

Creating More Customer Value

2018 LG Chem Sustainability Report



Contents

New LG Chem	02
CEO Message	04
Our Strategy	06
Materiality Assessment	08
2018 ISSUE STORY	
Issue 1. Creating Customer Value	12
Issue 2. Environmental Sustainability	28
Issue 3. Business & Human Rights	46
Issue 4. Participation and Sharing with Communities.	58
Performance	
Financial Performance	73
Non-financial Performance	75
Appendix	
Corporate Governance	85
Stakeholder Engagement	87
Company Profile	88
Our Focus Areas on SDGs	90
Our Business Model	92
Business Ethics	94
Risk Management	96
Independent Assurance Statement	98
GRI Content Index	100
Association and Principle	104
Awards and Recognitions	104
Contributors to Report Preparation	105
Investor Information	105
About This Report	106

Creating More Customer Value

Creating Customer Value



ISSUE 1 12p

Customers are at the heart of LG Chem. We introduce ceaseless challenge and innovation of LG Chem to create customer values.

Protecting Our Planet



ISSUE 2 28p

We introduce climate change response activities of LG Chem to secure sustainability of the environment and hand down rich natural environment to the future generations.

Business & Human Right



ISSUE 3 46p

People are at the center of our sustainable management. We introduce human rights policies and activities to enhance human rights of stakeholders.

Giving Back to Communities



ISSUE 4 58p

Communities are precious companions of LG Chem. We introduce social contributions of LG Chem for communities.

New LG Chem

We have restructured our business by focusing on 'customers' and 'future markets.'

LG Chem restructured its businesses from Basic Materials, Energy Solutions, Information and Electronic Materials, Life Sciences and Materials to Petrochemicals, Energy Solutions, Advanced Materials and Life Sciences in April. This was an effort to create a synergy of new and existing businesses and become one of the 'Global Top 5 Chemical Companies' by 2025. We have been constantly evolving our business structure by fully utilizing our capacity and knowledge accumulated for about 70 years. Our business portfolio was expanded to include green bio and red bio in 2016 and 2017. Uniseal, an automobile adhesive maker, was acquired and a joint venture (JV) was founded with Huayou Cobalt in 2018. LG Chem was the first Korean company to be listed among the '2017 Global Top 50' announced by C&EN in 2018. The brand value of LG Chem was evaluated to be 3.34 billion USD in the '2019 Top 10 Chemical Companies' reported by Brand Finance of UK, ranked 4th in the world higher than Dupont and next to BASF, Dow and Sabic.

Petrochemicals

We contribute to the development of the petrochemical industry with world-class quality. The petrochemicals business of LG Chem has secured outstanding productivity and cost competitiveness by constructing a vertical structure of basic materials like ethylene and propylene and downstream products such as PE, ABS and synthetic rubber. This business is focused on high-value products and promising future materials like carbon nanotube to gain competitiveness in the global market.

NCC, PO, PVC/Plasticizer, ABS, Acrylates/SAP, Rubber/Specialty Polymers



Energy Solutions

We lead the future green energy industry by developing differentiated materials and batteries.

LG Chem is the one and only battery maker in the world that has the base in chemistry. Our energy solutions business leads the global lithium ion battery market. We have become a strong global contender of batteries for EV and Energy Storage System (ESS). We are dominating the next-generation energy market with unrivaled technologies, new products and production capacity.



Automotive Battery, ESS Battery, IT & New Application Battery

Automotive Materials, IT Materials, Industrial Materials



Advanced Materials

We prepare for the future with materials made using advanced technologies. This is a customer-centered business area that provides specialty materials for customers in the fields of automobile, IT and industry. We secured competitiveness in the fields of lightweight materials, next-generation display and energy materials by reinforcing our capability with high-value materials and customer care.

Life Sciences

We work toward healthy lifestyle.

LG Chem was the first Korean company to obtain new drug approvals from the U.S. FDA. Planning to foster this business in the mid to long run, we are also targeting overseas markets to become a global pharmaceutical company through continued investment, R&D and new drug development.

PD, SD, Aesthetic



CEO Message

“Building strength on strength”

Dear respected stakeholders,

I deeply appreciate your unchanging love for LG Chem. Ever since the foundation in 1947, LG Chem has undergone constant innovation to become a leading chemical company of South Korea. After inventing an unbreakable cosmetic bottle cap around 70 years ago, LG Chem has been developing advanced technologies and products. Leading global companies are looking for our products, and we are making aggressive R&D investment to develop even better solutions. LG Chem was listed among top 10 global chemical companies selected by the Journal of American Chemical Society and ranked 4th for chemical brand value announced by Brand Finance UK. LG Chem is working toward a higher position of global top 5 by accumulating its capability and knowhow. As there are new demands and values in the market that are changing business management of companies, LG Chem needs to seek for constant innovation with advanced business portfolio and excellent organizational culture. We would like to drive change and innovation by focusing on the 4 major initiatives to make LG Chem strong.

We will regard ‘customers’ and ‘markets’ as the heart of all businesses.

LG Chem already has outstanding technologies and products, but customers and markets are the ultimate goals of all technologies and products. We are going to establish a more customer-oriented and market-centered business model. The existing system of 5 business divisions was reorganized into a system of 4 business divisions in April 2019. The Advanced Materials Division was formed in response to the needs of customers and markets, divided into 3 units of Automobile Materials, IT Materials and Industrial Materials to shift the focus from ‘products’ to ‘future markets and customers.’ LG Chem will concentrate on finding customer values by maintaining a powerful business portfolio.

All technology innovations will focus on commercialization.

LG Chem has about 5,000 researchers and annually invests KRW 1 trillion into R&D. Aggressive investment in R&D has always been the foundation of LG Chem. The true meaning of R&D is in commercializing products needed by customers and markets. We will rearrange the gate review procedure and performance measurement method from the perspective of commercialization and strengthen our R&D programs. Innovation can be achieved through flexible assignment of R&D resources and workers in appropriate places.

We will increase efficiency by enhancing productivity and quality.

Due to limited resources, it is difficult to survive in a competitive setting without increasing efficiency. While promoting innovative production surpassing internal costs that are increasing every year, LG Chem will engage in strict quality control. The Six Sigma will help us increase efficiency with a common productivity and quality management system. Standardized IT systems and processes can ensure same communication in Korea and overseas.

We will secure people, leadership and organizational culture for greater LG Chem.

True innovation is only possible when all members of an organization can express their latent values. Members can grow in a learning organization, which thus leads to innovation. LG Chem is preparing for leadership and organizational culture based on creativity, learning and discussion. We embrace diverse individuals and exchanges to have a global mindset. Participation of female workers and ratio of female managers will be increased, and local talents recruited in overseas will be invited to the head office for increased diversity.

LG Chem can accomplish sustainable management with the help and attention of various stakeholders. More channels will be added to communicate with stakeholders. The recent issue of Yeosu Plant covered by press media left an important lesson for LG Chem. LG Chem promises to prevent similar issues by implementing an advanced air pollutant management system. A crisis can become an opportunity to increase corporate values for strong companies. LG Chem is a strong company prepared to take a step forward. By building strength on strength, we will endeavor to increase our values and prepare for the future.

Our goal is to make ‘LG Chem trusted by customers’ as one of global top 5 chemical companies. Please continue your support and encouragement.



June 2019

Shin, Hak-Cheol, Vice chairman and CEO of LG Chem

Our Strategy

LG Chem has fulfilled its social responsibility through value creation, human respect and Jeong-Do management. CSR Team was formed in 2013 to establish the sustainable management system and communicate with stakeholders about core sustainability tasks.

The CSR Committee supervised by the CEO was launched in 2016 to discuss issues related to 10 topics including economy, environment and society. We have solidified our sustainability governance system through the Board of Directors.

Matters reported to the Board of Directors

Year	Trend	Achievement and plan
2016	High expectation and demands of stakeholders on CSR	Strengthen communication with external stakeholders and internal CSR capacity
2017	International regulatory trends on CSR	Strengthen CSR evaluation on suppliers
2018	High demands on managing CSR risk in supply chain	Promotion of social contribution activities
		Promotion and expansion of Cobalt supply chain review through third-party institutions

Sustainability Strategy for a New Step Forward

LG Chem strives to find a better solution for the humankind. We turned 'materials of dream' into reality by presenting unprecedented technologies and products. In 2019, LG Chem will prioritize customer values and deliver abundant lives to the humankind by analyzing the global environment, sustainability strategy and internal capabilities. LG Chem helps its executives and employees become aware of sustainability by coming up new core areas and tasks for sustainability of the world.

Increased Communication with Stakeholders

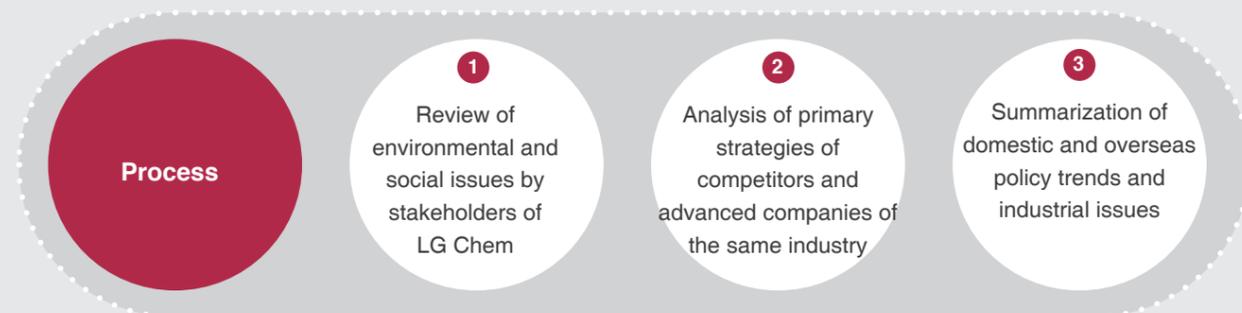
Communication with stakeholders is an important part of sustainability pillars. LG Chem considers opinions of stakeholders when establishing its sustainability goals.

Customers	Importance of sustainability of products for sustainable development	Social responsibility of products is becoming as important as quality. LG Chem needs to have a sense of responsibility for the entire supply chain from mining of raw materials to finished battery products. In all manufacturing stages, LG Chem must reduce carbon emission, air pollution and water usage while complying with the rules on evaluation of child labor and human rights infringement
Investors	Need for business growth and strict risk management	LG Chem has secured diverse business portfolios for the future. The diversity of business portfolios has a positive effect on profit, but we need to manage risks involved with the supply of raw materials
Partners	Need to support excellent partners	LG Chem is actively promoting shared growth with partners. There must be a system to better review and support partners. We try to inform such support programs to partners through various communication channels
Communities	Expectation for continual social contribution of youth education	Through Fun Chemistry Park, we started to think positively about social contributions of LG Chem. Both schools and students are highly satisfied with the program because it provides science (chemistry) education contents that are difficult for schools to prepare. I want to see LG Chem expand the scope of this program by increasing the number of participants

Plan

LG Chem plans to come up with the sustainability strategy and goals in the second half of 2019, reporting them in the sustainability report.

Process of Selecting Sustainability Pillars

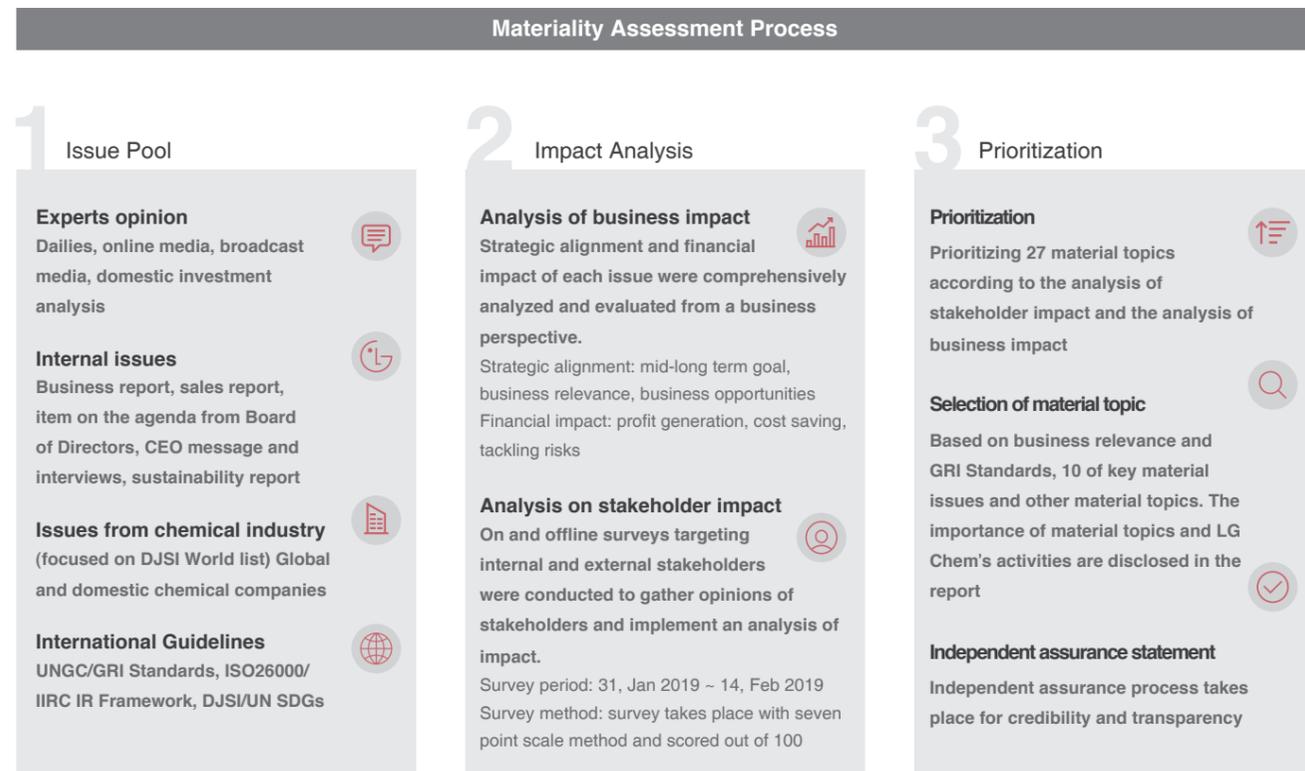


Sustainability Pillars



Materiality Assessment

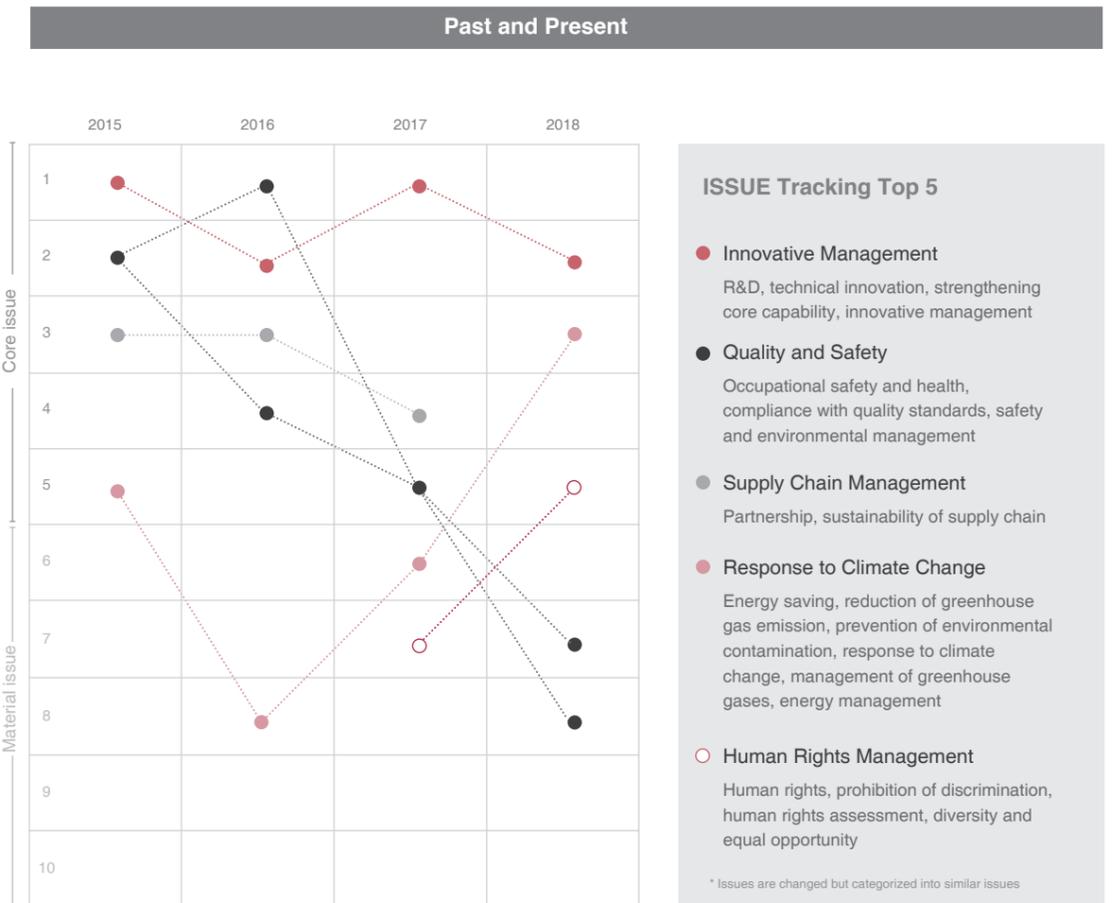
Materiality assessment is very important in establishing the sustainable management strategy and understanding the interest of stakeholders. Companies can set goals and improve sustainability through materiality assessment. LG Chem has been conducting materiality assessment annually since 2007 to analyze the influence of important issues on our management activities. The detailed assessment procedure is as described below.



We have summarized 460 major issues related to sustainable management of LG Chem through media research, analysis of sustainable management standards, policies, regulations and industrial cases. Overlapping issues were removed to sort 21 issues based on internal and external correlations, importance and probability.

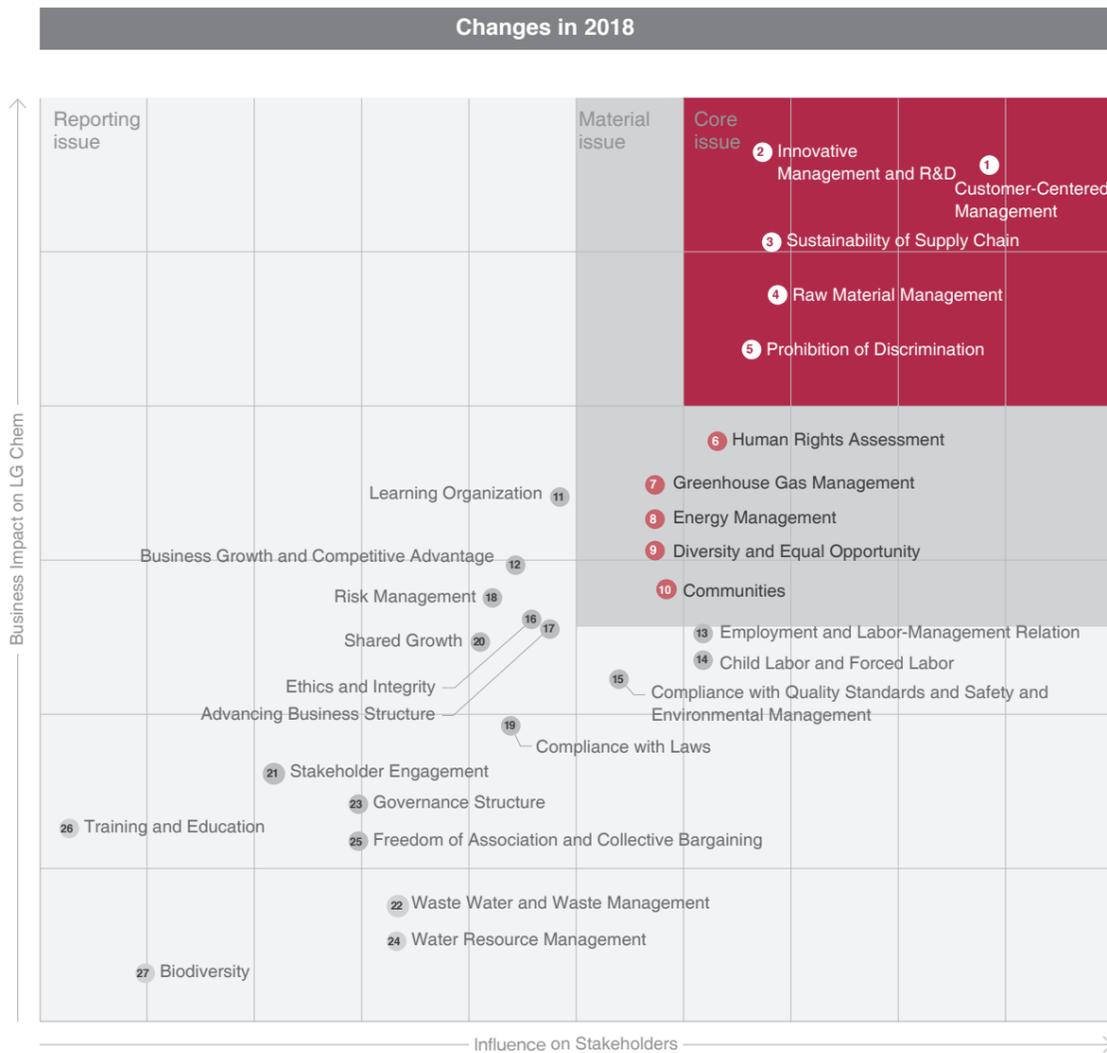
The 27 issues selected were comprehensively analyzed for 'influence on business' and 'influence on stakeholders.' 'Influence on business' was reviewed by measuring strategic importance with experts, and 'Influence on stakeholders' was reviewed by conducting a survey on our employees and external stakeholders.

