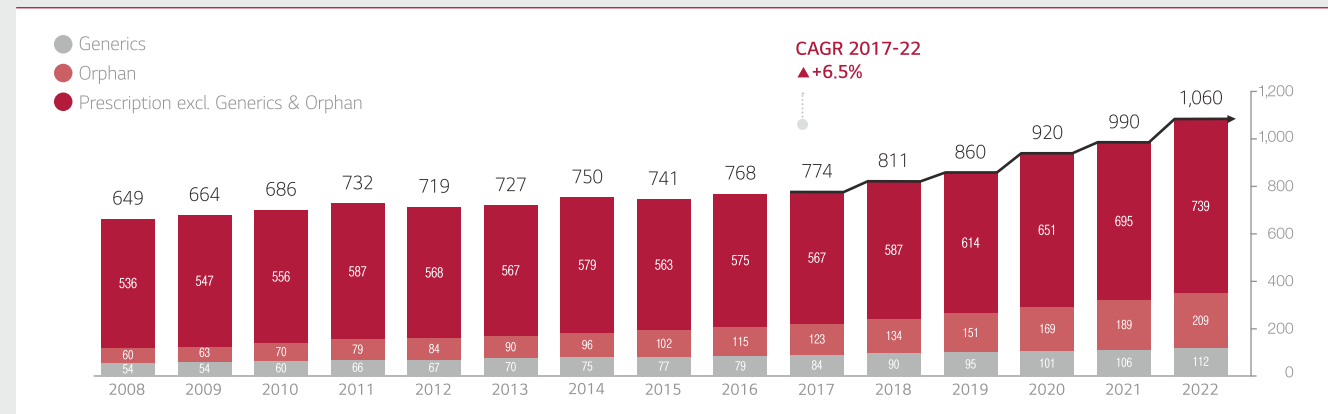
### Business Overview

LG Chem officially launched its red bio business by merging with LG Life Sciences in January 2017. LG Chem's Life Sciences Division was the first in Korea to receive US FDA approval for a new drug in 2003 and is now strengthening its competitiveness in the future biotechnology industry based on its outstanding technologies that led to the successful commercialization of new drugs. We are also utilizing our advanced technology, R&D capacity, and production facilities to continuously increase our competitive edge in the pharmaceutical, vaccination, and fine chemical markets.

### Market Prospects

The global prescription drug market (excluding over-the-counter drugs and medical devices) is projected to expand from approximately USD 774 billion in 2017 to USD 1.1 trillion in 2022, maintaining a steady growth of 6.5% every year. This can be attributed to the increasing development of new drugs due to aging populations and innovations in life science technology. In particular, the anti-cancer and immune disorder markets are expected to lead the growth with active releases of new drugs. The market for metabolic disorders, including diabetes, will also continue its growth. Due to the constantly increasing costs related to the development of new drugs, finding ways to improve R&D efficiency will be key to attaining a competitive edge in the red bio business.

Evaluate Pharma Market Prospects data (Unit: Billion USD)



Source: Evaluate Pharma (2017. 5)

### Business Strategy

The Life Sciences Division has concentrated its R&D activities on the development of new and innovative drugs that combat cancer, immune disorders, diabetes, and metabolic disorders. As a strategy to strengthen our R&D capacity and efficiency, we will promote open innovation in all areas, including building capacity at a global level and securing a global network, to actively expand the pipeline of new drugs. By 2030, the Life Sciences Division will grow into a global bio-pharmaceutical company with the development of new innovative drugs that have global competitiveness, and we will serve as the next generation growth engine for LG Chem.

## FarmHannong

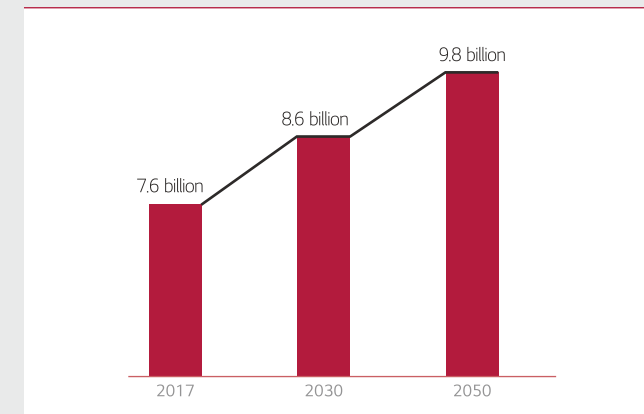
### Business Overview

LG Chem has diversified its business by entering the green bio industry with the acquisition of the nation's top green bio company, Dongbu FarmHannong, in 2016 and newly launched it under the name of FarmHannong. It is mainly engaged in the manufacturing and sales of agricultural products including crop protectants, seeds, and fertilizers. In 1953, FarmHannong started the first crop protectant business in Korea and still has the largest market share in the country. Now it is focused on developing and selling high value-added and differentiated products. The seed business secures a variety of genetic resources that can raise competitiveness in the future food industry and continues to develop new high-value added varieties. The fertilizer business focuses on the development and sales of special functional fertilizers that will lead the future fertilizer industry.

### Market Prospects

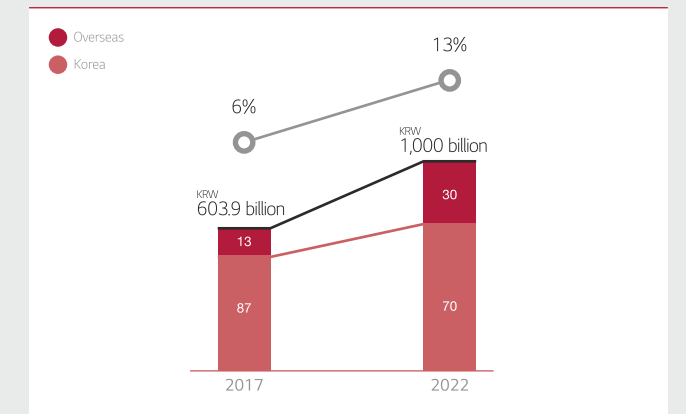
Recently, environmental and food issues, such as ecosystem conservation, population growth, and food safety, have become increasingly important, and green biotechnology is attracting much attention as the sole solution to these issues. As a result, the green bio market is expected to grow steadily across the globe. Global chemical companies have already entered the green bio market, and are actively pursuing mergers and acquisitions to respond to market growth and enhance competitiveness. At the same time, we are increasing investments to secure future technologies, such as genetic engineering technology and solutions for precision agriculture, and these movements are expected to accelerate the growth of the green bio market.