The final priorities were determined based on assessment of stakeholders and strategic importance. The 27 issues were classified into 5 key issues, 5 important issues and 17 reported issues. We tried to report key and important issues in greater detail, presenting the assessment results for each issue.



In this year's report, the trends of sustainable management issues from 2015 to the present were analyzed for increased understanding. Important issues of LG Chem that existed in the past include innovative management, quality and safety, supply chain management and response to climate change. Human rights management has become important in the recent.

Based on the results of materiality assessment from 2015 to 2018, similar issues such as innovative management, quality and safety, and response to climate change were considered as key issues each year. Among them, innovative management was selected by internal and external stakeholders as the most important issue in 2015 and 2017 and the second most important issue in 2016 and 2018. Response to climate change has become relatively less important than in the past, but it has always been a key sustainable management issue of LG Chem. The quality and safety issue was assessed to be the third most important in 2015 and 2016 and the fourth most important in 2017. Supply chain management was changed from a key issue to an important issue from 2015 to 2016, and then back to a key issue and the third most important in 2018. The human rights management issue has lately been regarded as important with conflict minerals and work-life balance of employees.



The core sustainable management issue of LG Chem in 2018 was ‘customer-centered management.’

There were many sustainable management issues in 2018, but ‘customer-centered management’ was regarded as the most important issue by internal and external stakeholders. Other core issues of LG Chem included innovative management and R&D, sustainability of supply chain, and raw material management. Sustainability of supply chain was changed from an important issue in 2015 to a key issue in 2018. Human rights issues have been segmented into 4 issues (prohibition of discrimination, freedom of association and collective bargaining, human rights assessment, and child labor and forced labor). Stakeholders nowadays do not simply want companies to develop core capabilities and pursue profit. They are interested in social values and responsibilities of companies, thus affecting sustainability of companies.

2018 Reporting principle						
Rank	Topics	Boundary		Report category	Report page	
		Internal	External			
1	Customer-Centered Management		●	Creating Customer Value		
2	Innovative Management and R&D	●	●			
3	Sustainability of Supply Chain	●	●	Business & Human Rights		
4	Raw Material Management	●				
5	Prohibition of Discrimination	●	●			
6	Human Rights Assessment	●	●	Environmental Sustainability		
7	Greenhouse Gas Management	●	●			
8	Energy Management	●	●	Business & Human Rights		
9	Diversity and Equal Opportunity	●				
10	Communities		●	Participation and Sharing with Communities		
11	Learning Organization	●		Performance		
12	Business Growth and Competitive Advantage	●		New LG Chem		
13	Employment and Labor-Management Relation	●		Performance		
14	Child Labor and Forced Labor		●	Business & Human Rights		
15	Compliance with Quality Standards and Safety and Environmental Management	●	●	Environmental Sustainability		
16	Ethics and Integrity	●	●	Performance		
17	Advancing Business Structure	●	●	New LG Chem		
18	Risk Management	●		Performance		
19	Compliance with Laws	●				
20	Shared Growth		●	Performance		
21	Stakeholder Engagement	●	●		Appendix	
22	Waste Water and Waste Management		●	Performance		
23	Governance Structure	●		Appendix		
24	Water Resource Management		●	Performance		
25	Freedom of Association and Collective Bargaining	●				
26	Training and Education	●		Participation and Sharing with Communities		
27	Biodiversity		●			

LG Chem determined priorities of major topics through materiality assessment, dividing top 10 topics into key issues and important issues. The 27 issues were reported in accordance with the global sustainability reporting guideline of the GRI Standards. Details are as presented in the table below.



ISSUE 1. Creating Customer Value

Creating Customer Value

How can we find a better tomorrow for our customers?

LG Chem is constantly working to find better solutions for the future of customers. Ever since the foundation in 1947, LG Chem has always regarded customers as the most important part of business operation. The mission of LG Chem is to promote shared growth and provide solutions of another level to customers. At this very moment, we are continuing our challenge and innovation for the 'creation of customer values.'

“ ”

ISSUE 1 **Creating Customer Value**

Our Approach

The competition structure of the chemical industry has been changing rapidly in the recent due to aggressive strategies taken by industrial leaders and protective trade policies of different nations. The market competition intensifies with the fierce chase of latecomers, and we can no longer settle for high-quality products. Companies are required to offer new innovative values to customers while finding new growth engines to dominate the future market. Customers nowadays pay in return for values. We must provide a differentiated solution to each customer in response to the changing demand. LG Chem engages in ongoing challenge and innovation in the global industrial scene. Customers are regarded as the center of all processes, and we ensure competitiveness of products through continual innovation of quality. 'Solution Partner' is a program to help find solutions for customers.



Our Focus Areas

1 Customer-Centered Business Process

We are reinforcing customer infrastructures by reorganizing the customer support organization and building a customer response system.

2 Customer Values Through Innovation

LG Chem continues challenge and innovation for customer values in all business processes including organizational culture, R&D and manufacturing process.

3 Customer Values Through Products

Perfect products are trusted by customers. LG Chem strives to make products that can guide the way of customers to success.

Special Q&A

We Asked Professionals.

LG Chem conducted interviews with professionals to find out what it needs to focus on to create customer values. These face-to-face interviews took place on February 14 and February 19.



1 2 3

Interview 1

Kim, Seung-Gyun Professor
The Catholic University of Korea



Q. How do you think about sustainable management activities of LG Chem?

LG Chem pursues global growth by ideally rearranging its vision, shared values and sustainable management system in the LG Way. The partner CSR evaluation system and measurement of the effects of social contribution programs using SROI are the efforts to lead sustainable management. I look forward to see our company create social values and show inclusive growth, contributing to the lives of internal and external stakeholders through innovation.

Q. What do you think LG Chem should focus on to provide better values to customers?

Whereas only financial values were taken as important in the past, the business environment of the present era is changes according to social influence. It is important to focus our capabilities to enhance economic, social and environmental values in response to such social changes. This applies to water treatment technologies and electric vehicle batteries of LG Chem. I expect to see socially 'valuable'

products and solutions that can bring positive changes to customers and the society.

Interview 2

Kim, Byeong-Yeon Team Manager
NH Investment & Securities



Q. What are some benefits of sustainable management conducted by LG Chem, what needs to be improved?

The strength of LG Chem is in making investment for the future. From the viewpoint of an investor, it has been very encouraging to expand the business portfolio through active R&D investment. Proactive material supply and R&D are the activities to manage risk and promote sustainable growth. LG Chem can operate responsible businesses in social, economic and environmental areas by creating values for various stakeholders including customers, investors and workers.

Q. What does LG Chem need to work on to provide better values to customers?

With the continuation of low growth and oversupply, 'value-oriented' management is important in securing competitive advantage. This is especially so in the chemical industry because of the rapid change and intense competition. Companies cannot maintain partnership simply with good products. They must be able to catch

what customers want and reach beyond expectations.

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Customer-Centered Business Process

“To actually create values for customers, LG Chem will communicate from a close distance.”



Stronger Customer-Centered Business Management

Customer-Oriented Business System

LG Chem regards customers to be in the center of idea planning, R&D, production and sales. We repeat our challenge and innovation to resolve difficult issues and fulfill values needed by customers with special materials and solutions. Customers have trust in values of LG Chem. LG Chem also seeks for potential needs of customers, even before they ask.

Customer Support Organization

LG Chem shifted the focus of its organization from products to future

markets and customers. Product planning, marketing and R&D workers have been recruited to ensure greater customer support and provide solutions. LG Chem will make an organization that engages in customer-centered management and thinking to provide differentiated values.

Customer Response System

LG Chem has established a customer response system based on a standardized process of finding the needs. This process allows us to find measures for improvement and review the improvement effects. The process was standardized for a prompt and stable response to various issues. Such activities are important in satisfying expectations of customers about LG Chem.

Protection of Customer Information and Increased Communication

Protection of Customer Information and Increased Right to Know

We implement periodic education programs for the information protection association and employees to safely protect customer information. LG Chem has a system to comply with information protection laws by monitoring related matters and operating the information protection association. A strong security system is in place to prevent leakage of information via persons, vehicles and articles coming in and going out of business places. In addition, LG Chem provides product information to customers on the Chemwide website (www.chemwide.co.kr) to guarantee the right of customers to know.

Product information includes primary uses, features, physical properties, MSDS and environmental certification documents. The Chemwide website can be accessed easily because it is linked to the official website of LG Chem. MSDS is one of the basic documents that are intended to provide environmental and health information to users of chemical substances. We will continue to update product information in order to reduce potential safety, environmental and health risks.

Efforts to Communicate with Customers

The very first step to the creation of customer values is to listen to the voices of customers. LG Chem is expanding its communication channel to assist customers from a close distance.

- 1 **Survey**
Periodic and continual surveys are conducted to find the needs of customers.
- 2 **Business Meeting**
Customers are visited frequently to examine their status and potential needs.
- 3 **Website**
We collect opinions from customers on our website.
- 4 **QTR(Quarterly Technical Review) Meeting**
- 5 **QBR(Quarterly Business Review) Meeting**
We find the means to promote shared growth through periodic business and technical meetings with major customers.



ISSUE 1. Creating Customer Value

Customer Values Through Innovation

“ True innovation comes from all business processes including the organization and manufacturing process beyond technologies and products. LG Chem creates customer values through innovation of all business areas. ”

R&D Innovation for Core Capabilities

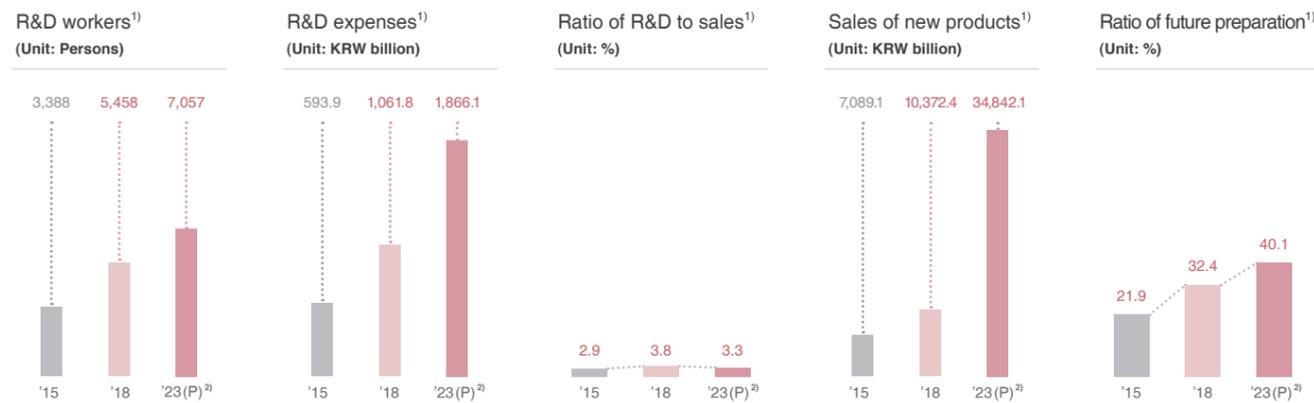
Solutions offered to customers must be differentiated to increase their satisfaction. LG Chem continues its R&D investment and technical innovation to provide advanced technologies and solutions in the changing business environment.

Increased R&D Capabilities for the Future

In the end of 2018, LG Chem reorganized its R&D sector into professional research centers based on the enhancement and diversification strategy of each division. Corporate

R&D Center that directly belongs to the CTO was divided into five centers including Platform Technology Research Center, Future Technology Research Center, Green Bio Research Center, Analysis Sciences Center and Pioneering Research Center. We prepare for the future by fostering new businesses and providing professional technical assistance. The Advanced Materials Division has combined three existing research institutes and centers into ‘Advanced Materials R&D Center’ and opened ‘Platform Technology Center’ for a generic technology system,

as well as ‘EP Center,’ ‘Functional Films Center,’ ‘Display Materials Center,’ ‘Industrial Materials Center’ and ‘Bonding Technology Center’ for R&D functions closely associated with our businesses. The Life Sciences Division was reorganized into Drug Discovery Center, CMC Center, Clinical Development Center and Product Development Centers in response to new drug pipelines and global clinical needs. Lastly, the Petrochemicals Division runs Petrochemicals Research Institute, Tech Center, and has newly opened Catalyst R&D Center.



1) The performance of FarmHannong and Life Sciences division is included in data from the second quarter of 2016 and after 2017 accordingly. 2) Based on 2019-2023 plan from the second half of 2018 business briefing session



Increased R&D Investment

LG Chem fosters new growth engines by making bold R&D investment. In 2018, we invested over KRW 1 trillion in R&D to prepare for future bio-related businesses. The ratio of R&D investment to overall sales has been kept above 3% since 2016, and over 30% of R&D investment is used to prepare for the future in the mid to long term.

Expanded Open Innovation

Our open innovation is intended to secure promising future technologies and increase business competitiveness. LG Technology Ventures was founded to invest in promising start-ups in the fields of energy solutions, lightweight vehicle materials and red and green bio. In addition to such direct investment efforts, we also manage investment risk and expand the network by participating in venture capital funds. We hosted the ‘Global Innovation Contest (GIC)’ for leading universities and research institutions around the world. We also offered an opportunity for universities and research institutions to share innovation ideas in five business areas and exchange researchers and technologies by financing R&D expenses. The program for projects of new professors is in place to form a cooperative network with rising professors of South Korea.

R&D Innovation Cases

Unpainted Metallic Color Materials

The metal look design has recently become the luxury trend of the premium home appliance market. The metal look was embodied using the painting process in the past, but the demand for the unpainted metal look was increased rapidly for cost reduction, eco-friendliness and automated process. An unpainted metallic color material was developed by mixing materials with metal particles. Our new material has increased impact strength by 40% without defect and gloss reduction through the dispersion of metal particles and embodiment of a real metal look. Our operating profit ratio exceeded 20% after replacing the conventional metallic ABS by this new material.

as cryogenic and life environment. PC is primarily applied to mobile phone housing and electronic materials that require high rigidity and chemical resistance. We have recently expanded the scope of PC to automobile interior materials such as Center fascia strong against friction and noise.

3rd Generation Long Range EV Batteries

LG Chem has secured the capability to lead the 3rd generation EV battery market after 2021 with high-capacity materials, increased energy density through a new electrode design, and shortened time of quick charging.

Particle Phase Separation Technology for Anti-Reflection Coating

An anti-reflection display film that is strong against scratches and contaminations was developed using a phase separation technology for inorganic particles with varying refractive index. This technology can form a multi-story structure with desired refractive index by single coating, simplifying the process and reducing cost.

Development of High-Performance Silicon PC (Polycarbonate)

PC (Polycarbonate) is a representative engineering plastic material with transparency, excellent mechanical rigidity and thermal resistance. Silicon PC of LG Chem not only maintains such strengths of PC but is designed to maintain physical properties under diverse conditions such

Open Innovation in Life Sciences

LG Chem constructed the 'Global Innovation Center' in Boston, U.S., a place with loads of R&D centers of global pharmaceutical companies, biotechnology institutes and professional medical institutions for cancer and immune disorders. Our new drug pipeline value is to be included among 'top 30 pharmaceutical companies in the world by 2030.' We have expanded our research areas from diabetes treatment to anti-cancer and immunology. Our passionate open innovation activities resulted in the expansion of the global new drug pipeline. PDC*line Pharma presented an anti-cancer vaccine project to overcome limitations in the production of anti-cancer vaccines through unlimited proliferation and culturing of cells. We signed a joint research and licensing agreement with Sprint to develop new drugs (first in class) for non-alcoholic steatohepatitis. We are conducting joint research with Avacta to develop protein treatment using a core platform technology (affimer) and working with CUE Biopharma on its three new immune anti-cancer drugs in the preclinical and candidate finding stages. We also signed a joint research agreement with Medipost on stem cell medicines for degenerative osteoarthritis.

Manufacturing Innovation for Increased Efficiency

LG Chem increases productivity and quality in the manufacturing area to enhance customer values. Various ICTs are applied to our manufacturing lines for intelligent manufacturing.

Activities to Increase Manufacturing and Development Capabilities

We are increasing our manufacturing and development capabilities to achieve intelligent manufacturing. This is done by selecting significant competitive indicators (core KPIs) of all businesses and establishing mid to long-term goals. In 2018, the Steering Committee supervised by the CEO was operated in 2018 to manage 26 KPIs selected for 7 business groups. The Steering Committee checked up on our activities and shared exemplary cases on a monthly basis.

Intelligent Manufacturing and Data Analysis Experts

In 2018, LG Chem executed 10 projects for the intelligent manufacturing PoC (Proof of Concept) and found a variety of cases in areas like AI and big data analysis, intelligent and automated processes, and intelligent testing. The Best Practice Contest (BPC) was held to share outstanding examples in 2018. Leaders of intelligent manufacturing gathered periodically to share examples of new technologies and discuss the directions for intelligent manufacturing. They benchmarked role models of leading global companies and engaged in external and internal communications on intelligent manufacturing. We have also spread intelligent manufacturing culture by announcing knowledge and trends of the 4th industrial revolution. Experts on AI and big data were trained within the group, and an internal data analysis training program was operated to increase data analysis capabilities of R&D, production and quality workers.

Innovation of Organizational Culture to Enlighten Members

It is very important in sustainable management to motivate members of the organization and help them commit to work. We can only create customer values through organizational culture in which all members can express their latent values. Our horizontal organizational culture and open communication aim to foster individuals who can work efficiently with value-centered decision making and work processes. LG Chem tries to make a happy workplace for employees by finding a balance between work and home.

Value-Centered Work Method

LG Chem has been providing the guidelines for an innovative work method. We focus on creating customer values and increasing autonomy of

members at work by getting rid of inefficient duties that are unrelated to customer values. Primary activities include simplification of reports and avoidance of unnecessary meetings.

Simplified Job Grading System for Horizontal Organizational Culture

A new job grading system was implemented in 2017 to spread horizontal and creative organizational culture in response to the changing business environment. We have simplified the grading system for office workers and researchers from a 5-stage system (assistant, assistant manager, manager, senior manager, general manager) based on 'position and seniority' to a 3-stage system (associate, specialist, professional) based on role. Team leader candidates were expanded to include 'senior-level managers' to provide more opportunities for young and capable individuals.

Open Communication Culture

LG Chem is strengthening the communication channel between managers and members to promote the downstream implementation of vision, core values and management strategies and to establish horizontal communication culture. To be trusted by customers in adhering to the basics and principle, we provide unique discipline guidelines including the Focus on Leading the Market Board and monthly letters. Our members can openly share their opinions and get responses from the management through the Speak Up Table, together with the Employee Council. We also try to make improvement after listening to the voices of members.

Energy Management of Members

LG Chem has been managing energy of members by introducing the 'Wellness Program' in 2018. This program manages three energies (physical, emotional and mental) of participants by controlling their stress and enhancing inner status at the Konjiam Resort in Gwangju, Gyeonggi-do. This program was planned out to prevent burnout of workers, which causes adverse side effects like the lack of accomplishment and poor productivity due to extreme work stress and physical, emotional and mental fatigue. Members have shown positive responses to the program for providing a healing experience. LG Chem will continue to manage energy of its members by bringing innovation to production and work method.



ISSUE 1. Creating Customer Value

Customer Values Through Products

“Perfect products are needed to gain trust from customers. LG Chem provides reliable and valuable products to customers based on thorough quality control.”

Increased Quality of Products

Products of LG Chem are used as materials to make finished products. Since quality of materials determine quality of finished products, LG Chem always endeavors to provide products of higher quality. LG Chem enhances customer values by increasing quality through strict management.

Product Responsibility System

LG Chem contributes to the sustainable future of customers to 'increase customer values' with competitive materials and solutions. The vision is to become an 'Eco-Product Solution Partner' that finds and offers an efficient and valuable solution to all manufacturing processes including R&D and disposal. We have regulations and systems to guarantee eco-friendliness of chemical products 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 REACH, SVHC, CA Proposition 65 and conflict minerals, LG Chem has established its own

criteria for materials and notified such criteria to suppliers. We only approve purchasing of materials that have been verified as hazardless based on material component information provided by suppliers. The department of procurement and the department of environmental safety communicate directly with suppliers to manage eco-friendly materials. The department of quality and the CS team communicate with clients to control product quality.

Building Product Responsibility Capacity

LG Chem conducts various education programs so that employees can recognize the importance of product responsibility and comply with environmental and social responsibility of products in business. Such programs include preparation and management of MSDS for managers of procurement, development and quality departments, substance registration process of EUREACH and the Act on Registration, Evaluation, etc. of Chemicals, and response to global production environment regulations.

Sharing Product Responsibility Information

Through the Safety & Environment Portal, LG Chem provides latest information related to environmental safety of global products and hazardous substance regulations to share product management information with quality managers of each business sector. Essential regulations of each country are shared to prevent violation of laws.

Company-Wide Quality Management System

LG Chem has established an advanced quality management system to increase trust and satisfaction of customers. A corporate level quality assurance team is in operation to 'enhance quality of products at all sites.' This team inspects the quality management system of 38 business sites to find and fix non-conformities. Special lectures of the

CEO, quality conferences of the CEO and quality workshops of the division heads are conducted to educate quality managers in each office and site on the quality mindset.

Advancing Quality Management System

LG Chem implements the Failure Mode & Effects Analysis (FMEA) and step-wise gate review processes to rearrange the quality criteria and secure stable quality in the development stage. A quarterly chemical quality council is operated to improve the quality management system of each business unit. The quality council comprised of the top management from all affiliates of LG Group lead the efforts to handle common quality affairs.

Improving Role and Capacity of Quality Organization

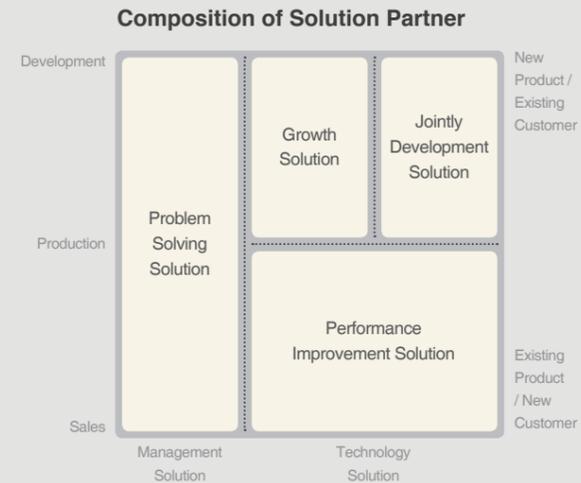
To improve the role and capacity of the quality organization, we opened the Quality Academy Level I (basic), II (intermediate) and III (advanced) courses to train talented quality workers. Especially, we are training experts of certification for organized management of the quality system. We have trained 119 experts of ISO9001, IATF16949 and VDA6.3 certifications so far. LG Chem continued to foster the Six Sigma for quality improvement. The number of Master Black Belts (MBBs), project leaders in key business areas, has increased from 66 to 143, and the number of Black Belts (BBs) the project sub-leaders has grown from 755 to 1,070. LG Chem engages in an activity to reduce failure cost by resolving persistent quality issues.



Zoom and Focus

Solution Partner

“Solution Partner is a unique partnership program of LG Chem that impresses customers through problem solving and outcome.”



Solution Partner for Innovation of Customer Values

The needs of the market and customers are changing constantly, and it is difficult to differentiate a company with products and services alone. For this reason, LG Chem attempts to gain trust of customers through Solution Partner, which offers product and service values of another level. We are finding the pain points and needs of customers to propose the values they want and utilize all available resources including R&D, production and service.

Composition of Solution Partner

Solution Partner is divided into management and technology. The problem-solving solution helps solve various business problems faced by customers. There are other solutions such as the growth support solution that increases sales and market share of customers through development, the performance increase solution that increases manufacturing competitiveness of customers, and the joint development solution that develops target products and technologies by working together with customers. We bring innovative customer values to all business areas according to the vision of becoming a 'global company that grows with customers through materials and solutions.'



Increased Quality Competitiveness Through Improvement of Colored Spots on Wallpaper

Colored spots created on wallpaper of new-built apartments are experienced by all customers (wallpaper makers). Though these spots are caused by the transfer of the residual sublimation dye on the plaster board, wallpaper makers were asked by construction companies to resolve this issue. To fulfill the needs of customers, LG Chem developed an evaluation technique, reviewed the factors influencing the spots, and optimized the treatment conditions. We were able to remove spots on wallpaper by changing the papering conditions through blending of additives. Our customers successfully reduced the cost for claims and enhanced their brand images to increase market share in the wallpaper market.

Provision of Values Through Brand Differentiation Message of Zemiglo

Zemiglo is Korea's first medicine for treatment of diabetes. Since it takes a long time to develop medicines and conduct clinical trials, we established a mid to long-term plan in the early stage of launching. Doctors who prescribe medicines must have enough knowledge in different treatment methods and clinical evidences to control blood sugar and manage associated diseases. LG Chem increased the selectivity of products and conducted a clinical experiment through direct comparison with three products showing highest market share. By evaluating brand positioning of the product, we delivered a differentiation message that conveys feedbacks from customers. Such customer-centered activities allowed us to be ranked 2nd in the complex medicine market.



Growth of Customers Through Development of LEV Battery Pack and Creation of Mass Production Line

In Southeast Asia, 2-wheeled vehicles like scooters are the primary means of transportation. The Light Electric Vehicle (LEV) market is growing rapidly as LEVs emit less carbon dioxide compared to internal combustion engines. Our customer was the Vietnam's first OEM that had the needs for an internalized battery pack technology to stably cope with the explosive demand. LG Chem formed a cross-functional task force among research institute, development and quality center to collaborate with this customer closely from promotion to mass production. We proposed a product solution based on a standardized module and supported the customer in building local production lines by founding a joint venture. This strategic cooperation helped our customer dominate the LEV market and create an eco-friendly brand image.



Protecting Our Planet

It is our responsibility and obligation to hand down abundant natural environment to the future generations.

Our planet is endangered by particulate matter, heat wave, heavy snow and flood. Children who are supposed to be playing in a playground are wearing a mask to breathe in less dust. LG Chem makes constant efforts so that the future generations can enjoy clean air.



EV Solution

LG Chem opens a new era of future mobility with the disruptive technology

Long Driving Range of 470km
High Energy Cell with Ni-rich NCM Cathode

Lightweight 「Advanced Module」 with Thermal Adhesive
Higher Volume Efficiency and Improvement of Cooling Performance

Underfloor Installation
Lower Profile by Design Flexibility of Pouch Cell



470 km
Driving Range (WLTP)
Up to

90 kWh
Battery Energy

* Worldwide Harmonized Light-duty Vehicles Test Procedure

ISSUE 2 Environmental Sustainability

Our Approach

Climate change is one of the most important current issues. After signing of the Paris Agreement in 2015, many countries in the world have been trying to reduce greenhouse gas emissions. South Korea has adopted various policies based on the specific reduction target for 2030 (to reduce emission by 37% compared to prediction). On the one hand, environmental issues can be a crisis and an opportunity at the same time to companies of the chemical industry that are highly energy dependent. Companies are developing eco-friendly technologies and products in response to the climate change issues. Responding to climate change has become an essential survival strategy.

LG Chem actively responds to climate change by creating an organization and removing hazardous factors in all business processes. We conserve energy and reduce greenhouse gas emissions by improving processes. There are direct and indirect ways of coping with climate change, such as the production of eco-friendly products like vehicle batteries and ESS batteries.



Our Focus Areas

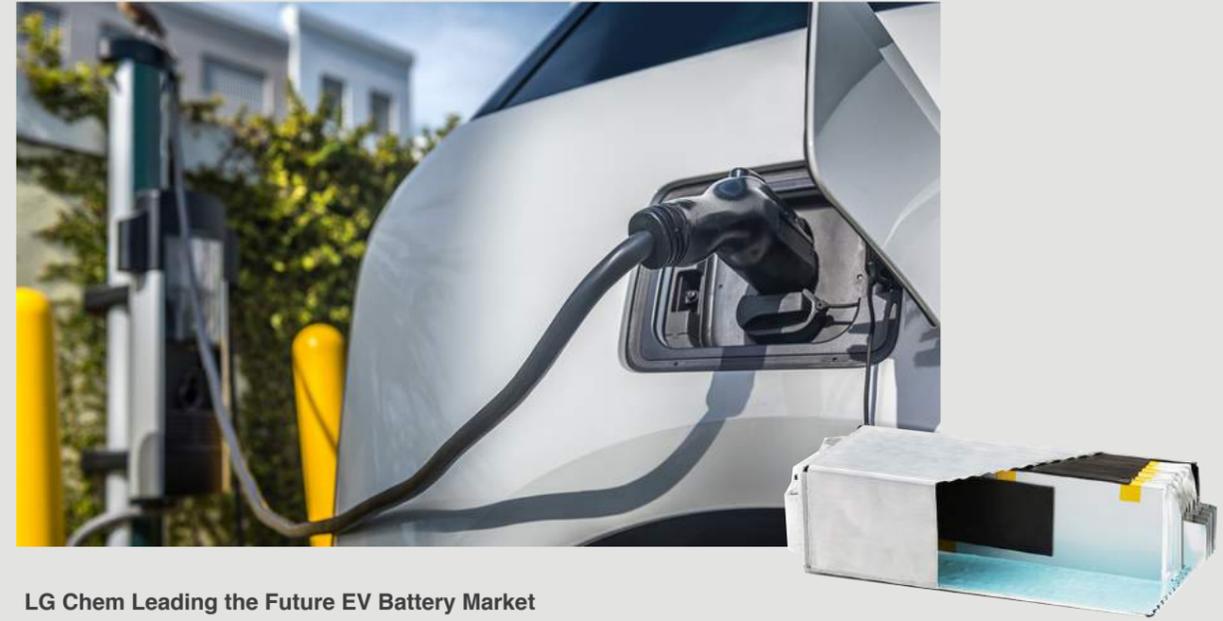
- 1 System for Tackling Climate Change**
 LG Chem takes climate change response as a new opportunity and establishes measures by closely analyzing risks of climate change.
- 2 Tackling Climate Change Through Products**
 LG Chem contributes to the sustainable development of the planet by developing eco-friendly products and controlling environmental hazards.
- 3 Efforts to Minimize Environmental Impact**
 We make every effort to minimize environmental impact of business activities by conserving energy and constructing a resource-recycling process. We assist small and medium companies that have difficulties responding to climate change on their own.
- 4 Management of Safety, Health and Environment**
 LG Chem reinforces management of safety, health and environment to protect the environment and safety of employees.

Special Page

We Contribute to the Formation of Sustainable Ecosystem Using EV Batteries.



LG Chem contributes to the reduction of carbon dioxide by supplying eco-friendly batteries for low carbon vehicles to OEMs. According to SNE Research, global EV sales will grow from 6.1 million in 2019 to about 22 million in 2025. The EV market is already forewarning the change of transportation means from internal combustion engines to EVs. The EV market is expected to grow faster with the stronger carbon dioxide emission target of EU, environmental taxes in China, and average mileage standards in the United States.



LG Chem Leading the Future EV Battery Market

As the numbers tell, EVs have come into our everyday lives. The lithium-ion battery is the primary source of power that moves EVs. This is a secondary battery that can charge and discharge electricity by moving between the anode and cathode. LG Chem is leading the market by supplying excellent EV batteries to global OEMs. In addition to making batteries for all eco-friendly vehicles including HEV, PHEV, and EV, LG Chem offers battery solutions based on a precise and reliable battery management technology, a design that accounts for output energy, cooling, size and price, and a specialized pack structure.

First 'Green Bond' Among Global Chemical Companies

On the one hand, LG Chem was the first chemical company in the world to issue a green bond of 1.56 billion USD (about KRW 1.78 trillion). The green bond is an international bond issued and distributed in primary financial markets such as the United States, Europe and Asia. The scope of the green bond is limited to eco-friendly investment in the fields of new and renewable energy and EV. LG Chem will further expand its EV battery business.



ISSUE 2. Environmental Sustainability

System for Tackling Climate Change

“Tackling Climate change is not just a crisis but also an opportunity for companies. LG Chem takes the global climate change issue as a chance for growth and focuses on greenhouse gas and energy management.”

Management of Climate Change Risks

LG Chem analyzes government regulations and new business opportunities related to climate change and classifies climate change risks into three aspects including regulatory and physical aspects. LG Chem is capable of assessing financial, qualitative and quantitative impact of climate change. LG Chem will continue its efforts to examine risks and opportunities of climate change.

Advancing Greenhouse Gas Emission Trading Portfolio

Ever since the emission trading scheme was implemented in 2015, LG Chem has been making various efforts to minimize risks in business operation. Financial risks are reduced by introducing a system that analyzes greenhouse gas emission and calculates expenses in advance. The ‘Council on Emission Credit Purchasing’ is in operation to make reasonable decisions and establish purchase strategies for each period.

LG Chem has internal regulations to analyze greenhouse gas effects of all extension investments after 2015 to facilitate low carbon investment and reflect greenhouse gas risks on investment decisions.

We prepared for 8 work guidelines in 2017 including the ‘Regulation on Response to Climate Change Regulations.’ Such guidelines are updated regularly to check up on the business process and internal R&R (Role & Responsibility) in response to the emission trading scheme.

Setting and Management of Greenhouse Gas Reduction Goals

Setting of Greenhouse Gas Reduction Goals

LG Chem has established goals to reduce greenhouse gas emission by 23% compared to the business-as-usual (BAU) level by 2020 and to reduce energy intensity in the mid to long term. We are accomplishing annual reduction goals each year. After 2020, we plan to come up with a strategy and road map to reduce greenhouse gases through various activities such as the use of new and renewable energy, response to RE100, development of carbon dioxide reduction technologies, and promotion of overseas greenhouse gas reduction businesses. This strategy can turn LG Chem into a global leader of greenhouse gas reduction.

GHG Emission (Unit: thousand tons)



Energy and Greenhouse Gas Management System

LG Chem has established the Greenhouse Gas and Energy Management System (GEMS) in response to government regulations and financial risks. The GEMS is used to calculate monthly emission credit expenses and reflect them on production cost. We purchase emission credits according to the changing emission credit market conditions. We prepare manuals and conduct periodic workshops to train related workers. Monthly newsletters are published to share important global issues related to energy and climate change at worksites.

Disclosure of Information

Corporate efforts to respond to climate change are regarded as important by investors and customers. LG Chem reports its greenhouse gas emission, emission credit trading results, and energy uses through sustainability and business reports. Annual DJSI and CDP reports disclose information about the climate change response system and status of LG Chem to investors at home and abroad. Upon request, we publish the LCA (Life Cycle Assessment) report by analyzing greenhouse gases emitted during the life cycle of products. We actively participate in greenhouse gas and energy projects of the government such as the emission credit trading system, efficient energy business, and collaboration with SMEs.



ASPECT	ISSUE	RISK	OPPORTUNITY
Regulatory aspect	External emission report, emission credit trading system, product energy efficiency	Increase of operating expenses due to regulations	Expansion of new businesses to eco-friendly products
Physical aspect	Increase of average temperature, change of precipitation due to heavy rain and drought, uncertainty of physical threats	Increase of energy operation ratio, disaster at worksites due to extreme weather, reduction of production quantity	Creation of business opportunities according to increased physical risk
Others	Enhancement of brand image, uncertainty of social factors, uncertainty about market signals	Decline of market value, decrease of demand for products and services	Enhancement of corporate image through leading response activities

Energy Management

LG Chem is advancing the energy management system (ISO50001), which manages monthly energy usage of business sites and configures annual energy reduction targets to improve processes, facilities and technologies. Energy technology exchange meetings and internal systems are utilized to share energy conservation cases.

ISSUE 2. Environmental Sustainability

Tackling Climate Change Through Products

“LG Chem contributes to environmental sustainability by developing eco-friendly products and analyzing the effects of products on the environment.”

Development of Eco-Friendly Products

LG Chem contributes to climate change response by developing products for sustainable social development. We are concentrating our R&D capacity on developing products that can protect the environment such as automobile batteries, ESS batteries and water treatment filters.



Automobile batteries

LG Chem contributes to eco-friendly EV by producing batteries, securing competitiveness in the EV battery market by receiving supplier awards and winning contracts for core EV projects.



ESS batteries

For ESS batteries, LG Chem solidifies global partnership by expanding large-scale power grid projects and signing long-term supply contracts with primary power generators.



Water treatment filters

Our water treatment business is an effort to help resolve the global water problem so that people can drink clean water.

Preliminary Survey to Develop Eco-Friendly Products

To decide the direction and level of eco-friendly product designs, LG Chem sets an eco-friendly supply chain management guideline based on regional and national environmental laws, regulations, specifications, claims and accidents. We restrict the use of substances that are known to be hazardous to human body or the environment.

Eco-SCM Eco-Supply Chains Management

LG Chem operates a system (CHARMs) that prevents adverse environmental effects of products by managing eco-friendliness of materials and reducing environmental hazard.

Securing Safety of Products Through Management of Chemicals

LG Chem produces and supplies materials and products closely related to the everyday life. We try to reduce the environmental impact of our products.

Product Safety System

LG Chem applies a strict standard to check environmental hazard of all products according to the ‘product environment management skills.’ We classify hazardous items into three phases according to risk, and all materials are purchased after verification. We review the product regulation guarantee through CHARMs (Chemical Hazard Assessment and Risk Management). There is a computer network to check MSDS of all materials. We also support the issuance of product environmental guarantees within the system.

Chemicals Management System

LG Chem created the CHARMs in 2014 to prevent environmental safety accidents and comply with regulations throughout the entire process from the purchase and warehousing to the use, delivery and disuse of chemicals. We have been advancing the system for increased legal compliance and product safety. All raw materials purchased through the CHARMs must acquire chemical component information before an order is placed. We carefully check harmfulness and legal response information in advance. Such raw material information is combined with BOM (Bill of Material) information of products to manage risks of products made using raw materials. In 2018,

LG Chem reviewed the chemicals management procedure through PI (Process Innovation). Based on the results, the system will be renewed in 2019 to amend work procedures, instructions and regulations for overseas corporations and subsidiaries.

Response to Chemicals Regulations

LG Chem has created a database for chemicals used by the company or regulated at home and abroad to prevent violation of global regulations. The database identifies new chemicals, existing chemicals and regulated chemicals to guarantee legality of chemicals in each nation and for each client. In accordance with the Act on Registration, Evaluation, etc. of Chemicals enforced in South Korea in 2015, LG Chem joined a consortium of the Korea Petrochemical Industry Association to comply with substance registration. We have registered 40 existing chemical substances out of 510 substances subject to registration in a timely manner. In overseas, we have registered 35 substances according to the EU REACH Regulation and are responding to chemical substance registration laws of different countries including China, U.S. and Taiwan.

Sharing of Response to Chemicals Regulations with Partners

LG Chem hosts an annual eco-friendly partnership conference to explain domestic and international chemical substance regulations. The conference in 2018 accommodated for 172 employees of 136 partner companies to provide explanations on the domestic and international policy trends for chemicals, CSR evaluation and shared growth activities for partners, eco-friendly supply chain management guidelines, and material component

analysis system of LG Chem. LG Chem will continue to pursue shared growth with partners.

Global Chemicals Management

LG Chem responds proactively to global regulations to reduce risks related to chemical substance regulations. ‘Development and Management of Eco-Friendly Products’ was revised and retitled as ‘Product Management Environment.’ The criteria for product component management and the prohibition on harmful substances designated at home and abroad have been subdivided for each material and regulation. We provide guidelines across product development, production and supply to respond efficiently to the demand of different countries and clients. An advanced IT system has been applied to provide MSDS of our products in 33 languages, and the demand of global clients and latest legal trends are reflected on the guarantee form issued by the system.

Advancing Pollutant Emission Management System

In April, LG Chem discovered that Yeosu Hwachi Plant has been recording and reporting pollutant measurement values incorrectly. LG Chem has taken this incident seriously and is making company-wide efforts to prevent the same issue from recurring. LG Chem immediately closed down the plant and is cooperating with the investigation of relevant government agencies. We are conducting hazard and health impact assessment of an assessment agency with public confidence in order to resolve concerns of residents and authorities. We have also reinforced the pollutant management system.

ISSUE 2. Environmental Sustainability

Efforts to Minimize Environmental Impact

“We are trying to reduce greenhouse gases by conserving energy and using eco-friendly processes. We support SMEs that have difficulties responding to climate change and spread environmental management through our supply chain.”



Energy Saving

Installation of ESS (Energy Storage System) at Business Place

The ESS (Energy Storage System) can increase stability of national power supply and suppress construction of additional power plants. LG Chem has been expanding its ESS supply to promote efficient power usage and reduce power cost at business sites. The ESS was added to five business sites in 2018 to operate 130MWh. LG Chem is gradually increasing photovoltaic power generation facilities and will continue to expand the use of renewable energy.

Expansion of Energy Diagnosis

LG Chem strives to increase the energy efficiency by improving the energy process at business sites. We find and apply ideas for waste heat recollection, energy saving technologies and facility improvement. Energy diagnoses are planned out and executed to save energy. Power devices in five business sites at home and

abroad were diagnosed in 2018. The efforts to save energy so far had been focused on reduction through fuel and steam, but many shortfalls have been improved to increase the power efficiency. LG Chem has discovered items to save power usage by KRW 7 billion through the diagnosis of power devices at business sites. We measure spec data and operating status of power devices to create a database. The database is used to come up with measures to replace low-efficiency devices and improve power quality. LG Chem promises to engage in a variety of energy diagnosis activities to continue saving energy.

Improving Energy Technology DB

LG Chem is operating an energy portal system to support energy and greenhouse gas reduction activities. The energy portal is used to manage energy and greenhouse gas reduction goals and share annual activities and issues. Over 1,000 successful cases of energy saving have been uploaded onto the technology DB system to share excellent energy saving technologies. There is an online system to perform internal and external reviews of the ISO 50001 energy management system. Monthly energy and greenhouse gas newsletters deliver important issues.

Excellent Energy Business Certification

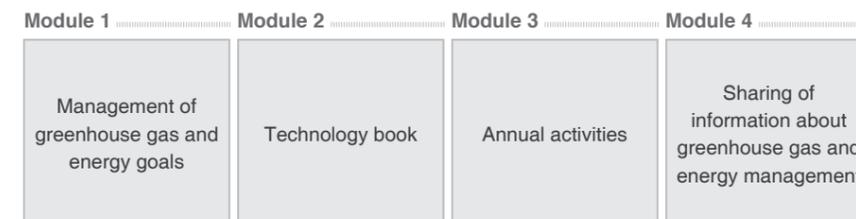
Cheongju Plant, Ochang 1 Plant and Daesan Plant of LG Chem were certified as excellent energy business sites by the Korea Energy Agency in 2018. The excellent energy business certification system was introduced in 2018 to measure energy saving efforts of business sites and evaluate companies that endeavor to increase the energy efficiency. Ochang 1 Plant reduced the energy use by 6% compared to the prediction in 2017. Daesan Plant showed 4-year average basic unit improvement of 2%. LG Chem will further create excellent energy business sites by showing continued efforts.

Support of Small and Medium Companies for Environmental Management

Energy Shared Growth Business

LG Chem has been working together with the Korea Energy Agency since 2012 to help clients and partners save energy through facility education, energy diagnosis, facility investment and performance management. Energy diagnosis was performed on 52 SMEs from 2012 to 2018 to find about 300 energy saving items. This is equivalent to about 10,000 tons of greenhouse gases and energy expense of KRW 4.6 billion. LG Chem was acknowledged by the Korea Energy Agency for such efforts and was selected as an excellent conglomerate for shared growth in 2018. LG Chem has provided facility investment of KRW 300 million through shared growth investment and

Energy Portal



green fund to help financial difficulties of SMEs in saving energy. Sinwon Chemical, a partner of LG Chem that received support, acquired the energy challenger certification (certification for excellent energy management of SMEs) in 2018. LG Chem will expand its support on small and medium partners to increase the energy efficiency and reduce greenhouse gas emission of the entire supply chain.