World Population Growth



Source: UN, World Population Prospects: 2017 revision

Sales



### Business Strategy

Farmhannong has maintained its leading position in the domestic market for crop protectants, fertilizers, and seeds, and it achieved KRW 603.9 billion in sales and KRW 35.5 billion in operating profits in 2017. Farmhannong established its first overseas research station in 2018, and is working to expand its business to the global market. We will continue to focus on overseas markets to grow into a global green bio company with annual sales of KRW 1 trillion by 2022.

# APPENDIX

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## Corporate Governance

### Composition and Independence of Board of Directors

LG Chem's Board of Directors incorporates two executive directors, one non-executive director, and four independent directors. For max efficiency against management, independent directors make up a majority of the BOD. Appointed directors serve a three-year term in principle and are then re-appointed, considering their activities and performance evaluations. Moreover, according to the Commercial Act, a director can only serve one other executive position in another company that does not have a stake in LG Chem.

### Expertise and Diversity

The four independent directors have expertise in finance, tax, law, administration, and chemical substances or in chemistry, LG Chem's core business. Each must possess a strong understanding of management, chemistry, batteries, IT & electronics, and life sciences. To enhance the expertise and efficiency of the Board of Directors, LG Chem also operates three committees under the Board of Directors: the Audit Committee, the Nomination Committee for Independent Directors, and the Management Committee.

**Audit Committee** The Audit Committee conducts audits on accounting, business practices, and directors' execution of duties, and has the authority to request a director's sales report or investigate the company's business or property. All members of the Board of Directors are independent.

**Nomination Committee for Independent Directors** The Nomination Committee for Independent Directors recommends candidates with strong expertise and capabilities who also meet the interests of LG Chem to the stakeholders and shareholders and appoints said candidates at the shareholders general meeting. To secure the diversity of independent directors, LG Chem does not discriminate against gender, nationality, or race. In order to ensure fairness in selecting candidates for outside directors, two of the three members are outside directors.


**Management Committee** The Management Committee was established in July 2017 to handle daily business matters delegated by the BOD and financial matters under a certain amount.

### Board of Directors Activity

The Board of Directors officially meets once each quarter excluding the possible unscheduled meeting. In 2017, the Board held 11 meetings resulting in 37 approvals and eight reports. Meetings are mandatory for Board of Directors except in regard to unavoidable situations. Participation rate was 100% for executive directors and 93.1% for independent directors in 2017.

### LG Chem's Board of Directors

Category	Name	Role	Experience
Executive Directors	Park, Jin-Soo	Chairperson of the Board of Directors Chairperson of Management Committee	Current CEO and Vice Chairman of LG Chem * Concurrent post: CEO of FarmHannong Former CEO of Hyundai Petrochemical, CEO of LG Petrochemical
	Jeong, Ho-Young	Member of the Management Committee	Current CFO of LG Chem * Concurrent post: Auditor of LG Academy Former CFO of LG Display, CFO of LG Household & Health Care
Non-Executive Director	Koo, Bon-Joon	Chairperson of the Nomination Committee for Independent Directors	Current Vice Chairman of LG Corp. Former CEO of LG Display, CEO of LG Electronics
Independent Directors	Ahn, Young-Ho	Chairperson of the Audit Committee Member of the Nomination Committee for Independent Directors	Current Adviser at Kim & Chang Former Director General for Planning and Coordination of Fair Trade Commission, Standing Commissioner of Fair Trade Commission
	Char, Kook-Heon	Member of the Nomination Committee for Independent Directors	Current Professor at the School of Chemical and Biological Engineering, Seoul National University, Permanent Vice President of The National Academy of Engineering of Korea, Senior Vice President of The Polymer Society of Korea
	Jeong, Dong-Min	Member of the Audit Committee	Current Partner at Barun Law LLC Former Chief Prosecutor at Daejeon District Public Prosecutors' Office, Chief Prosecutor at Seoul Western District Public Prosecutors' Office
	Kim, Mun-Su	Member of the Audit Committee	Current Adjunct Professor of Graduate School of Science in Taxation, The University of Seoul, Member of the Deliberation Committee on Taxation Development at the Ministry of Strategy and Finance, Non-Executive Judge of Tax Tribunal Former Vice Commissioner of National Tax Service

 Please refer to the homepage for details

As of June 2018

**Board of Directors Activity**

		unit	2015	2016	2017
Attendance	Executive Directors, Non-Executive Director	%	82.5	100	100
	Independent Directors (Non-Executive)	%	95.8	100	93.1
Number of meetings		Time	10	10	11
Number of agenda submitted	Approval	Case	32	38	37
	Report	Case	13	9	8

**Evaluation and Compensation**

Independent evaluations on the activity and performance of directors are conducted at the end of each term. The results are reflected in the decision to re-appointment.

Directors receive compensation within the limit approved at the general meeting of shareholders. Wages for executive directors are calculated in consideration of their work performance. Incentives are provided according to the comprehensive evaluation of quantitative indicators, such as sales, and qualitative indicators, such as evaluation of key projects and implementation of mid to long-term expectations. The same wages are paid to all independent directors within the compensation limit approved at the general meeting of shareholders. The upper limit of wages of the Board of Directors decided by the general shareholders meeting in 2017 is KRW 8 billion, and the total amount of wages paid was KRW 3.38 billion. Wages for individual directors and auditors that exceed KRW 500 million are made public through a business report in accordance with related law.

**Compensation for Directors in 2017 (Unit: KRW million)**

	Number of People	Total Payment	Average Compensation Per Person
Registered Directors (Independent Directors and Audit Committee members excluded)	3	3,144	1,048
Independent Directors (Audit Committee members excluded)	1	-	-
Audit Committee members	4	241	60

**Transparent Disclosure**

Important decisions on management resolved by the BOD shall be immediately made public to provide related information to shareholders and stakeholders. Major business issues related to investors' interests are disclosed through the Data Analysis, Retrieval and Transfer System (DART) of the Financial Supervisory Service, the Korea Exchange (KRX), and the LG Chem website.