Green Credit Finding Business

The green credit finding business is an energy saving business jointly promoted by large companies that have enough financial and technical resources and SMEs that have high potential for greenhouse gas reduction but are short of financial and technical resources. Large companies can reduce the burden for emission regulations and SMEs can improve cost competitiveness by reducing energy use. This is a win-win business for all participants. SMEs can make additional profit by selling the portion of greenhouse gas reduced. LG Chem is prepared to continue providing technical and financial support to reduce greenhouse gas emission by SMEs.

Creating Resource Recycling Process

LG Chem minimizes environmental contamination and increases resource recycling rates by creating a resource recycling process.

Recycling & Reuse

Less than 5% of lithium-ion batteries are recycled, resulting in an adverse effect on the environment. With the coming of the era of EV, over 10 million tons of waste batteries will be produced until 2030. LG Chem plans to recycle waste batteries and waste scraps produced during the manufacturing process using the optimal recycling technology that minimizes environmental contamination and increases recovery rate to about 100%.

Resource Recycling Process of LG Chem



① Recycle: Process scraps generated during the battery manufacturing process and waste batteries that cannot be reused undergo the recycle process. Raw materials like nickel and cobalt are extracted by crushing and melting scraps or waste batteries, creating a closed recycling loop where cathode materials are manufactured using the extracted raw materials.

② Reuse: Waste batteries that are used on EVs for long time can show adequate performance after 8-10 years. We can contribute to the virtuous cycle of batteries by using such waste batteries for other purposes such as the ESS. Recycled waste batteries can be recycled again by our company once they are used up.

Best Practice

Eco-Friendly Manufacturing Process

Each business site of LG Chem gives efforts to improve the manufacturing process for environmental sustainability.



We are reducing carbon dioxide emission by making eco-friendly business sites.

Ochang Plant of LG Chem installed a photovoltaic power generation facility on its building to increase the rate of new and renewable energy. Ochang Plant is reducing fossil fuel generation and carbon dioxide emission. The photovoltaic power generation facility at Ochang Plant has capacity of 291KW individually and 2,988KW as a grid-connected system.



Photovoltaic facility at Ochang Plant

3,279 kW

We are increasing the amount of wastes recycled.

Cheongju Plant of LG Chem switched from incineration and landfill of wastes to recycling as cover materials for construction. By recycling synthetic resin wastes into plastic raw materials, Cheongju Plant reduced the amount of wastes by about 1,769 tons in 2018. Ochang Plant of LG Chem turned the raw material for polarizing plate packing materials from wood to recyclable paper, reducing the amount of waste packing materials by about 74 tons in 2018.

Waste reduction at Cheongju Plant

1,769 ton ▼



ISSUE 2. Environmental Sustainability

Management of Safety, Health and Environment

“We are reinforcing safety and health management to secure safety of employees and protect the environment.”

In the chemical industry, it is important to manage safety accidents as they can cause damages to the environment, human life, corporate image and financing. Accordingly, LG Chem prioritizes management of safety, health and environment.

Safety, Health and Environment System

LG Chem is operating a safety, health and environment management system based on ISO 14001, OHSAS 18001 and KOSHA 18001. By declaring the management commitment for safety, health and environment, LG Chem has established a consistent safety, health and environment policy. Each business site manages safety and environment based on the work manual. On-site management activities of leaders and organizational activities are conducted to prevent accidents. Safety accidents are reflected on personnel evaluation to practice safety management at the sites.

Safety, Health and Environment Policy of LG Chem

LG Chem recognizes that safety, health

and environment are the basic elements required to secure competitiveness of the company. LG Chem will faithfully implement the following matters to show continual improvement of safety, health and environment performance.

Safety, Health and Environment Governance

The Safety and Environmental Committee is an organization that makes important decisions about safety and environment. This committee is comprised of members of the Management Committee including the CEO and chief managers of safety and environment at each business site. The Safety and Environmental Committee is convened twice a year to discuss important issues related to safety and environment, performance and future plans. The committee presents the directivity for proactive safety and environment policy. The Labor-Management Occupational Health and Safety Committee at each plant makes decisions about major safety and health issues to prevent risks and manage health of workers. LG Chem discusses

Safety, Health and Environment Policy

- 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.

improvement methods and shares excellent cases among plants through the Corporate Safety and Environment Working Committee, manager meetings and workshops.

Building Safety and Environmental Capacity

LG Chem operates a number of safety and environmental capacity building programs for employees in relevant positions. There are four major programs including Process Safety Management (PSM), chemical substance management, electrical safety, and firefighting and dangerous substances. LG Chem will add capacity building programs on working environment management, accident cause analysis and accident investigation techniques.

Increased Safety and Environment Management Competency Through Performance Conference

LG Chem hosts annual performance conferences to share accident prevention activities of domestic and overseas business sites and improve work competency. About 250 employees of LG Chem and partners participated in the 4th Safety and Environment Performance Conference held at Osan Leadership Center in November 2018.

Best practice themes of safety and environment, excellent cases of health management, and excellent safety management partners were announced at this performance conference. Sharing of site-driven themes and poster sessions on primary business activities took place as well. The conference offers opportunities to benchmark best practices and settles safety first culture.

Safety Inspection and Management

The safety and environment inspection system of LG Chem is subdivided into regular inspection, planned inspection and special inspection. Regular inspection is related to the management system, process safety, facility and work safety, industrial health, firefighting, dangerous goods and environment. Planned inspection involves safety inspection on partners, facility safety management, emergency response system and implementation check. Special inspection is conducted at worksites where serious accidents have occurred or are likely to occur. In

2018, LG Chem conducted 16 regular inspections, 42 planned inspections and 9 special inspections for a total of 67 inspections. We also plan out in-depth inspections for plants with frequent accidents and system inspections for new plants. LG Chem will optimize the emergency response system of plants through emergency response inspections without advanced notice.

Spreading of Behavior Based Safety (BBS) Program

LG Chem introduced the Behavior Based Safety (BBS) program in 2017 to guide safe behavior and create voluntary safety management culture. Major contents of the BBS program include complimenting of safe behaviors and coaching of 'unsafe behaviors' among coworkers. The program was spread to Yeosu and Daesan Plants in South Korea. In 2019, we plan to expand the scope of the BBS program to Cheongju, Ochang, Naju, Iksan and Gimcheon Plants.

Participants of Safety and Environment Competency Programs in 2018



Zoom and Focus

Safety Culture Improvement Project

We have been promoting the safety culture improvement project with professional agencies since 2016 to create safe working environment.

LG Chem has promoted the safety culture improvement project in collaboration with professional global safety and environment consulting agencies since October 2016. This project is intended to remove the possibility of accidents caused by unsafe behaviors and conditions of on-site workers. This project includes advancement of the accident investigation method, formation of the Chemical Safety Rating System (LG CSRS) and creation of the Behavior Based Safety (BBS) program. After completion of the first part of the project in June 2018, we have been spreading the project throughout the company to increase the level of safety and environment management for zero accident.

Observation 1
Manufacturing and transportation of chemical substance



Observation 2
Operation of facility



Observation 3
Shipment of chemical substance



Advancing Accident Investigation Method

LG Chem identifies fundamental causes of accidents and advances the method of investigating accidents to prevent recurrence of similar accidents. A global accident analysis technique was implemented to easily come up with prevention measures. The accident investigation training program produced 379 accident experts at domestic and overseas plants. These experts place efforts to prevent recurrence of accidents. In 2019, we will perform in-depth inspection on the accident reporting and investigation procedures.

* BBS Process
Selection of dangerous work and task—Observation (filling up observation card with consent) — Feedback (discussion over findings) — Improvement (changes in unsafe activities) — Analysis (analyzing the results and reflecting improvement points)

Quantitative Evaluation of Safety and Environment Management System

LG Chem has completed evaluation of Yeosu and Daesan Plants using the LG CSRS, a quantitative evaluation system that can evaluate the level of safety and environment management and find out matters that need to be supplemented. The LG CSRS is designed to quantitatively evaluate 720 items of internal management system organically linked to safety, environment and health. The advanced quantitative evaluation system can clearly identify weaknesses of each plant and maintain the best safety and environment management system on a global level.

Feedback
Discussion over findings (safe and unsafe activities)





ISSUE 3. Business & Human Rights

Business & Human Rights

People are at the core of sustainable management of LG Chem.

Human rights are the basic rights of all human beings, but there are people around the world who are not guaranteed to enjoy the basic rights. As companies expand their businesses, the human rights infringement is also expanding to a variety of regions and fields. It would be the most basic part and social responsibility of companies to respect human rights of their members.



ISSUE 3 Business & Human Rights

Our Approach

There is an increasing social interest in the human rights issues of companies around the world. Global corporate evaluation indexes such as DJSI and EcoVadis regard human rights as important, and companies are expanding the domain of corporate responsibility for human rights. On the one hand, South Korea is actively working on the legislation of human rights laws by establishing the National Human Rights Action Plan in August 2018. As such, the human rights issues associated with corporate management activities are perceived as serious business problems nowadays.

Having a complicated supply chain structure as a global chemical company, LG Chem places diverse efforts to prevent infringement of human rights in business. We perform periodic human rights impact assessment and conduct periodic CSR evaluation on partners to control all human rights infringement risks. We also prevent human rights issues in the supply of raw materials by prohibiting the use of conflict minerals. We strive to protect human rights of workers and minorities.



Our Focus Areas

- 1 Human Rights Management Policy**
 LG Chem practices its responsibility to respect human rights by establishing a global human rights policy and performing human rights impact assessment.
- 2 Respect of Human Rights**
 LG Chem respects human rights of all workers and creates good working environment.
- 3 Responsible Mineral Supply Activities**
 To resolve global human rights issues similar to the child labor issue in the mining of cobalt, LG Chem does not use unethical minerals that induce infringement of human rights.
- 4 Human Rights Management in Supply Chain**
 LG Chem inspects and prevents the factors of human rights infringement that can occur in business by demanding partners to comply with the behavioral codes and conducting CSR evaluation on partners.

ISSUE 3. Business & Human Rights

Human Rights Policy and Management

“LG Chem respects human rights of all employees and stakeholders and attempts to fulfill its responsibility.”

LG Chem evaluates human rights impact of business activities on stakeholders. In the case of the supply chain that has an indirect but large effect on businesses of the company, we conduct CSR inspection on partners to identify risks related to human rights. Stakeholders at home and abroad are increasingly demanding companies to protect human rights. The international society has already reached a worldwide consensus led by the UN that companies are greatly responsible for respecting human rights. This bond of sympathy formed in the international society has become a driving force to implement government policies and regulations. The South Korean government has already claimed through its 5-year plan that it is very important for companies to attain social values. Public agencies and enterprises are including human rights management in management evaluation. Customers identify human rights risks and verify performance by reviewing documents and conducting spot inspections before making transactions. Investors also intervene in human rights issues of companies using diverse evaluation indexes.

Human Rights Policy

LG Chem is aware that respecting human rights is the most important part of business operation. The ‘Global Human Rights & Labor Policy’ was enacted and announced in 2016. The human rights policy of LG Chem respects and supports the spirit and purport of international human rights as regulated in labor laws of all nations and regions that comply with the international standards, such as the Universal Declaration of Human Rights, UNGC Human Rights Principles, UN Guiding Principles on Business and Human Rights, and conventions of the International Labor Organization. The human rights policy of LG Chem is applied to all global plants and shared with all stakeholders that are affected by its businesses, including customers and partners.

Human Rights Impact and Risk Inspection

LG Chem developed a self-inspection checklist for each domain to evaluate and inspect human rights impact at each plant in accordance with the ‘Global Human Rights & Labor Policy.’ We conduct surveys using this checklist

and execute on-site inspections (third-person verification). A feedback report is prepared to come up with matters of improvement. Workers of subcontractors are most vulnerable to human rights infringement. The domains of the evaluation indicators include the human rights management system, humane treatment, prohibition of

forced labor, prohibition of child labor, prohibition of discrimination, labor hours, wage and welfare benefits, and freedom of association and collective bargaining. Primary methods of identifying risks include document review, interview, questionnaire and on-site inspection.

Interview 3

Q. How do you think LG Chem should practice and manage human rights management and impact assessment from now on?

Global companies like LG Chem are affected more by risks and opportunities from human rights issues. It would be important therefore to implement company-wide human rights management. Human rights management needs to be carried out according to the international principles, standards and protocols. LG Chem must come up with all stages and factors of human rights management including the scope, procedure, category, monitoring system, and grievance handling system in a way they can be acknowledged by stakeholders. I would like to also emphasize that human rights management should be

based on a preventive perspective. Companies can easily focus on functional and partial issues if they were to come up with a system after problems occur. In this sense, it is desirable to execute human rights management and impact assessment as preventive measures.

Ahn, Jeong-Kwon

Commissioner of BSI KOREA



ISSUE 3. Business & Human Rights

Human Rights of Employees

“LG Chem respects diversity of employees, provides equal opportunities to all, and strives to create pleasant working environment.”

Increased Quality of Life

Welfare System for Employees

Diverse welfare systems are in place to help workers maintain the balance of work and life. A retirement pension system is in operation to enable employees to have stable old age income after retirement. There are two types of the retirement pension system, defined benefit (DB) and defined contribution (DC). Other welfare programs for employees include family support, health support and leisure support.

Health Management of Employees

LG Chem promotes disease prevention and health management activities for employees to remove health hazards and create pleasant working environment. A health management office is operated at each plant to provide personalized medical services. Employees aged 35 years or above who worked for five consecutive years or longer can receive personalized health examination. A psychotherapy

office is operated to provide in-depth inspection by professional therapists. Diverse health care programs are in place to create healthy culture and minimize potential health risks. LG Chem measures hazardous work environment through a specialized external agency in the first half and second half of each year. Our internal health standards are stricter than legal standards. We are constantly improving the working environment for all employees and will maintain the safest working environment in the industry.

Maternity and Childcare Leaves

We have policies to reduce the burden of employees for childbirth and childcare. The rate of return after parental leave, which is a key indicator of job security for employees who go on a parental leave, is 95.8%.

Balance of Work and Life

LG Chem places continual efforts to create corporate culture that finds

the balance of work and home. The 'Flexitime' system that was partially implemented in July 2017 was expanded to all office workers and engineers in 2018. The 'Flexitime' system allows individuals to work at different times according to work characteristics. Starting in 2018, LG Chem has been operating an improved work system to enhance 'quality of life' of employees while increasing productivity. The selective flexible working hour system was introduced to work 40 hours a week on average and 52 hours in maximum. For every hour of overtime work on weekdays and holiday work exceeding the basic monthly working hours, LG Chem offers 1.5 hours of compensative holiday to give enough rest from work. LG Chem also adopted the 'Working Hour Management System' to monitor and manage working hours. Working hours of managers and employees can be managed in an organized way by entering the starting time, ending time and off hours on the system. A seminar was conducted to explain the new system. We monitor the system and provide periodic feedbacks to any organizations that fail to apply the system properly.

Respect for Diversity and Increased Communication

Prohibition of Discrimination and Respect for Diversity

LG Chem offers equal opportunities for recruitment, promotion, reward and training to all employees based on the clause prohibiting discrimination within the Global Human Rights & Labor Policy. Discrimination against gender, age, race, religion, labor union, disability, pregnancy, marital status and social status is strictly prohibited. The HR policies and employment rules specify recruitment of individuals without discrimination based on race, nationality, gender, religion, disability, region and affiliated groups. For the balanced regional development and settlement of youth unemployment, LG Chem fosters local talents of non-capital areas and operates many related programs. The LG Smart Convergence Engineering Department was opened at Pusan National University and Chonnam National University in 2018 to train professionals who are suitable for our businesses. We are operating the Battery Customized Track in the Chungbuk area to train engineers specialized in battery businesses.

Provision of Equal Opportunities

LG Chem contributes to the development of the society by providing equal opportunities to all and increasing

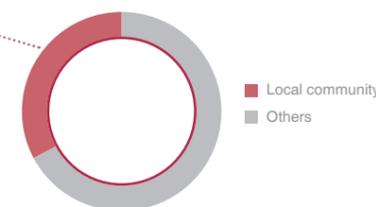
diversity of members. 'Happy Nuri' is a subsidiary for workers with disabilities. As of 2018, 151 disabled workers are taking care of beautification, steam washing, cafeteria, café, welfare facility, health keeping and packing at Ochang, Cheongju, Daejeon, Osong, Magok and Yeosu Plants. LG Chem will continue to fulfill its social responsibility by maintaining diversity of workers with women, disabled persons and minorities.

Grievance Handling System

LG Chem operates a variety of grievance handling programs. The mobile grievance handling system takes grievances from employees. Such grievances are checked and handled by staffs of the relevant departments. The Labor Management Council has placed provisions for handling grievances. The Grievance Handling Committee comprised of three or less members presenting labor and management must notify the results of handling grievances within 10 days. We also take grievances through the ombudsman system on the company website, which is operated in three languages including Korean, English and Chinese. Grievances related to sexual harassment are received through the Sexual Harassment Reporting Center, which handles the reports in accordance with the legal procedures and in cooperation with the related departments.

Ratio of local talents* among new administrative and technical employees in 2018

32.8%



*Local talents: Excluding talents who graduated from universities in Seoul, Gyeonggi-do, Incheon and overseas

Special Q&A

Yeo, Da-woon
a job applicant asks LG Chem.



Interview 4



Choi, Eun-Mi, Team Leader
Recruiting Team, LG Chem

Q. Many job applicants are interested in LG Chem because it is a leading chemical company of South Korea that is growing consistently. As an undergraduate preparing to get a job, I would like to know what systems and policies are in place at LG Chem to provide equal opportunities and create jobs.

To offer equal and non-discriminating opportunities, LG Chem does not ask for a photo, family information, career information and overseas experience in the CV. LG Chem also tries to ensure fair competition by recruiting veterans

and disabled persons separately from new regular employees. The ratio of local talents is kept at 30%. There are various activities in place to secure talented individuals from home and abroad, including job fair, internship system, and job fair supervised by top management (CEO, CTO, CHO). LG Chem examines hidden abilities of applicants by asking them to answer the three questions below on their CV:

1. Reason for application and efforts they put to prepare for the field of application;

2. Personality and characteristics; and
 3. Dream and vision to be achieved by working for LG Chem.
- Lastly, LG Chem was selected as one of the best job-creating companies of South Korea in June 2018 by making a variety of efforts to create high-quality jobs.

ISSUE 3. Business & Human Rights

Responsible Mineral Supply Activities

“ LG Chem does not use unethical minerals that infringe human rights. ”

Issues Related to Cobalt

The global market for lithium-ion batteries is expanding with IT devices and EVs. This leads to a rapid increase in the demand for primary raw minerals used to produce lithium-ion batteries. Cobalt is a very rare mineral, and over 60% of global cobalt production comes from the Democratic Republic of the Congo (DRC). Amnesty International, an international human rights organization, raised the issue of child labor in the mining of cobalt in

2016. Cobalt has become equivalent to conflict minerals as major international press media including CNN began to report the issue. The child labor issue in the mining of cobalt is not simply the problem of the Congo government but a joint responsibility of all companies within the battery supply chain that produce cars and IT devices using cobalt. As stakeholders are having increased interest in the responsible supply of raw materials, companies

are making efforts to purchase cobalt from other regions or prevent cobalt produced in Artisanal and Small-Scale Mines (ASMs). This has led to further increase of cobalt prices.

On-Site Inspection

LG Chem recognizes that the human rights issue of cobalt mining in the Democratic Republic of the Congo is a serious human rights problem. LG Chem has established the 'Due Diligence Policy' to ensure transparency of the supply chain and prevent the use of cobalt mined using child labor. A third party audit was carried out on cobalt smelting companies and precursor suppliers of China in 2017. On-site inspections were conducted on ASMs in the Democratic Republic of the Congo in April 2018 to check the conditions of child labor. All inspection results are disclosed on the website of LG Chem,



Cobalt mining site



and information about the cobalt supply chain of LG Chem is also available on the website. The social responsibility issue triggered by cobalt has been expanded to all core raw materials of EV such as lithium, nickel, manganese and graphite. LG Chem will make the best efforts to form a sustainable raw material supply chain and actively cooperate internationally to resolve the human rights issue.

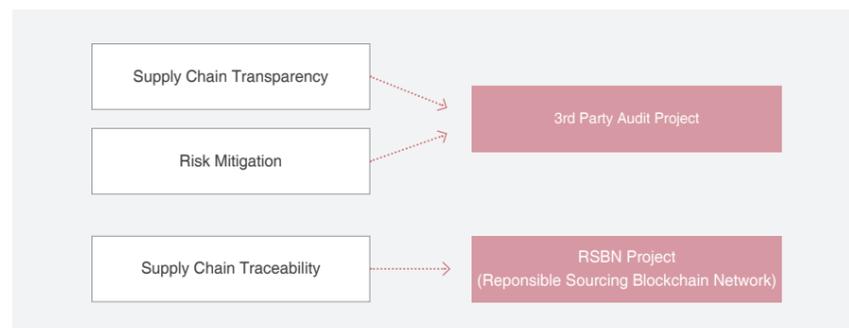
Establishing Policies and Participating in the Initiatives

The child labor issue in the mining of cobalt cannot be resolved by LG Chem alone. Accordingly, LG Chem participates in international initiatives to cooperate with other companies. LG Chem became a member of the Responsible Cobalt Initiative (RCI) supervised by the China Chamber of

Commerce of Minerals, Metals and Chemicals (CCCMC) in 2017. LG Chem will also register as a member of the Responsible Minerals Initiatives (RMI) under the Responsible Business Alliance (RBA) by June 2019. In addition to joining of the initiatives, we make joint efforts with EV makers to resolve the issue. In 2019, we demonstrated a cobalt supply verification system using the 'blockchain' technology by collaborating with global companies including EV makers, IT companies, raw material

suppliers and international verification agencies like 'RCS Global.' The blockchain technology uses distributed data storage to prevent manipulation and hacking of data. This system can help manage the cobalt supply chain transparently. LG Chem aims to fundamentally prevent the use of minerals that infringe human rights.