**CSR Governance**

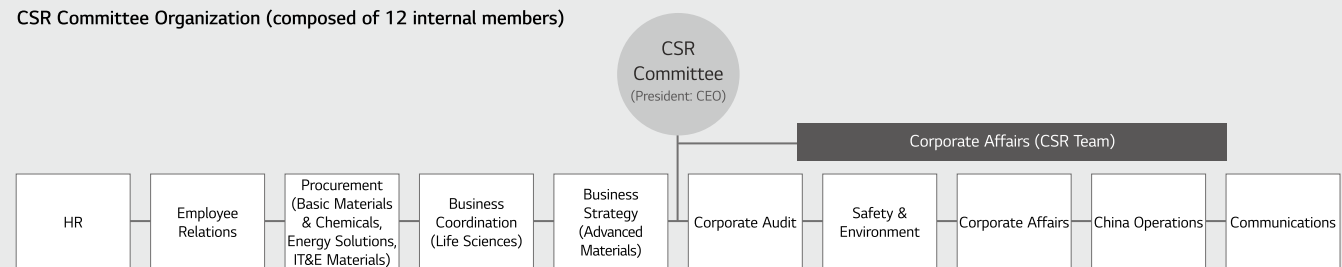
In order to strengthen the CSR promotion system throughout the company, LG Chem operates the CSR Committee composed of executives from relevant departments and the CEO as the chairman. In 2017, the executives in charge of Communications and Procurement at Life Sciences Division and Advanced Materials Business Unit were added, bringing the total number of members on the Committee to 12 executives.

As the highest decision-making body dealing with CSR-related issues, the CSR-related Committee identifies tasks for improvement in each area through the CSR Team Leader Council. The Committee reports on the implementation of the proposed tasks and makes decisions on key issues to be pursued in the future.

**CSR Task to Promote in 2018**

Category	Tasks for CSR Risk Management
Supplier CSR	· Evaluation of supplier procurement · CSR meeting with the evaluated suppliers
HR	· Sharing and educating employees about Global Human Rights & Labor Policy, managing risks related to working hours
Safety and Environment	· Activating local consultative groups, developing the company-wide management index
Jeong-Do Management	· Strengthening the evaluation system of corruption risk
CSR	· Establishing and applying the Code of Contribution · Operating the Power Plant for Green Hope and Planning for new CSR activities

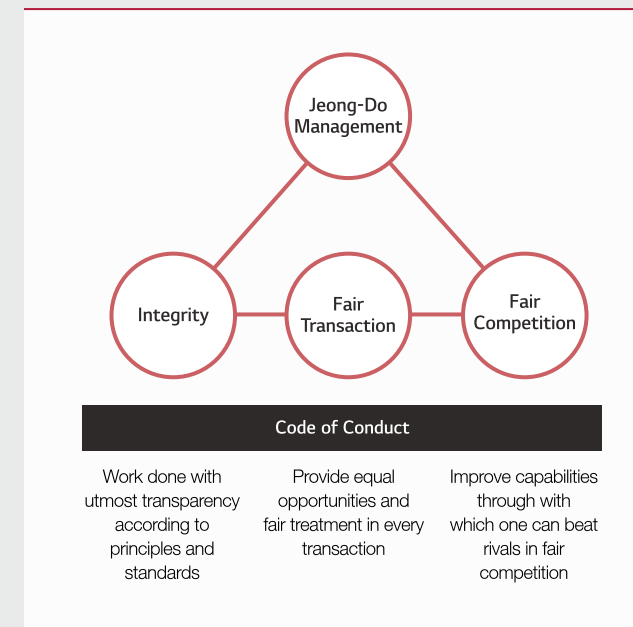
**CSR Committee Organization (composed of 12 internal members)**



**Business Ethics**

**Jeong-Do Management Principles**

Jeong-Do Management is LG's own way of committing to playing fair through ethical management practices. Jeong-Do Management is not simply a standard for ethical management but also an expression of LG's mission to achieve high competitiveness in a respectable and fair manner.



**LG Code of Ethics**

The LG Code of Ethics provides all LG Group employees with the standards for appropriate behavior and value judgment that serve as the foundation for all business conducts of LG Chem employees and business sites at home and abroad. The LG Code of Ethics consists of customer responsibilities and obligations, fair competition, fair trade, basic ethics of employees, employee responsibilities, and national and social responsibilities.

**Practice Jeong-Do Management in Life**

LG Chem provides regular training on Jeong-Do Management for all employees and partners, pursuant to the Jeong-Do Management training and promotion system. In particular, we send Jeong-Do

Management letters tailored to each business and constantly emphasize that fair competition through capacity building is the core of Jeong-Do Management. We also promote Jeong-Do Management practices in daily life that encourage business sites to autonomously eliminate poor business practices, identify risks and improve processes, through programs such as Outreach Activities for Consensus Building, and Workshop for On-site Issue Management.

**Reporting System**

LG Chem runs Corruption Reporting Systems to prevent unfair transactions and rapidly address any violation of Jeong-Do Management such as employees' corruption and bribery. Internal employees and external stakeholders can report violations anonymously or with their real name on the LG Jeong-Do Management homepage. In the case of reporting with a real name, LG Chem strictly protects the confidentiality of informants and the contents of reports to prevent causing disadvantages to the informants. In case of verifying the company's loss reduction or contribution to Jeong-Do Management, LG Chem runs the 'Compensation System for Corruption Report' to compensate informants. In addition, LG Chem runs a win-win bulletin board with suppliers to solve their difficulties.

**Respond to Corruption**

Category	Unit	2015	2016	2017
Inspection by the Ethics Office	Case	17	10	19
Persons punished	Person	18	5	10
Closing transaction due to corruption	Supplier	20	3	16

\* Data covers domestic and overseas employees

\* Corruption: accepting bribes and embezzlement

\* Persons punished: number of people who is imposed severe penalty

**Compliance Management System**

LG Chem has established the compliance management standard to promote fair and transparent business practices, ensure the sound development of the company, and gain customer trust by complying with laws and regulations. In line with this, we also operate the compliance management system to identify laws and regulations that must be complied with during business operations and self-check the compliance of our employees, so as to prevent legal violations and respond to various legal risks.

LG Chem's legal compliance support and management activities are the responsibilities of the compliance officer appointed by the Board of Directors. The effectiveness of the compliance support and inspection system is evaluated every year, and the results are reported to the BOD.

In addition to the support activities of the compliance officer, the company operates the Compliance Support Team under a person in charge of legal affairs, and the team performs compliance support activities in cooperation with related departments.

### Compliance Inspection and Risk Prevention Activities

LG Chem constantly checks and analyzes new legislations and amendments made domestically and abroad as well as regulations and legal trends. We review the scale and frequency of legal risks to identify risk probability, which is used for risk categorization. To ensure the effectiveness of the compliance management system, we conduct regular and irregular compliance checks, and when legal risks are identified through the compliance checks, they are shared with the relevant department managers so that proper measures, such as suspension, improvement, correction or sanction, can be taken. Moreover, to prevent the recurrence of the same or similar violations, we have established a recurrence prevention plan. When tasks closely related to legal risks need to be performed, they must be run past the legal department in advance and the results must be reported to the compliance officer.

### Compliance Training

LG Chem develops and operates a variety of compliance training programs tailored to job grades and duties, and provides an online compliance training session once every year for all employees. In 2017, a series of compliance training programs were operated on cartel, internal transaction, and subcontracting transaction, and a fair trade training session was organized for employees in the Life Sciences Division. In 2017, the online compliance training was conducted under the theme of "the Importance of Compliance," providing information on the necessity of compliance, increased regulatory risks, increased possibility of noncompliance detection, and relevant requests.

### Self-Compliance Program for Fair Trade

LG Chem has introduced the four business practices recommended by the Korea Fair Trade Commission (KFTC) to promote fair subcontract transactions among large, mid and small-sized entities and to build a foundation for mutual cooperation.

We have operated the Compliance Program with a focus on preventive measures. In 2017, we performed inspections on cartel, internal transaction, subcontracting transaction, and agency transaction while we conducted an inspection of and compliance training for the newly added businesses. We have also established a 'Fair Competition Guideline' and formed a self-compliance team at the working-level under the control of the fair trade and self-compliance manager to build, implement, and report the operation plan of the Compliance Program.

### Operating Fair Trade System

LG Chem pursues fair contracts based on the standard subcontract agreement recommended by the KFTC, and with the immediate reflection of amendments to the Fair Trade Act, Subcontracting Act, and Agency Transactions Act.

We also operate the Internal Committee on Subcontracting Transactions that carry out preliminary inspections to prevent unfair transactions that may occur in subcontracting transactions with small to mid-sized suppliers.

The Committee, consisting of three members including an executive related to subcontracts, conducts a review on transactions that exceed a standard annual amount, focusing on whether or not to conclude a contract and the adequacy of the transaction amount. Furthermore, the Dispute Resolution Group classifies the cases of dispute into grades based on the level of response, and takes measures for follow-up and recurrence prevention.

### Spreading Fair Trade Culture

In order to establish a fair trade culture throughout the company, LG Chem provides customized training programs every year, including Q&A training, new team leader training, and leader W/S training, that reflect the characteristics of each business. In addition, we distribute the Fair Trade Compliance Manual, which reflects new legislations, legal amendments, practical issues, and the Do's & Don'ts. Compliance Newsletters provide all employees with behavior standards for self-compliance. All employees also make the Fair Trade Compliance Pledge every year to show their commitment to observe the Fair Trade Act and Subcontracting Act.

### Information Security Management System

LG Chem has established a systematic information security management system to protect all of its business secrets, core technologies, R&D information, customer information, and personal information. Also, we operate the security control system around the

clock to provide real-time responses to external hacking attacks, and we perform regular inspections on security vulnerabilities as well as hacking simulations to constantly improve the level of internal security.

To prevent information leakage, we have strengthened the pre-identification of abnormalities through a detailed analysis of leakage channels, along with security measures for all IT media, including PCs and emails. Furthermore, our main business sites, including the Technology Research Institute in Daejeon and the Ochang Plant, have maintained global security levels by obtaining the ISO 27001 certification, which is the international standard for information security.

### Improving Security Awareness

LG Chem provides online and offline training on information security for all domestic employees once a year to continuously raise the level of their security awareness. We are also extending the security training to overseas business sites, including China, and the employees of our partners are also required to meet essential security requirements as part of the efforts to create a culture where all personnel working for LG Chem perform their duties with a proper awareness of security.

### Responding to Information Protection Regulations

LG Chemis responds to external regulations on domestic and overseas information protection, which have been strengthened in recent years. With regard to the Personal Information Protection Act of Korea, we have taken protection measures for personal information that was collected prior to the enforcement of the Act and for each amendment. In addition, we established a personal information management system for all our European corporations prior to the enforcement of the European General Data Protection Regulation (GDPR). We are also continuously identifying and improving legal imperfections in regard to the China's Network Safety Act, which was enacted in 2017.

# Risk Management

## Company-wide Risk Management System

For efficient risk management, the company-wide risk management system was structured in three stages: daily management at the working level, integrated management by a risk management team, and supervision by the BOD. Daily management includes monitoring of each business division, risk identification, and cause analysis. For integrated management, the Risk Management Committee (RMC) reviews risks according to the characteristics of each division, establishes response measures, and manages risks at the corporate level. Corporate-level guidelines and risk response measures are discussed with the CFO, the chief executive of risk management. The final risk management directions and decisions are confirmed by the BOD in accordance with the compliance management standards, and the BOD supervises whether the CEO has rightfully reflected their decisions and effectively operates the compliance management system.

## Risk Management Activities

**Identifying Risks** LG Chem pinpoints risks in various areas through the company-wide mid-term strategy, analysis of work process by function. Interviews are also used to analyze and manage risks. To respond to the rapidly changing business environment, LG Chem

operates a working-level risk analysis session on a weekly basis, and key issues of each division are discussed during the monthly business management meeting with the CFO. In addition, LG Chem checks business environment changes and discusses counter plans before the mid-term strategy and business plan are established each year.

**Preventing Risks from Recurring** LG Chem prevents risks from recurring by identifying risks which need to be managed and taking countermeasures through an Internal Audit. Moreover, all major projects are evaluated based on sales, profit/loss data, and investments in comparison with investment plans for the last 3 years. For projects whose results were different from predicted outcomes, major factors are examined through follow-up inspection to improve the success rate of future investments.

**Internal Control System** LG Chem operates the Internal Control System based on the IACS (Internal Accounting Control System) Framework to secure the reliability of financial data, effectiveness and efficiency in business operations, and ensure compliance with applicable laws and policies. LG Chem continues to operate the Internal Control System for the Board of Directors, management, and other members to secure trust of investors and strengthen management's responsibility for risks.