Responsible Sourcing



On-site inspection in mines



ISSUE 3. Business & Human Rights

Responsible Sourcing

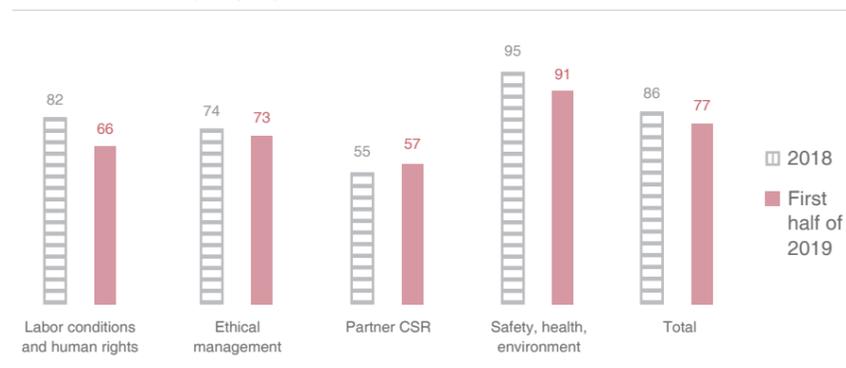
“We Advise Human Rights Management of Partners Through Code of Conduct and CSR Evaluation.”



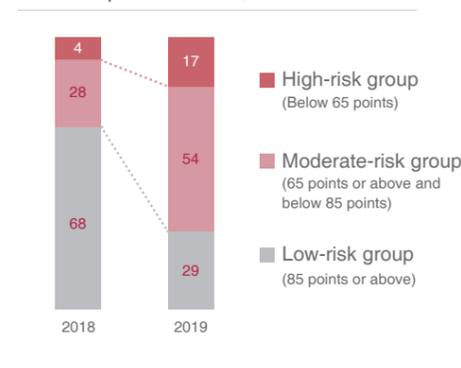
Value chain sustainability issues are increasingly affecting businesses, and the importance of sustainability risk management is becoming more important. There is an absolute demand for increased level of social responsibility to be fulfilled by our partners because issues that arise in the supply chain have great impact on the overall value chain. LG Chem has created a supply chain management system as required by international organizations like the UN and OECD. We communicate closely with major stakeholders such as partners, clients, investors and NGOs.

The overall score was dropped and the ratio of high-risk group was increased in the first half of 2019 compared to 2018 as we have introduced a more sophisticated evaluation tool. LG Chem was evaluated to have a high level of response to environment, health and safety, but there was a lack of processes to manage labor conditions, human rights and partner CSR (establishment of policy, evaluation, management of conflict minerals). Detailed matters for improvement included compliance with working hours, protection of workers and management of dangerous substances.

Score on Each Item (Unit: point)



Risk Group Status (Unit: %)



Demanding Compliance of Partners with Code of Conduct

LG Chem enacted the Code of Conduct for Partners in 2016, comprised of 10 items including human rights, labor, ethical management, safety, environment and ethical procurement. The Due Diligence Policy was established in 2017 to reinforce monitoring and prohibit the use of raw materials acquired by unethical means, such as illegal and serious infringement of human rights. The Code of Ethics for Partners are disclosed to various stakeholders on the website (<http://www.lgchem.com>) and Procurement Portal (<https://procurement.lgchem.com>). Partners are obliged to agree with the compliance with the Code of Conduct every year.

CSR Evaluation on Partners

LG Chem annually evaluates partners to make sure they fulfill the Code of

Conduct. Improvement tasks and implementation results are monitored in connection with on-site inspections. CSR evaluation is carried out in relation to procurement evaluation (new supplier evaluation and periodic evaluation). New supplier evaluation is comprised of 10 CSR items. Periodic evaluation is performed on raw material suppliers (239 in 2018, 171 in the first half of 2019 and expected to be about 50 in the second half of 2019). There are 60 evaluation items (as of 2019) including the prohibition of child labor, protection of workers, compliance with working hours, management of conflict minerals, management of safety, health and environment approvals, and risk prevention. Partners are required to fill out the LG Chem CSR SAQ (Self-Assessment Questionnaire), and LG Chem conducts on-site inspections by selecting the high-risk group based on the SAQ. On-site inspections were

carried out on 2 companies in 2016, 3 companies in 2017 and 11 companies in 2018. On-site inspections will be conducted on over 20 companies in 2019. Local CSR compliance inspections were conducted on five battery partners in Nanjing, China in 2018. Inspection targets will be expanded to global production bases like Poland to minimize CSR risk of the supply chain.

Analysis of Evaluation Results

In the first half of 2019, the overall evaluation score was dropped by 9 points compared to 2018 with the introduction of a more sophisticated evaluation tool and global evaluation criteria. The ratio of high-risk group was increased as well. This can be utilized as an opportunity to increase the CSR capacity of partners to a global level. We were found to have inadequate labor conditions, human rights and partner CSR management processes (establishment of policy, evaluation, management of conflict minerals). Detailed matters for improvement included compliance with working hours, protection of workers and management of safety and environment approvals.

Monitoring of Improvements

LG Chem applies the social responsibility clause to its standard procurement contracts so that partners can recognize the importance of CSR in the early stage. We make promises for improvement when a major CSR risk is found. LG Chem demands and monitors partners to make improvement based on the procurement contract and Code of Conduct. The compliance issue based on local laws must be managed according to the strict criteria to ensure stable value creation of the supply chain. LG Chem will encourage partners to implement an organized business management system.



ISSUE 4. Participation and Sharing with Communities

Giving Back to Communities

We will raise community values.

Bamseom Island in Yeouido used to be an inhabited island of about 400 residents, but it was exploded in February 1968 to help the flow of the Han River. Bamseom Island turned into an uninhabited island as people stopped visiting the island. Despite its painful history, Bamseom Island was naturally regenerated with time and has been designated as a Ramsar wetland and rare habitat for migratory birds.

LG Chem engages in an activity to protect and preserve ecological values of Bamseom Island by removing hazardous plants and purifying the environment. In December 2018, LG Chem opened Bamseom Eco Experience Center with the Han River Business Division of the Seoul Metropolitan Government.



ISSUE 4 Participation and Sharing with Communities

Our Approach

Social contribution activities that were limited to charities in the past have been expanded to create shared values using corporate capability and influence. Many companies are contributing to the society by resolving social issues and creating values instead of simply donating. With the global expansion of companies, the scope of corporate social responsibility is also expanding internationally with the UN SDGs.

LG Chem concentrates on social contribution activities to promote shared growth instead of a one-time charity. We fully utilize our capacity to support local youths who have dreams and visions for chemistry. We participate in important local issues such as environmental problems. The 'LG Social Contribution Evaluation Guideline' has been implemented to effectively measure social contribution of our businesses each year.



Our Focus Areas

1 Participation and Sharing for Future Generations

LG Chem operates chemical and environmental education programs for youths such as Chemistry Camp and Fun Chemistry Park.

2 Participation and Sharing for the Earth

LG Chem participates in various activities to protect environmental values of our neighbors and form eco-friendly social organizations by creating social funds.

3 Participation and Sharing in Different Regions

Employees of LG Chem are actively involved in regional issues and sharing activities to fulfill their roles and responsibilities as residents at home and abroad.

ISSUE 4. Participation and Sharing with Communities

Participation and Sharing for Future Generations

“We foster talented individuals for the future of science in South Korea through high-quality chemistry education programs.”

Education for Future Generations

Fun Chemistry Park, a World We Create

LG Chem is operating 'Fun Chemistry Park' for elementary students since 2015. This is a program for elementary schools that are less advantaged in terms of education and culture nearby the business places of LG Chem. The program was applied to 6 schools in 2018. This program was also held during the Young Maker Festival hosted by the LG Yonam Cultural Foundation, where about 1,000 students participated. In addition, an undergraduate mentor group was selected to help operation of the program.



Chemistry Camp

Fun Chemistry Park,

Chemistry Camp to Grow Young Dreams

LG Chem visits future generations to educate them on chemistry, science and environment. 'Chemistry Camp' for middle school students is a representative education program of LG Chem that was conducted 59 times ever since the first occasion in 2005, accommodating for about 7,000 students. In January 2019, about 400 middle school students participated in this program near the capital area. This 2-night, 3-day camp program offers high-quality education comprised of chemistry experiment, 3D printing, career exploration and special lecture on YouTube creators. Similar to Fun Chemistry Park, Chemistry Camp is operated with assistance of an undergraduate mentor group. LG Chem will strive to 'guarantee fair and high-quality education for everyone' by continually expanding the scope of its education programs.

Special Q&A

We Ask LG Chem.

With a sense of responsibility as a global company, LG Chem is working with overseas branch offices toward a better future. We make efforts to protect the ecological environment of Bamseom Island. As we published the 2018 Sustainability Report, we asked Jun-Seong Park the Executive Director of Corporate Affairs about social contribution activities.

Interview ⑤

Park, Joon-Seong

Vice President of Corporate Affairs Department, LG Chem



Q. LG Chem engages in a variety of social contribution activities. What are your goals, and what businesses are you focusing on the most?

LG Chem is always thinking about how to make substantial contributions to the community by reflecting our capability and opinions of stakeholders. We are trying to foster future talents in the field of science based on our unique social contribution policy of 'LG's Love for Young Dreams.' LG Chem started education charity with the 'Chemistry Camp' for middle school students in 2005 and has been providing educational opportunities such as Chemistry Camp and Fun Chemistry Park to neglected children. In September 2018, LG Chem was selected as an 'excellent institution for educational charity' by the Ministry of

Education for hosting science education programs for 14 years. We will lead the efforts to develop more social contribution programs for youths and spread the educational charity culture.

Q. What is the future direction of LG Chem for social contribution?

As a global corporate citizen, LG Chem fulfills its social and environmental roles at home and abroad. By taking the UN SDGs as new business opportunities for international cooperation, we

are maintaining our technologies to increase social and environmental values. From now on, we plan to come up with detailed objectives based on the guidelines of the UN SDGs and practice them.

ISSUE 4. Participation and Sharing with Communities

Participation and Sharing for the Earth

Participation for Environmental Protection

Protection of Bamseom Island

LG Chem launched 'Green Maker,' a volunteer group to protect Bamseom Island in Yeouido, in 2017. Bamseom Island is an island that was exploded to get stone materials for the development of Yeouido and regenerated naturally as a Ramsar wetland. This is also a rare urban habitat for migratory birds. LG Chem removes hazardous plants that endanger the ecosystem in the first half of each year and cleans garbage piled up on the island in the second half. About 170 employees of the head office participated in this activity in 2018. In addition to preserving Bamseom Island, LG Chem opened 'Bamseom Eco Experience Center' above Mapo Bridge in December 2018 by cooperating with the Han River Business Division of the Seoul Metropolitan Government to share the history and values of Bamseom Island with citizens. Eco Experience Center is comprised of the exhibition space, experience space and education space. The exhibition space has a graphic panel display of the history and environmental protection of Bamseom Island. The experience space allows citizens to experience the ecosystem of Bamseom Island using VR and AR without having to get into the island. The education space conducts diverse education programs for neglected students from regional



Opening of Bamseom Eco Experience Center in 2018



children's centers on different themes like Bamseom Island, environment and biodiversity. LG Chem will continue its efforts to 'preserve biodiversity' according to the UN SDGs and engage in more activities to inform the importance of biodiversity to people.

Green Partnership Project

In 2017, LG Chem signed an MOU with the Community Chest of Korea, Seoul City and Energy Peace Foundation to promote the 'Green Partnership Projects' which began with the completion of the 'Power Plant for Green Hope' in 2018. A 622kW photovoltaic power generation facility was constructed in the Jungnang Sewage Treatment Center

in Seongdong-gu, Seoul. This facility is capable of producing eco-friendly electricity for about 200 households (4-person). This is equivalent to about 370 tons of carbon emission per year and 130,000 pine trees of 20 years or older. Annual profit of about 60 KRW million expected to arise from the 'Power Plant for Green Hope' for about 20 years will be used to support 2,000 adolescents of the neglected and low-income classes. The half of profit is used in the region nearby the power plant, and the other half is donated to the city of Seoul. LG Chem is also planning for the 'Green Remodeling' project, which reduces energy costs of children's welfare facilities by installing insulation systems and windows in

Seongdong-gu and Dongdaemun-gu. Differentiated social contribution activities of LG Chem will be continued to help neglected neighbors.

LG Social Campus

'LG Social Campus' is an integrated socioeconomic platform jointly operated by LG Chem and LG Electronics. We have been supporting social and economic organizations with a multilateral cooperation model of government ministries, academia and NGOs for the first time since 2011. This project is largely divided into 4 domains including financing, space, growth and human resource. The 3rd phase of the project was started in 2018 to diversify the promotion channels and spread the

Social Campus brand. We are focusing on encouraging participations of various stakeholders such as adolescents, youths and ordinary adults. We launched new programs like Local Value-Up, Social Talk Concert and Social Film Festival in 2018. Local Value-Up is a program that provides business education, networking and mentoring for sustainable innovation. Social Talk Concert is a program to communicate with social entrepreneurs of different fields. Social Film Festival is a contest of social and economic films. LG Chem will continue to build sustainable social and economic ecosystems through innovation of local communities.



ISSUE 4. Participation and Sharing with Communities

Participation and Sharing in Each Region

LG Chem in Daejeon

Junior Engineering School for Young Dreams

In 2018, we visited 4 elementary and middle schools and 4 regional children's centers to conduct lectures on 400 children using educational materials made of our products such as ESS, SAP and polarizing plates. We have selected 3 elementary and middle schools for 9 lectures in 2019.



Hi! Chemi! Science Club

LG Chem sponsored science clubs at 4 high schools in 2018. Science clubs at 4 new high schools including Woosong High School, Daejeon Girls' High School, Dongsin High School and Daesin High School were selected in 2019.

Do! Dream! Child Center

In 2018, LG Chem selected 4 child centers to remodel buildings to create better living and learning environment for children. The volunteer group of each organization formed sisterhood with centers to operate programs like Junior Engineering School, Cultural Experience and Christmas Party.

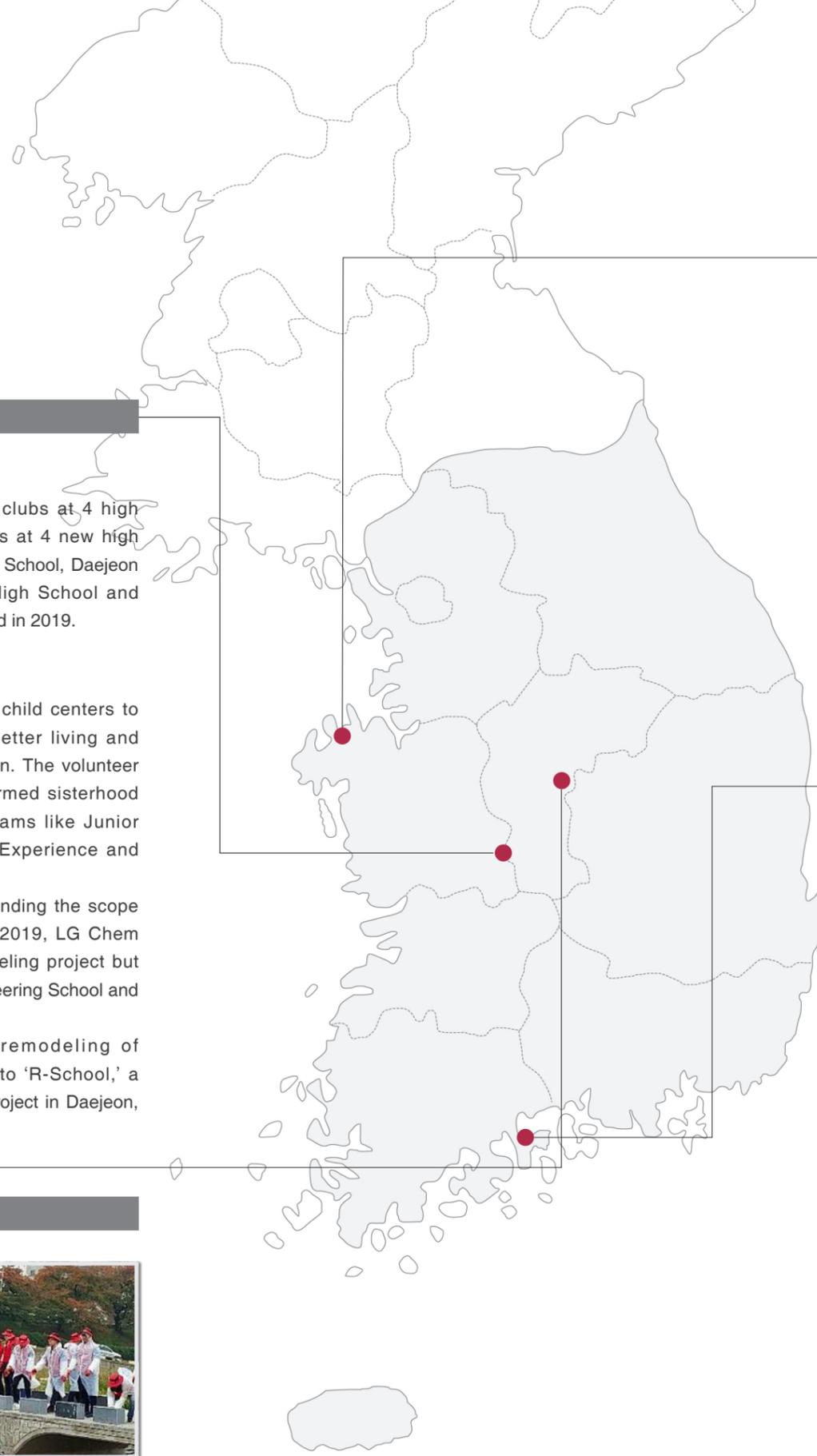
As local governments are expanding the scope of support for child centers in 2019, LG Chem will stop its child center remodeling project but continue to operate Junior Engineering School and Cultural Experience programs.

The fund donated to help remodeling of child centers will be donated to 'R-School,' a multicultural alternative school project in Daejeon, to help underprivileged children.

LG Chem in Ochang

Musim Stream Keeper

'Musim Stream Keeper' of Ochang Plant is a new social contribution activity to preserve 'Musim Stream.' Ochang Plant will continue to carry out various activities to preserve the urban ecosystem and enhance convenience of residents.



LG Chem in Daesan

'Dong-Go-Dongrak Program' for Mentoring of Local Youths

Daesan Plant of LG Chem has been fostering local talents with the 'Dong-Go-Dongrak Program' for students attending nearby high schools. Various programs are in place to assist students in planning their academic future: Research mentorship to explore creative career choices; college entrance briefing sessions to help close the gap between urban and rural areas; chemical analysis experience and field trip to increase understanding

of chemistry; and general courses that provide cultural benefits. Being aware of the partnership with the community, Daesan Plant will continue operating sincere contribution programs.



LG Chem in Yeosu

Completion of 10th House of Hope

Yeosu Plant helped repair houses of low-income families in Yeosu. A low-income house selected by the city government was remodeled entirely including the bathroom and kitchen. Yeosu Plant also provided daily necessities like refrigerator and TV. House of Hope is a welfare project conducted in collaboration with the city of Yeosu to provide pleasant home to neighbors in need. By 2018, 10 houses were completed.

School Uniform Sharing Program

Yeosu Plant has been operating the school uniform sharing program for high school students of low-income families in Yeosu since 2012. Candidates for this program are selected by the city of Yeosu. This program took place on February 22 in 2018, and Yeosu Plant has sponsored KRW 600 million worth of school uniforms for 3,023 middle and high school students.





LG Chem in China

Love School Project

LGCCI is deeply interested in health and education of youths in China. The Love School Project was promoted since 2010 with the China Youth Development Foundation, China Women's Development Foundation and China Environmental Protection Foundation. This project is intended to provide small and medium-sized school facilities in China. The 'Love School Project' supported schools using about 3 million RMB until 2018. This project not only involves repair and remodeling of toilets, water purification facilities and libraries but also includes regular visiting of schools. Our employees visit

schools to regularly check the usage of various school facilities. Library remodeling was done for a middle school in Urumqi City, Xinjiang Uygur Autonomous Region in 2018, and we donated PCs, TVs, OHPs, multimedia systems and books. We revisited the middle school in Dunhuang City, Gansu Province, whose library was remodeled in 2015, to check additional needs for PCs, OHPs and multimedia facilities. LGCCI will continue with the project to help local youths grow in a good environment.

College Student Contest on Creativity and Innovation for Automotive Batteries

LGCCI is operating the 'College Student Contest on Creativity and Innovation for Automotive Batteries,' which was designed to find and develop talented individuals interested in automotive batteries. The award ceremony for the contest started in November 2017 took place in June 2018. This contest of students from prestigious universities of China was carried out for half a year, awarding the Grand Award and Excellence Award on 3 themes of innovation, creativity and distribution of science. In August 2018, 11 representative undergraduates were invited from 7 prestigious universities of China to visit LGCNJ and LGCNA in Nanjing. Students took a tour around our production lines and shared in-depth communication with plant engineers about technical issues related to energy solutions.

LGCCI will contribute to the industrial development by training outstanding talents of automotive batteries.



Love School Project



Zoom and Focus

Effects of Social Contribution Projects

Assessment of social influence of Bamseom Island and biodiversity projects

LG Chem is measuring social and economic effects of social contribution projects in each year to verify their social influence and effectiveness. In 2018, we assessed ‘Bamseom Island and biodiversity projects’ with an agency specialized in social values called Impact Square, examining the social influence of our projects and finding improvement measures.

1. Defining Social Influence of Bamseom Island and Social Contribution Programs

For objective assessment of this project, LG Chem and Impact Square reviewed the social influence based on the leading global biodiversity frameworks, Aichi biodiversity targets and SDGs. According to the analysis results, this project was found to have positive effects on the Aichi biodiversity target A-1 (enhancing biodiversity awareness), B-5 (slowing or reducing the rate of habitat loss) and B-8 (reducing contaminations). Potentially, the project could possibly contribute to target B-9 (preventing and controlling invasive exotic species), C-12 (reducing danger of extinction) and C-13 (protecting genetic diversity). From the perspective of SDGs, this project contributes to 15.1, 15.5 and 15.a of Goal 15 (protection of terrestrial ecosystem). Potentially, the project can also contribute to 15.4 and 15.8.

In conclusion, LG Chem was assessed to create core social values of spreading awareness of the need for

Aichi Strategic Goals and Targets Related to LG Chem

Strategic goal	Targets	
A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	1. Enhancement of awareness of the biodiversity values	
	2. Integrating biodiversity values	
	3. Innovation in incentive system	
	4. Establishing plans for sustainable production and consumption	
	5. Reduction in the rate of loss of all natural habitats	
	6. Managing sustainable aquatic life	
	B. Reduce the direct pressures on biodiversity and promote sustainable use	7. Managing sustainable agriculture, aquaculture and forestry
		8. Pollution reduction
		9. Preventing and controlling invasive alien species
		10. Protecting vulnerable ecosystems from climate change
C. To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	11. Conservation area	
	12. Reduction for extinction of known threatened species	
	13. Protecting genetic diversity	
D. Enhance the benefits to all from biodiversity and ecosystem services	14. Ecosystem services	
	15. Ecosystem resilience	
E. Enhance implementation through participatory planning, knowledge management and capacity building	16. Access to genetic resources and the fair and equitable sharing of benefits	
	17. Biodiversity strategy and action plan	
	18. Respect of traditional knowledge	
	19. Sharing information and knowledge	
	20. Mobilization of financial resources from all sources	

UN SDGs Goal 15 Related to LG Chem

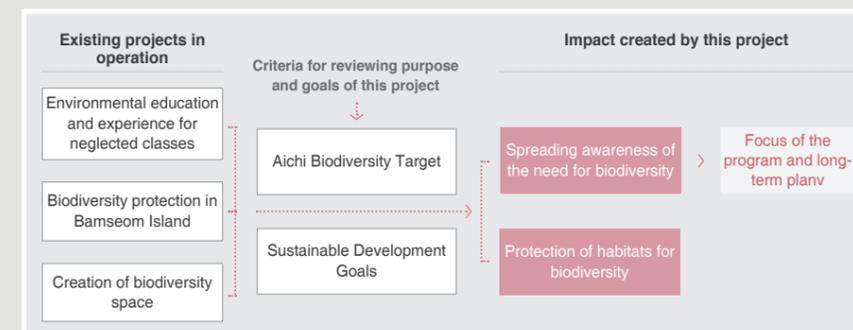
Targets	Description	Targets	Description
15.1 Protection of inland freshwater ecosystems	By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.7 Poaching and trafficking of protected species	Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products
15.2 Deforestation	By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	15.8 Prevention of invasive alien species	By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species
15.3 Desertification	By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	15.9 Integration of ecosystem and biodiversity values into policy and plan	By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts
15.4 Conservation of biodiversity	By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	15.a Financial resources for biodiversity and ecosystems	Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems
15.5 Urgent action to reduce the degradation of natural habitats	Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	15.b Financial resources for sustainable forest management	Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation
15.6 Promotion of fair sharing of benefits from genetic resources	Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed	15.c Enhance global support for efforts to combat poaching and trafficking of protected species	Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities

biodiversity and protecting habitats. Spreading awareness of the need for biodiversity involves the development of education and experience programs and operation of exhibition space

for citizens. Protecting habitats for biodiversity is defined as removal of direct threats to habitats and reduction of environmental contaminations that cause habitats to collapse.

2. Directions for Improvement

LG Chem will strive to increase 2 core social values of this project (1. Spreading awareness of the need for biodiversity, 2. Protecting habitats for biodiversity) and follow up on the progress using pre and post survey tools. Scale of exposure, durability and involvement will be increased to spread biodiversity awareness. Endangered animals and plants will be selected to provide protection.



Factsheet

Performance

Financial Performance

Non-financial Performance

Financial Performance

Financial Performance

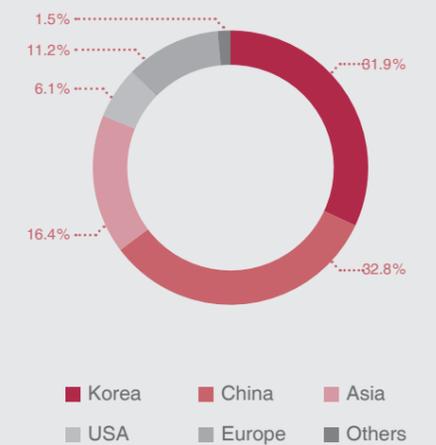
Financial Status	Consolidated Income Statement (Unit: KRW million)	'16	'17	'18
Sales		20,659,296	25,698,014	28,183,013
Operating income		1,991,920	2,928,457	2,246,070
Net income		1,280,994	2,021,973	1,519,312
Owners of the parent		1,281,124	1,945,280	1,472,608
Consolidated Financial Statement (Unit: KRW billion)				
Current assets		9,226,934	11,205,581	12,088,512
Non-current assets		11,260,126	13,835,640	16,855,625
Total assets		20,487,060	25,041,221	28,944,137
Current liability		5,446,851	6,644,689	7,273,534
Non-current liability		989,242	2,057,955	4,348,475
Total liability		6,436,093	8,702,644	11,622,009
Owners of the parent		13,937,352	16,168,527	17,083,044
Non-controlling interests		113,615	170,050	239,084
Total equity		14,050,967	16,338,577	17,322,128
Financial Ratio (Unit: %)				
Stability Indicators	Current ratio	169.4	168.6	166.2
	Debt-to-equity ratio	45.8	53.3	67.1
	Dependency on borrowing	20.6	18.6	30.7
Profitability Indicators	Operating income margin	9.6	11.4	8
	Net income margin	6.2	7.9	5.4
	ROA	6.6	8.9	7.5
	ROE	9.4	13.3	12
Growth Indicators	Sales growth	2.2	24.4	9.7
	Operating income growth	9.2	47	-23.3
	Net income growth	11.5	57.8	-24.8
	Total assets growth	10.3	22.2	15.6

* Based on consolidated financial performance

Business Results by Business Area	Business Results by Business Area (Unit: KRW million)	'16	'17	'18
Basic Materials & Chemicals	Sales	14,281,574	17,245,735	17,762,142
	Operating income	2,138,625	2,808,142	2,131,072
Energy Solutions	Sales	3,561,601	4,560,546	6,498,916
	Operating income	-49,337	28,875	209,170
IT&E Materials, Advanced Materials	Sales	2,490,794	2,742,327	2,745,143
	Operating income	-54,965	111,443	-28,297
Life Sciences	Sales	-	548,457	571,129
	Operating income	-	53,522	49,547
Others	Sales	325,327	600,949	605,683
	Operating income	-42,403	-73,525	-115,422
Total	Sales	20,659,296	25,698,014	28,183,013
	Operating income	1,991,920	2,928,457	2,246,070

* Others: FarmHannong, etc.

Sales Ratio by Region
(Unit: %)



* Domestic sales include export totals according to local LC conditions

** Asia: excluding Korea and China

Non-financial Performance

Employee

Distribution of Economic Achievement	Distribution of Economic Achievement (Unit: KRW hundred million)			
		'16	'17	'18
Employees	Total annual wage	12,483	15,080	16,249
	Average wage per head	0.83	0.9	0.88
Government	Income tax expense	3,788	5,419	4,207
Suppliers	Purchase of raw materials	101,582	130,800	161,234
Shareholders & Investors	Total dividends	3,681	4,601	4,601
Community	Expenses for social contribution	299	367	162
R&D (Unit: Persons, KRW billion, %)				
	Number of R&D Employees	4,242	4,760	5,458
	R&D Investment	6,861	8,925	10,618
	Sales to R&D investment ratio	3.3	3.5	3.8
	Sales of new product	69,379	90,216	103,724
	Sales of new product rate	33.6	35.1	36.8

Total Value of Political Contributions	Total Value of Political Contributions (Unit: KRW thousand)			
		'16	'17	'18
	Total	3,434,531	1,725,168	2,098,253

Top 5 Groups for Policy Contributions (Unit: KRW thousand)	Amount
Korea Employers Federation	319,630
Korea PC-BPA Council	290,050
Korea Petrochemical Industry Association	256,249
Korea Battery Industry Association	160,000
Korea Vinyl Environmental Council	128,700

* LG Chem prohibits political contribution.

Raw Material Purchase	Purchase (Unit: KRW million)	Item	Use	Companies
Basic Materials & Chemicals	10,020,959	Naphtha, EDC, etc.	PE/PVC materials	GS Caltex, Mitsui etc.
Energy Solutions	3,765,126	Cathode, Anode materials, separation membranes, etc.	Battery materials	Hitachi, Mitsubishi etc.
IT&E Materials, Advanced Materials	1,983,244	TAC film, cobalt, surfactant	Polarizer, LCD materials, Intermediates for pharmaceuticals	Fuji, SANYO Korea BASF etc.
Life Sciences	77,951	Medical material, organic compound	Medicine, medicine of animals, material for agricultural chemicals	Recordati, Techwell, Sinochem Agro etc.
Others	276,073	Granule, etc.	Chemical fertilizer materials	Others

Tax Policy

Tax Policy

LG Chem is aware that compliance with tax laws and management of tax risks are as important as maximizing of shareholder values as they contribute to the national finance. Accordingly, LG Chem has established and is operating strict principles and regulations related to tax. For international transactions with overseas corporations, we have a reasonable transfer price policy based on domestic tax laws and the OECD guidelines on transfer prices. LG Chem has local corporations and branch offices in China, U.S., Poland, India, etc. We faithfully fulfill our duty to pay taxes and submit documents required by tax authorities of each nation. Detailed information regarding taxes is notified publicly through business reports. LG Chem takes measures in response to anti-dumping lawsuits and engages in 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

Employment and Salary Status	Employees Status (Unit: Persons)			
		'16	'17	'18
By region	Korea	14,897	16,810	18,431
	China	10,104	10,447	11,658
	Europe	495	773	1,690
	Asia	397	655	692
	USA	689	753	1,223
	Total	26,582	29,438	33,694
Regular employees (Korea)	Male	13,230	14,566	15,600
	Female	1,667	2,115	2,492
Non-regular employees (Korea)	Male	55	95	299
	Female	22	34	40
Overseas	Male	6,861	7,812	9,266
	Female	3,861	3,942	4,579
The disabled	Korea	137	137	151
	Overseas	9	10	8
Ethnic minority	Korea	555	649	884
	Overseas	334	376	355
National veteran	Korea	334	376	355
	Overseas	3	3	0

* 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.

* For the number of domestic social minority group, the disabled and national veteran group are included, and the disabled, ethnic minority, and national veteran group of China (LGCCI) and overseas manufacturing facilities are included for overseas

* Minority data for 2016 and 2017 are changed due to the data alteration at LGCBH.

Salary (Unit: %)	'16	'17	'18
Management position	1.13	1.10	1.10
Non-management position	1.16	1.11	1.07

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

Employment and Salary Status	Female Employees (Unit: Persons, %)			
		'16	'17	'18
Number of female office worker	Korea	1,558	2,000	2,366
	Overseas	940	1,080	1,303
Ratio of female office worker	Korea	19.1	20.9	21.5
	Overseas	32.3	32.5	33.9
Number of female employees in management positions	Korea	454	690	867
	Overseas	137	181	209
Ratio of female employees in management positions	Korea	5.6	7.2	7.9
	Overseas	4.7	5.6	5.4

* 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 position / Total office workers * 100

Recruitment and Retirement	New Recruitment (Unit: Persons)			
		'16	'17	'18
Korea	Male	1,315	914	1,776
	Female	267	237	488
	Total	1,582	1,151	2,264
Overseas	Male	1,576	3,597	5,393
	Female	733	1,300	2,121
	Total	2,309	4,897	7,514

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

New Employment by Age (Unit: Persons)	'16	'17	'18
	10s	5	-
20s	920	596	1,137
30s	475	431	893
40s	130	69	157
50s	39	33	38
60s	13	22	38
70s	-	-	1
Total	1,582	1,151	2,264

* Data is limited to sites in Korea.

Employment and Retirement	Manager from Local Community of Business Sites (Unit: Persons, %)	'16	'17	'18
Locally hired employees in management position		475	586	766
Percentage of locally hired employees in management position		66.0	67.0	76.8

* Data is limited to China (LGCC) and overseas manufacturing facilities.

* Manager is employees above professional level in Korea, and manager level in overseas subsidiary companies

Turnover Rate (Unit: Persons, %)	'16	'17	'18
Male	389	533	639
Female	75	128	124
Total	464	661	763
Male	2.6	3.6	3.5
Female	0.5	0.9	0.7
Total	3.1	4.4	4.1
Male	232	355	395
Female	68	98	110
Total	300	453	505
Male	1.5	2.1	2.1
Female	0.5	0.6	0.6
Total	2	2.7	2.7

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

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

Welfare System for Employees
 LG Chem provides diverse welfare benefit systems to satisfy employees and help them maintain a stable work-life balance. In addition, we operate a retirement pension system to secure stable old-age income of employees after retirement. The retirement pension system is divided into two types according to the legal standards, defined benefit (DB) and defined contribution (DC).

Employee Welfare

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
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
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

Maternity and Child Care Leave (Unit: Persons, %)	'16	'17	'18
Number of maternity leave beneficiaries	149	124	163
Number of child-care leave beneficiaries	126	183	259
No. of employees who have not returned since child-care leave	10	3	11
Ratio of those returning to work	92.1	98.4	95.8
Number of employees working for 12 months or more after a maternity leave	88	96	190
Ratio of employees working for 12 months or more after a maternity leave	93.6	93.2	89.6

* Data is limited to workplaces in Korea.

Training for Employee	Training for Employees (Unit: hour, KRW hundred million, KRW ten thousand, persons)	'16	'17	'18
Total training hour		751,467	738,634	946,440
Average training hour		50	44	51
Total training cost		168	184	232
Average training cost		112	109	127
Employees		14,974	16,891	18,431

* Data is limited to workplace in Korea.

Strengthening Job Competency by Occupational Group

LG Chem runs education on sales, marketing, purchase and quality to strengthen job competency required for each occupational group. This competency education program is operated in connection with the group education system (LG Chem Academy), and 443 persons have completed the education program (4.5 points on a 5-point scale). LG Chem has also launched a common job training course (negotiation, presentation skill, introduction to financing, accounting and statistics) in addition to leadership education and job competency education, which was completed by 232 persons (4.7 points on a 5-point scale).

Nurturing On-Site Experts

LG Chem delivers know-how and educates plant workers. This is an opportunity to become experts for individuals and a way of increasing production competitiveness for the organization. The scope of our expert training system has been expanded from large business sites to small and medium-sized business sites.

Starting in 2018, Ochang Plant constructed the Growth Support Center to provide personalized competency development programs for members. They can receive adequate consulting from internal and external experts by requesting the service in a field they desire, such as leadership, expertise and self-development. Members who have the vision of becoming experts can come up with their own growth plan after consulting.

Training for Employee
Fostering Entrepreneurs
 LG Chem conducts training for future entrepreneurs such as the pool of division leader candidates, next-generation global business leaders and High Potential Individuals (HPIs). For the pool of division leader candidates and next-generation global business leaders, we provided small group debates to foster basic competencies and innovation of the way we work. HPIs were provided 2 courses of Business Insight and Leadership, making a selective education program comprised of 9 courses in total.

Increasing Leadership Capacity

LG Chem annually educates all employees on leadership. We conducted education on fairness of evaluation for managers in response to the new personnel evaluation system in 2018. We also provided job training to help establish Individual Development Plans (IDPs) for counseling according to the reorganized personnel system. A selective education program was launched for potential team managers.

Nurturing Global Talents | Candidates for Expatriate Employees

LG Chem strives to enhance capabilities of expatriate employees (candidates) and local employees. With the continued expansion of global businesses, we have established a personalized training plan for expatriate employees to exhibit their capabilities. We produced 20 local experts in 5 nations by going through an intense beginner's local language course, consulting on on-site tasks, domestic course to prepare for on-site duties (2.5 months), advanced local language course, and on-site course (5 months). The team nurturing expatriate employees operated education on the capabilities (business management, leadership and organizational management, business specialization, foreign language) of expatriate employees for 4 months. The effectiveness of education was increased by providing essential information (understanding of nation and businesses, safety, environment, Jeong-Do management, compliance, stress management, etc.) online.

Nurturing Global Talents / Expatriate and Local Employees

and Poland (October, 2 sessions, 35 trainees). We added health and psychotherapy for expatriate employees and their family members in 2018. We are considering expansion of the scope to the United States and Europe in 2019.

Management of Intellectual Properties **Securing Patent Competitiveness**
 LG Chem promotes strategic patent management from product development to commercialization. We make efforts to secure strategic patents for each product development stage and establish response strategies to patents of other companies. Especially, we have created a mid to long-term patent portfolio by strengthening our IP-R&D activities for primary technologies related to bio and advanced materials. As of the end of 2018, LG Chem possessed about 55,000 intellectual properties, of which about 39% are patents in the field of information and electronics material and 40% are in the field of energy solutions. We have been and will continue to increase patent competitiveness in the future business areas including bio.

Strengthening Management of Intellectual Properties

LG Chem operates a company-wide intellectual property management system. Workers in charge of managing IP supports each stage from early R&D to commercialization, thus establishing relevant strategies and strengthening patent competitiveness. We are also strengthening the expertise of IP management by recruiting patent attorneys and legal experts. IP experts are dispatched to strategic areas overseas. An advanced patent management system was developed to manage all activities including patent application, analysis and litigation.

Workplace Safety	Injury and Severity Rate (Unit: %, day)				
		'16	'17	'18	
Employee	Injury rate	Korea	0.19	0.23	0.18
		Overseas	0.13	0.28	0.45
	Severity rate	Korea	0.06	0.09	0.06
		Overseas	0.03	0.02	0.03
	LTIFR	Korea	0.98	1.15	0.91
		Overseas	0.47	1.42	2.24
OIFR	Korea	0.07	0.03	0.03	
	Overseas	0	0	0	
Contractors	Injury rate	Korea	0.4	0.31	0.17
		Overseas	0	0.41	0.32
	LTIFR	Korea	2.04	1.55	0.86
		Overseas	0	1.85	1.71

* Overseas data for injury rate and severity rate is limited to China (LGCCI) and overseas manufacturing facilities.
 * Data for 2016 and 2017 are changed because the formula of injury rate, LTIFR, OIFR calculation changed.
 * The Enforcement Regulations of the Occupational Safety and Health Act was applied for the injury rate of domestic subcontract workers, starting in 2018. (Number of injured workers among subcontract permanent and daily workers / number of subcontract permanent and daily workers x 100)

Workplace Safety	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, LGCBJ, LGCYX, LGCNJ, LGCNA, LGCWA
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		LGCBT, LGCTJ, LGCBJ, LGCMI, LGCVH, LGCYX, LGCNJ, LGCNA, LGCWA, 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		Yeosu Plant, Naju Plant, Ochang 1 Plant, Paju Plant, Gimcheon Plant, Daesan Plant, Ulsan Plant, Iksan Plant (EP), Cheongju Plant, Onsan Plant, Osong 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

Safety and Health Training (Unit: hour)			
	'16	'17	'18
Korea	377,753	399,559	388,123
Overseas	37,624	98,151	105,577

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * Domestic data for 2017 is changed due to the data alterations in Onsan plant and Ulsan plant.
 * Domestic data for 2016 and 2017 are changed due to the data alterations in Osong plant.
 * The Enforcement Regulations of the Occupational Safety and Health Act was applied for Korea, starting in 2018. (Supervisors (persons) x 16 (hr/year) + workers other than salespersons (persons) x 24 (hr/year))

Employee Health LG Chem is implementing activities to prevent diseases and promote health care of employees by eliminating health hazards and creating a pleasant working environment. Personalized medical services are provided to employees by operating health care offices at each workplace. In addition to physical health management, we have introduced a system for mental health care programs to diagnose, consult and treat depressive disorders. Counseling offices are in operation by professional therapists to provide proper assistance for employees in need. Various health promotion programs are in place to create spread the health care culture. LG Chem aims to minimize potential health-related risks in addition to creating a working environment that complies with legal standards. We have established internal standards stricter than legal standards and will continue our efforts to maintain the highest safety level in the industry.

Labor-Management Relationship LG Chem pursues a horizontal labor-management relationship where the management and employees respect one another on equal footing. LG Chem also practices labor-management partnership of participation and cooperation based on the philosophies of 'creating customer values' and 'human respect.'

We are creating continuous outcomes to secure world-level competitiveness, enhance quality of life of employees, and create a labor-management relationship that contributes to the society. To do so, LG Chem operates a unique labor-management cooperation model on 3 levels including corporate management, worksite and collective bargaining. On the level of corporate management, we are raising values of the company and members by strengthening communication. On the level of worksite, we secure highest productivity by complying with the basics and principles and training talented individuals at the site. On the level of collective bargaining, we are building a business-oriented labor-management partnership through a reasonable and productive negotiation culture and mutual cooperation.

Labor Union (Unit: Persons, %)				
	'16	'17	'18	
Number of members	Korea	6,437	6,889	6,964
	Overseas	8,736	9,105	10,091
Rate	Korea	75	75	72
	Overseas	95	89	95

Supplier

Shared Growth **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. The safety and environment manager was appointed as a new member of the Shared Growth Steering Committee in 2018 to expand the scope of shared growth activities to the field of safety and environment. 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.

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.