## Major Risks and Mitigation Actions

LG Chem identifies major potential risks and applies them to business practices. Risks that require management are categorized into business risk, financial risk, and social and environmental risk, and activities are performed to measure their potential impacts and prevent them.



Category	Risk Type	Impact on LG Chem	Mitigation Actions
Business Risk	Management of order	Necessity for systematic management due to an increase in winning project orders and large-sized projects	-Establishing company-wide management of order system -Secure profitability through management from a quotation stage -Establish response basis to risk of loss
	Expansion of new businesses and fierce competition	Shifts in industrial and competitive structures due to intensified competition in emerging markets and expansion of new businesses	-Securing the position of a technical leader by enhancing manufacturing and R&D capacity -Raising competitiveness in new businesses through various channels including Open Innovation
	Changes in Business Environment	Lowered mid to long-term growth with an insufficient response to the rapidly-changing business environment	-Focusing on the changes in business environment for establishing mid/long-term strategies and business plans -Responses to each indicator such as oil price and exchange rates -Analysis of short-term business environments and risks with the head office and overseas subsidiary companies
	IT system management and information security	Legal responsibilities or lowered competitiveness due to poor management of sensitive internal information Negative impact on production and sales in case of IT system error	-Maintain the company-wide information protection organization and operate an information protection association -On and offline education for employees on information security and data management -Establishing dual system equipment and remote disaster recovery system to minimize risks related to IT systems
	Strengthening product responsibility	Damage to corporate competitiveness due to lowered credibility in case of chemical accidents or legal violations	-Strengthening material safety training for employees that handle hazardous materials -Strengthening pre-filtering of materials exceeding domestic or overseas legal standards on chemicals -Operating dedicated QA organizations in the headquarters and business divisions to achieve optimized quality management
Financial Risk	Investment	When investment results in a failure to achieve profit gain due to wrong investment or changes in business environment, it is likely to cause financial loss and deterioration of cash flow	-Building an investment management system to enhance investment efficiency and respond preemptively to risks -An investment committee is operated for each business sector -Examine investment from the corporation and operate the corporate investment committee -Operate a company-wide contract examination committee to manage general risks of major large-size projects
	Finance	Being exposed to various financial risks according to global business expansions and business sector expansions (market risk, credit risk, liquidity risk, etc.)	-Implementing risk management by divisions for market risks from the micro- and macro-perspective -Pre-identifying and evaluating financial risks through cooperation among business divisions
Social/ Environmental Risk	Safety and environmental management	Financial loss and damage to corporate image upon the occurrence of non-compliance with laws and regulations	-Regular and special inspections of safety and environment in all plants at home and abroad -Strengthen company-wide safety and environment management such as the Safety and Environment Committee held by the CEO -Enact company-wide safety and environmental policies and regulations, and build the safety and environment portal
	Response to carbon policy changes	Increase of production costs caused by operational expenses due to investment in energy conservation and purchase of emission trading right	-Discussing energy and greenhouse gas issues at the company level through the Energy Committee led by the CEO and strengthening response capacity -Making investment decisions for energy reduction based on the priorities for maximum effects -Minimizing financial impact through preliminary estimation of purchasing cost of emission credits
	Management of water resources	Increase trade technical barriers due to emergence of various regulations related to water footprint and incur loss due to export restrictions	-Using water resource risks as business opportunities by expanding the water treatment business -Strengthening the water resource inventory management system in domestic and overseas business sites



# Independent Assurance Statement

## Relating to LG Chem, Ltd.'s Sustainability Report for the 2017 calendar year

This Assurance Statement has been prepared for LG Chem, Ltd. in accordance with our contract but is intended for the readers of this Report.

**Terms of engagement** Lloyd's Register Quality Assurance (LRQA) was commissioned by LG Chem, Ltd. (LG Chem) to provide independent assurance on its 'LG Chem Sustainability Report 2017' ("the report") against the assurance criteria below to a moderate level of assurance using AA1000AS (2008), where the scope was a Type 2 engagement.

Our assurance engagement covered LG Chem's operations and activities in Korea specifically the following requirements:

- ▶ Evaluating adherence to AA1000 Account Ability Principles of Inclusivity, Materiality and Responsiveness
- ▶ Confirming that the report is in accordance with:
  - GRI Standards<sup>1</sup>: Core option
- ▶ Evaluating the accuracy and reliability of data and information for only the selected indicators listed below:
  - GRI 200 (Economic): 201-1, 202-2, 203-1, 203-2, 205-3, 206-1
  - GRI 300 (Environmental): 303-1, 305-1, 305-2, 305-3, 305-4, 305-7, 307-1
  - GRI 400 (Social): 401-2, 403-2, 404-1, 404-2, 405-2, 408-1, 415-1

Our assurance engagement excluded the data and information of LG Chem's suppliers, contractors and any third-parties mentioned in the report.

LRQA's responsibility is only to LG Chem. LRQA disclaims any liability or responsibility to others as explained in the end footnote. LG Chem's responsibility is for collecting, aggregating, analysing and presenting all the data and information within the report and for maintaining effective internal controls over the systems

**LRQA's Opinion** Based on LRQA's approach nothing has come to our attention that would cause us to believe that LG Chem has not, in all material respects:

- ▶ Met the requirements above
- ▶ Disclosed accurate and reliable performance data and information as all errors or omissions identified during the assurance engagement were corrected
- ▶ Covered all the issues that are important to the stakeholders and readers of this report.

The opinion expressed is formed on the basis of a moderate level of assurance and at the materiality of the professional judgement of the verifier.

Note: The extent of evidence-gathering for a moderate assurance engagement is less than for a high assurance engagement. Moderate assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a moderate assurance engagement is substantially lower than the assurance that would have been obtained had a high assurance engagement been performed.

**LRQA's approach** LRQA's assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- ▶ Assessing LG Chem's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this through reviewing documents and associated records.
- ▶ Reviewing LG Chem's process for identifying and determining material issues to confirm that the right issues were included in their report. We did this by benchmarking reports written by LG Chem and its peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material issues to evaluate whether LG Chem makes informed business decisions that may create opportunities that contribute towards sustainable development.
- ▶ Auditing LG Chem's data management systems to confirm that there were no significant errors, omissions or mis-statements in the report. We did this by reviewing the effectiveness of data handling procedures, instructions and systems, including those for internal verification. We also spoke with those key people responsible for compiling the data and drafting the report.
- ▶ Reviewing supporting evidence made available by LG Chem at their head office in Seoul, Korea.

**Observations** Further observations and findings, made during the assurance engagement, are:

- ▶ Stakeholder inclusivity:
  - We are not aware of any key stakeholder groups that have been excluded from LG Chem's stakeholder engagement process.
- ▶ Materiality:
  - We are not aware of any material issues concerning LG Chem's sustainability performance that have been excluded from the report. It should be noted that LG Chem has established extensive criteria for determining which issue/topic is material and that these criteria are not biased to the company's management. However, in the materiality process, LG Chem should make more efforts to better reflect reasonably estimable economic, environmental and social impacts for determining significance of relevant issues.
- ▶ Responsiveness:
  - LG Chem operates, on an annual basis, a CSR committee chaired by CEO and composed of senior executives of relevant function, discussing the risks, deciding what to improve and reviewing its performance associated with corporate social responsibility.
- ▶ Reliability:
  - LG Chem has reliable data management systems for the indicators in the report. However, LG Chem should review its procedures regarding compiling data and determine where it needs to develop documented guidance to ensure more reliable data, and should also improve the data quality assurance procedures.

**LRQA's standards, competence and independence** LRQA implements and maintains a comprehensive management system that meets accreditation requirements for ISO/IEC 17021 Conformity assessment – Requirements for bodies providing audit and certification of management systems that are at least as demanding as the requirements of the International Standard on Quality Control 1 and comply with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants.

LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

LRQA is LG Chem's certification body for ISO 9001, ISO 14001 and OHSAS 18001. We also provide LG Chem with a range of training services related to management systems. The verification and certification assessments, together with the training, are the only work undertaken by LRQA for LG Chem and as such does not compromise our independence or impartiality.

Dated: 6th July 2018

LRQA reference: SE000000269



Tae-Kyoung Kim  
 LRQA Lead Verifier  
 On behalf of Lloyd's Register Quality Assurance Limited  
 17th Floor, Sinsong Building, 67 Yeouinaru-ro, Yeongdeungpo-gu, Seoul, Korea



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<sup>1</sup> <https://www.globalreporting.org>

# LG Chem Code of Conduct for Suppliers

LG Chem, Ltd. (“LG Chem”) is committed to be a global chemical company that carries out its roles and responsibilities as a member of global society. We strive to provide sustainable solutions that can contribute to resolve social/environmental problems, while endeavoring to adhere to the basic principles of sound growth of the business.






We have established the LG Chem Code of Conduct for Suppliers based on international norms, standards and legal requirements to fulfill our social responsibilities at global level and to achieve sustainable performances. We particularly expect mutual support from our supplier (the “Company”) to comply with the following standards.

- A. The company does not hire any person below the legal working age, and complies with the legal requirements for juvenile labor regarding minimum age, working hours and working conditions.
- B. The company prohibits all forms of involuntary labor, including forced labor, labor exploitation, and establishes employment contracts that clearly define the working conditions in the employees’ native languages.
- C. The company prohibits all forms of discrimination such as race, skin color, age, gender, place of origin, physical disability, pregnancy, religion, political views, labor union membership or marital status in terms of employment, promotion, remuneration, educational opportunities, etc.
- D. The company respects the human rights of all employees, and effectuate humane working circumstance by prohibiting any sexual harassment, abuse, punishment, psychological or physical coercion, violent language, etc.
- E. The company abides by all legal requirements related to maximum working hours, days of work, minimum wage, welfare and remuneration, etc.
- F. The company respects the employee’s right to have association and collective bargaining in accordance with local laws and regulations. Employees can communicate with the management with regard to their working conditions without any risk of discrimination, retaliation, threats or harassment.
- G. The company maintains the highest level of integrity in all transactions and relations, and strictly prohibits any types of corruption including undue acquisitions of improper advantages or bribery, while fully complying with all legal requirements related to anti-corruption. The company also guarantees confidentiality and protection of whistle-blowers.
- H. The company must comply with legally mandated precautionary measures including evaluating and eliminating hazardous matters, providing regular education and emergency trainings, disseminating personal protective equipment, etc., to ensure that employees can work and live (if accommodation is provided) in a safe and healthy environment.
- I. All required environmental permits, approvals, and registrations shall be obtained and maintained in the most recent versions. The company shall devote utmost efforts to minimize the adverse impact of their manufacturing process on the environments and local community, such as hazardous substances, solid waste, waste water, air emissions, resource reduction, etc.
- J. The company shall prohibit the use of conflict minerals and materials sourced through any illegal and unethical processes including the processes where human rights are infringed, and shall establish a precautionary system. In addition, the company must be able to provide due diligence measures of the origin and chain of custody on raw materials in accordance with [Appendix1], and actively cooperate with LG Chem’s due diligence.

[Appendix1]



Due Diligence Policy	
1. Due Diligence Target	
<b>Minerals</b>	Conflict minerals (Tin, Tantalum, Tungsten, Gold), minerals mined in conflict affected and high-risk areas such as cobalt
<b>Conflict-Affected Areas</b>	Democratic Republic of the Congo, Sudan, Rwanda, Burundi, Uganda, Congo, Zambia, Angola, Tanzania, Central African Republic
<b>High-risk Areas</b>	The areas where The UNITED STATES DEPARTMENT OF LABOR regulates
2. Due Diligence Standard OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas	
<b>Establish strong company management system</b>	· Establish Due diligence Policy and management system (Ref : OECD Guidance Annex II) · Communication with stakeholders, including suppliers (Relevant provisions included in the contract) · Supply chain history management
<b>Identify and assess risk in the supply chain</b>	· Identify risks in supply chain · Assess risks of suppliers based on OECD Guidance Annex II
<b>Design and implement a strategy to respond to identified risks</b>	· Devise and adopt a risk management plan identified in the 'Identify and assess risk in the supply chain' phase · Report findings of the supply chain risk assessment and risk management plan to the designated senior management of the company
<b>Carry out supply chain due diligence at identified points in the supply chain</b>	· Due diligence based on OECD Due Diligence Guidance (Conduct independent third-party audit)
<b>Report on supply chain due diligence</b>	· Publicly report on supply chain Due Diligence result (through Sustainability management report, Annual report, etc.)