Supplier Management (Unit: company)	'16	'17	'18
Number of new suppliers among the primary suppliers	290	564	397
Total number of registered suppliers	3,673	5,213	4,759
Number of suppliers to conduct document investigation (audit)	843	1,146	1,306
Number of suppliers to conduct visit survey (audit)	316	450	399
Number of suppliers to take corrective action	22	33	2
Number of suppliers to be suspended transaction temporarily or permanently	2	11	3

* Criteria for registration of official suppliers in the respective year
 * Number of suppliers with transactions in the last 5 years (cumulative)
 * Total number of registered suppliers is as of the end of the respective year, and the number of audited suppliers is cumulative.
 * The number of suppliers for basic materials was changed in 2017.

Supplier Support Status **Financial Support** LG Chem conducts financial support activities such as direct financial support, shared growth fund, network and family loans, and shared growth investment resources to help suppliers. Direct financial support is an interest-free direct loan program to support new investment of suppliers that grants loans through recommendation and review of suppliers and secondary review of the department of finance and economy. The shared growth fund is a low interest loan fund designed to resolve financial difficulties of suppliers. Network and family loans are operated with financial institutions, and shared growth investment resources are used for R&D, human resource development, productivity, overseas expansion and energy saving.

Status of Financial Support to Suppliers (accumulated) (Unit: KRW billion)	'16	'17	'18
Shared Growth Fund	69.8	81.0	98.4
Investment Resources	0.3	0.4	0.89

Operating 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. The amount of the shared growth payment system was increased by about 50% in 2018 to provide KRW 1,036 billion to 1,377 companies.

Supplier Support Status **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.

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. LG Chem doubled the number of suppliers supported with the recruitment subsidy in 2018. We will increase the amount of subsidy each year to close the gap in wages among small, medium and large companies.

Training Suppliers' Employees 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. General education courses were added in 2018 to educate 212 employees of 59 suppliers.

Supporting Technology and Entry into 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.

Supplier Support Status **Participation in Production Innovation Partnership** LG Chem is participating in the production innovation partnership project supervised by the Ministry of Trade, Industry Energy and the Large and Small Business Cooperation Foundation to support suppliers in increasing productivity and export competitiveness. We strengthen competitiveness and self-sufficiency of suppliers by promoting the worksite smart factory project and providing incidental expenses for export. This project offers innovative solutions for productivity and direct costs of export (tariffs, logistics agency, etc.)

Supplier Support Cases **KS Compressor** This supplier is specialized in repairing compressor and machinery parts. The supplier participated in the productivity innovation partnership of LG Chem to increase work efficiency by removing process losses and waste of maintenance time.

NPK / WISTEK / Kyesung Industry Facilities were replaced and new and renewable energy facilities were constructed for major suppliers. Shared growth investment successfully reduced energy costs and greenhouse gas emission of suppliers.

Communication with Suppliers **Communication Activities** LG Chem holds periodic meetings with suppliers to share business status and issues and listen to their opinions. The Energy Solutions Division formed an organization with various suppliers. The management of LG Chem visits production sites of suppliers to resolve difficulties. In 2018, the CEO visited two partner companies of the Energy Solutions Division to manage CSR of the supply chain. LG Chem will continue to settle down a sound collaboration culture through meetings and visiting of suppliers.

External Activities The COO of LG Chem participates as a member of the Mutual Growth Committee to represent LG Group and chemical industry. As a mutual growth member, the COO is working with the government to discuss mutual growth issues and spread the mutual growth culture.

Customers

Customer Satisfaction	Customer Satisfaction (Unit: point, %)	'16	'17	'18
	NPS score	64.9	64.3	61.4
	Data coverage	93.3	94.7	94.1

Local Communities

Social Contribution Status	Social Contribution (Unit: KRW billion)	'16	'17	'18
	Social contribution in Korea	29.5	36.3	15.9
	Social contribution in overseas	0.36	0.49	0.33

* Overseas data for 2016 and 2017 are changed due to the data alterations in LGCGZ, LGCTJ and LGCCQ.

Environment

Resource Management	Raw Materials (Unit: Ton, Ton / Sales)			'18
		'16	'17	
Korea	Total amount raw material use	16,894,226	19,680,892	19,268,513
	Intensity	0.98	0.94	0.83
	Total amount of recycled raw materials	22,984	20,526	28,907
Overseas	Total amount raw material use	2,260,488	2,497,083	2,673,704
	Intensity	0.67	0.52	0.55

* Overseas data for raw material use is limited to China (LGCCI) and overseas manufacturing facilities.
 * Domestic data for 2017 is changed due to data alteration of Iksan plant (Life Science, EP).
 * Intensity data for 2016 and 2017 are changed due to the change of measuring standard.

Water Usage by Source (Unit: m ³ , %, m ³ / Sales)			'18		
	'16	'17			
Korea	Ground water	427,020	396,376	407,039	
	Industrial water	54,146,262	55,349,317	56,495,243	
	Municipal water	941,563	1,725,155	1,924,549	
	Surface water	977,777	-	-	
	Rainwater collected directly and stored by the organization	8	27,448	28,567	
	Others	-	-	-	
	Total	56,492,630	57,498,296	58,855,398	
	Intensity	8.45	6.90	6.54	
	Overseas	Ground water	-	-	-
		Industrial water	5,821,406	6,804,223	7,799,448
Municipal water		1,499,533	1,552,726	2,274,536	
Surface water		607,027	601,509	687,961	
Others		632,731	169,605	38,065	
Total		8,560,697	9,128,063	10,776,154	
Intensity		2.52	1.89	2.21	

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * Municipal water usage data (2017) of Osong plant is changed.
 * Total domestic water usage data for 2016 and 2017 are changed.
 * LGCHZ data of industrial and municipal water usage (2017) is changed.
 * Overseas intensity data for 2016 and 2017 is changed due to the change of measuring standard.

Wastewater and Waste Management	Wastewater Management (Unit: m ³ , %, m ³ / Sales)			'18
		'16	'17	
Korea	Amount of wastewater discharged	14,956,833	15,069,541	15,709,551
	Amount of wastewater recycled	1,051,806	1,194,080	999,194
	Recycling rate	6.6	7.4	6.0
	Intensity	0.87	0.72	0.67
	Amount of wastewater discharged	4,089,292	4,737,703	5,084,714
Overseas	Amount of wastewater recycled	1,805,663	3,038,429	2,127,829
	Recycling rate	30.6	39.1	29.5
	Intensity	1.20	0.98	1.04

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * Domestic data for 2017 is changed due to the data alteration at Iksan plant (Life Science).
 * Intensity data for 2016 and 2017 is changed due to the change of measuring standard.

Waste Management (Unit: Ton, %, Ton / Sales)			'18		
	'16	'17			
Korea	Waste generation	General waste	111,695	113,137	115,442
		Hazardous waste	87,466	105,685	116,811
	Recycling amount	146,193	170,747	180,974	
	Recycling rate	73.4	78	77.9	
Overseas	Waste generation	General waste	33,900	44,683	53,254
		Hazardous waste	14,621	15,940	18,706
	Recycling amount	20,397	29,930	39,417	
	Recycling rate	42	49.4	54.8	
Total	Total amount of waste generated	199,161	218,822	232,252	
	Intensity	0.012	0.010	0.010	
	Intensity	0.014	0.013	0.015	

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * Total amount of waste generated in overseas (2017) is changed.
 * For domestic sites, figures from 2016 are changed due to classifying waste into waste code according to waste management law
 * Intensity data for 2016 and 2017 is changed due to the change of measuring standard.

Pollutants Management	Discharge of Water Pollutants (Unit: Ton, kg / sales)	'16		'17		'18	
		Amount	Intensity	Amount	Intensity	Amount	Intensity
Korea	COD	679	0.04	755	0.04	724	0.03
	T-N	276	0.02	284	0.01	312	0.01
Overseas	COD	385	0.11	387	0.08	310	0.06

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * Intensity data for 2016 and 2017 is changed due to the change of measuring standard.

Emission of Air Pollutants (Unit: Ton, kg / sales)	'16		'17		'18		
	Amount	Intensity	Amount	Intensity	Amount	Intensity	
Korea	Dust	152	0.01	143	0.01	136	0.01
	NOx	1,008	0.06	953	0.05	1,022	0.04
	SOx	119	0.01	106	0.01	268	0.01
Overseas	Dust	18	0.01	59	0.01	41	0.01
	NOx	164	0.05	213	0.04	244	0.05
	SOx	17	0.01	32	0.01	29	0.01

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * LGCYX SOx emission data for 2016 and 2017 is changed.
 * Intensity data for 2016 and 2017 is changed due to the change of measuring standard.

Hazardous Waste Management	Total Use of Toxic Substances (Unit: Ton, Ton / sales)	'16		'17		'18
		Amount	Intensity	Amount	Intensity	
Korea	Amount	6,653,370		6,320,435		7,110,914
	Intensity		0.39		0.30	0.30
Overseas	Amount	1,335,662		1,563,341		1,659,064
	Intensity		0.39		0.32	0.34

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * Domestic data for 2016 and 2017 is changed due to the data alteration at Iksan plant (Life Science, EP).
 * Intensity data for 2016 and 2017 is changed due to the change of measuring standard.

Energy Management	Energy Use (Unit: TJ, GJ / sales)	'16		'17		'18
		Amount	Intensity	Amount	Intensity	
Korea	Direct	97,622		98,896		96,633
	Indirect	50,565		54,462		57,144
	Total	148,187		153,358		153,777
Overseas	Direct	1,868		3,103		3,591
	Indirect	8,608		8,399		10,016
	Total	10,476		11,502		13,607
Intensity		3.09		2.39		2.80

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * Intensity data for 2016 and 2017 is changed due to the change of measuring standard.

Greenhouse Gas Management
 LG Chem has established the Greenhouse Gas and Energy Management System (GEMS) in response to government regulations and financial risks arising from the introduction of the emission trading system. We have come up with procedures and strategies for operating emission credits. Monthly cost of purchasing emission credits is reflected on production cost for a proactive response to associated risks. Our strategy is to purchase emission credits according to volatile market conditions. There is a manual to train persons in charge of the emission trading system. Important global issues related to energy and climate change are shared at worksites.

Scope 1, Scope 2 Greenhouse Gas Emissions (Unit: tCO ₂ -eq, tCO ₂ -eq / sales)			'18	
	'16	'17		
Korea	Direct	5,119,076	5,116,711	5,220,380
	Indirect	2,319,920	2,547,469	2,784,869
	Total	7,438,996	7,664,180	8,005,249
	Intensity	0.431	0.367	0.343
Overseas	Direct	129,587	142,109	203,987
	Indirect	1,574,172	1,549,883	1,783,813
	Total	1,703,759	1,691,992	1,987,800
	Intensity	0.502	0.351	0.408

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * Intensity data for 2016 and 2017 is changed due to the change of measuring standard.

Scope 3 Greenhouse Gas Emissions (Unit: tCO ₂ -eq)			'18
	'16	'17	
Wastewater discharge	19,145	19,289	20,108
Waste disposal	15,274	15,390	16,631
Water use	5,836	5,218	6,401
Employee business trip	2,478	2,640	3,130

* Data of polluted water and waste management for 2016 and 2017 is changed.

Environmental Investment (Unit:KRW thousand)			'18
	'16	'17	
Korea	39,926,074	43,126,284	109,760,241
Overseas	4,427,427	32,726,855	30,183,838

* Overseas data is limited to China (LGCCI) and overseas manufacturing facilities.
 * Overseas data for 2016 and 2017 is changed.
 * Domestic data for 2017 is changed due to the data alteration at Iksan plant (Life Science), Osong plant and Research Center in Daejeon.

Factsheet

Appendix

- Corporate Governance
- Stakeholder Engagement
- Company profile
- Our Focus Areas on SDGs
- Business Model
- Business Ethics
- Risk Management
- GRI Content Index
- Independent Assurance Statement
- Association and Principle
- Awards and Recognitions
- Contributors to Report Preparation
- Investor Information
- About This Report

Corporate Governance

Composition and Independence of Board of Directors The Board of Directors of LG Chem is comprised of 3 executive directors and 4 non-executive directors. The ratio of non-executive directors is kept higher than the majority of the BOD in order to maintain the balance. Directors serve a 3-year term and can be reappointed based on their activities and performance.

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 independence directors, two of the three members are independence 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.

LG Chem's Board of Directors		Executive Directors
Park, Jin-Soo	Chairperson of the Board of Directors Member of the Nomination Committee for Independent Directors	<ul style="list-style-type: none"> · Former CEO and Vice Chairman of LG Chem, CEO of Hyundai Petrochemical, CEO of LG Petrochemical
Shin, Hak-Cheol	Chairperson of Management Committee	<ul style="list-style-type: none"> · Current Vice chairman and CEO of LG Chem · Former Vice Chair and Executive Vice President of 3M, Executive Vice President of International Operations at 3M
Jeong, Ho-Young	Member of the Management Committee	<ul style="list-style-type: none"> · Current CFO of LG Chem · Former CFO of LG Display, CFO of LG Household & Health Care
		Independent Directors
Ahn, Young-Ho	Chairperson of the Audit Committee Member of the Nomination Committee for Independent Directors	<ul style="list-style-type: none"> · 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	<ul style="list-style-type: none"> · Present Professor at the School of Chemical and Biological Engineering, Seoul National University, Gutenberg Research College-Fellow, American Physics Society-Fellow
Jeong, Dong-Min	Member of the Audit Committee	<ul style="list-style-type: none"> · 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	<ul style="list-style-type: none"> · Current Member of the Deliberation Committee on Taxation Development at the Ministry of Strategy and Finance, Adjunct Professor of Graduate School of Science in Taxation, The University of Seoul · Former Vice Commissioner of National Tax Service

Board of Directors Activity
The Board of Directors officially meets once each quarter excluding the possible unscheduled meeting. In 2018, the Board held 9 meetings resulting in 36 approvals and 11 reports. Meetings are mandatory for Board of Directors except in regard to unavoidable situations. Participation rate was 85% for executive directors and 97% for independent directors in 2018.

Board of Directors Activity		'16	'17	'18
Unit: %, times, cases				
Attendance	Executive Directors, Non-Executive Director	100	100	85
	Independent Directors (Non-Executive)	100	93.1	97
Number of meetings		10	11	9
Number of agenda submitted	Approval	38	37	36
	Report	9	8	11

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.

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 total wages for the Board of Directors decided at the general shareholders meeting in 2018 is KRW 8 billion, and the total amount of wages paid was KRW 3.98 billion. Wages for individual directors and auditors that exceed KRW 500 million are made public through business reports in accordance with relevant laws.

Compensation for Directors in 2018 (Unit: KRW million)	Number of People	Total Payment	Average Compensation Per Person
Registered Directors (Independent Directors and Audit Committee members excluded)	3	3,665	1,222
Independent Directors (Audit Committee members excluded)	1	78	78
Audit Committee members	4	241	60

CSR Governance
LG Chem operated 'CSR Team' since 2013 to be in charge of 'sustainability.' Starting in 2016, LG Chem operated the 'CSR Committee' with the CEO as the chairman. The CSR Committee is comprised of members related to sustainability such as personnel, labor affairs, supplier management, corporate ethics, safety, environment and health. This is the highest sustainability decision making organization that checks current status of sustainable management, discusses improvement methods and makes decisions. As CSR issues such as renewable energy and cobalt supply chain had great influence over businesses of LG Chem in 2018, the CSR Committee established the Responsible Sourcing Policy. It also shared and discussed the methods of expanding social contribution activities and increasing the effectiveness of such activities.

CSR Task to Promote in 2018

CSR audit and evaluation	On-site inspection and external evaluation of CSR (by investors, NGOs, evaluation agencies, etc.) Management of policy and supply chain related to the cobalt human rights issue
Supply chain CSR	Evaluation and inspection of supplier CSR Management of cobalt CSR risks

Stakeholder Engagement

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

Company Profile



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.'

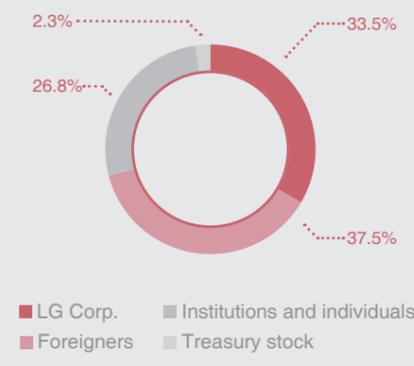
Company Status		As of December, 2018
Company Name	LG Chem, Ltd.	
Headquarters	LG Twin Towers, 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, South Korea	
Foundation	January 1947	
Employees	33,694 Korea 18,431, Overseas 15,263	
Net Income	KRW 1,519 billion	
Revenue	KRW 28,183 billion	
Total Assets	KRW 28,944.1 billion capital KRW 17,322.1 billion, liabilities KRW 11,622 billion	

Business Areas

LG Chem's business area is Petrochemicals, Energy Solutions, Advanced Materials, Life Sciences

Petrochemicals	NCC, PO, PVC/Plasticizer, ABS, Acrylates/SAP, Rubber/Specialty Polymers
Energy Solutions	Automotive Battery, ESS Battery, IT & New Application Battery
Advanced Materials	Automotive Materials, IT Materials, Industrial Materials
Life Sciences	PD, SD, Aesthetic

Shareholder Status



Global Network

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.

Global Network

Manufacturing plants (23)

1 USA	Holland, Evansville
5 Poland	Wroclaw
9 China	Beijing, Tianjin, Ningbo, Quzhou, Guangzhou, Nanjing, Huizhou, Chongqing, Wuxi
11 India	Visakhpatnam
14 Vietnam	Ho Chi Minh, Haiphong
15 Taiwan	Taipei

Representative offices (5)

7 Jordan	Amman
8 Russia	Moscow
12 Thailand	Bangkok
13 Vietnam	Ho Chi Minh

Subsidiaries (14)

1 USA	Atlanta, Torrance
2 Mexico	Mexico City
3 Brazil	Sao Paulo
4 Germany	Frankfurt
6 Turkey	Istanbul
9 china	Beijing, Hongkong
10 Japan	Tokyo
11 India	Gurgaon
13 Taiwan	Bangkok
16 Malaysia	Kuala Lumpur
18 Australia	Sydney

R&D Campus (1)

1 USA	Troy
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Domestic Network

HQ (1)

1 Seoul

R&D campus (3)

1 Magok
3 Gwacheon
6 Daejeon

Training center (1)

4 Onsan

Manufacturing plants (13)

2 Paju
5 Daesan
7 Ochang
8 Osong
9 Cheongju
10 Iksan
11 Gimcheon
12 Ulsan
13 Onsan
14 Naju
15 Yeosu

Our Focus Areas on SDGs



The 'UN Sustainable Development Goals (SDGs)' were set forth by the UN to promote sustainable development of the international society. This is a promise of the entire international society to resolve critical issues faced by the humankind. In September 2015, UN member states agreed on 17 goals and 169 targets embracing the 3 major fields of economy, society and environment to be achieved by 2030. LG Chem has been sympathizing with the UN SDGs based on the philosophy of 'Jeong-Do Management.' We have set 13 goals and more targets according to the effects of LG Chem's business models on the UN SDGs by following the UN Compass Guideline. LG Chem regards this as a new business opportunity and will broaden the scope of sustainable development activities.

2 ZERO HUNGER
2.4



+ LG Chem enters the green bio market to present a solution to the food shortage issue

- LG Chem produces crop protection agents by promoting a seed business
- 25% market share in the domestic crop protection agent market
- Exported to about 20 overseas nations

3 GOOD HEALTH AND WELL-BEING
3.2 3.3



+ LG Chem enters the red bio market to enhance health of the humankind.

- LG Chem provides vaccines for infants through UNICEF.
- 'Euvax' vaccination for 20 years and over 200 million persons in 80 nations
- 'Eupenta' vaccination for 2 years and about 30 million persons

4 QUALITY EDUCATION
4.3 4.4



+ LG Chem increases educational opportunities by sharing its technical capacity.

- LG Chem conducts youth education programs every year.
- LG Chem finances the College Student Contest on Creativity and Innovation for Automotive Batteries.
- LG Chem operates the Junior Engineering School (R&D Campus).
- Chemistry Camp (7,200 persons, cumulative)
- Fun Chemistry Park (3,300 persons, cumulative)
- Selected 11 award winners for the Creativity and Innovation Contest (LGCCI)
- Junior Engineering School (9 times, 140 children at 3 children's centers)

5 GENDER EQUALITY
5.4 5.c



+ LG Chem supports women.

- LG Chem operates a female leader training program.
- LG Chem has a policy to provide maternity leave and childcare leave.
- The rate of female employees, managers, executives increased by 18%, 26%, 33% accordingly
- The rate of return after parental leave 96%

6 CLEAN WATER AND SANITATION
6.1



+ Settles the water shortage issue through water treatment businesses like RO filter

- Indirect effect on the shortage of water resources caused by business operation
- LG Chem develops high-flow RO filters for home uses.
- LG Chem is the sole distributor of RO filters for the 8 seawater desalination projects in 5 nations.

7 AFFORDABLE AND CLEAN ENERGY
7.2 7.3 7.a



+ LG Chem expands the supply of new and renewable energy to build sustainable cities and ecosystems.

- LG Chem contributes to the expansion of an eco-friendly ecosystem with automotive batteries.
- Construction of 'Power Plant for Green Hope' was started in the Jungnang Water Recycling Center.
- LG Chem has expanded installation of Energy Storage System (ESS) and improved energy technology DB.
- Sales and operating profit of the Energy Solutions Division increased by 143% and 724% compared to previous year
- 'Power Plant for Green Hope' with total power capacity of 622kW, equivalent to annual profit of KRW 60 million

8 DECENT WORK AND ECONOMIC GROWTH
8.3 8.5 8.8



+ Promotion of shared growth with supplier by fostering growth of corporation

+ Job creation in Korea

- LG Chem strengthens shared growth with suppliers by providing educational and financial support.
- LG Chem creates high-quality jobs.
- Use of the shared growth payment system (increased by 50% compared to previous year, providing KRW 1,036 billion to 1,377 suppliers)
- Operation of the Polymer Processing School (212 trainees of 59 suppliers)
- Financial support of suppliers (cumulative fund of KRW 13 billion)
- Domestic jobs increased by 97% compared to previous year and 98% rate of regular employees

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
9.1 9.4



+ LG Chem contributes to the creation of social infrastructures through eco-friendly processes.