[Appendix2]

References for the LG Chem Code of Conduct for Supplier	
The following standards were used in referencing this LG Chem Code of Conduct for Supplier, on which additional information can be found at the sites listed:	
<b>RBA Code</b>	 <a href="http://www.responsiblebusiness.org/standards/code-of-conduct/">http://www.responsiblebusiness.org/standards/code-of-conduct/</a>
<b>ILO International Labor Standards</b>	 <a href="http://www.ilo.org/global/standards/lang--en/index.htm">http://www.ilo.org/global/standards/lang--en/index.htm</a>
<b>ISO 14001</b>	 <a href="http://www.iso.org">www.iso.org</a>
<b>OECD Guidelines for Multinational Enterprises</b>	 <a href="http://www.oecd.org">www.oecd.org</a>
<b>OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas</b>	 <a href="http://www.oecd.org/investment/mne/mining.htm">http://www.oecd.org/investment/mne/mining.htm</a>
<b>SA8000 and SAI (Social Accountability International)</b>	 <a href="http://www.sa-intl.org/">http://www.sa-intl.org/</a>

# Sustainable Management Index

## GRI Content Index

General Disclosures				
GRI Standard	Disclosure	Page	External Assurance	
GRI 102: General Standard Disclosures 2016	102-1	Activities, brands, products, and services	10	✓
	102-2	Location of headquarters	10	✓
	102-3	Location of operations	10	✓
	102-4	Ownership and legal form	11	✓
	102-5	Markets served	10	✓
	102-6	Scale of the organization	10-11	✓
	102-7	Information on employees and other workers	10-11	✓
	102-8	Supply chain	75	✓
	102-9	Significant changes to the organization and its supply chain	14-15, 51-57	✓
	102-10	Precautionary Principle or approach	About This Report	✓
	102-11	External initiatives	45-49, 55, 92-93	✓
	102-12	List of the main memberships of industry or other associations.	103	✓
	102-13	Statement from senior decision-maker	103	✓
	102-14	Key impacts, risks, and opportunities	8-9	✓
	102-16	Values, principles, standards, and norms of behavior	12-13	✓
	102-17	A description of internal and external mechanisms for ethics and compliance	89-90	✓
	102-18	Governance structure	87-88	✓
	102-23	Report whether the Chair of the highest governance body is also an executive officer	87	✓
	102-34	Nature and total number of critical concerns that were communicated to the highest governance body and the mechanism(s) used	87-88  Please refer to the homepage	✓
	102-40	List of stakeholder groups engaged by the organization	16	✓
	102-41	Collective bargaining agreements	77	✓
	102-42	Identifying and selecting stakeholders	16-17	✓
	102-43	Approach to stakeholder engagement	16-17	✓
	102-44	Key topics and concerns raised	16-17	✓
	102-45	Entities included in the consolidated financial statements	 Please refer to the homepage	✓
	102-46	Defining report content and topic Boundaries	About This Report, 22-23	✓
	102-47	List of material topics	21	✓
	102-48	Restatements of information	77-99	✓
	102-49	Changes in reporting	About This Report	✓
	102-50	Reporting period	About This Report	✓
	102-51	Date of most recent report	About This Report	✓
	102-52	Reporting cycle	About This Report	✓
102-53	Contact point for questions regarding the report	104	✓	
102-54	Claims of reporting in accordance with the GRI Standards	About This Report	✓	
102-55	GRI content index	98-100	✓	
102-56	External assurance	94-95	✓	

Material Topics				
GRI Standard	Disclosure	Page	External Assurance	
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	73	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 201: Economic Performance 2016	201-1	Direct economic value generated and distributed	74	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	30	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 202: Market Presence 2016	202-2	Proportion of senior management hired from the local community	76	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	65	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 203: Indirect Economic Impacts 2016	203-1	Infrastructure investments and services supported	66-71	✓
	203-2	Significant indirect economic impacts		
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	89-90	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 205: Anti Corruption 2016	205-3	Confirmed incidents of corruption and actions taken	89	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	89-90	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 206: Anti Competitive Behavior 2016	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	N/A*	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	78	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 303: Water 2016	303-1	Materials used by weight or volume	79	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	45	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 305: Emissions 2016	305-1	Direct (Scope 1) GHG emissions	47	✓
	305-2	Energy indirect (Scope 2) GHG emissions	47	
	305-3	Other indirect (Scope 3) GHG emissions	47	
	305-4	GHG emissions intensity	47	
	305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	79	

\* N/A: Not Applicable

Material Topics				
GRI Standard	Disclosure	Page	External Assurance	
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	78-79	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 307: Environmental Compliance 2016	307-1	Non-compliance with environmental laws and regulations	N/A	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	59	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 401: Employment 2016	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	62	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	35	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 403: Occupational Health and Safety 2016	403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	77 (Injury rate without breakdown by gender)	✓
	403-4	Health and safety topics covered in formal agreements with trade unions	77	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	76	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 404: Training and Education 2016	404-1	Average hours of training per year per employee	76 (Average hours of training without breakdown by gender)	✓
	404-2	Programs for upgrading employee skills and transition assistance programs	76	
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	77	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 405: Diversity and Equal Opportunity 2016	405-2	Ratio of basic salary and remuneration of women to men	77	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	55	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 408: Child Labor 2016	408-1	Operations and suppliers at significant risk for incidents of child labor	56-57, 61	✓
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	74	✓
	103-2	The management approach and its components		
	103-3	Evaluation of the management approach		
GRI 415: Public Policy 2016	415-1	Political contributions	74	✓

ISO 26000 (Global Guidelines for Social Responsibility)

Core subject	Issues	page
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	Avoidance of complicity	61
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	Discrimination and vulnerable groups	61
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	Conditions of work and social protection	61-63
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	Protection of the environment, biodiversity and restoration of natural habitats	78-79
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	Promoting social responsibility in the value chain	55
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	Sustainable consumption	37
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	Consumer data protection and privacy	N/A
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SASB Chemicals

Section	Issues	page
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	Description of long-term and short-term strategy or plan to manage Scope 1 emissions, emission-reduction targets and an analysis of performance against those targets	45-47
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	Number of production facilities in or near areas of dense population	N/A
Energy & Feedstock Management	Total energy consumed, percentage grid electricity, percentage renewable	46
	Percentage of raw materials from renewable resources	N/A
Water Management	(1) Total water withdrawn, percentage in regions with High or Extremely High Baseline Water Stress and (2) percentage recycled water usage	46-47
	Number of incidents of non-compliance with water quality permits, standards, and regulations	78-79
Hazardous Waste Management	Amount of hazardous waste, percentage recycled	79
Safety & Environmental Stewardship of Chemicals & Genetically Modified Organisms	Percentage of products that contain Registration, Evaluation, Authorisation and Restriction of Chemical (REACH) substances of very high concern (SVHC)	N/A
	Percentage of products that contain Class I World Health Organization (WHO) Acute Toxicity Hazard Categories pesticides	N/A
	Discussion of strategy to (a) manage chemicals of concern and (b) develop alternatives with reduced human and/or environmental impact	36
Product Design for Use-phase Efficiency	Percentage of products by revenue that contain genetically modified organisms (GMOs)	N/A
	Revenue from products designed for usephase resource efficiency	N/A
Political Spending	Amount of political campaign spending, lobbying expenditures, and contributions to tax-exempt groups, including trade associations	74
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\* SASB: Sustainability Accounting Standards Board

RBA

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\* RBA: Responsible Business Alliance

10 Principles of UN Global Compact

10 principles		page
Human Rights	1. Businesses should support and respect the protection of internationally proclaimed human rights; and	60
	2. Make sure that they are not complicit in human rights abuses.	
Labor	3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;	60-62, 77
	4. The elimination of all forms of forced and compulsory labor;	
	5. The effective abolition of child labor; and	
	6. The elimination of discrimination in respect of employment and occupation.	
Environment	7. Businesses should support a precautionary approach to environmental challenges;	46-49
	8. Undertake initiatives to promote greater environmental responsibility; and	
	9. Encourage the development and diffusion of environmentally friendly technologies.	
Anti Corruption	10. Businesses should work against corruption in all its forms, including extortion and bribery.	89-90

# Membership in Organizations and Associations

Fair Competition Federation
Korea Customs Logistics Association
Green Company Council
Chamber of Commerce and Industry
Business Institute for Sustainable Development(BISD)
Korea Display Industry Association
Maekyung Safety & Environment Leaders(SEL) Club
Seoul Chamber of Commerce and Industry
International Institute of Synthetic Rubber Producers
Korea Business Council for Sustainable Development
Korea Electric Vehicle Association
Korea AEO Association
Korea Association for Chief Financial Officers
Korea Exchange
Korea Employers Federation
Korea Management Association
Korea Mecenat Association
Korea Vinyl Environmental Council
Korea Invention Promotion Association
Korea Industrial Technology Association
Korea Listed Companies Association
Korea Petrochemical Industry Association
Korea Fire Safety Association
Korea Smart Grid Association
Korea Drug Research Association
Korea Crop Protection Association
Korea Power Exchange
Korea Battery Industry Association
The Korean Information Display Society
Korea Intellectual Property Association
Korea Chlor Alkali Industry Association
Korean Standards Association
Korea Chemical Industry Council
Korea Environmental Management Association
Korea Environmental Preservation Association
RCI (Responsible Cobalt Initiative)
Korea PCBPA Council
UN Global Compact Network Korea

# Awards and Recognitions

Awards

Dow Jones Sustainability Indices (DJSI), Asia Pacific & Korea
2017 Nano Korea Award in Industrial Technology Sector, Prime Minister
The Brad Roberts Award
The Most Admired Companies in Korea's Top Prize in the petrochemical industry
2018 Volkswagen Award for E-Mobility sector
50th CEO of Korea Award (Vice Chairman Jin-Soo, Park)
CDP Korea Awards Climate Change: Leadership A
Carbon Disclosure Project (CDP) Awards: Sector Leader for Raw Materials
Grade A for ESG Evaluation of Korea Corporate Governance Service
MSCI Korea ESG Leaders

Presented by

S&P Dow Jones Indices, Robeco SAM
Ministry of Trade, Industry and Energy, Ministry of Science, ICT and Future Planning
Energy Storage Association
KMAC
Volkswagen
KMAC
CDP Korea
CDP Korea
Korea Corporate Governance Service
Morgan Stanley Capital International

Participation Information

Korea	Overseas
CSR Team, Planning & Coordination Team, Credit Management & Compliance Team, Investor Relations Team, Ethics Office, HR Planning Team, Talent Recruiting Team, Global HR Team, Leadership Development Team, Competency Development Team, Corporate Culture Transformation Team, Employee Relations Team, HR Service Team, Safety & Environment Team, Safety & Environment Audit Team, Chemical Stewardship Team, Public Affairs Team, Energy / Climate Change Team, Technology Management Team, IP Strategy Team, Corporate Strategy Team 1, Basic Materials & Chemicals.Planning Team, Energy Solution.Management Strategy Team, IT&E Materials.Business Strategy Team, Advanced Materials.Business Strategy Team, Life Sciences.Corporate Strategy Team, Farmhannong.Strategy Planning Team, Quality Management Team, Management Innovation Team, Corporate Tax Team, Overseas Tax Team, Basic Materials & Chemicals.Procurement Strategy Team, Energy Solution.Procurement Strategy Team, IT&E Materials.Procurement Strategy Team, Advanced Materials.Procurement Team, Life Sciences.Strategic Purchasing Team	LGCCI.Business Support Vice Dept.Public Relations Part, LGCCI.Safety&Environment Team, LGCBH.Management Department.HR Team.General Affairs Part, LGCBT.HR/GAP, LGCGZ.HR&GA Team.GA part, LGCBJ.Security&Facility Team.Admin Part, LGCNJ.HR&GA Dept, HR&GA Vice Dept.GA T.Public Relations Part, LGCNA.Vice President.Corporate Culture Part, LGCTJ.Operating Management.GA Part, LGCYX.Administration Team.Public Relationship Part, LGCTW.Logistics & GA Team.GA Part, LGCCQ.General Administration Team.GA Part, LGCHZ.HR&Administration Dept.GA Part, LGCMI.Accounting/Purchasing Team.Accounting Part, LGCVZ.CFO.Legal, LGCVH.General Affairs Department, LGCWR.Administration Team

Investor Information

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<b>Establishment Date</b>	January 1947
<b>Paid-in Capital</b>	KRW 391,406 million (As of December 31, 2017)
<b>Number of Issued Shares</b>	78,281,143 Shares (As of December 31, 2017)
<b>Status of Listed Stock Exchanges</b>	Korea Stock Exchange: 051910.KS
<b>Transfer Agent and Registrar</b>	Securities Agent Services Team in the Korea Securities Depository 4Gil 23 Yoinaru, Youngdeungpo-gu, Seoul, Korea
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