- LG Chem operates the Genie Day Program.
- LGCCI operates the Love School Project.
- LG Chem conducts the Green Credit Project to help small and medium companies reduce greenhouse gas emission.
- Yeosu Plant sponsoring 14 regional children's centers
- Completed 13 Love School Projects (7 toilets, 1 water treatment facility and 5 libraries)

10 REDUCED INEQUALITIES



+ LG Chem reduces inequality through the protection of human rights.

- LG Chem prohibits discrimination and respects diversity of employees.
- Ratio of local talents among new administrative and technical employees: 33% (excluding talents from the capital area and overseas universities)

12 RESPONSIBLE CONSUMPTION AND PRODUCTION
12.5 12.6 12.a



- Managing chemicals produced in the manufacturing process

- Indirect effects on resource depletion

- LG Chem conducts education to strengthen product responsibility.
- LG Chem makes efforts to recycle waste water and wastes generated in the manufacturing process.
- LG Chem engages in shared growth energy businesses.
- Practical chemical substance education completed by 445 persons, chemical substance expert program completed by 53 persons, understanding of safety and environment by 30 persons and basic education by 24 persons
- Waste recycling rate increased by 8.3%p in Korea and 1.4%p in overseas
- Discovered about 300 energy saving items for 52 suppliers, reducing energy cost by KRW 4.6 billion per year

13 CLIMATE ACTION
13.1 13.3



- LG Chem manages direct and indirect effects on climate change and air pollution.

- LG Chem plans to reduce greenhouse gas emission to 37% of BAU by 2030.
- LG Chem engages in continuous environmental investment activities.
- Amount of domestic environmental investment increased by 155% compared to previous year

15 LIFE ON LAND



- LG Chem controls the effects on habitat destruction and ecosystem disturbance.

'Brighter Future, LG Chem's Green World'

- About 370 employees participated in Bamseom protection, opening of the Bamseom Eco Experience Center

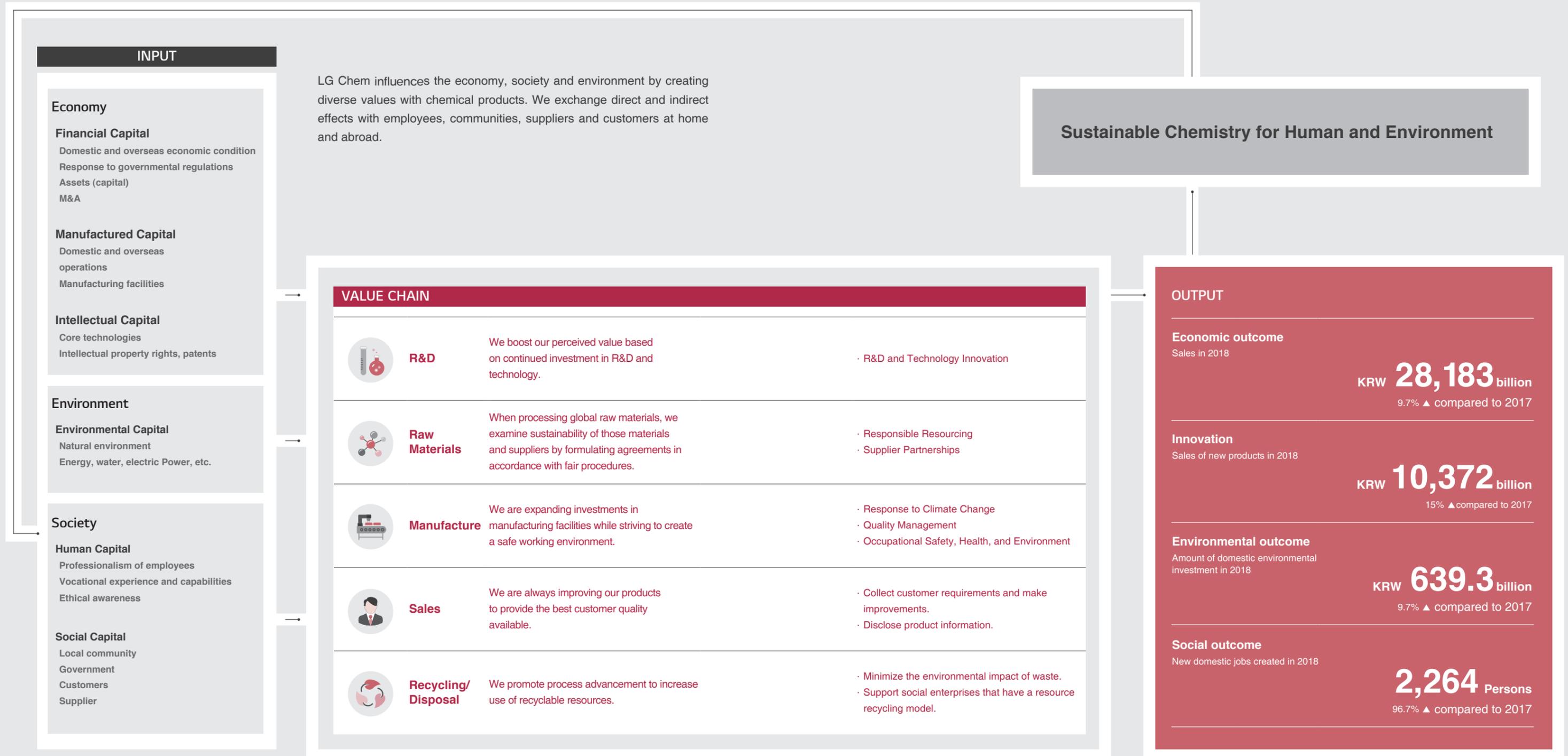
17 PARTNERSHIPS FOR THE GOALS
17.14 17.16 17.17



+ LG Chem manages indirect effects on sustainable development by cooperating with stakeholders.

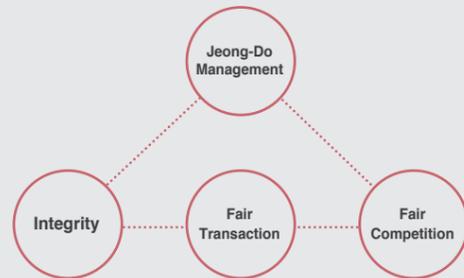
- LG Chem publishes sustainability reports (published 13 reports so far, starting with the 2006 report).
- LG Chem conducts global partnership activities for sustainable management.
- LG Chem has established the Due Diligence Policy (based on OECD standards) and participates in child labor issues through RCI activity related to the cobalt issue.
- LG Chem enhances partnership with various stakeholders.
- Activities of LG Chem include LG Social Campus (government ministries, academia, NGOs), Green Partnership Project (Community Chest of Korea, Seoul City, etc.) and Bamseom Biodiversity (Seoul City, NGOs).

Our Business Model



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.



Internalization of Jeong-Do Management
 LG Chem conducts periodic education on Jeong-Do Management for employees and suppliers. 'Jeong-Do Management Letters' are sent out to remind that the essence of Jeong-Do Management is in 'fair competition by cultivation of skills' and show the commitment of the management to practice Jeong-Do Management. We attracted attention of employees to Jeong-Do Management by reorganizing the Jeong-Do Management Portal and producing a web drama called 'Ethics Dictionary.' LG Chem is constantly practicing 'Jeong-Do Management in Daily Life' through 'Outreach Activities for Consensus Building' and 'Workshop for On-Site Issue Management.'

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.

Reporting System
 LG Jeong-Do Management has a 'Corruption Reporting System' to prevent violations of Jeong-Do Management such as corruption and bribery of employees. LG Chem strictly protects confidentiality of informants to prevent disadvantages. There is a 'Compensation System for Corruption Report' to reward informants. The win-win bulletin board is operated with suppliers to help resolve their grievances.

Corruption

Respond to Corruption (Unit: Case, persons, companies)	'16	'17	'18
Inspection by the Ethics Office	10	19	29
Persons punished	5	5	13
Closing transaction due to corruption	3	16	13

* Corruption: accepting bribes and embezzlement
 * Persons who received a severe disciplinary action for corruption or bribery (including domestic and overseas employees)

Compliance Management System
 With the increasing demand and legal regulation of corporate social responsibility, the scope of lawful management of LG Chem is expanding. LG Chem has been enforcing the compliance management standard since 2012 to promote fair and transparent business practices, ensure the sound development of the company, and gain trust of customers. We also operate the compliance management system to identify domestic and foreign laws that must be followed during business operations and to prevent employees from violating laws.

The compliance support and management activities of LG Chem are managed by the compliance officer appointed by the Board of Directors. The compliance officer evaluates the effectiveness of the compliance support and management system and reports to the Board of Directors. Legal Compliance Team is in operation to support the compliance officer.

Strengthening Compliance Education
 LG Chem develops and operates various compliance education programs for different positions and conducts annual online compliance education. Offline compliance education programs in 2018 included fair transaction, safety and environment, HR, anti-corruption and prevention of sexual harassment. Online education included 'Power Harassment and Communication' and 'Prevention of Sexual Harassment and Improvement of Awareness of Disabled Persons.' Online education for employees of LGCCI in China was on 'Importance of Compliance' and offline education was about anti-corruption regulations. In addition, LG Group distributes the LG Compliance Manual to help employees understand and respond to legal risks based on Jeong-Do Management.

Prevention of Compliance Risks
 LG Chem not only complies with global standards but also manages compliance of overseas corporations in order to minimize management risks and fulfill its social responsibility. 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.

Operating Fair Trade System
 LG Chem is operating self-compliance program for fair trade program to encourage fair trade and competition. With self-compliance program for fair trade program, LG Chem carries out preventative activities to comply with the law. Also 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. In addition, 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.

Self-Compliance Program for Fair Trade
 LG Chem tries to establish a fair-trade culture throughout the company by conducting self-compliance activities supervised by the team under the self-compliance manager. Legal education and practical guidelines are provided for purchase, production, sales, marketing, research and development. Hands-on workers and leaders (new team managers, division leaders, W/S, etc.) are educated periodically to effectively spread the self-compliance culture. The practical guidelines are revised and informed promptly to remove any blind spots in cartels, subcontracts, agencies and internal transactions. All employees make the 'Fair Trade Compliance Pledge' every year.

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 preidentification of abnormalities through a detailed analysis of leakage channels, along with security measures for all IT media, including PCs and emails. In addition, main business sites in South Korea such as Daejeon R&D Campus and Ochang Plant have secured global security levels by obtaining the ISO 27001 certification, the international standard for information security. We are expanding the scope of the security management system to major overseas production bases such as Nanjing and Poland.

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 Chem is 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

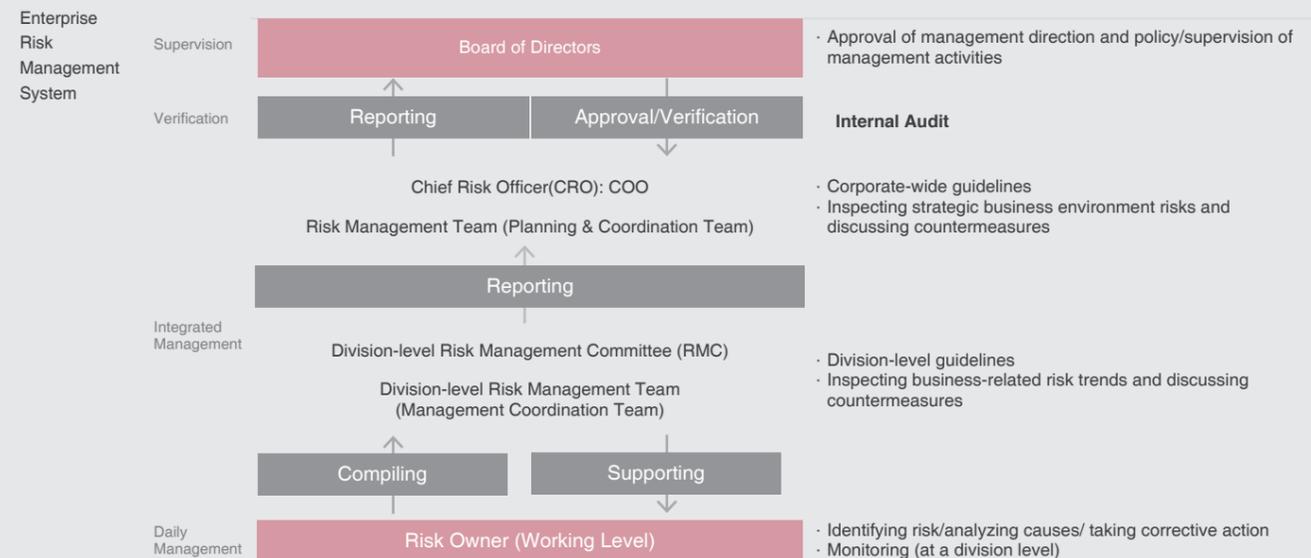
Company-wide Risk Management System
 LG Chem applies company-wide risk management divided into 3 stages including daily management of workers, integrated management by a risk management team, and supervision by the Board of Directors.
 The daily management stage is executed by workers and monitored by each business division to identify risks, analyze the cause and make corrections. In the integrated management stage, the Risk Management Committee (RMC) reviews risks of each division and provides a guideline for the risk management team to come up with countermeasures. The corporate guideline and risk response measures are discussed with the COO, the chief executive of risk management. The BOD is in charge of confirming final risk management decisions and supervising company-wide risk management activities.

Risk Identification and Management Activities
Identifying Risks LG Chem pinpoints risks in various areas by analyzing mid to long-term strategies and work processes of the company and conducting interviews. A weekly management system was implemented to respond to the business environment that changes rapidly. Key issues of each division are discussed at the monthly business management meetings with the COO. LG Chem check changes in the business environment before establishing mid to long-term strategies and business plans so as to prevent risks.

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.



	Risk Factors	Potential Impacts	Mitigating 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	-Strengthening of the high value-added product portfolio -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 production and business environment	Poor mid to long-term growth and inefficient resource operation can result from an inappropriate business portfolio	- 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
	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 -Organization and operation of a quality control team in each business division for optimal system-based quality control
	IT system management and information security	Businesses of LG Chem are managed by an IT system. Information leakage and data manipulation can have adverse effects on the manufacturing and logistics processes. Negligent management of internal information can lead to legal responsibilities and poor competitiveness.	- Maintain the company-wide information protection organization and operate an information protection association -Strengthening of the DB access control system -Education of employees on information security and data
	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
Finance		Global business expansion can be exposed to various risks such as market risk, credit risk and liquidity risk	-Risk management of each department according to the policy approved by the Management Committee -Preliminary identification and evaluation of financial risks through collaboration among hands-on departments
Social and 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	Developed nations are expanding the application of the global water management system. Trade barriers are increasing due to water footprint regulations, causing losses from limitation of export	- Strengthening the water resource inventory management system in domestic and overseas business sites

Independent Assurance Statement

LRQA Independent Assurance Statement

Relating to LG Chem, Ltd.'s Sustainability Report for the 2018 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 2018' ("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 AccountAbility Principles of Inclusivity, Materiality and Responsiveness
- ▶ Confirming that the report is in accordance with:
 - GRI Standards¹: Core option
- ▶ Evaluating the accuracy and reliability of data and information for only the selected indicators listed below:
 - GRI 200 (Economic): 201-1, 201-2, 202-2, 203-1, 203-2, 205-3, 206-1
 - GRI 300 (Environmental): 301-2, 303-1, 305-1, 305-2, 305-3, 305-4, 305-7
 - 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 from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of LG Chem.

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.
- ▶ Checking that the GRI Content Index allows stakeholders to access sustainability indicators.

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, LG Chem should take into more account differences among its various business sectors for better identifying and understanding sustainability topics in materiality process that may be relevant and significant to itself.
- ▶ Responsiveness:
 - LG Chem conducts due diligence on supply chain of minerals such as cobalt to evaluate the scope and nature of child labor risks and takes actions to avoid being complicit, in the non-legal context, in these activities.
- ▶ Reliability:
 - LG Chem has reliable data management systems for the indicators in the report.

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: 21st June 2019

LRQA reference: SEO00000269



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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¹ <https://www.globalreporting.org>

GRI Content Index

General Disclosures

GRI Standard	Disclosure	Page or URL	External	
GRI 102: General Standard Disclosures 2016	102-1	Name of the organization		
	102-2	Activities, brands, products, and services		
	102-3	Location of headquarters		
	102-4	Location of operations		
	102-5	Ownership and legal form		88
	102-6	Market served		89
	102-7	Scale of the organization		88~89
	102-8	Information on employees and other workers		75
	102-9	Supply chain		79~81, 56~57
	102-10	Significant changes to the organization and its supply chain		2~3
	102-11	Precautionary Principle or approach		34-37
	102-12	External initiatives		102
	102-13	Membership of associations		102
	102-14	Statement from senior decision-maker		4-5
	102-15	Key impacts, risks and opportunities		2-5
	102-16	Values, principles, standards, and norms of behavior		94~95, Code of conduct for suppliers
	102-17	Mechanisms for advice and concerns about ethics		94~95
	102-18	Governance structure		85~86
	102-20	Executive-level responsibility for economic, environmental, and social topics		86
	102-23	Report whether the Chair of the highest governance body is also an executive officer		85~86
	102-34	Nature and total number of critical concerns that were communicated to the highest governance body and the mechanism(s) used		86
	102-40	List of stakeholder groups		87
	102-41	Collective bargaining agreements		79
	102-42	Identifying and selecting stakeholders		87
	102-43	Approach to stakeholder engagement		87
	102-44	Key topics and concerns raised		8-11
	102-45	Entities included in the consolidated financial statements		Please refer to the homepage (https://www.lgchem.com/kr/investment-information/ir-report/business-report)
	102-46	Defining report content and topic Boundaries		11
	102-47	List of material topics		11
	102-48	Restatements of information		73-83
	102-49	Changes in reporting		9
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	103		
102-54	Claims of reporting in accordance with the GRI Standards	About this report		
102-55	GRI content index	98-101		
102-56	External assurance	98~99		

Material Topics

GRI Standard	Disclosure	Page or URL	External
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	92~93
	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	73-74
	201-2	Financial implications and other risks and opportunities due to climate change	34-45
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 202: Market Presence 2016	202-2	Proportion of senior management hired from the local community	78
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	60-61
	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	62-71
	203-2	Significant indirect economic impacts	
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	94~95
	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	94
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	94~95
	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*

* Not Applicable

Material Topics

GRI Standard	Disclosure	Page or URL	External
GRI 103: Management Approach 2016	103-1	30-31	
	103-2		
	103-3		
GRI 301: Materials 2016	301-2	82	
GRI 103: Management Approach 2016	103-1	30-31	
	103-2		
	103-3		
GRI 303: Water 2016	303-1	82	
GRI 103: Management Approach 2016	103-1	30-31, 83	
	103-2		
	103-3		
GRI 305: Emissions 2016	305-1	83	
	305-2		
	305-3		
	305-4		
	305-7		

Material Topics

GRI Standard	Disclosure	Page or URL	External
GRI 103: Management Approach 2016	103-1	51-52, 77	
	103-2		
	103-3		
GRI 401: Employment 2016	401-2	76	
GRI 103: Management Approach 2016	103-1	42-43	
	103-2		
	103-3		
GRI 403: Occupational Health and Safety 2016	403-2	78 (Injury rate without breakdown by gender)	
GRI 103: Management Approach 2016	103-1	77	
	103-2		
	103-3		
GRI 404: Training and Education 2016	404-1	77	
	404-2	77	
GRI 103: Management Approach 2016	103-1	52	
	103-2		
	103-3		
GRI 405: Diversity and Equal Opportunity 2016	405-2	75	
GRI 103: Management Approach 2016	103-1	50	
	103-2		
	103-3		
GRI 408: Child Labor 2016	408-1	50, 54-55	
GRI 103: Management Approach 2016	103-1	74	
	103-2		
	103-3		
GRI 415: Public Policy 2016	415-1	74	

Association and Principle

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
RCl (Responsible Cobalt Initiative)
Korea PC-BPA 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	

Contributors to Report Preparation

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

Overview	<p>LG Chem has been publishing Sustainability Report every year since 2006 by gathering opinions of stakeholders. The 13th Sustainability Report of 2018 provides detailed reports on sustainable management activities, performance and future plans for each topic based on materiality assessment.</p>
Reporting Principle	<p>This Sustainability Report complies with the Core Option in accordance with the Global Reporting Initiative (GRI) Standards, which is an international guideline for sustainability reporting. The report also complies with some of the principles and concepts provided by the International Integrated Reporting Council (IIRC). In addition, the report reflects the 10 principles of the UNGC, ISO 26000, and core requirements of the EICC. Financial information included in this report complies with the K-IFRS.</p>
Reporting Period	<p>This report covers activities of the company that occurred from January to December 2018. To enable time series analysis of major sustainable management performance, the report includes data from the past 3 years (2016~2018). The report also includes information from before 2018 or from 2019 that can have important effects on stakeholders.</p>
Reporting Scope	<p>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, LGCHP in Vietnam, LGCVZ in India, and LGCWR, LGCWA in Poland, etc. (except corporations founded and operated recently or in preparation during 2018). Economic data covers all consolidated companies. Some social and environmental data sets of a different reporting scope are indicated separately</p>
Independent Assurance	<p>To secure reliability of the report, DNV GL verified the report in accordance with the 3 principles (completeness, materiality, responsiveness) of AA1000AS (2008). The verification results are presented on page 98.</p>
Additional Information	<p>LG Chem publishes Sustainability Reports in Korean and English to increase accessibility of information for stakeholders. They are also available on the website of LG Chem.</p>



To minimize impact on environment and use of natural resources, spot color and coating are avoided, and soybean oil is used for printing process.